2009

A Qualitative case study of an NCAA division III female tennis player's self-regulation prior to, during, and after a singles tennis match

Lilyana T. Mladenova
Ithaca College

A QUALITATIVE CASE STUDY OF AN NCAA DIVISION III FEMALE TENNIS PLAYER'S SELF-REGULATION PRIOR TO, DURING, AND AFTER A SINGLES TENNIS MATCH

A Masters Thesis presented to the Faculty of the

Graduate Program in Exercise and Sport Sciences

Ithaca College

In partial fulfillment of the requirements for the degree

Master of Science

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by

Lilyana T. Mladenova

August 2009

Ithaca College
School of Health Sciences and Human Performances
Ithaca, New York

CERTIFICATE OF APPROVAL

MASTER OF SCIENCE THESIS

This is to certify that the Thesis of

Lilyana T. Mladenova

submitted in partial fulfillment of the requirements for the
degree of Master of Science in the School of
Health Sciences and Human Performance
at Ithaca College has been approved.

Thesis Adviser:

Committee Member:

Candidate:

Chair,
Graduate Program:

Dean of Graduate Studies:

Date: 8/21/09

ABSTRACT

The sport of tennis demands high physiological and psychological self-regulation (SR). To date, the existing research focuses on isolated self-regulatory techniques and strategies employed by tennis players in competitive and non-competitive settings (McPherson, 2000; Van Raalte, Brewer, Rivera, & Petitpas, 1994; Van Raalte, Cornelius, Hatten, & Brewer, 2000). However, little research exists to provide a holistic description of tennis players' SR during the three phases of a singles tennis match (i.e., preparation, performance, and reflection). To gain an in-depth understanding of the self-regulatory techniques and strategies used by a tennis player prior to, during, and after a singles match, an NCAA Division III female tennis player (n=1) was purposefully selected for the present case study. The player was observed while competing in two competitive tennis matches at the end of the 2007-2008 tennis season. The participant was then interviewed several days (i.e., 2 days and 5 days, respectively, for the first and the second interviews) following the completion of each of the observed matches. A third interview was conducted 5 days after the player competed in the NCAA Division III tennis tournament. Three higher-order themes emerged after comparing and integrating the higher-order themes from the three interviews. Results indicate that the player used a combination of techniques (e.g., breathing and relaxation techniques) and strategies (e.g., self-talk, imagery, problem solving, reappraising) to self-regulate. Overall, the findings from the present study corroborated the existing theoretical and empirical knowledge regarding athletes' use of self-regulatory techniques and strategies during a competition. Additionally, the present study extended the current empirical knowledge by providing insight on a tennis player's SR prior to and after a competition. Several conclusions are

discussed. Recommendations for future research and suggestions for practitioners are also presented.

TABLE OF CONTENTS

Page

TABLE OF CONTENTS (continued)

TABLE OF CONTENTS (continued)

TABLE OF CONTENTS (continued)

TABLE OF CONTENTS (continued)

Chapter Page

Chapter 1

INTRODUCTION

Performing consistently at one's best is a much desired and, at the same time, hard-to-achieve state. Peak performance is more likely to happen when athletes are able to match their abilities with the challenges of the competition (Krane & Williams, 2006; Miner, Shelley, & Henschen, 1999). Therefore, it is essential for athletes to manage stressful competitive encounters effectively and to maintain optimal emotional states before and during performance (Robazza, Bortoli, & Hanin, 2004; Robazza, Bortoli, & Nougier, 2000). An athlete's ability to respond to both internal and external demands of competition requires proper employment of self-regulation techniques and strategies.

Self-regulation (SR) has been defined as interrelated processes that enable individuals to manage their actions by using systematic monitoring, planning, and evaluating based on performance feedback and personal standards (Bedny, Seglin, & Meister, 2000; Cleary & Zimmerman, 2001; Karoly, 1993). Specifically, one maintains or changes affect, attention, thoughts, and behaviors by setting goals, monitoring progress, and adjusting goals and effort based on one's perceived self-efficacy (Bandura, 1997, 1999; Karoly, 1993). Through the process of SR, athletes are able to maintain and to enhance their performances by controlling arousal, effort, and focus according to the performance demands (Anshel & Porter, 1996; Samulski & Lima, 1998). Moreover, effective SR can positively influence performing motor skills under demanding circumstances (Singer, 2000) and prevent performance slumps (Anshel & Porter, 1996).

Athletes use a variety of techniques and strategies to (a) overcome stressful encounters during practice (Holt & Hogg, 2002) and competition (Nicholls, Holt,

Polman, & Bloomfield, 2006; Samulski & Lima, 1998) and (b) maintain optimal arousal before and during performance (Robazza, Pellizzari, & Hanin, 2004). By using breathing and relaxation techniques, athletes can increase their awareness of bodily responses and regulate the activation level according to the situational demands (Miner et al., 1999; Williams & Harris, 2006). To enhance confidence and to improve performance in practice and competition, many athletes employ cognitive techniques such as visualization, imagery, positive self-talk, thought stoppage, and cognitive restructuring (Miner et al., 1999; Vealey & Greenleaf, 2006; Zinsser, Bunker, & Williams, 2006). Finally, by using techniques and strategies for mastering concentration and attention control, athletes are more likely to effectively react and respond to environmental influences (Miner et al., 1999).

The quality of athletes' SR varies among skill levels (Anshel & Porter, 1996; Cleary & Zimmerman, 2001) and is often determined by athletes' goal setting (Gano, 2001; Kane, Baltes, & Moss, 2001; Williams, Donovan, & Dodge, 2000) and self-efficacy beliefs (Bandura, 1997, 1999). Specifically, through setting goals athletes create and maintain high performance standards (Kane et al., 2001; Williams et al., 2000) and self-regulate effectively after failure (Gano, 2001). Athletes' self-efficacy beliefs play a vital role in the process of goal setting as well as in the SR of their actions, thoughts, emotions, and motivation (Bandura, 1997, 1999). Finally, the quality of athletes' SR differs across skill levels (Anshel & Porter, 1996; Cleary & Zimmerman, 2001), perhaps due to differences in their knowledge about motor skills and their own abilities, as well as conceptualization of the task across expertise groups (Ferrari, Pinard, Reid, & Bouffard, 1991).

Tennis is a dynamic and complex sport where the outcome is determined by the combined influence of individual and environmental factors. The structure of a tennis match (i.e., constant alteration of high intensity effort and short breaks), as well as the scoring system (i.e., each point can be considered a mini-win or mini-loss) raise physiological and psychological demands on tennis players. There has been a great deal of research investigating isolated self-regulatory techniques employed by tennis players in competitive settings and during motor skill performances. The focus of this research has been on differences in the planning/cognitive strategies of tennis players (McPherson, 2000; McPherson & French, 1991), observable self-talk in competitive settings (Van Raalte et al., 1994, 2000), players' experiences with sport psychology (Gentner, 2004a, 2004b), assessment of performance enhancement strategies (DeFrancesco & Burke, 1997), and the development and implementation of psychological skills training programs for collegiate (Daw & Burton, 1994) and junior (Mamassis & Doganis, 2004) tennis players. Mamassis and Doganis (2004) suggested that it would be beneficial to study the dynamics of tennis players' somatic and cognitive anxiety during tennis matches, as well as the techniques used to adjust performance in accordance with the situational demands. Despite the evidence that tennis players self-regulate, to date little research has been conducted to provide an in-depth description of the self-regulatory techniques and strategies used by tennis players during competition. Therefore, it is essential to gain a thorough understanding about tennis players' SR. The present study attempted to extend the existing knowledge by providing a more comprehensive understanding of the combinations of self-regulatory techniques and strategies employed

by an NCAA Division III female tennis player while preparing for, competing in, and reflecting back upon a singles tennis match.

Purpose

The purpose of this study was to gain an in-depth understanding of the self-regulatory techniques and strategies used by an NCAA Division III female tennis player before, during, and after a singles tennis match.

Research Question

How does an NCAA Division III female tennis player self-regulate while preparing for, competing in, and reflecting back upon a singles tennis match?

Significance of the Study

Self-regulation (SR) is a complex phenomenon, and to comprehend it fully the use of a multidimensional approach is needed; therefore, both interviewing and observation were employed in the present study. A multidimensional approach allowed the researcher to (a) identify key moments in a tennis match, (b) examine the player's resulting emotional states and bodily symptoms, (c) identify the corresponding SR techniques and strategies used by the player, and (d) describe the player's perception of the effectiveness of the employed SR techniques and strategies.

Additionally, by comparing and contrasting the self-regulatory techniques and strategies employed throughout a match and across different matches, the researcher was able to (a) understand the antecedents and consequences of the tennis player's SR, (b) examine the changes that occurred within the self-regulatory techniques and strategies over time and across different contexts, and (c) determine if self-regulatory patterns were associated with particular circumstances.

The present study provides potential benefits for tennis coaches and players, as well as sport psychologists and consultants by providing a conceptual framework for assessing tennis players' performance-related requisites. This can further contribute to the development of performance enhancement programs, as well as help improve the stress management training process.

Assumptions

For the purpose of the present study, the following assumptions were made at the start of the investigation:

1. The participant would accurately describe her experiences in the situations upon which she was asked to reflect.
2. The match situations that were chosen for the purpose of the study, as well as the methodology used, allowed the researcher to answer the research question.

Delimitations

The delimitations of the present study were as follows:

1. This study was delimited to a NCAA Division III female tennis player.
2. This study was delimited to three competitive tennis matches.
3. This study was delimited to using qualitative methodology (i.e., retrospective interviewing and researcher observation).

Limitations

The limitations of the present study were as follows:

1. The study was limited to interviewing the player several days after the matches of interest.

2. The study was limited to the researcher's ability to conduct qualitative interviews and research.

Definition of Terms

The following terms are operationally defined for the purpose of this investigation:

1. Attributions- one's explanations of performance outcomes (i.e., success and failure) that further influence one's expectations, reactions, and motivation (Duda & Treasure, 2006; Weinberg & Gould, 2003).
2. Self-efficacy- one's perceived competence and ability to achieve desired performance attainments consistently and in the face of obstacles; one's self-efficacy beliefs play a vital role in the self-regulation of one's actions, thoughts, emotions, and motivation (Bandura, 1997).
3. Self-evaluation- evaluation of one's performance through comparison of intermittent and final results to self-set or imposed standards, which further impacts one's motivation and directs actions and behavior (Bandura, 1999; Bedny et al., 2000; Kitsantas & Zimmerman, 2002).
4. Self-monitoring- deliberate monitoring of one's responses (e.g., emotions, thoughts, behaviors) to external influences (e.g., situational demands, performance outcomes) for regulating one's actions (Bandura, 1999; Karoly, 1993; Kitsantas & Zimmerman, 2002).
5. Self-regulation (SR)- interrelated processes that enable an individual to manage his/her actions by using systematic monitoring, planning, and evaluating based on performance feedback and personal standards (Bedny et al., 2000; Cleary & Zimmerman, 2001; Karoly, 1993).

Chapter 2

REVIEW OF LITERATURE

The purpose of the present study was to gain an in-depth understanding of how an NCAA Division III female tennis player self-regulates while preparing for, competing in, and reflecting back upon a singles tennis match. This chapter outlines (a) the theoretical concepts of self-regulation, (b) self-regulation research in sport and exercise settings, (c) self-regulation research in tennis, and (d) quantitative and qualitative measures of self-regulation.

Theoretical Concepts of Self-Regulation

Self-Regulation as a Process

The process of SR has been described by several theorists and, to a certain extent, SR theories overlap and/or compliment one another. To outline a framework for the present study, a review of the theoretical concepts will be presented.

According to Bedny et al. (2000):

> Self-regulation provides flexibility and adaptiveness of human behaviour. People actively and purposefully select and interpret information about the environment and themselves, and develop a dynamic plan of performance and criteria of evaluation in order to optimize the strategies of activity performance (p. 201).

In other words, one actively manages his/her behavior and performance by (a) monitoring internal and external performance requisites, (b) developing adaptable plans for performance, and (c) evaluating intermittent and final outcomes according to previously set criteria.

Consistent with the activity theory, Bedny (1985, 1987) has developed a model of SR that attempts "to describe the different dynamic, functional mechanisms involved in performance" (Bedny et al., 2000, p. 196). The model is represented by several functional blocks that comprise the following SR stages: (a) goal formation and orientation, (b) execution, and (c) evaluation (Bedny et al., 2000). Similarly, Kanfer and Karoly's cybernetic model of SR consists of the processes of self-monitoring, self-evaluation, and self-consequation (self-rewarding and self-punishment) (as cited in Crews, 1993). Furthermore, Kirschenbaum and Wittrock's (1984) model of self-regulation consists of the following five processes: (a) problem identification—identifying disruptive performance behaviors (Anshel & Porter, 1996), (b) commitment—setting goals and developing specific plans for their accomplishment (Weinberg & Williams, 2006), (c) execution—initiating actions toward goal attainment (Weinberg & Williams, 2006), (d) environmental management—establishing a compatibility between athletes and environmental competitive influences (Anshel & Porter, 1996), and (e) generalization—maintaining changed behavior(s) over extended periods of time and across differing situations (Weinberg & Williams, 2006).

Crews (1993) acknowledged that Kirschenbaum and Wittrock's (1984) model reflects the person-environment interaction and encompasses all of the aspects of the individual (i.e., behavior, cognitions, affect, and physiology) at the conscious and subconscious levels. Ferrari et al. (1991) argued that Kirschenbaum and Wittrock's (1984) model of SR does not elaborate on how the executive factors—planning, monitoring, evaluating—can be used and controlled during an actual performance; they have suggested Lefebvre-Pinard and Pinard's (1985) model as one that provides further

insights into the cognitive aspect of one's SR. Lefebvre-Pinard and Pinard's (1985) model contains three main components:

(a) Habitual metacognitive knowledge, which is one's understanding of cognitive tasks and potential objectives, as well as the means of task accomplishment (i.e., cognitive and metacognitive strategies);

(b) Actual SR, which is realized through planning, monitoring, and evaluating prior to, during, and after performing cognitive tasks; and

(c) Actual outcome, which provides external feedback for validating internal feedback (as cited in Ferrari et al., 1991).

Bandura's (1997) social cognitive theory and Locke and Latham's (1990) theory of goal setting describe one's SR as a dynamic process that involves goal setting for creating goal-performance discrepancies based on feedback monitoring (Kane et al., 2001; Williams et al., 2000). According to Cleary and Zimmerman (2001), the existing self-regulatory models reveal the influence of certain processes on athletes' motivation and ability to self-regulate thoughts, emotions, behaviors, and performance. Moreover, the social cognitive model of SR affirms three cyclically interrelated microanalytic phases:

(a) Forethought phase, which is realized through goal setting, strategy choice, and self-efficacy prior to performing a motor task;

(b) Performance control, which is realized through strategy employment and self-monitoring while performing a motor task; and

(c) Self-reflection phase, which is realized through self-evaluation, causal attributions, and self-satisfaction after each performance attempt (Cleary & Zimmerman, 2001).

In sum, through the process of SR one effectively responds to a particular situation. One's SR can be presented as a three-phase process where the goal is the achievement of a balance between the environment (sport/non-sport context) and the individual (athlete/non-athlete). The three-phase process encompasses: (a) assessment, (b) approach, and (c) appraisal.

The first phase is represented by the athlete's assessment of (a) the environmental demands (i.e., task at hand, disturbing and/or maladaptive behaviors, cognitions, and emotions), and (b) his/her reaction and necessary response for meeting these demands. There is almost always an imbalance, positive or negative, between the environmental demands and one's reaction and responses to these demands. To restore the balance an athlete must set goal(s), develop strategies, and/or employ balancing techniques. After the athlete's action(s), s/he assesses whether or not there is a balance between him/herself and the environment; here the environment is represented by the outcome of the athlete's actions. Whether the outcome is compatible to the athlete's personal standards and/or expectations creates two possible scenarios:

(a) balance: the goal is accomplished and/or the athlete is satisfied with the result, in which case the athlete can reuse the strategies or techniques when s/he encounters the same or a similar situation; or

(b) imbalance: the goal has not been accomplished and/or the athlete is not satisfied with the result, in which case the cycle must start over. The SR process enables

the athlete to monitor and make the necessary adjustments in each one of the three phases: assessment, approach, and appraisal.

Self-Regulation Components

As it can be inferred from the aforementioned theoretical perspectives on SR, one's SR is a complex process, which includes components, such as self-monitoring, goal setting, techniques and strategies, self-evaluation, and new experience.

Self-Monitoring. One can self-regulate effectively when she self-monitors her thoughts and performances, the conditions in which they occur, as well as the intermittent and final outcomes (Bandura, 1999). Moreover, athletes' awareness of performance deficiencies and a further recognition of possible and desirable change(s) initiate action and foster athletes' responsibility for increasing commitment toward performance enhancement (Anshel & Porter, 1996; Weinberg & Williams, 2006).

Goal Setting. Goal setting or goal acceptance is impacted by an individual's perception of the significance and difficulty of the task at hand (Bedny et al., 2000). According to the social cognitive theory, one's goals are internal standards that determine the requisites for one's affirmative self-evaluation (Williams et al., 2000). Therefore, personal goals regulate one's motivation and action through self-reactive influences (e.g., perceived self-efficacy, self-satisfaction/dissatisfaction) (Bandura, 1997). People self-regulate by (a) creating goal-performance discrepancies—discrepancy production—and (b) consequently adjusting the effort they put forth to achieve the desired performance(s)—discrepancy reductions (Bandura, 1997). The effectiveness of one's goals in performance regulation is determined by the specificity, difficulty, and proximity of the goals set (Bandura, 1997; Locke & Latham, 1984). Overall, SR as a process is

centered on enhancing performance: athletes set personal goals to create and to maintain high personal standards as a means for increasing motivation and working toward elevating their performances (Williams et al., 2000).

Techniques and Strategies. Employing SR techniques enables athletes to control and direct their cognitive patterns, emotional states, and physiological responses (Singer, 2000). Controlling the aforementioned aspects of athletic performance simultaneously is a requisite for performance enhancement (Miner et al., 1999). The strategies and techniques for exerting control over the three components of athletic performance have been categorized as physical control, environmental control, and cognitive control (Miner et al., 1999).

(a) Physical control. Based on the mind-body connection, through techniques, such as centered breathing, progressive relaxation, and autogenic training, an athlete adjusts—increases or decreases—his/her activation level to reach the optimal level corresponding to the demands of the situation (Miner et al., 1999). In addition, these techniques increase the athlete's awareness of his/her bodily responses, which causes the athlete to regulate consciously (Williams & Harris, 2006).

(b) Environmental control. By using techniques and strategies for mastering concentration and attention control, athletes effectively react and respond to environmental influences (Miner et al., 1999).

(c) Cognitive control. By using cognitive techniques and strategies—visualization, imagery, positive self-talk, thought stoppage, cognitive restructuring, positive affirmations, and positive expectancies—athletes enhance their confidence and

subsequently improve performance while practicing and competing (Miner et al., 1999; Vealey & Greenleaf, 2006; Zinsser et al., 2006).

Furthermore, investigators of sport psychology (e.g., Holt & Hogg, 2002; Nicholls, Holt, & Polman, 2005; Nicholls et al., 2006; Nicholls, Holt, Polman, & James, 2005) have adopted the following categorization of coping styles when assessing athletes' coping responses:

(a) Problem-focused coping, which involves strategies to manage or alter the problem that is causing stress (e.g., goal setting, problem solving, information gathering);

(b) Emotion-focused coping, which involves strategies to regulate the emotional responses that result from a stressor (e.g., relaxation, meditation, cognitive restructuring);

(c) Avoidance coping, which involves behavioral and psychological disengagement from a stressful situation (e.g., blocking, walking away); and

(d) Appraisal-reappraisal, which involves assessing the effectiveness of the employed coping techniques.

In sum, there are different classifications of self-regulatory techniques and strategies depending upon the perspective of the researchers. In addition, one can modify and/or develop one's own techniques or strategies to achieve and to maintain optimal physical and mental readiness (Nitsch & Hackfort, 1979, as cited in Samulski & Lima, 1998).

Self-Evaluation. According to Bandura (1999), "self-evaluation gives direction to behavior and creates motivators for it" (p. 176). One self-evaluates by comparing intermittent and final performance attainments to internal standards, which were previously set based on one's past experiences, social comparison, and the significance of

the task (Bedny et al., 2000). Additionally, in the process of setting standards for performance attainment, one determines the deviations in the self-set standards that will be accepted in progressing toward one's performance (Bedny et al., 2000).

New Experience. The main purpose of the process of SR is not only attainment of a particular goal, but also "formation of an experience of goal achievement" (Bedny et al., 2000, p. 201).

In conclusion, the process of SR consists of several components (i.e., self-monitoring, goal setting, techniques and strategies, self-evaluation, and new experience) that are functionally interrelated. Therefore, to comprehend one's SR in sport and exercise settings, SR should be regarded as a process.

Self-Regulation Research in Sport and Exercise Settings

Self-Regulation During Motor Skill Acquisition and Practice

There is a great deal of research on the self-regulatory processes during motor skill acquisition and practice (e.g., Cleary & Zimmerman, 2001; Cleary, Zimmerman, & Keating, 2006; Ferrari at al., 1991; Kermarrec, Todorovich, & Fleming, 2004; Kitsantas & Zimmerman, 1998, 2002). In several experimental studies, Cleary and Zimmerman (2001) and Kitsantas and Zimmerman (2002) showed that employing goal setting, performance strategies, and self-evaluation was beneficial for individuals when acquiring or practicing motor skills. Moreover, these researchers provided further support to the contention that one's SR phases—forethought, performance, and self-reflection—were cyclically interrelated. These researchers also found that the processes within the aforementioned phases (goal setting, strategy choice, self-efficacy, and causal attributions) were considerably related. Additionally, these researchers examined

significant differences across skill groups; in short, more experts used SR processes during practice and had a higher quality of SR than non-experts and/or novices. According to Ferrari et al. (1991), experts regulate their own performance more efficiently than novices, perhaps because of their elaborate knowledge about motor skills and their own abilities, as well as their better conceptualization of the task. Therefore, individual differences of one's SR might be a substantial contributor to mastering a motor skill (Ferrari et al., 1991) as well as a predictor of sport success (Kitsantas & Zimmerman, 2002).

Kitsantas and Zimmerman (1998) also discussed the effect of different types of strategies, goals, and self-regulative recording on the acquisition of novel motor skills. These researchers concluded that high school students who used analytic strategies, set dynamic goals, and self-evaluated exhibited superior acquisition of dart skills than the students who used the contrasting components (i.e., imaginal strategies, fixed goals, and absence of self-evaluation).

Continuing in this line of research, Kitsantas, Zimmerman, and Cleary (2000) studied the influence of modeling and social feedback on acquisition of dart-throwing skills in female high school students. These researchers concluded that using coping models that showed a gradual improvement of skill execution during the initial stages of learning was beneficial for students' motor skill acquisition, self-regulatory skills, and self-motivation. For instance, girls who were exposed to a coping model attributed their mistakes to strategy limitations, whereas girls who were exposed to either a mastery model or no model tended to attribute their mistakes to inability or a lack of effort. In addition, these researchers concluded that social feedback improved the effectiveness of

learning and enhanced learners' self-motivation. In line with these findings, Clark and Ste-Marie (2007) found that self-modeling (i.e., viewing one's best performance of a skill) enhanced young swimmers' self-regulation and their performance while learning. Similarly, in a qualitative study, Rymal and Ste-Marie (2007) explored that self-modeling had a positive influence on divers' self-regulatory processes within a competitive environment.

In a descriptive study, Kermarrec et al. (2004) found that physical education students employed six learning strategies, seven management strategies, and four types of epistemological knowledge while learning a novel motor task. From these findings, the researchers developed three different models of SR: (a) training or repeating: managing motivation, time, and situation, and activating knowledge about situations; (b) using verbal interactions: thinking and understanding, listening to verbal instructions, and seeking help from peers and/or teachers; and (c) associating nonverbal information: looking at and imitating, visualizing and imagining, focusing attention, managing attention, and reducing peer interactions, and having self-evaluative knowledge.

Finally, Frey, Laguna, and Ravizza (2003) found that NCAA Division I baseball and softball players used more mental skills in competition than in practice. These researchers partially explained this with the coaches' dismissive attitude toward the use of mental skills in practice, and athletes' lack of understanding about the benefits of such use and/or unwillingness to put forth more effort in practice. Frey et al. (2003) further suggested that qualitative studies could shed more light on this matter, and provide practitioners with an understanding of how to promote more efficient mental skills training in practice.

Employing SR techniques and strategies enhances one's acquiring and mastering of motor skills; the type and the quality of one's SR processes vary depending upon one's skill level and/or individual characteristics (Cleary & Zimmerman, 2001; Ferrari at al., 1991; Kermarrec et al., 2004; Kitsantas & Zimmerman, 1998, 2002). However, using mental skills in practice seems to be somewhat overlooked by coaches and athletes in non-experimental, practice settings (Frey et al., 2003).

Self-Regulation During Competition

There are few studies within the sport psychology literature that examine athletes' SR during competition. However, much is written in terms of examining athletes' coping with stress, as well as defining the arousal-performance relationship, which can be viewed as subcomponents to the process of SR. Therefore, it is important to review these two areas of research as well.

Self-Regulation as a Process. Anshel and Porter (1996) used Kirschenbaum and Wittrock's (1984) SR model to compare and contrast the self-regulatory characteristics of Australian swimmers across skill level and gender. These researchers found that elite athletes exhibited a higher quality SR than non-elite athletes. To begin with, non-elite swimmers doubted their abilities, experienced negative somatic symptoms, and responded negatively to insignificant distracters before a race more so than did elite swimmers. Moreover, elite athletes showed greater commitment, set more process goals, and closely followed their training programs. Finally, these researchers detected more differences across gender on the non-elite level than on the elite level. Even though elite and non-elite swimmers differed significantly in several SR components, Anshel and Porter (1996) concluded that the results from their study are an indication of a deficient

use of SR strategies at the elite level, and further suggested a need for implementation of SR training for these swimmers.

The need for developing specific SR techniques for overcoming critical situations during a competition was also suggested by Samulski and Lima (1998). These authors examined the SR techniques used by Brazilian table tennis players and concluded that cognitive techniques (e.g., self-talk, imagery, and re-evaluation of the problem) are more efficient when the immediate result (after each critical situation) has been considered. However, the observed female athletes in the study used more motor techniques to self-regulate, such as slow controlled breathing, bouncing the ball repeatedly on the floor, and successive jumps. These researchers suggested additional studies on how individual and intercultural differences might influence the efficacy of SR techniques and players' perception of stressful situations during a table tennis match. Extending these findings, Kim and Duda (2003) and Puente-Diaz and Anshel (2005) also observed differences in athletes' perceived controllability and subsequent use of coping strategies when comparing athletes of different cultural backgrounds.

Coping With Competitive Stressors. Coping with competition-related stressors has been examined extensively. The focus of this research often centers on studying the coping process (Anshel, 2001; Kim & Duda, 2003; Nicholls et al., 2006) as well as determining the influence of personal and/or situational factors impacting athletes' selection and effectiveness of coping strategies used (Anshel & Anderson, 2002; Anshel, Raviv, & Jamieson, 2001; Hammermeister & Burton, 2004). A theoretical framework for most of these studies has been the transactional process prospective, which conceptualizes coping as a result of the interaction between an individual's situational

appraisal and his/her coping responses (see Dugdale, Eklund, & Gordon, 2002; Lazarus & Folkman, 1984; Nicholls, Holt, & Polman, 2005 for review). According to this prospective, when an individual encounters a particular situation, he evaluates the significance of the situation (i.e., primary appraisal) after which he assesses the available coping resources (i.e., secondary appraisal), or what he can do to overcome the stressful situation. The coping responses are generally categorized into problem-focused (e.g., goal setting, increasing effort, etc.) and emotion-focused coping (e.g., relaxation, acceptance, wishful thinking, etc.).

Anshel (2001) proposed and further validated a model that described the coping process following stressful sporting events. The model consisted of three components: (a) cognitive appraisal (i.e., athlete's perception of an event as stressful), (b) use of (behavioral and cognitive) coping strategies, and (c) post-coping cognitions and behaviors (i.e., remaining on task, engaging in cognitive appraisal of the stressor, self-examining coping effectiveness, etc.). The author acknowledged that this coping model, "features different stages of the coping process in response to different sources of acute stress experienced during the sport contest and immediately after a stressful event" (p. 232). Furthermore, Anshel (2001) recommended in-depth future research for better understanding of the coping process and improving coping effectiveness in sport.

Several researchers have conducted descriptive studies to examine how athletes manage the stressful situations they encounter in practice and competition (Dugdale et al., 2002; Holt & Hogg, 2002; Nicholls, Holt, & Polman, 2005; Nicholls, Holt, Polman, & James, 2005; Nicholls et al., 2006). It has been acknowledged that athletes often use a combination of strategies to effectively cope with competitive stress. In addition,

particular athletes (i.e., golfers and rugby players) generally use more coping strategies when they experience a greater number of stressors (Nicholls, Holt, Polman, & James, 2005; Nicholls et al., 2006).

In one of the few qualitative studies to date, Holt and Hogg (2002) showed that there were both similarities and differences between the coping strategies used by athletes from team and individual sports. Specifically, these researchers presented the case of a national soccer team and outlined players' perceptions of stress and coping during their preparation for the World Cup finals. Holt and Hogg (2002) classified the coping strategies into four main themes: (a) reappraisal (positive self-talk, problem solving, remembering past successes), (b) social support from teammates, family, and significant others, (c) performance behaviors (on-field task communication, good warm-up/start), and (d) blocking out irrelevant stimuli and coaches. These researchers concluded that the soccer players used various coping strategies and further acknowledged that "it was not clear how the perceived effectiveness of these strategies influenced their emotional coping" (p. 269).

In a phenomenological study, Nicholls, Holt, and Polman (2005) reported that international golfers perceived that using a combination of (a) cognitive strategies, such as rationalizing, reappraising, blocking, and positive self-talk, (b) behavioral strategies, such as following a routine, and (c) emotionally-oriented strategies, such as breathing exercises, physical relaxation, and seeking on-course support was effective in coping with competition-related stressors. In contrast, the golfers perceived that they had coped ineffectively when they changed their routine, tried too hard, sped up, had negative thoughts, and did not deploy coping skills.

Furthermore, researchers (Nicholls, Holt, Polman, & James, 2005; Nicholls et al., 2006) have concluded that athletes often use more problem-focused than emotion-focused and avoidance strategies. Additionally, Amiot, Gaudreau, and Blanchard (2004) found that self-motivated athletes were more likely to use task-oriented coping strategies during competition and to have a positive perception of their goal attainment. In contrast, non-self-motivated athletes were more likely to use disengagement-oriented strategies, have a negative perception of goal attainment, and experience increased negative affect from pre- to post competition (Amiot et al., 2004). However, findings regarding the effectiveness of the different types of coping strategies (problem-focused vs. emotion-focused and avoidance coping) are controversial.

Researchers (Amiot et al., 2004; Anshel & Anderson, 2002; Anshel et al., 2001; Wang, Marchant, & Morris, 2004) have generally acknowledged that athletes' use of coping strategies is determined by the combined influence of personal factors (e.g., coping style, cognitive appraisal, emotional responses, self-determination, and goal attainment) and situational factors (i.e., type and intensity of stressor). Anshel et al. (2001) studied how male and female athletes interpreted and coped with stress during competition and concluded that athletes' cognitive appraisal of stressful events influenced their subsequent use of coping strategies; the type of appraisal varied depending upon the type of stressful situation. In addition, Dugdale et al. (2002) found that athletes perceived unexpected stressors as more threatening than expected stressors in a study of elite athletes' appraisal and coping. Also, the athletes in this study indicated that they had employed a variety of strategies (e.g., acceptance, increasing effort, planning, thought

suppression, and social support). However, there were no significant differences in the coping strategy used with expected versus unexpected stressors (Dugdale et al., 2002).

Kim and Duda (2003) found that when stressful situations were appraised as controllable, both Korean and US athletes were more likely to use active/cognitive restructuring and emotional calming-focused strategies. Furthermore, in a cross-gender study, Hammermeister and Burton (2004) established that female and male endurance athletes perceived similar types of threat and in the same manner. However, females reported that they had less control over environmental threats than did males. Moreover, female athletes used more emotion-focused coping strategies (e.g., positive reinterpretation, emotional social support, and dissociation), whereas males used more problem-focused strategies. As these authors acknowledged, these findings supported Lazarus' (1999) suggestion that emotion-focused strategies should be employed when facing uncontrollable stressors, whereas problem-focused strategies be used with controllable stressors (Hammermeister & Burton, 2004). In addition, Hammermeister and Burton (2001) found that highly anxious endurance athletes exhibited lower perceived control and used fewer coping strategies, while, at the same time, less anxious athletes reported lower perceived threat, higher perceived control, and used more coping strategies. Therefore, these researchers concluded that coping resources should be compatible to the players' threat and control profile for effective coping. Additionally, Wang et al. (2004) examined the relationship between athletes' coping style and their state anxiety and susceptibility to choking in the sport of basketball. These researchers discovered that athletes who used avoidance coping styles perceived lower levels of threat in pressure situations, while athletes who used approach coping strategies

perceived higher levels of threat; the latter athletes were more likely to perform poorly, or to choke under pressure. In contrast, Anshel and Anderson (2002) found that table tennis players who predominantly used approach coping strategies had better performance than players who used more avoidance coping strategies. These authors concluded that coping effectiveness is a function of both task and situational demands.

Mental Strategies: Arousal-Performance Relationship. Gould, Eklund, and Jackson (1992a, 1992b) studied the thoughts, affect, and use of mental strategies in Olympic wrestlers before and during their best, worst, and crucial performances by using retrospective interviewing. These researchers found that wrestlers performed at their best when they had positive expectations, maintained optimal arousal, sustained effort and commitment, and employed mental preparation strategies prior to and during competition. In contrast, the worst performances were associated with negative feelings and thoughts, as well as deficiencies in mental preparation strategies. As Gould et al. (1992a) acknowledged, medalist more so than non-medalist wrestlers used mental strategies consistently, regardless of the match situation. Furthermore, medalist wrestlers (or wrestlers describing their best match) described their pre-match states with high emotional intensities and yet also high confidence. In contrast, non-medalists (or wrestlers describing their worst match) experienced high intensity levels before competition, but not high confidence. These researchers concluded that the relationship between arousal and athletic performance is a function of both emotional intensity and its interpretation by the athlete (Gould et al., 1992a).

Robazza and colleagues studied the emotion-performance relationship in elite and non-elite athletes (Robazza & Bortoli, 2003), rugby players (D'Urso, Petrosso, &

Robazza, 2002), high-level karate athletes (Robazza, Bortoli, & Hanin, 2004), and an elite archer (Robazza et al., 2000). The framework for these studies was the Individual Zone of Optimal Functioning (IZOF) model: "each individual performs at his or her best when an optimal arousal or anxiety level is reached" (D'Urso et al., 2002, p. 174). One's perception of the intensity and the meaning of the experienced emotion determines the effect (i.e., facilitative or debilitative) that this emotion will have on one's performance (Robazza et al., 2000). Moreover, there is a bidirectional relationship between emotion and performance that can be revealed by a "performer's attribution in response to a situation, focusing on the effects of performance upon emotions" (D'Urso et al., 2002, p. 189). Therefore, D'Urso et al. (2002) suggested that future research explore athletes' individual performance-related psychobiosocial states (i.e., cognitive, affective, motivational, bodily-somatic, psychomotor, performance, and communication). The latter are multidimensional descriptions of one's "situational subjective experiences related to performance" (Robazza & Bortoli, 2003, p. 173). Furthermore, multimodal SR interventions should be implemented to address one or more of the components of one's psychobiosocial states based on the athletes' individual needs and sport-specific demands (D'Urso et al., 2002). Athletes' awareness of their optimal and dysfunctional emotional states and bodily symptoms prior to, during, and after competition is essential for the implementation of SR interventions (Robazza, Bortoli, & Hanin, 2004).

In conclusion, athletes use a variety of SR techniques and strategies to achieve optimal emotional states prior to and during performance, to sustain effort, and to overcome stressful encounters (Dugdale et al., 2002; Gould et al., 1992a, 1992b; Holt & Hogg, 2002; Nicholls, Holt, & Polman, 2005). However, there is a need for more

consistent utilization of such techniques and strategies (Anshel & Porter, 1996; Samulski & Lima, 1998).

Self-Regulation Training

Robazza, Pellizzari, and Hanin (2004), using a multiple baseline single-subject design, identified and further developed an emotional SR program for eight elite Italian athletes. The individualized procedures were implemented to help these athletes manage their pre-competitive emotions and somatic symptoms more effectively. From the results of the study and the social validation interviews, these researchers concluded that the treatment was effective for the majority of the participants. In addition, most of the athletes reported that their performances had also improved.

Similarly, Prapavessis, Grove, McNair, and Cable (1992) tested the effectiveness of a cognitive-behavioral intervention for reducing state anxiety and improving sport performance. A six-week SR training consisting of relaxation, thought stoppage, refocusing, coping statements, and biofeedback was provided to a small-bore rifle shooter. These researchers concluded that the treatment was effective and acknowledged that the effectiveness of such interventions be enhanced by addressing the needs of a particular athlete and providing enough time for the target behaviors to be well learned. In addition, Prapavessis et al. (1992) advocated simulating one's performance conditions in training and testing.

Research that examines the effectiveness of mental skills training programs also contributes to this discussion. For example, researchers have concluded that mental skills training packages including goal setting, relaxation, imagery, and self-talk contributed to enhancing gymnasium triathlon performances (Thelwell & Greenlees, 2001, 2003) and

equestrian performances (Blakeslee & Goff, 2007). In addition, researchers used a single-subject multiple-baseline-across-subject design to study the effectiveness of psychological skill interventions designed to meet the sport-specific requirements of soccer midfielders (Thelwell, Greenlees, & Weston, 2006) and ice hockey goaltenders (Rogerson & Hrycaiko, 2002). These researchers have concluded that the treatments were effective and further suggested the need for more research on the effectiveness of athletes' use of mental skills during actual competition (Rogerson & Hrycaiko, 2002; Thelwell et al., 2006).

To conclude, SR or mental training programs are deemed to be beneficial for athletes when they are designed to address sport-specific and/or individual-specific factors (Prapavessis et al., 1992; Rogerson & Hrycaiko, 2002; Thelwell et al., 2006).

Self-Regulation Research in Tennis

To date, the studies examining the self-regulatory strategies and/or techniques employed by tennis players during actual tennis matches are limited. However, there has been a great deal of research investigating isolated self-regulatory techniques employed by tennis players in competitive settings and during motor skill performances (McPherson, 2000; Van Raalte et al., 1994, 2000).

Some research has focused on differences in the planning/cognitive strategies in tennis players and learners (Davies & Housner, 2004; Lee, Landin, & Carter, 1992; McPherson, 2000; McPherson & French, 1991). For example, McPherson (2000) found that for expert and novice tennis players there was a discrepancy in the quality and elaboration of the cognitive strategies used between points in a simulated tennis match. The expert collegiate tennis players, more so than novice tennis players, extensively

planned their actions based on constant monitoring of past and current context-specific conditions and anticipating future events. Moreover, the experts and novices differed considerably in the content of the reactive statements they generated during competition. While the novices' reactive statements were mainly maladaptive expressions of their emotions, the experts' statements were self-thoughts used to positively alter their emotions, and/or maintain proper concentration (McPherson, 2000).

Additional SR tennis research has examined the self-talk employed by adult (Van Raalte et al., 2000) and junior (Van Raalte et al., 1994) tennis players in competitive settings. These researchers have found that both adult and junior tennis players use substantial self-talk (instructional, positive, and negative) while in play; moreover, the self-talk employed by some players is often negative in tone. However, players tended to compliment their opponents rather than abusing them after a successful play. Van Raalte et al. (2000) partially explained this as a result of the players' admiration for their opponents' play, a consequence of the players attempt to stop the pressure, or an indication of some player's undermined confidence. Finally, results from these two studies were not consistent when the relationship between sport outcomes and tennis players' self-talk was considered (Van Raalte et al., 1994, 2000). Thus, these researchers have concluded that the match circumstances, to some extent, contribute to the generation of self-talk, which subsequently influences the competitive sport outcomes. However, Van Raalte et al. (2000) argued that personality characteristics likely affect players' self-talk as well.

Another important area in the SR tennis research rests in assessing performance enhancement strategies (DeFrancesco & Burke, 1997) and implementing psychological

skills training programs for collegiate (Daw & Burton, 1994) and junior (Mamassis & Doganis, 2004) tennis players. To begin with, DeFrancesco and Burke (1997) studied the performance enhancement strategies employed by tennis players who competed in the 1992 Lipton Tennis Tournament. They found that professional tennis players commonly used imagery, relaxation, goal setting, self-talk, and preparatory routines before the serve or serve reception. In addition, the strategy selection and use were not attributed to personal, social, or skill level differences. Moreover, most of the athletes predominantly used these strategies before and during competition, while only 26% of the interviewed players used strategies following competition. However, top-20-ranked players acknowledged the benefits of psychological strategies for their tennis performance more so than lower-ranked players (DeFrancesco & Burke, 1997).

Researchers have also assessed the effects of mental training programs with collegiate (Daw & Burton, 1994) and junior (Mamassis & Doganis, 2004) tennis players. The results from these studies indicate that possessing and employing a combination of psychological skills (e.g., goal setting, positive thinking, self-talk, arousal regulation techniques, and imagery) has a positive impact on tennis players' performances. Moreover, Daw and Burton (1994) concluded that some players benefit more from the psychological skills training than other players and further explained the differences as a result of a player's level of commitment to his/her mental training programs.

Finally, Gentner (2004a, 2004b), in two phenomenological studies, attempted to gain more insight into professional tennis players' personal experiences when utilizing sport psychology skills and training. As the author acknowledged, it is essential for practitioners to realize the importance of understanding the individual player's needs,

past experiences, and expectations when providing them with the most effective services and treatments (Gentner, 2004b). In both case studies, the main themes related to the players' positive experiences with sport psychology consultants were (a) seeking happiness and satisfaction with one's performance, (b) focusing on the moment and positive experiences and then utilizing them in prospective situations, (c) anticipating and preparing for the upcoming match, and (d) using visualization for event-specific preparation and building confidence (Gentner, 2004a, 2004b). Furthermore, both tennis players experienced burnout, and for one of them, sport psychology played a vital role in his recovery (Gentner, 2004b). Put in a slightly different perspective, through psychological interventions, sport psychology practitioners can help identify athletes' goals and potentially help them to enhance their performances by employing approaches that best fit each player's personal needs.

Quantitative and Qualitative Measures of Self-Regulation

Questionnaires/Scales

Several researchers have used questionnaires for measuring one's self-regulatory processes and techniques (Anshel & Porter, 1996; DeFrancesco & Burke, 1997; Morossanova, 2003). Morossanova (2003) used a "Self-Regulation Profile Questionnaire" to study the individual self-regulatory styles applied by students aged 16-18 years. The 46 statements on the questionnaire are divided into six scales:

(a) Planning, which assesses how one has set goals hierarchically, realistically, and independently;

(b) Modeling, which assesses one's ability to single out meaningful conditions for goal accomplishment;

(c) Programming, which assesses one's ability to deliberately program his/her own actions, as well as the complexity and flexibility of such actions;

(d) Result evaluation, which assesses one's ability to adequately and independently evaluate and correct the results of his/her own activity, as well as one's ability to formulate and sustain subjective criteria for success;

(e) Flexibility, which assesses one's ability to rebuild the SR system when changes in conditions occur;

(f) Independence, which assesses one's ability to independently plan, execute, control, analyze, and evaluate his/her activity and behaviors; and

(g) General level of SR, which is the overall measurement of the six aforementioned scales, and assesses one's ability to consciously self-regulate voluntary activity (Morossanova, 2003).

In a sport setting, Anshel and Porter (1996) tested the Kirschenbaum and Wittrock's (1984) SR model with Australian competitive swimmers. Their survey consisted of 100 questions relating to five components of the model (i.e., problem identification, commitment, execution, environment management, and generalization): With this survey, responses were provided by way of a Likert scale. Finally, DeFrancesco and Burke (1997) developed a 13-item questionnaire to assess performance enhancement strategies used by professional tennis players. In this study, the researchers also used survey methods to assess how tennis players learned to use the strategies they employed, as well as the psychological areas with the most influence on players' performances.

In review of the aforementioned studies, it has been concluded that using only questionnaires may not be a sufficient method for studying one's SR. It is true that using

questionnaires enables the researcher to draw general conclusions about the studied phenomenon, but questionnaires may not enable the researcher to provide an in-depth description of one's SR. To gain more insight into one's SR, qualitative methods, such as interviewing and observation, should be strongly considered.

Retrospective Interviewing

Several researchers have conducted in-depth interviews to study athletes' thoughts, affects, and behaviors prior to and during competition (D'Urso et al., 2002; Gould et al., 1992a, 1992b) and athletes' perceived effectiveness of coping strategies (Nicholls, Holt, & Polman, 2005). Employing qualitative interviewing enables the researcher to gain an in-depth understanding about athletes' experiences during competition, and to more extensively assess those factors that determine athletes' performances; the fulfillment of these objectives is not likely possible when using only self-reported measures and instruments (Gould et al., 1992a). However, in studying wrestlers, Gould et al. (1992a) acknowledged that retrospective interviewing does have limitations. For instance, these researchers acknowledged that using only interviewing may not provide a full description of the mental strategies used by wrestlers, because some strategies could be exhibited subconsciously and the athletes might not be aware of them. To overcome this limitation, these authors suggested the use of video analysis combined with in-depth interviewing (Gould et al., 1992a). In addition, the outcome of a competition could influence the objectivity of athletes' responses (Gould et al., 1992a; Greenleaf, Gould, & Dieffenbach, 2001). However, by controlling some of these variables, retrospective interviews could be a valuable research tool for exploring athletes' thoughts, emotions, and behaviors before, during, and after competition.

Unobtrusive Observation

Van Raalte et al. (1994) and Van Raalte et al. (2000) used the Self-Talk and Gestures Rating Scale (STAGRS) to study tennis players' self-talk and gestures while in play. STAGRS was designed to record as many player behaviors as possible while accurately recording the score during a tennis match (see Van Raalte et al., 1994; Van Raalte et al., 2000 for details). In addition, Van Raalte et al. (1994) used a post-match questionnaire to assess junior tennis players' internal self-talk, thoughts, and beliefs.

Like all measures, STAGRS has its advantages and disadvantages. It is true that this scale enables the researcher to observe unobtrusively and record the studied variables. Still, it does not provide a thorough description of the antecedents and consequences of tennis players' self-talk. First, this technique does not allow the researcher to record all of the observed behaviors. Second, as the authors have acknowledged, the presence of a researcher might influence a player's self-talk and gestures; it is likely that the players kept some of the positive and/or negative self-talk and gestures private (Van Raalte et al., 1994). Finally, these researchers likely did not tap into the players' internal self-talk. With that said, this observational technique is somewhat flawed methodologically. Thus, while the research is unobtrusive, the level of accuracy (i.e., validity and reliability) of the players' answers is still arguable.

Combined Use of Qualitative and Quantitative Methods

Microanalytic Methodology. Microanalytic methodology is used for studying one's cognitive processes and personal beliefs by using brief open- and closed-ended context-specific questions at key points during actual performances (Kitsantas & Zimmerman, 2002). The obtained information provides more insight into one's goal

setting, motivation, confidence, and ability to self-correct and adjust performance when necessary (Cleary & Zimmerman, 2001). Moreover, by measuring one's self-efficacy this methodology can detect changes in the agent of regulation (Cleary & Zimmerman, 2001). Cleary and Zimmerman (2001) and Kitsantas and Zimmerman (1998, 2002) used this methodology to compare and contrast students' and student-athletes' self-regulatory processes while learning and performing. However, several limitations exist with such methodologies. First, with the aforementioned studies, because the primary focus of the researcher was to assess the self-regulatory components during self-directed practices, the participants were tested individually. The researchers acknowledged that the results from these studies could not be generalized to competitive contexts because the two settings considerably differ in the demands put on the athletes (Cleary & Zimmerman, 2001). The second limitation centers on the specificity of the microanalytic methodology employed by the researchers: The participants were questioned while performing or practicing. Although the researchers argued that this was a minimal disruption to the participants' performances (Kitsantas & Zimmerman, 2002), it can be countered that it may be a validity threat due to the researcher's intrusion with the athlete's performance. Finally, the participants in the aforementioned studies were asked to report their perceptions regarding some of the studied psychological constructs (e.g., self-efficacy and self-satisfaction) by using scales, which, as discussed previously, may not be the most effective means for measuring.

Immediate Recall Technique. McPherson (2000) conducted immediate recall interviews between two points in a tennis match to study the players' current thoughts and planning strategies in competitive settings. The interviews consisted of two

questions: "What were you thinking about while playing that point?" and "What are you thinking about now?" (p. 44). According to the author, using neutral questions ensured that the participants would generate and report their own thoughts, not externally directed ones. McPherson (2000) classified the participants' verbal reports into concept categories and sub-categories. The author subsequently analyzed each participant's concepts for content and structure. The five categories were:

(a) Goal concepts, statements that refer to the hierarchical goal structure during the game;

(b) Condition concepts, statements that specify the conditions under which to apply the action(s) toward the goal(s) as well as the timing of those actions;

(c) Action concepts, statements that refer to the actions selected to produce changes related to the goal accomplishment;

(d) Regulatory concepts, statements that specify whether an action was executed; and,

(e) Do concepts, statements which specify the way to perform the action (McPherson, 2000).

This study is one of the few (in tennis) that combines both qualitative and quantitative methods to describe player's thoughts. However, there are still limitations when using such methodologies. First, the participants were instructed to record their thoughts on a tape recorder after playing two points. The author has argued that this had no interference with the players' performances (McPherson, 2000). Still, the internal validity of the study, as well as the generalizations of the study findings, are arguable for several reasons. While reporting their thoughts, the participants were not time restricted.

In a real tennis match the time between two points is, indeed, restricted. A tennis player has a limited time to analyze his/her actions and make decisions. Furthermore, by not having a time restriction for reporting their thoughts, the players have more time to recover physically and mentally, which could further influence performance. In addition, McPherson (2000) has acknowledged additional limitations to the study: only 16 randomly selected between-points reports were used for each player, and the simulated matches were conducted between teammates in non-tournament conditions. Despite the aforementioned limitations, this study can be a basis for future in-depth research using both qualitative and quantitative methodologies.

Stimulation Recall Technique. According to Kermarrec et al. (2004), a sufficient description of spontaneous (self-regulatory) strategies can be created by the combined use of participant observation and participant verbalization within the natural context of their occurrences. In addition, this method can be used to enhance the ecological validity when exploring complex phenomena (as cited in Kermarrec et al., 2004).

In contrast, Van Raalte et al. (2000) argued that the stimulation recall technique was not a sufficient method for assessing players' cognitions and behaviors because they might be reevaluating their performance instead of recreating it; the performance outcome, as well as other potential factors, might influence the players' reports as well. However, it can be argued that some of the limitations of this method can be reduced if multiple methods for data collection are used. For example, in a study of the self-regulatory components employed by students in physical education settings, Kermarrec et al. (2004) used triangulation methods (i.e., multiple sources of data collection) to provide sufficient evidence of the participants' cognitive activity.

Furthermore, several researchers have used the stimulation recall technique in studies addressing different issues in physical education settings (Allison, 1990; Kermarrec et al., 2004; Tan, 1996; Wilcox & Trudel, 1998) and students' cognitive processes during tennis instruction and game situations (Lee et al., 1992). For instance, Lee et al. (1992) employed this technique in a study that explored students' cognitive processes and lesson content awareness during tennis instruction to determine if there was a relationship between the students' thoughts and their skill performances. However, in this study, the researchers did not use triangulation methods; they coded the students' behaviors only to measure participants' successful trials during practice. Finally, Samulski and Lima (1998) used the self-confrontation method to analyze the critical situations and SR techniques employed by table tennis players during a competition. These authors concluded that this methodology should be considered when studying athletes' behaviors during both practice and competition.

Summary

According to Zimmerman:

> Self-regulation is defined as self-generated thoughts, feelings, and behaviors that are planned and cyclically adapted based on performance feedback (as cited in Cleary & Zimmerman, 2001, p. 187).

In other words, through the process of SR one alters his/her own thoughts, feelings, and behaviors. The first step in this process centers on one's awareness and recognition of deficient and/or desirable cognitions, behaviors, or performances. Through one's interpretation of the environmental demands and/or personal needs or expectations, an individual sets goals and develops plans for accomplishment. Based on performance

feedback, one evaluates intermittent and/or final outcomes of his/her actions, and further corrects the achievement strategies to meet the initially set personal standards.

An athlete uses SR to enhance his/her performance and/or to achieve personal goals, to overcome undesirable emotional states, and to alter maladaptive behaviors. Through the process of SR, one effectively responds and/or adapts to a particular situation. SR can be realized on both conscious and subconscious levels through a variety of strategies and/or techniques (Crews, 1993). One's ability to self-regulate can be influenced by his/her personality characteristics, dispositional styles, familiarity with the task at hand, affect, self-focused attention, and environmental variables (Crews, 1993). Additionally, researchers (Anshel & Porter, 1996; Cleary & Zimmerman, 2001; Ferrari at al., 1991; Kitsantas & Zimmerman, 1998, 2002) have acknowledged that athletes' quality of SR varies among expertise levels.

In short, research is minimal in terms of describing the SR of athletes, tennis players in particular, before, during, and after a competition. However, identifying performance stressors and specific coping interventions is important (Holt & Hogg, 2002). Given the specificity of the subject, each athlete's implementation of coping and SR interventions should be examined and treated individually (Hammermeister & Burton, 2001; Prapavessis et al., 1992; Robazza, Bortoli, & Hanin, 2004).

Numerous researchers (e.g., Anshel & Porter, 1996; Kermarrec et al., 2004; Morossanova, 2003) have attempted to examine SR by using various techniques for data collection (i.e., questionnaires, personality scales, observation, and interviews). It can be argued that using multiple methods for data collection will provide the most sufficient means for describing a multidimensional phenomenon such as SR.

Chapter 3

METHODS AND PROCEDURES

The purpose of the present study was to gain an in-depth understanding of how an NCAA Division III female tennis player self-regulates while preparing for, competing in, and reflecting back upon a singles tennis match. This chapter outlines the (a) research design, (b) participant, (c) instrumentation, (d) procedures, (e) data collection, (f) data management, and (g) establishing trustworthiness.

Research Design

A qualitative methodology was used to gain an in-depth description of how an NCAA Division III female tennis player self-regulates during the preparation, performance, and reflection phases of a singles tennis match. Qualitative studies are useful to gain a comprehensive understanding of how one's actions and behaviors are shaped by the circumstances in which they occur (Maxwell, 1998). Qualitative approaches are characterized by high internal validity and contextual understanding, and allow the researcher to study the processes that lead to a particular outcome (Maxwell, 1998). Therefore, through phenomenological interviewing, the researcher can gain more insight into an athlete's experiences during practice and competition by allowing him/her to be the "expert on the subject" and describe his/her experiences freely (Dale, 1996, p. 310).

A qualitative single-subject case study design was followed in the present study. Yin (1984) defined case study as an empirical inquiry that studies complex and contemporary phenomena within the context of their occurrence by using multiple sources of evidence. Therefore, by using a case study research design, a single entity or

phenomenon can be described and analyzed in a holistic manner (Merriam, 1988). Simultaneous use of multiple methods for data collection (e.g., interviewing and observation) enables the researcher to study the same phenomenon with multiple measures (Yin, 1984) while, at the same time, optimize the quality of any single method used (Patton, 1990).

Participant

The participant in the present study (Ann; not her real name) was an NCAA Division III female tennis player. At the time when the study was conducted, she was 18 years old and had been playing tennis for 7 years. She was purposefully selected at the onset of the study because she was experiencing a negative performance discrepancy during the second half of the 2007-2008 collegiate tennis season. Particularly, the participant had recorded several consecutive losses after recording a substantial number of consecutive wins. This enabled the researcher to study the phenomenon of interest in light of performance disequilibrium.

During the initial meeting with the participant, the researcher provided her with an opportunity to ask questions regarding the study, the forthcoming interview process, and other issues of concern. After agreeing to participate in the study, the participant was asked to sign an informed consent form (Appendix A), approved by the Ithaca College Human Subjects Review Board. The form outlined the issues of confidentiality, anonymity, potential risks, and benefits. At the onset of the study, the participant declared that she had not received any prior or formal sport psychology consulting or training.

Instrumentation

Interviewer

In qualitative research, the researcher is the instrument for collecting and analyzing the data (Mertens, 1998; Patton, 1990). According to Patton (1990), the interviewer's skills, rigor, and competence determine the quality of the information obtained during an interview. Therefore, the researcher's ability to create a trustful and collaborative relationship with the participant is one of the essential factors for conducting a successful qualitative study. To establish a rapport with the participant, the interviewer should be neutral to what s/he is saying, while at the same time conveying the importance of what has been stated (Patton, 1990). Therefore, the interviewer must be a good communicator; and more so, must be a good reflective listener (Merriam, 1988).

The interviewer in the present study did not have prior experience in conducting qualitative research. However, she completed relevant graduate coursework whereby she practiced her communication and interviewing skills. She further enhanced her knowledge and skills by reviewing pertinent literature, outlining practical skills for conducting successful qualitative research. It should be noted that the primarily researcher is a non-native English speaker.

Retrospective Interview

Interviewing has been defined as a conversation with the particular purpose of gathering information (Berg, 2004). In the present study, semi-structured retrospective interviews were conducted by following an interview guide. An interview guide was defined as a set of questions that provides a framework for the topics and issues pertinent to the research question to be covered during the interview (Patton, 1990). However, the

interviewer can adjust the wording and the sequence of the questions being asked according to the participant's responses (Patton, 1990).

For a qualitative interview to be successful, the interview questions should be clear, neutral, open-ended, and asked one at a time (Patton, 1990). By asking the questions in this manner, the interviewer helps the interviewee to express and describe his or her thoughts, feelings, and actions without confusing and/or directing him/her. Additionally, "Why?"- questions should be avoided: These questions can be perceived by the interviewee as threatening (Mertens, 1998) or suggesting inappropriateness (Patton, 1990). Furthermore, during the interview, the interviewer needs to make statements about the questions being asked, to explain the purpose and importance of particular question(s), and to provide feedback and reinforcement (Patton, 1990). This communicates respect for the interviewee and increases his or her motivation to participate actively in the interview by giving detailed and open responses (Patton, 1990).

Retrospective interviews were conducted following an interview guide (Appendix B) that was designed after reviewing the theoretical perspectives on self-regulation. The interview guide was structured in a manner to elicit specific information about:

1. the participant's emotional states and physical reactions before, during, and after a singles tennis match (e.g., How did you feel before the match? Did you have any physical reactions to your feelings?),
2. the antecedents (e.g., What made you feel that way?) and the consequences (e.g., How did [this] affect your performance?) of the aforementioned states on the participant's performance,
3. the SR techniques and strategies the participant used to overcome or maintain the

negative or positive states (e.g., What did you do to overcome the resulting states?) and,

4. the effectiveness of the SR techniques and strategies used (e.g., How effective do you think [this technique] was?).

Researchers (Gould et al., 1992a; Greenleaf et al., 2001) have acknowledged that retrospective interviewing may not be the most efficient method to study player's use of mental strategies. Gould et al. (1992a) argued that because some of the techniques and strategies employed by the athletes could be exhibited subconsciously, the athletes might not be aware of them; therefore, athletes' descriptions might not be sufficient. In the present study, an attempt to address this issue was made by combining observation and interviewing. That is, during the interviews, the participant was asked to elaborate on the actions and behaviors observed during the matches of interest.

Finally, Gould et al. (1992a) recognized that in retrospective interviewing, the outcome of a competition might have an influence on the objectivity of athletes' responses. In the present study, an attempt to address this issue was made by conducting the interviews several days after the competitions of interest. However, having time to reflect on sport experiences might also influence the participant's reports. That is, instead of reporting actual reactions and responses before, during, and after the matches, the participant may report desired perceptions of particular situations.

Observation

The purpose of observation as a research method is to provide a detailed description of the (a) setting(s) of interest, (b) participant's actions and behaviors, and (c) participant's perspective on what was observed (Patton, 1990). Moreover, through

systematic observation, the researcher can obtain information about processes and phenomena that the participants are not fully aware of or they are not willing to disclose during an interview (Patton, 1990). For an observation to be accurate, valid, and reliable, it is essential that the observer develop and master the skills of descriptively writing field notes that capture information that is relevant to the question of interest (Patton, 1990).

Therefore, at the onset of the present study, the researcher developed an observational protocol (Appendix C) based on existing research protocols (Van Raalte et al., 1994) and personal observations of actual collegiate tennis matches. The protocol was designed in a manner to enable the researcher to record the participant's behaviors and the context of these behaviors simultaneously. Thus, the researcher was able to focus on observing the participant's behaviors on the court while also documenting the result of the played points, games, and sets.

In the present study, overt observations were conducted. Therefore, the presence of the researcher in the competitive settings may have affected the participant's actions on the court (Van Raalte et al., 1994). To address this issue, the researcher attempted to establish strong rapport with the participant prior to and during the study.

Procedures

Researcher's Observation of Matches

The researcher conducted two overt observations of two competitive collegiate matches. The matches were selected by convenience from the available matches during the second half of the 2007-2008 collegiate tennis season. Particularly, the researcher observed two matches played on March 30, 2008, and April 23, 2008. Match #3 was not observed.

The researcher observed the two matches in their full length. During the observations, the researcher attempted to record (a) the outcome of each played point and (b) the participant's corresponding reaction(s) (if any) to the outcome of each point. Specifically, the researcher was interested in the participant's:

1. Motor behaviors, such as jumping, bouncing, stretching, or imitating a stroke motion,
2. Self-talk, such as motivational, critical, instructional audible statements, or complimenting the opponent and oneself,
3. Maladaptive behaviors, such as abusing the ball, the racquet, the opponent, or oneself,
4. Body language, such as circles with the head, or fist pump,
5. Facial expressions, such as expressions of frustration, helplessness, or satisfaction and,
6. Miscellaneous behaviors, such as taking deep breaths, adjusting the racquet strings, or kicking her shoes with the racquet.

The observed behaviors and the context of these behaviors (e.g., losing or winning a point, game, or set) were recorded in observation protocol (see Appendix C for more details). In short, the observation protocol was designed as a matrix with (a) four horizontal cells that represented all the possible—positive and negative—outcomes of a particular point (i.e., ace, double fault, success, and error), and (b) multiple vertical cells that represented the played points; thus, each column contained the information pertinent to a particular point. That is, if the participant was serving during the first set and she made a double fault on the first point, her reaction (e.g., negative self-talk) was recorded

in the first column on the second row (i.e., double fault). Two rows were added to the matrix to enable the researcher to (a) write any comments (e.g., whether the participant was a receiver or a server) during the observation, and (b) recreate the result of the match after the observation. The obtained information was used during the interviews to help the participant recall particular events and/or behaviors.

Retrospective Interviews

The researcher conducted three interviews in the present study. Each interview was administered several days after the participant competed in each one of three competitive collegiate tennis matches. Specifically,

1. the first interview was conducted on April 1, 2008, or 2 days following the completion of the first match,
2. the second interview was conducted on April 28, 2008, or 5 days following the completion of the second match and,
3. the third interview was conducted on May 8, 2008, or 5 days following the completion of the third match.

The interviews were scheduled according to the participant's availability.

Each interview began with a pre-interview disclosure statement, which provided the participant with information regarding (a) the interview itself, (b) the cultural differences that might impede the interview process, and (c) the participant's right to stop the interview process at any point. In addition, the participant was assured that there were no right or wrong answers, and the interviewer did not have any predetermined expectations for the given answers.

The interviews were conducted following an interview guide (Appendix B). The interviews began with general questions about the participant's pre-match states (i.e., bodily sensations, mental and emotional states). The latter questions provided the participant with an opportunity to discuss the issues that were most prominent and/or the easiest for her to openly discuss.

The interviews were divided into three sections: (a) before, (b) during, and (c) after a singles tennis match, which, as expected, facilitated the participant's recollection process. Additionally, the researcher used the information obtained during the two observations to help the participant recall particular events and/or behaviors.

Because of the repetitive nature of the research design (i.e., three interviews were conducted), the researcher attempted to adjust the questions accordingly to avoid boredom and elicit more accurate information about the player's SR. In addition, the researcher attempted to enhance her comprehension of the participant's narrations by restating the participant's answers and/or asking the participant to elaborate on the given information when deemed necessary.

During the third interview, after discussing the third match, the researcher presented the participant with a tentative overview of the previous two interviews. This enabled the researcher to verify the intermittent conclusions (i.e., member check). In addition, the researcher asked the participant to clarify and/or elaborate on information obtained during the previous two interviews. Finally, the participant was provided with an opportunity to review the previous two interview transcripts (which she declined).

The actual duration of each of the three interviews was 51 min, 48 min, and 55 min respectively for the first, the second, and the third interviews. The interviews were taped digitally.

Data Collection

As stated, the researcher conducted two overt observations of competitive collegiate tennis matches and three retrospective interviews pertinent to each one of the selected matches. The matches were selected by convenience from the available matches for the second half of the 2007-2008 collegiate tennis season. Data was gathered following a structured sequence, which is visually presented in Appendix D.

Data Management

Data management in qualitative research is a creative process that involves making sense of verbal data, identifying significant patterns, and creating a framework for presenting the findings (Patton, 1990).

The primary researcher transcribed all of the interviews verbatim. Each of the three interview transcripts was analyzed separately by using techniques for qualitative analysis (Glaser & Strauss, 1967; Patton, 1990) and following the analytical steps suggested by Shelley (1999). For the present study, the analytical steps were as follows:

1. The transcripts were read multiple times by the primary researcher to gain a general sense of the data.
2. Significant statements that were perceived as relevant to the matter of study were coded and extracted from the transcripts.
3. The extracted significant statements were subsequently integrated into meaning units based on the proximity of the information they contained. For example, the

following significant statements were organized into a meaning unit because they described the participant's reaction after making a mistake during a match:

> *I try usually [when I] lose a point, I react for a couple of seconds and then I just get it all out of my system...*
>
> *I probably was, 'That was such a stupid shot. Why would you do that? So that was just me reacting so that I could go on and focus onto the next point.*
>
> *[hitting oneself] It just relieves whatever is there.*
>
> *I just have, like, either, like, smack my racquet or the ball and once I do that it just releases all the energy and I feel so much better...*

4. The resulting meaning units were combined to form lower-order themes. For example, reacting after losing a point: negative self-talk, abusing the racquet/ball, hitting oneself, and complimenting the opponent after a good shot, were classified into a lower-order theme because they contained information about the participant's reactions after losing a point during the first match (both after making a mistake and after the opponent hit a winning shot). In the process of integrating the meaning units into lower-order themes, when a factual proximity was not found among the meaning units, they were organized into a separate lower-order theme. During the subsequent stages of the analysis, some of the meaning units were extracted and incorporated into higher-order themes.
5. The lower-order themes were organized into higher-order themes that provided a description of the participant's self-regulation. For example, reactions after losing a point, fixing a mistake, achieving correct execution, and SR techniques for maintaining proper focus were clustered into a separate higher-order theme

because they exhaust the techniques and strategies, which the participant used to regulate her performance during the first match.

6. Steps 1 through 5 were applied for each of the three interviews.
7. During the third interview, the researcher asked the participant to review the intermittent results from the previous two interviews and make changes as deemed necessary.
8. The higher-order themes from the three interviews were then compared and integrated to form the final description of the tennis player's SR while preparing for, competing in, and reflecting back upon a singles tennis match.

The aforementioned analytical steps are visually presented in Appendix E.

Establishing Trustworthiness

Credibility

Credibility can be viewed as the qualitative parallel to internal validity: Specifically, the compatibility between the reality constructed by the participant and the researcher's representation of this reality (Guba & Lincoln, 1989). Therefore, the credibility of qualitative research depends greatly on (a) the methods for data collection and analysis being used, and (b) the researcher's skills, rigor, and discipline related to, and involved in, the research process (Patton, 1990). To enhance the credibility of the present study, the researcher adhered to the following strategies:

Prolonged Engagement and Persistent Observation. Long-term involvement in the settings of interest enables the researcher to get to know the participant and to establish rapport and build trust: This involvement often lessens the effects (e.g., misinformation, misrepresentation) of the researcher's presence on the findings (Guba & Lincoln, 1989;

Patton, 1990). Guba and Lincoln (1989) defined persistent observation as sufficient observation that enables the researcher to single out and further study in detail salient issues that are pertinent to the question of interest.

In the present study, the researcher observed the participant and interviewed her on several occasions. The information obtained during the observations was used during the interviews. This approach enabled the researcher to verify her observations and clarify the participant's intentions. In addition, by conducting two observations and three interviews, the researcher was able to build on the data obtained in the previous stages of data collection. That is, if salient issues emerged in the early stages of data collection, they were explored in detail in the subsequent interview(s).

Member Check. The participant's reaction to the description and analysis of the data is an imperative method for enhancing the credibility of a qualitative study (Guba & Lincoln, 1989; Patton, 1990). Through member checking during data collection and analysis, the researcher provides the participant with an opportunity to (a) clarify intentions, (b) correct errors of fact and interpretation, (c) offer additional information, and (d) confirm responses (Guba & Lincoln, 1989).

In this study, during the third interview, after discussing the third match of interest, the researcher asked the participant to (a) clarify some facts and intentions disclosed during the previous two interviews, (b) verify the intermittent results from the tentative analysis of the previous two interviews, and (c) review the transcripts from the previous two interviews (which she declined).

Researcher's Bias. Although the researcher in the present study had limited formal training in coaching tennis, the researcher did not have personal experience in

competitive tennis settings. Therefore, the researcher's preconception regarding the studied subject was delimited to the researcher's understanding of athletes' SR. In an attempt to address this issue, the researcher regarded SR as a process and developed a framework for the study based on different theoretical perspectives on SR.

Transferability

Transferability can be viewed as the qualitative parallel to external validity (Guba & Lincoln, 1989). Through "thick description," or elaborate description of the settings of interest, the researcher provides the reader with the opportunity to extrapolate the findings from one study to other, similar contexts (Guba & Lincoln, 1989; Patton, 1990).

To enhance the transferability of the present study, the researcher attempted to provide elaborate description of (a) particular match situation(s) (e.g., winning or losing a point), (b) the participant's corresponding reactions and/or responses, and (c) the participant's perception of the effectiveness of the employed SR techniques and strategies. Presented in this manner, the findings of this study will likely enable the reader to relate these findings to similar situations. Nevertheless, it should be noted that the presented findings reflect only the participant's experience (i.e., reaction and response(s)) in a given situation. Thus, the presented findings are only one set of possible reactions and responses that individuals can experience in similar situations.

Dependability

Dependability can be viewed as the qualitative parallel to reliability, or stability over time (Guba & Lincoln, 1989). In qualitative research, change is expected; however, it should be easily tracked, as well as inspected from outside reviewers (Guba & Lincoln,

1989; Patton, 1990). This can be achieved by a dependability audit, or "technique for documenting the logic of process and method decisions" (Guba & Lincoln, 1989, p. 242).

In the present study, the researcher attempted to develop the research instruments (i.e., interview guide and observation protocol) in a manner to enable her to gain a holistic understanding of the participant's SR. Specifically,

1. Observations. The research protocol was designed in a manner that enabled the researcher to record the participant's behaviors and the circumstances of these behaviors. Although, at the onset of the study, the researcher predetermined categories of anticipated behaviors, during the observations, the researcher attempted to descriptively record the participant's behaviors as they occurred.
2. Interviews. The researcher developed an interview guide based on the theoretical framework for the study. Nevertheless, during the interview process, the researcher attempted to adjust the questions being asked according to the participant's answers. In addition, because the interviews were pertinent to particular competitive tennis matches, the asked questions were germane to the observed events and behaviors.

Thus, given the situation-specific sensitivity of the research instruments and the specificity of the research design (i.e., overt observations and retrospective interviews), the data collected during the three interviews was considerably different. That is, the data differed in both content and depth. Therefore, to enhance the rigor of the study, the researcher compared and integrated the data obtained during the three interviews. In addition, the researcher presented the theoretical framework for the study, the procedures

for data collection and management, description and discussion of the findings, her conclusions and recommendations for future research, and suggestions for practitioners. This will likely enable the reader to further judge the dependability of the study.

Confirmability

Confirmability can be viewed as the qualitative parallel to objectivity (Guba & Lincoln, 1989). To minimize the subjectivity, the researcher needs to (a) be aware of and document how his/her perspective affects the process of collecting and analyzing the data, (b) document all of the procedures used for data collection and analysis, and (c) disclose the limitations of the findings (Patton, 1990). Through a confirmability audit, qualitative data can be traced to its source, and the logic that stands behind the researcher's interpretations can be inspected (Guba & Lincoln, 1989). Therefore, when reporting the findings the researcher must provide (a) sufficient citations of relevant information obtained throughout the study, (b) a description of the procedures used during the data collection, as well as, the actual circumstances under which the data was obtained, and (c) evidence of the link between the findings and the research questions (Yin, 1984). Providing such a "chain of evidence" will enable an outside reader to move back and forth between the data and the conclusions using the methodological framework (Yin, 1984).

To enhance the confirmability of the present study, the researcher attempted to provide the reader with a sufficient description of the process of data collection and management. That is,

1. The researcher provided a complete description of the procedures for data collection. This information was supplemented with (a) the interview guide, (b)

the observation protocol, and (c) the timeline for data collection. In addition, the researcher disclosed information pertinent to her qualifications for conducting qualitative research. Finally, the researcher disclosed the limitations of the study. This will likely enable the reader to judge the objectivity of the process of data collection.

2. The researcher attempted to provide a sufficient description of the techniques and strategies for data management. In addition, the researcher enclosed tables illustrating the emergent higher-order themes for all three interviews, as well as the final higher-order themes for the study. These tables visually present (a) the process of integrating meaning units into lower-order themes, and lower-order themes into higher-order themes for the three interviews and, (b) the process of integrating the higher-order themes from the three interviews to form the final higher-order themes for the study. This will likely enable the reader to judge the researcher's rigor in analyzing the data.
3. The researcher attempted to present the participant's perspectives on the issue(s) under study by providing quotes illustrating the emergent themes, while limiting any personal judgment and interpretations. The researcher's narrations throughout Chapter 4 were included to facilitate the reader in comprehending the participant's responses.
4. The researcher attempted to (a) discuss the emergent higher-order themes in relation to SR literature, and (b) present her interpretations of the data and plausible explanations of the findings. This will likely enable the reader to judge

the researcher's rigor when drawing the conclusions, and the appropriateness of the presented recommendations and suggestions.

Chapter 4

RESULTS

The purpose of the present study was to gain an in-depth understanding of how one NCAA Division III female tennis player self-regulates while preparing for, competing in, and reflecting back upon a singles tennis match. A qualitative methodology (i.e., observations and interviews) was employed in order to follow a single-subject case study design. This chapter provides (a) a description of the participant, (b) the final higher-order themes, and (c) a summary of the results.

Participant's Profile

Ann was an NCAA Division III female tennis player. She was experiencing a substantial decrease in her performance after having a very successful and satisfying previous season. Ann's dissatisfaction with her performance resulted in "having more temper" during the season in which the study was conducted. When she was reflecting back upon her feelings and thoughts after one of the matches of interest, Ann revealed:

> ... but it's just hard because I knew [that] I was more, [I] have more of a temper this semester and I was, kind of like, playing down and I knew that I was so much better but I just couldn't get to that level, so I was really frustrat[ed]. I was like missing shots that I wouldn't be missing in the fall. It's just very hard.
>
> Basically the fall season I had no idea what I was doing and now, that I have more experience under my belt, I, like, know where I could be at and it's very frustrating to me because I am not there.

The negative performance discrepancy during the spring season undermined Ann's confidence. Ann disclosed:

> It was totally different, like, [this] season and last season. Like, I just had a totally different confidence level, so, like, I was just playing totally different.

> I was playing very well in the fall and in the fall I just like whenever I stepped on the court, like, I knew I could do it.

It was found that Ann's self-efficacy had a major effect on her self-regulation by influencing her pre-competition and in-competition mental and physical states as well as her actions on the court. For instance, her reduced confidence induced negative feelings (i.e., nervousness) when she was starting one of her matches. This nervous feeling usually resulted in negative body sensations which impaired Ann's performance on a technical (i.e., execution of a skill) and tactical (i.e., strategizing) level. This was apparent from the following statements:

> I was actually very nervous 'cause I didn't have a very good result last time at my previous match and I hadn't been playing as much tennis as I would've liked to, so I was very nervous going in.

> When I start getting, like, nervous during the match, like, I said, like, my arm tenses up and stuff like that.

> My arm like tenses up and so, like, I don't, like, finish the stroke...When I am nervous I, kind of just, won't go for my shots, so, I will hit, like, an easier one to my opponent, which does not set the point very well.

In contrast, when Ann was feeling relaxed on the court, she was not experiencing the aforementioned performance impairments and she was able to deal better with pressure situations while competing. This was evident from the following statements:

> [being relaxed] My muscles are relaxed. I am not, like, tensing up on my strokes. I'm just, like, going [and] it's nice and flowing.

> [being relaxed] My mind is, kind of, in a different place too. Like, when I'm under pressure and, like, I lose a crucial point, it's, like, more deman[ding], like, I care more. But when I am more relaxed like, 'It's O.K., you can get the next point'. Like, the pressure situations aren't as intense.

Finally, external distractions (i.e., crowd) and negative results and feelings (i.e., ineffective serving, feeling helpless on the court) were the most stressful events or circumstances Ann faced. She reported:

> It's very hard to play against someone that I feel like I am playing against their whole team... Let's say we are away and, like, their whole school is basically there and just me out on the court, that's stressful for me too.
>
> Another thing is obviously when my serve isn't working well because that's the big part of my game that sets things up.
>
> Obviously, another thing that stresses me out is when I just can't do anything. Kind of like the [xx] match, which ... there was nothing that I could do and that is very frustrating to me because I was working just as hard as I can. I just can't [*sic*] figure it out.

To maintain optimal body sensations and mental and emotional states, Ann employed various techniques and strategies. A visual illustration of the higher-order themes for each of the three interviews is provided in Appendices F, G, and H. The following section provides a comprehensive description of the final higher-order themes for the study.

Higher-Order Themes

One NCAA Division III female tennis player was interviewed on three occasions at the end of the 2007-2008 season. The interviews were conducted after the participant suffered three losses. The player lost all three matches in two sets, while winning only seven games overall. That is, she had success in 16.28% of the games played. The percentage of the games she won during the first, second, and third matches were 7.69% (1 game), 25% (4 games), and 14.29% (2 games) respectively. Three final higher-order themes emerged after comparing and integrating the higher-order themes from the three interviews (see Appendix I):

1. The player's SR before the match consisted of (a) resting and hydrating, (b) breathing and relaxation, (c) blocking out distractions, (d) goal setting, (e) gathering information, (f) planning, and (g) reviewing notes on technical execution.
2. The player's SR during the match consisted of (a) self-talk, (b) imagery, (c) blocking out distractions, (d) planning, (e) problem solving, (f) relaxation and breathing, and (g) external outbursts of negative emotions.
3. The player's SR after the match consisted of (a) distancing and rationalizing the score, (b) recognizing the positives, (c) appraising the performance, and (d) learning from mistakes.

Higher-Order Theme #1

The player's SR before the match consisted of (a) resting and hydrating, (b) breathing and relaxation, (c) blocking out distractions, (d) goal setting, (e) gathering information, (f) planning, and (g) reviewing notes on technical execution.

To maintain optimal arousal, Ann rested and hydrated before her singles match.

> After the match [doubles] I went to the shade and try to cool off a little bit. Sat down, [drank] some more water.
>
> I just wanted to, like, cool down.
>
> I just try to drink enough fluid to keep my body at optimal performance level.

Ann also used breathing and relaxation techniques between the matches to maintain optimal body sensations and emotional states:

> I, like, try to calm myself down by, like, breathing more and just being relax[ed], 'It's O.K'.
>
> Like, before the match, I was just trying to calm myself down.

> [I] just breathe a lot.
>
> I just focus on my breathing.
>
> [I just wanted to] calm down, just relax.

Even though it took Ann " a while to get into the singles match," she perceived the techniques she employed to maintain optimal pre-match states as effective. Ann stated:

> It helped me in the sense like my body felt better that I was just a lot cooler. Like, I wasn't, like, sweating as much and, like, that was more helpful. Because then once I was, like, cool[ed] down and not really thinking about it, I was able to focus on the match.

To further maintain optimal pre-match states, Ann attempted to block out external distractions and internal sensations, which she perceived as effective techniques as well.

> I was trying to not focus on it [hot weather, fatigue]. Obviously, I was trying to not focus on it 'cause I knew if I did, it will get me really bad.
>
> I try to think of other things besides the match and stuff that's, like, not distracting.
>
> Before the match I just stare off [...] and don't even think about it, about anything. [I just focus on] clearing my mind.
>
> When I am tired I just don't really think about it. ... When I am tired I just don't even think about it.

To prepare herself better for the singles match, Ann was setting process goals to regain her level of play after not being able to practice two days before one of the matches. Ann stated:

> [During the warm up] I was trying to focus on, like, getting my strokes back...

> [During the warm up I was] trying to be as consistent as possible.

In addition, before and during the warm up for the singles match, Ann was gathering information about her opponents. On several occasions, she stated:

> ..., so I was trying to pay attention before the match. Kind of, watch her warm up a little bit and watch her play doubles a little bit.
>
> In doubles, kind of, when I am changing over a little bit and not focusing on my match, I am actually watching my opponent to see how they play too. That's how I prepare before singles.
>
> With my opponent, I kind of saw her play a little bit in doubles. I knew she was a very powerful player, but I knew I had to try to neutralize her game, so I knew I had to hit deeper balls. So I was trying to work on that.
>
> ..., so I just [was] trying to figure out a way to, like, neutralize her game, [so that] I could seek advantage of it.
>
> When we were warming up she hit totally different than what I expected her to hit. She hit a lot of spin and with, like, change the depth of the ball. She won't hit hard like a lot of the players try to do, so I was trying to figure out what I could do to be most effective.

As it can be inferred from the aforementioned statements, Ann perceived that information gathering was an important part of her preparation before a match. Based on the information regarding the opponent's style of play, Ann planned her subsequent actions against her opponent.

Finally, during the third interview, Ann disclosed that prior to her singles match, she was reviewing notes regarding critical points for technical execution of a particular shot. Ann reported:

> I sat down after the doubles and I have a list of, like, notes of, like, my strokes from what my coach used to tell me. I just sat down and was looking over those before I got on the court to play. Like, follow through more on your forehand or, like, don't pull off and stuff like that. It's

> helpful. It's just like sometimes, I just, like, forget a tiny thing and I ... that's what I need to fix this, so it's helpful.

Higher-Order Theme #2

The player's SR during the match consisted of (a) self-talk, (b) imagery, (c) blocking out distractions, (d) planning, (e) problem solving, (f) relaxation and breathing, and (g) external outbursts of negative emotions.

Self-Talk

It was apparent that Ann engaged in audible and internal self-talk to regulate her emotions, focus, body sensations, and actions on the court. Specifically, Ann used negative or critical self-talk predominantly to manage the negative emotions after making a mistake:

> ..., so I was probably saying, 'That was such a stupid shot. Why would you do that?'
>
> In between points I [was] just [saying], 'That was a stupid shot'.

Ann perceived her negative or critical self-talk as facilitating because it helped her to relieve the negative energy and refocus on the next point:

> I try usually [when I] lose a point, I react for a couple of seconds and then I just get it all out of my system, and then I try to focus for the next point.

In addition, Ann perceived that criticizing her own performance was an effective technique for performance regulation as well. Ann acknowledged:

> ... just trying to critique things to make it work a little bit better.
>
> ... because if I didn't change anything the second set would've been completely different than it was.
>
> It helps because, even though I didn't win that match, it helps me think in a different way for, like, the next match or something like that.

Ann extensively used self-instructions for achieving correct execution after making a mistake. The self-instructions were generated based on performance feedback and performance goals. This was evident from the following statements:

> If, like, I am a little late to a ball, but I can still get it and not hit a good shot, like, 'Get back to a position. You need to work on your footwork.'
>
> During the point, I am still, like, telling myself to recover and to get back in there and things to fix. I am also try[ing] to think where to put it at the same time.
>
> Say, I miss, like, the first ball in the net then I'll just like before I serve my next ball, 'O.K., stay up a little bit. Keep your shoulder a little bit longer.'
>
> ... 'You have to make sure that if you wanna keep the point going, you have to hit it in the certain spot, so she doesn't attack you.' So, I think I was saying that to myself.
>
> I just [...], like, at that point I was just [saying], 'You have to get your first serve in. You have to 'cause that's going to be so crucial.'
>
> I also tell myself where I am serving then before I serve the ball too.
>
> Like, say, I want to serve it out wide, I am, like, think[ing] it my head where I want to serve it.

In addition, Ann used self-instructions for regulating muscle tension. On several occasions, she reported:

> Before when I am receiving or anything like that, I am just, 'O.K., relax your shoulders. Relax your shoulders.'
>
> When I am playing in the game I hit a shot I feel like I am tense, I like I actually told myself, '[O.] K., relax your shoulders.'
>
> I just trying [*sic*] to relax like every time when I am bouncing the ball I am, like, ' O.K., just take it slow, and then just work into it.'

Finally, Ann used self-instructions for maintaining proper focus, which was apparent from the following statements:

> [to maintain proper focus] I tell myself to focus more... [to maintain proper focus] I also tell myself to just, 'move your feet.' Because if I just move my feet and get to the ball then I will be able to, like, hit a nice shot.

There was only one instance when Ann perceived that using a self-instruction was an ineffective strategy for self-regulation. During the second interview, Ann stated:

> [to maintain proper focus] I tried, but just it didn't work.
>
> I just told myself just to focus more.

Imagery

Ann was observed to rehearse a stroke after making a mistake during a match. When asked to elaborate on this observation, she explained:

> After I make a mistake, I tried to correct it in my mind and fix it before I go on onto the next point.
>
> It helps....what I do is during that time [when] I am trying to refix, like, fix my shot, I say, like, the words she [coach] says to me, and to help get it back to the way it is.

Additionally, Ann reported that she used imagery combined with self-instructions to achive a correct execution of her serve as well. This was evident from the following statements:

> Actually when I am about to serve the ball, I never look at where I am serving it. I picture it in my mind and that's where I go.
>
> I also tell myself where I am serving then before I serve the ball too.
>
> Like, say [that] I want to serve it out wide, I am, like, think[ing] it in my head where I want to serve it.

Finally, Ann used imagery to affirm a correct execution of a winning shot. After winning a point, Ann tried " to, like, replay the point in my mind, and think, 'What did you do to get that?"

Blocking out Distractions

To maintain proper focus while in play, Ann tried to block out the internal and external distractions by (a) looking at or adjusting her racquet strings, (b) distancing herself mentally and physically from the match situation (i.e., point, game, set), and (c) focusing on relevent cues. For example, Ann stated:

> [To manage external distractions] you just try to block out the surroundings, and just like not even think about what's going on around you. You just don't hear anything going on one way or the other.
>
> The crowd thing I just try to block out as much as possible.

Ann was also observed during the match to be adjusting her racquet strings between points. Ann elaborated on this ritual by saying:

> I look at my strings some and then I just try to refocus for the next point.
>
> After a point, after I get everything what I need to say, I try looking, I try to look at my strings that sometimes that helps me focus.
>
> [adjusting the strings] That's when I really focus.
>
> I was just looking at my racquet and not looking at the court, just trying to block everything [crowd] out.

Additionally, to maintain proper focus when receiving a point, Ann sometimes would hit herself to shift her attention to the upcoming match situation (i.e., playing a particular point). She reported:

> Sometimes when I am receiving a point, like, right before she serves, I just, like, do it [hit herself] ... if I do it before the points is, kind of like, focusing myself.

Furthermore, Ann was paying attention to relevant cues to focus effectively while in play. During the third interview, Ann disclosed that it was challenging for her to "get

focused back to what [she] was doing" after the changeover in between the first and the second set. When asked to reflect on the technique she employed to refocus, Ann reported that she used self-istructions combined with directing her focus on the ball. She stated:

> [I] just look at the ball ... because that really helps me, like, determine where the ball's going...

Finally, Ann found that distancing herself mentally and physically from the match was an effective means of refocusing for subsequent actions (e.g., point, game, set). Some excellent examples of how Ann attempted to distance herself mentally from particular match situations were:

> I kind of turn away from the court 'cause I just don't want to look at it.
>
> I just feel that if I look at the court too much I overthink things and just, like, distracts me a little bit.
>
> Sometimes I need to step away from the cour[t]. Like, step away from my particular match, and I look at my teammates playing down there, and I just see how they are doing, and then it kind of rests my mind, and then when I am going back to focus again it's easier for me.
>
> During changeovers, this is what I do a lot: I drink my water. I don't look at my court. I don't look at the opponent. I look at my teammates' courts 'cause that rests my mind, and when I am about to go back to where when I finish my break or whatever, and go to start play tennis, it's better for me to like refocus again. It's a lot easier because my brain is just relaxed.
>
> [during changeovers] I usually just sit there, drink my water, and not think about anything. Just stare off.
>
> After the first set was over I just tried to forget about it and just start all over again.
>
> I just sat down after the first set, put the towel on my head...
>
> [Between sets] I [was] just trying to like get my mind back.

> When I make a mistake, like, [I] wouldn't really think about it too much. Like, I would just go on to the next point.

One additional form of distancing from a match situation was found in Ann's following statement:

> [to maintain proper focus when serving] I just don't [say the score before serving] because it helps me focus better. If I don't say the score ... like, I know it in the back of my mind and as long as I don't verbally say it, I am good.

Planning

To exert control over her performance on tactical level, Ann engaged in extensive planning and goal setting based on constant monitoring and anticipating her opponent's shots. To build up an initial strategy against an unknown opponent, Ann typically "tested" the opponent in the beginning of the match to determine her strengths and weaknesses. She reported:

> ... usually the first shot that I go for is a high ball to the backhand to see how they are able to handle that. A lot of people actually can't handle that. So if I am in a long rally I usually just throw that out and it's able to get me back into the point.
>
> Next [...], I work on another high ball to the forehand to see how they are able to interact with that.
>
> The third shot I do is a backhand slice to see how they are with the low balls and amm usually [...] that play low are very good at volleys anyways, so that's something that I don't even really look for...
>
> ... obviously their serves are major and, very important because some hit them very hard, some hit them with spin, and then some don't put [...] on it at all. So, like, to see if I can attack that too.

In addition, Ann acknowledged that to be successful in a tennis match, it is essential for a player to adapt the initial match strategy for a particular opponent based on the opponent's current performance. For instance, Ann disclosed:

> I just try to find something that is working that day.
>
> In the fall, I played the same girl twice and the second time it [strategy] wasn't working on her. So I just try to, like, look to see what's working that day and what shot maybe isn't working [in] her favor, and to see which ones are working for me and, like, strategies that are working on me, [and] just try to capitalize on that.
>
> 'cause every player is different you can't go in with the same strategy for everyone. Everyone has a different mentality of how they are brought up playing and stuff like that, so...you have to adapt a little bit.

Finally, from excerpts of the second interview, it was apparent that Ann was planning her actions on the court based on her opponent's performance during the match. Examples of statements supporting this observation were:

> Her game kind of changed in those three games. Like, she was missing a lot more, and going for way too much, so I was just trying to keep that pressure on [her].
>
> If there is a point like where is like a double fault or anything, I am just, like, there is nothing I can really think about, [I] just put pressure on to the next point to try to get a little bit of an advantage.
>
> Her first game that she served that I won I guess at love she was missing [a lot]. She was going for way too many shots.
>
> ... and then I like talk to myself, 'O.K., if I keep one more ball in, then she'll try to go for something big and she'll messed [*sic*] up' and so that was my game plan.
>
> For my service game, I just had to get my serves in, so that I can make this work.
>
> [During the] second game, I was just trying to hold my serve, so that I can keep that break on her.
>
> [If there is a point that she misses, for example,] if she misses a forehand maybe the next point I'll try to set up [will be] a hard shot to her forehand to see if she can handle it again, and see if she makes another error.

Problem Solving

To correct technical or tactical mistakes, Ann analyzed the situation that led to the mistake on a particular shot or losing a set and attempted to change the motion or her tactics. This was evident from the following statements:

> [After a mistake] I just try to think about what I did and move forward from that 'cause I don't want to make the same mistake again.
>
> If it's a forehand or if it's a backhand I make a really bad error on it, I try to change it a little bit...

Additionally, during the second interview, Ann disclosed that one of the biggest stressors in competition was when her serve "[was] not working." To achieve correct execution, she:

> just try to go back to the basics of what I've learned and try to figure that out.

Finally, when reflecting back upon her second match, Ann revealed:

> So, I sat down after the first set, put the towel on my head, and tr[ied] to figure the new things out.

Ann perceived the new strategy as being effective in the beginning of the second set. She stated:

> It worked for a little while...Yea, I was up three games to zero [in the second set].

Relaxation and Breathing

It appeared as though Ann used relaxation and breathing techniques for regulating muscule tension throughout a match. This was evident from the following statements:

> [before I am receiving] like, I take a couple of deep breaths.
>
> Throughout the match if my muscles start to tense up I just try to breathe more, relax more.

> [Between sets] I was just trying to like relax...

External Outbursts of Negative Emotions

During two of the matches, Ann exhibited several external outbursts of emotions, such as hitting herself, abusing the racquet, or abusing the ball. She explained the outbursts as an effective means for releasing the negative energy being accumulated. This was evident from the following statements:

> [hitting oneself] It just relieves whatever is there.

> I just get, like, really fired up inside, and I just have, like, either [to], like, smack my racquet or the ball, and once I do that it's just releases all the energy and I feel so much better. But [it] usually builds up and then it gets to a point where I have to do something like... and then I am fine.

Higher-Order Theme #3

The player's SR after the match consisted of (a) distancing and rationalizing the score, (b) recognizing the positives, (c) appraising the performance, and (d) learning from mistakes.

Ann experienced failure in the three matches of interest. However, during two of the interviews, she reported that she did not dwell on the result for long:

> Usually I am down about that day, but the next day I am over it.

> I don't really think about the match afterwards. Like, I think about it for like 15 minutes.

She managed to overcome the negative emotions (i.e., frustration) by distancing herself from the activity and rationalizing after the loss. When asked to reflect on how she managed to overcome the negative mental and emotional states and body sensations (i.e., exhaustion, cramping, and soreness) after her loss in the first and the second matches, Ann reported:

> Well, I've taken two days off of tennis now (laughing)...Yes, I've taken a couple of days off.
>
> After I changed, I got to the bus. We went and eat [*sic*] on the way home. That night, I just stayed in. [I] just watched a movie and just relaxed in my room.

To rationalize the loss, Ann tried to reduce her perceptions of the importance of the result:

> I am, like, [thinking], 'That's really stupid. How I, like, was so upset over this?' Like, at the time it seems, like, it's a big deal, but, like, now I'm just [thinking], 'It's O.K.! It happens,' you know and you move on.

By distancing herself from the result, Ann was able to recognize the improvements in her performance and to be content with the quality of her performance. Excellent examples of statements supporting this assumption were:

> Actually, even though I lost and I didn't play very well, I felt like my state of mind, even though I wasn't as focused, how I was reacting to, like, the points [was], like, a lot more controlled and, like, better and that was the only improvement that I really saw in my match... I felt, like, a lot better of how I was controlling myself inside even though I wasn't focused 'cause usually my temper is a bit of a problem and just felt I was just under better control...
>
> ... game wise, like, shot wise, even though my ground strokes weren't really working very well, the only thing that I was able to control was my serve... [I] was really happy or pleased with myself that I was able to have better serves games that I'd had been [having]. Like, my serve over spring break, when I was playing those matches, I didn't have it at all and the opponent could totally take advantage. But I was serving very well and, even though that she was a very good returner and she made it difficult and it didn't look that my serve was good, I was very happy with [my serve].
>
> ... it wasn't like a bad performance. The girl was really nice. I was talking to her afterwards, she was, like, if [...] to a third set, it would've been a very nice match just like, so I definitely I thought it was so...
>
> I was, like, happy with how I, like, played in the second set... I played better than in the [xx] match and, like, I was using my head a little bit

> more so, like, that was positive thing that I could've taken out of that and...

Finally, by separating the quality of her performance from the result of the match, Ann was able to perceive the mistakes she made as something that she could improve on to further enhance her performance in subsequent matches. Support for this inference was found in the following statement:

> Like, when I [...] my serve that was the main thing that I took away from this match was that I went to practice actually the next couple of days and I was just [saying], 'O.K., [coach] just give me those high short balls and let me hit them and get them in.' 'Cause just that's what [I] took away from the match that I need to improve on. So, hopefully, that I will be able to set my serve up and make those changes and give myself opportunity. [It's] just I wasn't able to capitalize on them [in this match].

Summary

Three final higher-order themes emerged after comparing and integrating the higher-order themes from the three interviews. These themes answered the research question: "How does one NCAA Division III female tennis player self-regulate prior to, during, and after a singles tennis match?" by providing a description of the SR techniques and strategies used by the participant. These themes were:

- Higher-Order Theme #1: The player's SR before the match consisted of (a) resting and hydrating, (b) relaxation and breathing, (c) blocking out distractions, (d) goal setting, (e) gathering information, (f) planning, and (g) reviewing notes on technical execution.
- Higher-Order Theme #2: The player's SR during the match consisted of (a) self-talk, (b) imagery, (c) blocking out distractions, (d) planning, (e) problem solving, (f) breathing and relaxation, and (g) external outbursts of negative emotions.

- Higher-Order Theme #3: The player's SR after the match consisted of (a) distancing and rationalizing the score, (b) recognizing the positives, (c) appraising the performance, and (d) learning from mistakes.

A discussion of these final higher-order themes in relation to the current SR literature is provided in the following chapter.

Chapter 5

DISCUSSION

The purpose of the present study was to provide an in-depth understanding of how one NCAA Division III female tennis player self-regulates while preparing for, competing in, and reflecting back upon a singles tennis match.

One NCAA Division III female player was observed and subsequently interviewed after completing three competitive tennis matches at the end of the 2007-2008 collegiate tennis season. Three final higher-order themes emerged after comparing and integrating the data from the three interviews. This chapter provides (a) a discussion of the final higher-order themes in relation to the existing SR literature, and (b) a summary of the study.

Higher-Order Theme #1

The player's SR before the match consisted of (a) resting and hydrating, (b) breathing and relaxation, (c) blocking out distractions, (d) goal setting, (e) gathering information, (f) planning, and (g) reviewing notes on technical execution.

The results from the present study revealed that the player was employing several techniques and strategies to self-regulate prior to her singles matches. More specifically, to maintain optimal arousal and emotional states, the player was resting and hydrating combined with practicing breathing and relaxation techniques. These findings are consistent with the theoretical perspectives for physical regulation (Williams & Harris, 2006) and the empirical evidence of the effectiveness of breathing and relaxation techniques on athletes' pre-competitive states (e.g., Thelwell & Greenlees, 2003). Specifically, by employing breathing and relaxation techniques, athletes adjust—increase

or decrease—their activation level in accordance with the situational demands (Miner et al., 1999; Williams & Harris, 2006). Athletes' ability to regulate their activation level effectively is among the requisites for success during both practice and competition (Williams & Harris, 2006).

Additionally, to maintain proper focus, the player was trying to block out internal and external distractions. For example, she found it effective to not focus on her fatigue before her singles match. This finding is consistent with Williams and Harris' (2006) suggestion for using distractions for regulating negative bodily sensations. That is, when they experience fatigue athletes should direct their focus to the task at hand or potential objectives rather than dwelling on the experienced negative sensations (Williams & Harris, 2006).

Furthermore, the participant in the study was setting process goals to "get [her] strokes back" during the warm-up before one of her singles match. Setting process goals helped the player to direct her attention to improving the execution of the stroke motions before the match (Gould, 2006).

Finally, it was found that the player was observing her opponent to gather information, which she used to build her game plan for the match. From these findings, it was evident that the player was able to (a) pay attention to relevant cues and (b) shift her attentional focus within the broad-external (i.e., assessing)- broad-internal (i.e., analyzing) continuum (Niedeffer & Sagal, 2006).

Higher-Order Theme #2

The player's SR during the match consisted of (a) self-talk, (b) imagery, (c) blocking out distractions, (d) planning, (e) problem solving, (f) relaxation and breathing, and (g) external outbursts of negative emotions.

Self-Talk and External Outbursts of Negative Emotions

It appeared as though the participant extensively used internal and audible self-talk to exert control over her emotions, thoughts, and performance while competing. Even though some of the identified self-talk was negative in tone, a substantial part of the internal self-talk was instructional. In either case, the player perceived self-talk as an effective means of regulation. To some extent, these findings lend support to the theoretical perspectives for cognitive regulation, and are similar to the findings which suggest that many athletes engage in some form of internal dialog prior to, during, and after practice and competition (Miner et al., 1999; Zinsser et al., 2006). However, the quality and the tone of the employed self-talk determine the degree and direction of its influence on athletic performances (Miner et al., 1999; Zinsser et al., 2006). Specifically, when used appropriately one's self-talk is a valuable cognitive strategy for enhancing skill acquisition, regulating performance, adjusting mental and emotional states, directing attention, and regulating body sensations in practice and competition (Zinsser et al., 2006). In several qualitative studies, researchers found that athletes employed positive self-talk to prepare mentally for major competition (Gould et al., 1992a), as well as to manage stressful competitive encounters effectively (Holt & Hogg, 2002; Nicholls, Holt, & Polman, 2005).

Finally, researchers found that tennis players engaged in positive (e.g., motivational, instructional) and negative self-talk during a simulated (McPherson, 2000) and an actual (Van Raalte et al., 1994, 2000) tennis match. However, the findings regarding the effectiveness of the self-talk employed were not consistent across these studies. For instance, Van Raalte et al. (1994) found that for junior tennis players positive self-talk was not associated with better performance, while negative self-talk was associated with poor performances. Conversely, the results from a study with adult tennis players indicated that negative self-talk was not associated with losing (Van Raalte et al., 2000). In contrast, in the present study negative self-talk and external outbursts of negative emotions (e.g., abusing the ball, or the racquet) were appraised by the participant as efficacious means of regulation. More specifically, the player acknowledged that it helped her to release the negative energy, and did not have a negative influence on her subsequent actions on the court. In addition, positive self-talk was appraised as an effective strategy as well. The discrepancy in these findings may reflect the fact that Van Raalte et al. (1994) and Van Raalte et al. (2000) evaluated the effectiveness of the employed self-talk indirectly through the result in a match, while in the present study the athlete was asked to report her perceived effectiveness of the employed self-talk. Furthermore, it is possible that, with more experience, athletes learn how to manage their self-talk more effectively (McPherson, 2000; Van Raalte et al., 2000).

Van Raalte and colleagues (Van Raalte et al., 1994, 2000) only briefly examined the players' internal self-talk. This limitation was addressed in the present study and the study by McPherson (2000). Asking tennis players to explain their actions on the court in

a given situation, made it possible to gain a better understanding of the internal self-talk they employed. Similarly to McPherson's findings, the participant in the present study extensively used instructional self-talk for (a) achieving correct execution after a mistake, (b) regulating muscle tension, and (c) maintaining proper focus. After analyzing the player's reports, it was found that the self-instructions were generated based on performance feedback and performance goals. This is consistent with Zinsser et al.'s (2006) suggestion that outcome-oriented self-instructions are more beneficial for athletes than self-instructions that depict the mistakes made because outcome-oriented self-instructions affirm and reinforce correct execution and positive thinking patterns.

Imagery and Problem Solving

It appeared as though the participant in the present study used imagery to achieve correct execution of a particular shot. Additionally, she tried to correct mistakes by analyzing the circumstance that led to the mistake and picturing the desired execution(s). These findings suggest that the player was able to pay attention to relevant cues while competing and use the gathered information for improving her subsequent performance. In turn, engaging in problem solving helped the athlete to maintain concentration by focusing on achieving success instead of dwelling on her mistakes (Wilson, Peper, & Schmid, 2006). Finally, the finding that the participant was engaging in problem solving during the match was consistent with the theoretical perspective (Lazarus & Folkman, 1984) and research (e.g., Holt & Hogg, 2002) in the coping with stress literature. That is, through problem solving one manages stressful encounters by defining the problem and responding with an optimal solution, which is generated in accordance with the situational demands (Lazarus & Folkman, 1984). Similar, to what the participant in the

present study reported when explaining the means of correcting technical mistakes while in play, a soccer player reported:

> I think, 'let's sort it out, what did I do wrong? How am I going to fix it? And then I try to not do it the second time (Holt & Hogg, 2002, p. 264).

Through imagery athletes are able to create and recreate desired performances in their mind, which in turn positively influences their subsequent actions, as well as their mental and emotional states while competing (Vealey & Greenleaf, 2006). That is, mental practice, or mental rehearsal contributes to athletic performance enhancement (Miner et al., 1999; Vealey & Greenleaf, 2006). Experimental research in sport settings further lends support for this contention (e.g., Mamassis & Doganis, 2004; Thelwell & Greenlees, 2003; Thelwell et al., 2006). For example, one of the participants in Mamassis and Doganis' (2004) study benefited from implementing imagery as a part of her pre-service routine in overcoming a performance deficiency (i.e., excessive double faulting).

Planning

It was evident that the participant in the present study was planning and adapting her actions on the court based on constant monitoring and anticipation of her opponent's actions. That is, she was able to focus on relevant information, analyze the obtained information, and apply it to her performance (i.e., anticipation of the opponent's actions). These findings lend partial support to the model of SR proposed by Bedny et al. (2000), which consisted of (a) monitoring of performance requisites, (b) developing adaptable plans for performance, and (c) evaluating intermittent and final outcomes in relation to previously set goals.

Finally, this finding corroborated the findings of McPherson's (2000) study, which revealed that expert tennis players planned their actions on the court based on

elaborate interpretation and analysis of current and anticipated events, opponents' style and technique, and setting performance goals.

Blocking out Distractions

To maintain proper focus while in play, the participant in the present study tried to block out internal and external distractions by directing her attention to external cues (e.g., racquet strings), as well as by distancing herself from particular match situations. In relation to sport psychology theory, these findings lend support to the importance of athletes ignoring irrelevant external and internal stimuli to focus and refocus while competing (Wilson et al., 2006). This contention was further supported by findings from several qualitative studies. Athletes perceived their ability to block out distractions as a valuable performance enhancing strategy (Gentner, 2004a, 2004b; Greenleaf et al., 2001; Holt & Hogg, 2002; Nicholls, Holt, & Polman, 2005). Specifically, by eliminating irrelevant thoughts, such as thoughts regarding past and anticipated events, tennis players were able to play "one point at a time" and be successful on the court (Gentner, 2004b, p. 50).

Finally, consistent with Miner et al.'s (1999) and Wilson et al.'s (2006) suggestions, the participant in the present study was observed to use environmental cues to change her attention. For instance, to better focus and refocus while in play, the player adjusted her racquet strings, or clapped her hand against her thigh before receiving.

Relaxation and Breathing

In her attempt to regulate muscle tension while in play, the participant in the present study used relaxation and breathing techniques. More specifically, the player used these techniques to reach and maintain optimal body sensations before skill execution and

while recovering between sets. This finding was consistent with the existing evidence of the positive influence of breathing and relaxation techniques on physiological and mental regulation, which subsequently affects athletic performance (e.g., Gould et al., 1992b; Miner et al., 1999; Nicholls, Holt, & Polman, 2005; Williams & Harris, 2006).

Higher-Order Theme #3

The player's SR after the match consisted of (a) distancing and rationalizing the score, (b) recognizing the positives, (c) appraising the performance, and (d) learning from mistakes.

In all of the three matches of interest, the player suffered a loss. Even though the participant stated that she experienced the negative consequences of her losses only within a few hours after the matches, several techniques and strategies were discovered in her narrations when reflecting back upon her experiences after the matches. Consistent with Lazarus and Folkman's (1984) coping model, after a loss the player used predominantly emotion-focused coping strategies (i.e., taking time off, watching movie). By distancing herself from the activity and reappraising the situation, or reducing the importance of the result, the player was able to overcome the negative emotional and mental states and body sensations after a loss.

One finding that deserves considerable attention is the fact that the player was able to recognize the improvements in her performance and be content with the quality of her performance despite the loss. This finding underlined the importance of attending to improvements within a failure to build and maintain one's confidence and enhance performance (Zinsser et al., 2006). Particularly, tennis players reported that it was

beneficial for them to see the positives within their performances and build on them to achieve success in future matches (Gentner, 2004a, 2004b).

Finally, congruent with Zinsser et al.'s (2006) suggestion, the participant in the present case study was able to perceive the mistakes she made in her matches as a step toward further improvement. However, despite the evidence that the player self-regulated effectively after the match, some caution is required when interpreting these results. That is, the interviews were conducted several days after the matches. Therefore, the player's perception and reappraisal of the result could be influenced externally (i.e., coach, family, friends). The player's reports might also have been influenced by the nature of the investigation and the negative result of the observed matches. Thus, the player might have attempted to present herself in a desired light. Nevertheless, the fact that the player was able to restructure the event(s) and learn from her experience was anticipated to have a positive influence on her future development as an athlete.

Summary

From the results of this study, it was apparent that the participant employed various techniques and strategies to self-regulate prior to, during, and after a singles tennis match. Specifically, the participant used;

1. breathing and relaxation techniques to reach and maintain optimal bodily sensations prior to and during a singles tennis match,
2. self-talk to regulate her focus, emotions, bodily sensations, and technical and tactical executions while competing,
3. imagery to achieve and affirm correct execution of a particular shot,

4. blocking out distractions to maintain proper focus prior to and during a singles tennis match,
5. problem solving, planning, and information gathering to exert control over her performance on technical and tactical levels, and
6. rationalizing, learning from mistakes, and recognizing the improvements in her performance to overcome the negative emotional and mental states after a loss.

Overall, these findings are consistent with the empirical knowledge of the manner in which athletes manage competitive demands and improve their performances. Additionally, these findings are congruent with the theoretical perspectives for physical, mental, and performance regulation and extended the existing research by providing insight on how tennis players self-regulate prior to and after a singles tennis match.

Chapter 6

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The purpose of this study was to gain an in-depth understanding of how one NCAA Division III female tennis player self-regulates while preparing for, competing in, and reflecting back upon a singles tennis match. This chapter provides (a) a summary, (b) conclusions, (c) recommendations for future research, and (d) suggestions for practitioners.

Summary

The sport of tennis demands high physiological and psychological self-regulation. To date, the existing tennis research focuses on isolated self-regulatory techniques and strategies employed by tennis players in competitive and non-competitive settings (McPherson, 2000; Van Raalte at al., 1994, 2000). However, little research has been conducted to provide an in-depth description of tennis players' SR while preparing for, competing in, and reflecting back upon a singles tennis match.

One NCAA Division III female tennis player (n=1) was purposefully selected to gain an in-depth understanding of the self-regulatory techniques and strategies used by a tennis player before, during, and after a singles tennis match. The player was experiencing negative performances during the second half of the 2007-2008 collegiate tennis season. The player was observed in two competitive matches and interviewed after the matches. Additionally, a third interview was conducted after the player competed in the NCAA Division III tennis tournament. Three final higher-order themes emerged after comparing and integrating the higher-order themes from the three interviews:

1. The player's SR before the match consisted of (a) resting and hydrating, (b) breathing and relaxation, (c) blocking out distractions, (d) goal setting, (e) gathering information, (f) planning, and (g) reviewing notes on technical execution.
2. The player's SR during the match consisted of (a) self-talk, (b) imagery, (c) blocking out distractions, (d) planning, (e) problem solving, (f) relaxation and breathing, and (g) external outbursts of negative emotions.
3. The player's SR after the match consisted of (a) distancing and rationalizing the score, (b) recognizing the positives, (c) appraising the performance, and (d) learning from mistakes.

It was evident that the player employed several techniques and strategies to self-regulate in the three phases of a competition (i.e., before, during, and after a singles tennis match). Overall, these findings supported the existing knowledge regarding athletes' use of SR techniques and startegies during a competition. Aditionally, the present study extended the current empirical knowledge by providing some insight into a tennis player's SR prior to and after a singles tennis match. Based on the collected data, some conclusions were drawn. Several recommendations for future research and suggestions for practitioners were made as well.

Conclusions

Several conclusions were made after analyzing the final higher-order themes. First, it was concluded that the participant had utilized the necessary requisites (i.e., paying attention to relevant cues, shifting focus, setting performance goals, and evaluating personal and opponent's performances) to exert control over her performance

on technical and tactical levels. Particularly, consistent with Bedny et al.'s (2000) SR model, the participant was setting performance goals and attempting to adjust her actions on the court based on monitoring and evaluation of the competitive demands and her corresponding reactions. Additionally, the participant employed several techniques (i.e., physical and mental distancing, directing attention to external cues, blocking out distractions) for maintaining optimal focus prior to and during a singles tennis match.

Second, it was concluded that the effectiveness of the participant's SR on emotional level was somewhat arguable. More specifically, the participant perceived that engaging in negative self-talk and external outbursts of emotions were effective means for overcoming negative emotional states. Given the observed inconsistency between these findings and the existing theoretical and empirical knowledge, it can be argued that more efficient techniques and strategies for emotional regulation can be employed.

Finally, it was concluded that employing strategies for mental regulation (e.g., rationalizing a loss, learning from mistakes, and recognizing the improvements in one's performance) after a loss was beneficial for the participant.

Recommendations for Future Research

The present study provided some insight on how one NCAA Division III female tennis player self-regulates prior to, during, and after a singles tennis match. However, more research is needed to describe tennis players' SR.

First, despite the fact that one's SR should be examined and treated individually (Prapavessis et al., 1992; Robazza, Bortoli, & Hanin, 2004), it would be beneficial to replicate the present study with more tennis players to enrich the data from the present study and to make some generalizations regarding tennis players' SR. Additionally, it is

feasible to recommend future research that aims at comparing and contrasting tennis players' SR when they compete (a) in singles and doubles matches and (b) in matches of differing difficulty and importance. Finally, it has been acknowledged that little is known about tennis players' SR prior to and after a tennis match. Thus, more research in this direction will extend the findings from the present study and provide practitioners with valuable guidelines of how to improve coaching and consulting services.

Second, several researchers reported differences across gender and type of sport in athletes of coping with competitive stressors (Hammermeister & Burton, 2004; Holt & Hogg, 2002). Therefore, it would be beneficial to compare and contrast the SR in players who compete in individual and team sports. It is anticipated that this line of research would provide more insight into the factors that have an influence on athletes' SR.

Finally, several methodological suggestions could be made to facilitate and improve future research that aims at describing athletes' SR. During the interview process, it would be advantageous to ask the player to describe her emotional and mental states. In this study, based on the participant's answers regarding her pre-competitive, competitive, and post-competitive states, the self-regulatory techniques and strategies she used to maintain optimal states in the three phases of a competition (i.e., preparation, performance, and reflection) were explored. However, the player found it challenging to describe her feelings prior to and after a tennis match. Therefore, it might be beneficial to use questionnaires prior to and after a competition to better define the players' emotional, mental, and bodily responses to competitive demands. This might further facilitate the interview process by providing the researcher with a guideline for the interview. Researchers have used questionnaires prior to and after a competition to define the

baseline variables (i.e., self-confidence, facilitative and debilitative emotions) for performance enhancing interventions and to subsequently evaluate the effectiveness of such interventions in several experimental studies (Mamassis & Doganis, 2004; Prapavessis et al., 1992; Robazza, Pellizzari, & Hanin, 2004). Finally, during the interviews, it was recognized that asking the player to describe a particular behavior or an action observed during a match facilitated her recollection process. Therefore, it is anticipated that using stimulation recall technique would elicit more accurate and comprehensive information regarding the player's SR during a competition. Several researchers used the stimulation recall technique to address different issues in physical education settings (Allison, 1990; Kermarrec et al., 2004; Tan, 1996; Wilcox & Trudel, 1998) and tennis (Lee et al., 1992).

Suggestions for Practitioners

Coaches

It was apparent that receiving feedback from a coach played a vital role in the participant's SR. Similarly, Kitsantas et al. (2000) found that social feedback improved learning and enhanced self-motivation. Therefore, it is essential for coaches to provide the players with (positive) feedback that depicts key moments of the executed skill. It is anticipated that constructive feedback will help the players to achieve and affirm correct execution in practice and use the instructions given in practice to achieve correct executions in competition.

Consultants

It was apparent that the participant in the present study was regulating her emotions by engaging in maladaptive behaviors on the court. Even though the player

reported that the observed behaviors were an effective means of releasing the accumulated negative energy, it can be argued that using more constructive techniques and strategies might have a better impact on athletes' subsequent performances. Therefore, it is feasible to suggest that consultants should educate and train athletes on how to use techniques and strategies for exerting control over their emotional reactions while competing.

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APPENDIX A

Informed Consent Form

How does a Division III tennis player self-regulate while preparing for, participating in, and reflecting back upon competition?

1. Purpose of the Study:

The purpose of the present study will be to gain an in-depth understanding of the self-regulatory techniques and strategies used by a Division III tennis player before, during, and after a tennis match.

2. Benefits of the Study:

Your participation in the study will likely increase your awareness of your physiological and psychological states before, during, and after a tennis match, the impact of these states on your performance, as well as what you do or can do to regulate/maintain your reactions to the competitive demands. In addition, your participation in the study will give us an opportunity to gain a better understanding of how a Division III tennis player self-regulates in competitive settings. The present study will have potential benefits for tennis coaches and players, as well as sport psychology consultants: The findings will contribute to the development and implementation of performance enhancement programs and the improvement of stress management training programs.

3. What You Will Be Asked To Do:

You will be asked to participate in two or three interviews that will be conducted as soon as possible after you complete 2-3 competitive matches. The interviews will last between 50 and 60 minutes. Each interview will be tape-recorded and transcribed verbatim. All the transcripts will be presented to you for review and any additional comments. In addition, you will be observed unobtrusively during several practices and the two matches after which you will be interviewed.

4. Risks:

There are no foreseeable physical risks related to this study. However, during the interviews you might experience a certain level of apprehension.

5. If You Would like More Information about the Study:

Please contact Lilyana Mladenova if you have any question and/or concerns regarding your participation in the study. She can be reached at lmladen2@ithaca.edu.

6. Withdrawal from the Study:

You can refuse to answer particular question(s) and you can withdraw from the study at any point. There will not be any consequences of your withdrawal from the study.

Initial your Name_____

APPENDIX A (continued)

7. Confidentiality of the Data:

All the collected data will be kept under lock and key, and will be destroyed after the study is concluded. The audiotapes, the transcripts of the interviews, and the observation protocols will be kept confidential. Pseudonyms will be used and any information that can reveal your identity will be kept secret. Only the researcher and her two thesis committee members will have access to the aforementioned documents. Your name and identity will not be cited in the thesis.

8. Participant's Statement:

I have read the above and I understand its contents. I agree to participate in this study. I acknowledge that I am 18 years of age or older. I have received a copy of this consent form for my own records.

_____

Print Name (Participant)

_____ _____

Signature (Participant) Date

I give my consent to be audio taped.

_____ _____

Signature (Participant) Date

APPENDIX B

Interview Guide

1. Please recall and describe your feelings, thoughts, body sensations/physical reactions, and overall readiness before the match.

Probing questions (if not discussed):
What physical reactions did you have [to your feelings]?
What were you thinking about?
What were you paying attention to before the match?

2. What made you feel this way?

Probing questions regarding the importance and difficulty of the match (opponent and match conditions); preparation, personal goals and expectations, or issue(s) of particular interest for the athlete, if not discussed fully

3. What did you do to overcome/maintain [the aforementioned states]? How effective was [this technique]?

4. In your opinion, how did your [pre-competitive states] influence your performance in the beginning of the match?

5. Please recall and describe your feelings, thoughts, and body sensations/physical reactions during the match. Please recall and describe your ability to focus and shift your focus during the match.

Probing questions (if not discussed)
What physical reactions did you have [to your feelings]?
What were you thinking about during the match? How did your thoughts change during the match? What made you think this way?
How focused do you think you were during the match? What were you paying attention to during the match? How did your focus change during the match? What made you lose/sustain your focus?

APPENDIX B (continued)

6. What made you feel this way?

Probing questions about the match conditions; opponent's conduct and performance; expectations, difficulty and importance of the match; score and personal performance, or issue(s) of particular interest for the athlete, if not discussed fully

7. In your opinion, how did [the aforementioned states] affect your performance during the match?

8. What did you do to overcome/maintain [the aforementioned states]? How effective was [this technique]?

9. Please recall and describe your feelings, thoughts, and body sensations/physical reactions right after the match.

Probing questions (if not discussed):
What physical reactions did you have [to your feelings]?
What were you thinking about?
What were you paying attention to after the match?

10. What made you feel this way?

Probing questions about the personal performance and expectations, opponent's performance, or issue(s) of particular interest for the athlete, if not discussed fully

11. How did your feelings, thoughts, and body sensations/physical reactions change between the end of the match and now?

12. What caused such change(s)?

13. What are you going to do to overcome [the aforementioned states]?

14. Now, after talking about your match: If you had to play this match again, what would you change? What would make this match better?

15. What are you going to do/would you like to do to prepare for the next match?

APPENDIX C

Observation Protocol

Ace														
Double Fault	NST													
Success		√												
Error														
Result	0-15 15-15													
Comments	Server							Receiver						

The protocol is designed in a manner to enable the researcher to record the outcome (i.e., own/opponent's ace/double fault, any form of success and error) of each point during the match as well as the player's observable and/or audible reaction(s) to the outcome. Upon the completion of the observation, the researcher can recreate the result of the game/set/match.

For example, if the observed player is serving in the first game and makes a double fault on the first point, then in the first column on the double fault-row the researcher will record her reaction(s) to the fault (e.g., Negative Self-Talk, or NST). Let us say that the observed player wins the second point, because the opponent hits the ball out—this for the observed player is a form of success; therefore, in the second column on the success-row the reseacher will record her behavior(s). If there is nothing that the researcher can record, then a check mark will be put to record the outcome for the point. After the game is over, the researcher will indicate the end of the game. In the next cells the reasearcher will record the observed behaviors of the player while receiving the

APPENDIX C (continued)

opponent's serve. Here, on the ace and double fault-row the researcher will record the observed reactions of the player on the opponent's ace/double fault.

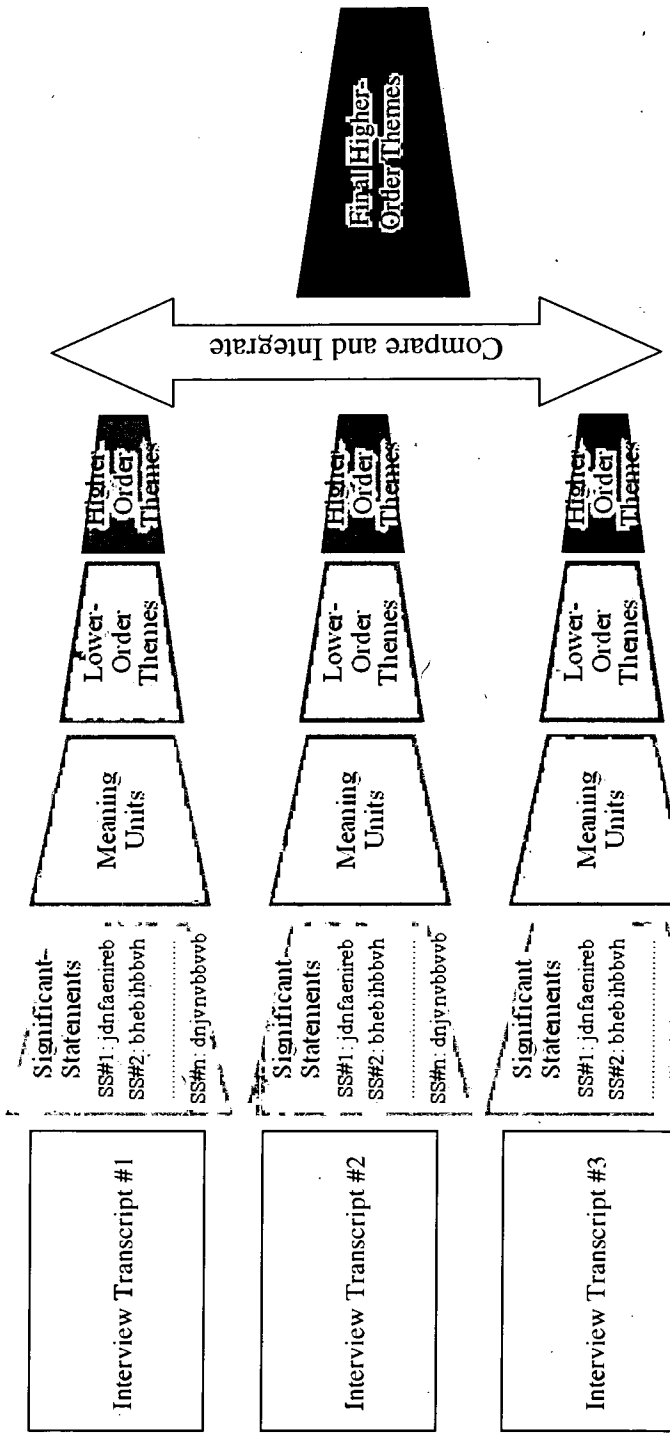
APPENDIX D

Timeline of Data Collection

Timeline of data collection. Match #3 was not observed. The space between the points indicated on the timeline is reciprocal to the time between the occurrences of the presented events.

APPENDIX E

Analytical Steps of Data Management



Analytical steps of data management. The size of the trapezoids represents the number of units within a cluster, whereas the intensity of the color represents the meaning of the units within a cluster. That is, as the units of one cluster are classified into a higher order cluster, the number of the resultant units is smaller than the initial number, whilst the meaning of the resultant units is more reach than the meaning of the initial units.

APPENDIX F

Higher-Order Themes for Interview #1

Meaning Units	Lower-Order Themes	Higher-Order Themes
Reacting after losing a point: negative self-talk, abusing the racquet/ball, hitting oneself Complimenting the opponent after a good shot	Reactions after losing a point	SR techniques and strategies during the match
Fixing a mistake: imagery, self-instructions	Miscellaneous: Fixing a mistake	
Imagery for correct execution	Miscellaneous: Achieving correct execution	
Techniques to focus: hitting oneself, not saying the score before serving Refocusing by looking at the strings Refocusing by mental or physical distancing from a particular match situation	SR techniques for maintaining proper focus	
Rationalizing after dissatisfaction with one's performance Distancing from the activity after dissatisfaction with one's performance	SR after failure: distancing, rationalizing	SR techniques and strategies after a failure
Recognizing the positives in a match after a loss	Miscellaneous: Recognizing the positives	

APPENDIX G

Higher-Order Themes for Interview #2

Meaning Units	Lower-Order Themes	Higher-Order Themes
Warm up before the match: setting process goals, planning Scouting the opponent before the match: information gathering Preparation for the match: resting, hydrating, relaxation, breathing, blocking out distractions	Preparation before the match	SR before the match
After losing a set: distancing from the situation, rationalizing, problem solving After winning a point: imagery, apply again After a correct execution: imagery, self-instructions	SR after/for correct execution	SR techniques and strategies during the match
Reaction after making a mistake: criticizing Self-instructions based on performance goals Fixing a mistake: Self-instructions based on performance feedback After a mistake: reaction, refocus, problem solving	SR after making a mistake	
Testing the opponent to build up the strategy for the match Build up strategy during the match: monitoring, anticipating, planning Recognizing the need to employing adaptable strategy based on the opponent's performance	Strategy during the match	
Block out external distractions Self-instructions for relaxation	SR techniques: Blocking & Self-instructions	
After a loss: relax, watch a movie Take a lesson from the match Satisfaction with one's performance after a loss: recognize the positives	After a loss	SR techniques and strategies after the match (failure)

APPENDIX H

Higher-Order Themes for Interview #3

Meaning Units	Lower-Order Themes	Higher-Order Themes
Preparation before the match: information gathering, planning Before the match: notes on technical execution Ignoring the problem (being tired)	Preparation before the match	SR techniques and strategies before the match
After a mistake: not dwell too long on it Between sets: relax and refocus	SR during the match	SR techniques and strategies during the match
Breathing and relaxation for regulating muscle tension Techniques for maintaining proper focus: self-instructions, focus on the ball	SR techniques	

APPENDIX I

Final Higher-Order Themes

Higher-Order Themes Interview #1	Higher-Order Themes Interview #2	Higher-Order Themes Interview #3	Final Higher-Order Themes
	HOT: SR before the match LOT: Preparation before the match MU: Warm up before the match: setting process goals, planning MU: Scouting the opponent before the match: information gathering MU: Preparation for the match: resting, hydrating, relaxation, breathing, blocking out distractions	HOT: SR techniques and strategies before the match LOT: Preparation before the match MU: Preparation before the match: information gathering, planning MU: Before the match: notes on technical execution MU: Ignoring the problem (being tired)	SR techniques and strategies before the match Resting and hydrating Breathing and relaxation Blocking out distractions Goal Setting Gathering information Planning Reviewing notes on technical execution
HOT: SR techniques and strategies during the match LOT: Reactions after losing a point MU: Reacting after losing a point: negative self-talk, abusing the racquet/ball, hitting oneself MU: Complimenting the opponent after a good shot LOT: Fixing a mistake MU: Fixing a mistake: imagery, self-instructions LOT: Achieving correct execution MU: Imagery for correct execution	HOT: SR techniques and strategies during the match LOT: SR after/for correct execution MU: After losing a set: distancing from the situation, rationalizing, problem solving MU: After winning a point: imagery, apply again MU: After a correct execution: imagery, self-instructions	HOT: SR techniques and strategies during the match LOT: SR during the match MU: After a mistake: not dwell too long on it MU: Between sets: relax and refocus LOT: SR techniques MU: Breathing and relaxation for regulating muscle tension MU: Techniques for maintaining proper focus: self-instructions, focus on the ball	SR techniques and strategies during the match Self-talk Imagery Block out distractions Planning Problem solving Relaxation and breathing External outbursts of negative emotions

APPENDIX I (continued)

Final Higher-Order Themes

Higher-Order Themes Interview #1	Higher-Order Themes Interview #2	Higher-Order Themes Interview #3	Final Higher-Order Themes
HOT: SR techniques and strategies during the match (continued) LOT: SR techniques for maintaining proper focus MU: Techniques to focus: hitting oneself, not saying the score before serving MU: Refocusing by looking at the strings MU: Refocusing by mental or physical distancing from a particular match situation	HOT: SR techniques and strategies during the match (continued) LOT: SR after making a mistake MU: Reaction after making a mistake: criticizing MU: Self-instructions based on performance goals MU: Fixing a mistake: Self-instructions based on performance feedback MU: After a mistake: reaction, refocus, problem solving LOT: Strategy during the match MU: Testing the opponent to build up the strategy for the match MU: Build up strategy during the match: monitoring, anticipating, planning MU: Recognizing the need to employing adaptable strategy based on the opponent's LOT: Blocking' & Self-instructions MU: Block out external distractions MU: Self-instructions for relaxation	HOT: SR techniques and strategies during the match (continued)	SR techniques and strategies during the match Self-talk Imagery Block out distractions Planning Problem solving Relaxation and breathing External outbursts of negative emotions

APPENDIX I (continued)

Final Higher-Order Themes

Higher-Order Themes Interview #1	Higher-Order Themes Interview #2	Higher-Order Themes Interview #3	Final Higher-Order Themes
HOT: SR techniques and strategies after a failure LOT: SR after failure MU: Rationalizing after dissatisfaction with one's performance MU: Distancing from the activity after dissatisfaction with one's performance LOT: Recognizing the positives MU: Recognizing the positives	HOT: SR after a loss LOT: SR techniques and strategies after the match (failure) MU: After a loss: relax, watch a movie MU: Take a lesson from the match MU: Satisfaction with one's performance after a loss: recognize the positives		SR techniques and strategies after the match Distancing and rationalizing Recognizing the positives Apprizing the performance Learning from mistakes