The Effects of Mental Skills Training on Serve Accuracy of an Intercollegiate Volleyball Team

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THE EFFECTS OF MENTAL SKILLS TRAINING ON SERVE ACCURACY
OF AN INTERCOLLEGIATE VOLLEYBALL TEAM

A Thesis
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Master of Arts

By
Amber N. Usry

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THE EFFECTS OF MENTAL SKILLS TRAINING ON SERVE ACCURACY
OF AN INTERCOLLEGIATE VOLLEYBALL TEAM

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Director of Thesis  Elizabeth L. Boudreau

Dean, Graduate Studies and Research  5/5/05
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THE EFFECTS OF MENTAL SKILLS TRAINING ON SERVE ACCURACY OF AN INTERCOLLEGIATE VOLLEYBALL TEAM

Amber N. Usry May 5, 2005 49 pages

Directed by: Elizabeth L. Shoenfelt, Ph.D., Reagan Brown, Ph.D., and Jacqueline Pope, Ph.D.

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A pre-season mental skills program for serving was implemented for the 12 members of a NCAA Division-I volleyball team. Key mental skills taught were relaxation, imagery, and attentional skills. A videotaped expert (i.e., the coach), who articulated and demonstrated the technical performance keys to effective serving, was used for behavioral modeling of the desired performance. Players utilized a three-phase service routine to increase automaticity of performance and to incorporate key mental skills. Phase I included: (a) selecting the target zone, (b) relaxing, (c) goal setting for pace, trajectory, and placement of the serve, and (d) imagery. Phase II included: (a) trusting the serve, (b) use of a serve trigger thought (e.g., “palm to target”), and (c) execution of the serve. Phase III included: (a) observing the outcome of the serve attempt, (b) if a good serve, reinforcing the performance through imagery; if a missed serve, correcting the error through imagery then letting go of the error, and (c) moving on to the next point.

Two criteria measures were utilized: season ace-to-error ratio (AER) and good serve percentage (GSP; i.e., percent serves in home matches that pulled the opponent’s setter off the net). These measures were highly correlated ($r = .85, p < .01$). Both were utilized, as GSP was more sensitive than the traditional AER.
End-of-the-season reported use of imagery was significantly correlated with GSP 
\(r = .82, p < .01\) and AER \(r = .63, p < .05\). End-of-the-season reported use of a service routine also correlated significantly with GSP \(r = .75, p < .01\) and AER \(r = .60, p < .05\). The mean GSP across all servers for the season was .49 (SD = .07); the team GSP goal was .50. Competitive anxiety was negatively correlated with GSP \(r = -.68, p < .05\). Results indicate that implementing the mental skills training program was associated with increased serve performance.
INTRODUCTION

The present study is an evaluation of a mental skills training program implemented for the skill of serving in an intercollegiate volleyball team. The program was designed to increase player self-efficacy and service effectiveness. In the last few decades, researchers, coaches, and athletes have come to acknowledge the importance of cognitive processes in athletic performance. Improved mental skills often enhance athletic performance, which ultimately leads to more success in competitive settings. Athletes who excel do so not just due to physical ability and skills but also because of their mental awareness, preparation, and skills. A mental skills training package can help to improve an athlete’s overall performance by providing the tools, guidance, and practical insight needed to sharpen his or her mental skills.

Quality performance is facilitated in competitive situations when mental skills are acquired and frequently practiced (Hanton & Jones, 1999). The mental skills program in the present study included training in relaxation methods, imagery, attentional focus, behavior modeling of the technical skill in the service routine, and goal setting. The rationale for the inclusion of each component of the training program and the criterion measures used to evaluate them are discussed in the following review of the literature.

Mental Skill Components

Andre and Means (1986) advocated the use of a combination of psychological skills to enhance athletic performance. A number of mental skills have been demonstrated to have positive effects on performance. Druckman and Bjork (1991) identified five categories of cognitive-behavioral interventions used by sport psychologists to optimize athletic performance. These categories are imagery, relaxation,
mental preparation strategies, skill development strategies, and cognitive restructuring-coping strategies.

In most situations, different mental skills are combined to achieve a more effective intervention. However, it is necessary to evaluate each situation to determine which skills are most likely to enhance performance in a particular competitive situation. The serve in volleyball is a closed-field skill in that the action is stopped and the timing of the initiation of the serve is under the control of the athlete. The serve is a precision skill in which accuracy in trajectory and placement is critical to effectiveness. Mental skills appropriate for such a situation include imagery, arousal management (relaxation), routine, and focus (Whelan, Meyers, & Donovan, 1995).

**Imagery.** Mental imagery, also called visualization and mental rehearsal, is the rehearsal of a task in the absence of actual physical movement (Driskell, Copper, & Moran, 1994). Imagery involves visualizing events in our mind’s eye to recall or create our own experiences or to imitate others. Neck and Manz (1992) defined imagery as an experience that resembles perceptual experience but which occurs in the absence of the appropriate stimuli for the relevant perception. Mental rehearsal can be thought of as visually repeating necessary information to oneself over and over again. Whenever we visualize ourselves performing an action in the absence of physical practice, it can be said we are using mental imagery.

Successful athletes purposefully use imagery to enhance performance. Imagery has been effectively used to learn and practice specific performance skills, to increase confidence and positive thinking, and for problem solving, control of arousal and anxiety, performance review and analysis, preparation for competition performance, and
maintenance of skill level during injury (Shoenfelt, 2003). Imagery has been found to improve performance in a variety of sports including tennis (Noel, 1980), darts (McKenzie & Howe, 1997), basketball free-throw shooting (Shoenfelt, 2003), and volleyball (Ridley, 1992). Imagery is best used in combination with other mental skills (e.g., relaxation, positive self-talk, and goal setting) over a period of time to enhance performance.

When one visualizes performing a task with complete precision and executing the task to the highest ability, it causes the physiological creation of neural patterns in the brain (Porter, 1990). This reinforcement of motor memory is the predominant explanation of why mental imagery is effective in enhancing performance. Porter (1990) further explained that mental imagery trains and exercises the mind to create the neural patterns in our brain that direct muscles to do exactly what is expected.

Mental practice is a positive and effective means of enhancing performance, but mental practice alone is not as effective as physical practice alone. Physical practice combined with mental practice is more effective for enhancing many performance skills than either technique alone (Driskell et al., 1994). Although mental practice is considered by many to be effective, Driskell et al. (1994) found that the type of task, the retention interval between practice and performance, and the length or duration of the mental practice interval moderated effectiveness of mental practice.

Relaxation. Relaxation training is a key component in a mental skills intervention because of the strong mind-body connection. The mind responds to the body and the body, in turn, responds to the mind. For example if one experiences sweaty palms, the reaction signals the mind that anxious and nervous feelings are present. On the other hand
Shoenfelt (2003) exclaims, if the mind is thinking one is nervous or anxious, the body may become tense and the palms sweaty, possibly causing negative thoughts and performance if the athlete is unable to control the physical reaction. Shoenfelt (2003) suggested the athlete should learn to control physical tension in the body and relax, thereby signaling the mind that the athlete is calm and in control. Feelings of relaxation, in turn, generate positive thoughts and confidence in one's self. A number of researchers have found that relaxation strategies enable people to obtain an optimal level of arousal while at the same time feeling organized and prepared to perform (e.g., Bull, Albinson, & Shambrook, 1996; Thelwell & Greenless, 2001). Relaxation can be used as part of a pre-performance routine before competition. Hanton and Jones (1999) found it is important to practice either a physical or mental relaxation strategy before competition. Participants who utilized relaxation strategies were shown to be more in control of their anxiety and had the ability to concentrate primarily on the relevant task processes.

**VMBR.** Visuo-motor behavior rehearsal (VMBR) is a technique that combines both visual imagery and relaxation. This dynamic combination of mental rehearsal and relaxation strategies make VMBR particularly relevant for use in athletic training situations, which is why it is frequently studied and reported in the sport psychology literature (Suinn, 1972; 1984).

Burke and Brown (2003) found that an athlete's perception of anxiety may have debilitating effects on his or her performance. The objective of VMBR is for the athlete to experience images of successful performance during specific anxiety prone situations (i.e., during competition). VMBR typically contains several phases. The first phase often begins with relaxation. The next phase involves visualizing performance during a specific
stressful situation. An example of the phase would be an athlete envisioning himself or herself during a volleyball game behind the line set to make a serve. The final phase includes performing the skill under a simulated stressful situation.

Kolonay (1977) found that basketball players who practiced VMBR (a relaxation and imagery tape) increased their free throw accuracy. Hall and Erffmeyer (1983) also found VMBR used with videotape modeling significantly improved free throw accuracy, as did Gray and Fernandez (1989). Higher ability VMBR tennis players significantly improved in the percentage of good first serves (Noel, 1980). Shipley and Baranski (2002) found VMBR was effective as a method of reducing acute stress and improving police officer performance on a critical event scenario, including significantly more assailant "hits."

**Automaticity.** The most important criterion of training effectiveness is whether or not the training transfers to the performance setting. Practice is a critical component for the transfer of a learned skill to the performance situation (Schmidt, 1975). Fitts (1964) and Anderson (1982) argued there are three stages to acquiring a certain motor skill. The first stage, the Cognitive Stage, consists of when the student is told or shown an example of how the task is to be performed and the student very consciously attends to each component of the skill. The student verbally guides himself or herself through the performance of the skill. As repetition continues the learner enters the second stage, the associative stage. In this stage, the performance becomes proceduralized such that the learner performs the skill with less and less verbalization. The performance becomes more fluid, and there are fewer errors than in the first stage. With continued repetition, the learner no longer verbalizes and, in fact, may even have difficulty describing his or
her actions. The third and final stage is the autonomous stage where the skill becomes automated. Cognitive involvement is almost entirely eliminated; the learner performs the skill automatically without thinking about it. Extensive and consistent quality practice is necessary for automaticity to develop.

When one's attention is focused on the relevant task processes, automaticity is not likely to be present. When focusing on the performance components, one regresses to the associative or even the cognitive state of motor learning. Not all behaviors are amenable to automaticity. Behaviors that are performed in a consistent manner and under generally the same performance demands are more likely to be susceptible to automation. When there is appropriate use of automatic processing techniques during a training intervention, performance may be maximized in a way that leads to success at the end of the training (Regian & Schneider, 1990).

When a given behavior is automated, the performance of that behavior runs from beginning to end without interruption and without the actor consciously attending to the behavior. Automated behaviors will run until completion, once initiated, unless there is a mindful effort made to hinder this process. The automation of behaviors is in contrast to controlled processing where task performance is cognitively monitored (Kimble, 2000; Rogers, Maurer, Salas, & Fisk, 1997; Singer, 2002). Performance is more likely to remain stable when a behavior is automatic and is not as susceptible to certain stressors. Automated behaviors are performed faster and more efficiently and usually more accurately than behaviors performed under controlled processing.

Certain situations, such as intense competition, may cause anxiety and increased arousal that may interfere with performance, which may cause an athlete to concentrate
on irrelevant cues and lead to poor performance. Automaticity enables one’s attentional space to be freed for the processing of relevant cues important to successful task completion. Howell and Cooke (1989) recommended that training programs be designed to take advantage of the benefits of automaticity to optimize the effectiveness of training, and, consequently, to increase performance.

Historically, theorists and researchers argued that constant practice (i.e., consistently practicing a skill in the same manner and under the same conditions) would lead to greater automaticity and better transfer of a skill performed in a consistent performance environment (Ackerman, 1986, 1988; Anderson, 1982, 1995; Rogers et al., 1997); whereas, variable practice (i.e., practicing a skill under differing conditions) was recommended for a skill that would be performed under varying conditions in the transfer setting. More recently, researchers (e.g., Bjork, 1994; Ghodsian, Bjork, & Benjamin, 1997; Shoenfelt, Snyder, Maue, McDowell, & Woolard, 2002) have suggested that variable practice may result in greater transfer even for a consistent task performed in consistent transfer environments. Variable practice typically leads to poorer performance in the learning environment but results in the learning of underlying performance principles and enables the performance to generalize across varying performance conditions resulting in better performance in the transfer setting.

**Routine.** Despite arguments regarding whether practice should occur under constant or varied conditions, researchers agree that a performance routine is an integral component for successful performance of a consistent task. Singer (2002) indicated that it is necessary for athletes to persistently practice a pre-performance routine with the target task. Routines have been found to improve performance in a variety of skills including
basketball free throws (Wrisberg & Pein, 1992), swimming (Hanton & Jones, 1999), and putting (Crews & Boutcher, 1986). Hanton and Jones found a pre-race routine decreased nervousness and increased attentional focus in elite swimmers.

Pre-performance routines are based on the premise that the few seconds immediately preceding execution are critical to successful performance. A routine is intended to divert attention away from irrelevant distracting information, to cease focusing on the execution of the skill to prevent disruption of automaticity, and to initiate the appropriate physical and mental states for successful execution (Druckman & Bjork, 1991). An athlete should have some proficiency in a variety of cognitive-behavioral techniques before developing a routine. Pre-performance routines have proven successful for tennis (Loehr, 1989), golf (Crews & Boutcher, 1986), and basketball free-throws (Hall & Erffmeyer, 1983; Lobmeyer & Wasserman, 1986).

A routine helps the athlete concentrate and block out distractions and increases trust in the performance of the skill. A good routine draws on two different parts of the mind: (a) the part of the mind that analyzes the situation, controls self-talk, and sets goals for the performance (i.e., controlled processing of the performance) and (b) the part of the mind that controls the automatic performance that has been built in muscle memory from repetition in practice and play. A pre-performance routine consists of two phases. Phase one relies on controlled processing; phase two on automaticity. Phase one may include using a relaxation technique to send a message to the mind that the athlete is calm and in control, which in turn increases confidence; analyzing the situation and attending to relevant performance information; making a decision on how to execute the performance to accomplish the objective for the performance; and, finally, using imagery to rehearse
perfect execution of the performance. Imagery will call up the muscle memory for the desired performance. Phase one of a pre-performance routine can take as little as 30 to 60 seconds (Shoenfelt, 2002b).

Phase two of a pre-performance routine begins when the athlete is prepared to execute the skill. It is helpful for many athletes to use an action thought at the beginning of phase two to trigger the performance. A trigger thought is a single word or a short phrase that captures the essence of the desired performance. In phase two, the athlete must trust that through many repetitions in practice and imagery the desired performance is strong in motor memory. In phase two, the athlete should use the trigger thought then execute. At this point, the athlete does not want to think about performance, but to rely on automaticity to accurately execute the performance. Thinking about the performance disrupts automatic performance driven by motor memory. After execution, the athlete should engage in the post-performance routine.

A post-performance routine uses controlled processing to observe and analyze the outcome of the performance. If the athlete executed well, he or she should reinforce the performance in motor memory by mentally rehearsing it. If the performance was not executed well, the athlete should use positive imagery to execute the skill properly to replace the poor performance with proper execution in muscle memory. Second, the athlete should let go of the error and forget about it. The athlete has done what he or she can to correct the performance in motor memory through imagery. The athlete should now move on.

Depending upon the nature of the competition, the pre- and post-routines may take place immediately before and after the skill is executed (e.g., golf shots, free-throws,
Behavior modeling is based on the work of Bandura (1977). Behavior modeling occurs when an individual observes a model exhibit a set of responses and is able to learn from watching the model. Bandura’s social learning theory, which emphasizes the use of observing, modeling, and vicarious reinforcement, focuses on acquiring novel responses through observational learning (Goldstein & Ford, 2002). Behavior modeling consists of four basic components central to the learning process. The first component, Attention Processes, consists of the learner attending to key aspects of the desired behavior, which are identified and emphasized by the model. In the next component, Retention Processes, the learner must mentally rehearse himself or herself performing the behavior previously seen performed by the model. The rehearsal helps to organize and retain relevant information necessary for future performance. Behavior modeling is especially important for a learner who may not be able to physically practice the behavior during the model observation (Decker, 1982; Feltz & Landers, 1983). The third component, Motor Reproduction, involves the learner beginning to physically practice the behavior being learned (Decker & Nathan, 1985). The final component of behavior modeling, Motivation Processes, the learner must have the desire to be able to perform, which emerges from performance feedback and goal setting (Wexley & Latham, 2002). These characteristics are considered effective means of motivating individuals to direct their efforts toward certain functional behaviors (Bandura, 1997; Wexley & Baldwin, 1986).
Learning can be acquired from observing others; we can learn by imitating or modeling those actions of others that are found to lead to desirable outcomes (Wexley & Latham, 2002). If the trainee or athlete sees a similarity between himself or herself with the model, it is more likely the model’s behavior will be imitated (Goldstein & Sorcher, 1973). The effectiveness of behavior modeling is augmented when there are combinations of positive and negative model demonstrations (Baldwin, 1992). Wexley and Latham (2002) suggested sequencing the models from easiest to hardest and portraying the behavior using several different models as a strategy for effective behavior modeling. Following the behavior modeling, it is important to implement repetitions of the behavior, leading to overlearning, for full retention (Decker & Nathan, 1985).

*Focus.* There are few constructs in sport psychology as important to overall performance as concentration or attention (Cox, 1990). Often the deciding factor in a loss or victory in competition is concentration. Concentration is vital to an athlete’s successful performance (Burgess & Martin, 2004). The ability to focus one’s attention on the task at hand is a critical component of concentration. A successful athlete must be able to disregard irrelevant external and internal cues during competition. The ability to not react to or be disturbed by distractions is achieved when athletes focus their attention correctly and understand how to control their thoughts and feelings. This can be difficult to do; it takes time to develop the skill to accomplish this, especially when distractions take place in competitive environments.

There are a number of dimensions important to the construct of concentration. Focus is the ability to direct one’s full attention to the appropriate cues pertaining to the impending task rather than allowing distractions by irrelevant external or internal stimuli.
A successful athlete attends to the appropriate aspects of the competitive situation and ignores irrelevant stimuli. The ability to control thoughts, arousal, and attentional focus is the common denominator in the concentration of winning competitors. Attentional focus can be described in terms of selective attention (Nideffer, 1990). Selective attention is the ability to gate out irrelevant sensory information (e.g., sounds, sights, feelings) and to pay selective attention to relevant information. All sport settings contain critical cues that must be selectively attended to. Selective attention is a skill that can be learned. It is important for the sport psychologist to provide exercises that demand the athlete to selectively attend to important cues.

Another way to conceptualize focus is to consider it in terms of attentional space—that is, the part of the mind that holds one’s current concentration. Humans have limited attention space, which enables one to attend to only a limited amount of information at a given point in time. Thus, it is important for an athlete to attend only to information that is essential for successful performance. Williams (2001) indicated there are two types of focus. One’s attention may be focused on the external environment and/or internally on one’s thoughts. The athlete must be capable of controlling whether the focus is internal or external. Sport psychologists refer to our thoughts as self-talk. Self-talk is what we are saying to ourselves in situations, whether it is spoken out loud or kept to ourselves (Shoenfelt, 2002b).

Thus, the total amount of attention that can be employed at a given time is limited, as is one’s capacity to process information. When the supply of attentional space does not meet the demands of the task, athletic performance may suffer. The attentional demands of a motor act decrease as learning increases, because the motor act becomes
learned or automated (Nideffer & Sagal, 2001). This automated behavior process allows the athlete to attend to new cues that were often ignored in the past.

Second, the athlete needs to be able to control the width of the attentional focus; some competitive settings require a broad focus of concentration while others require a narrow attentional focus. Nideffer (1990) indicated that it is important for an athlete to be capable of both narrowing and broadening his or her attention when necessary during competition. Under conditions of low arousal the athlete picks up both relevant and irrelevant cues. As arousal increases, the attention of the athlete begins to narrow. At the optimal performance level attentional narrowing gates out all of the irrelevant cues and allows the relevant cues to remain (Nideffer, 1990).

There are three important keys to attentional focus (Shoenfelt, 2002a). The first key is to focus on the present; the present is the one point in time an athlete can impact. The second key is to focus attention on the positive. The second key consists of positive self-talk, where thoughts are directed toward the correct, positive performance an athlete desires. Negative self talk wastes valuable attentional space. The final key directs attention on performance, which involves focusing on the actual behavior that will result in the desired outcome. Athletes have a tendency to focus on outcomes (e.g., whether the serve will be good or whether the team will win the match) rather than the process or performance that will achieve that outcome. Athletes also are inclined to cling to mistakes (i.e., the past) rather than letting them go from their attention. However, focus on the present positive performance is the most effective and efficient way to obtain desirable results (Shoenfelt, 2002a).
It is important for athletes to be able to focus on relevant cues in the present moment as opposed to being distracted by the past or things going on elsewhere. Attentional control training was developed to aid athletes in attending to the thoughts essential for successful performance (Nideffer & Sagal, 2001). Athletes must be able to assess their attentional strengths and weaknesses and the demands of their given sport to obtain the desired attentional focus.

The six component skills of imagery, relaxation, automaticity, routine, behavior modeling, and focus represent all five categories of cognitive-behavioral interventions identified by Druckman and Bjork (1991). A combination of these skills in a mental skills training program is most likely to affect performance-related variables such as confidence and self-efficacy and to ultimately result in positive transfer in the competitive setting.

Confidence

Confidence is developed over time through a combination of positive thinking and success experiences. Confident athletes consistently use constructive thinking to hang on to and benefit from their successes and to minimize their less successful experiences (Callow, Hardy, & Hall, 1998). Confidence allows us to let go and trust our performance.

Competition involves setbacks, obstacles, and disappointments, to which the successful athlete learns to respond optimistically to retain confidence. Errors should be treated as temporary and tied to that one serve, hit, game, or match, and as atypical of the athlete's potential. Confident athletes view successes as permanent and indicative of their true ability.
Confident athletes think they can. They use positive self-talk and positive imagery to focus on positive performance rather than worrying about past or future poor performance or the possible negative outcome of a poor shot. The hallmark of the successful athlete is a focus on the positive aspects of his or her game even in the face of setbacks. Focusing on the positive builds confidence, which, in turn, programs the athlete for success in competition.

Self-Efficacy

Self-efficacy has often been characterized as the belief in one’s capability to perform a particular task in a future setting. Positive self-efficacy has long been regarded as a key to successful performance among athletes. Bandura (1997) stated, “To execute the skills they have perfected effectively under intense competitive pressure, athletes must exercise control over the performance-impairing effects of acute stressors, disruptive ideation, discouraging slumps and setbacks, and vexing pain, which are part and parcel of grueling athletic activities…self-regulatory efforts rest heavily on a resilient sense of personal efficacy” (p. 369).

There are four key components to developing and strengthening self-efficacy (Bandura, 1977, 1997). The most influential component is enactive mastery, where the learner repeats performance accomplishments to help build the skill, coping ability, and general exposure needed to successfully perform the task. Manz (1986, 1992) found that while practicing a mental exercise one could symbolically experience the mastery of a task. Vicarious experience or modeling, the next component, is seeing a similar individual succeed at a difficult task. Another key component, verbal persuasion, occurs when a credible individual encourages the learner to believe he or she is capable of
completing a certain task successfully. The final and least influential component, emotional arousal, occurs when the learner’s perceptions of his or her physiological state alters belief in his or her ability. An individual who is calm and relaxed is more likely to develop high self-efficacy than a learner who is anxious and tense. Morin (1996) suggested self-efficacy aids in explaining the effects of mental practice on performance of a given task. She argued that mental practice facilitates enactive mastery, vicarious experience, and self-guided verbal persuasion.

Much research has examined the effects of an athlete’s self-efficacy on his or her performance and feelings of being able to perform effectively in order to successfully complete the desired task or goal. Successful performance leads to higher levels of self-efficacy, whereas failed past behavior leads to lower self-efficacy (Quiñones & Ehrenstein, 1997). Gist (1989) found that those trainees who experienced increased self-efficacy before and at the middle of the training program showed enhanced performance on assessments conducted after the training program was completed.

A person’s expectations seem to be important variables even in sports requiring a high degree of physical skill. Kane, Marks, and Zaccaro (1996) found an increase in performance of athletes in competitive situations associated with an increased self-efficacy.

Goal Setting

Locke, Shaw, Saari, and Latham (1981) introduced goal setting theory as a way to better comprehend what goals are and how they can be established in the most effective manner. Goal setting theory states that goals will result in higher performance if they are clearly stated, difficult, and specific.
The authors found that specific, difficult goals consistently led to higher performance than did urging individuals to do the best that they can. An individual achieved the highest levels of effort and performance; goals difficult to reach were originally set as opposed to goals that were easy and not challenging.

Task performance is regulated directly by the conscious goals that individuals are aiming for on the task. Locke and colleagues (1981) established three areas of importance that must be considered when examining goal setting theory: a) goal commitment, b) feedback, and c) task complexity. Individuals must place a certain degree of importance on their goal while maintaining positive levels of self-efficacy. Individuals need feedback that reveals their progress in relation to their goals, because it is almost impossible to adjust effort and direction if the individual does not know how he or she is doing. When goal setting in response to feedback is prevented or does not occur, it does not motivate high performance. As the complexity of the task increases, the higher level skills and strategies have yet to become automatic. Therefore, it is essential to successful goal completion that individuals’ have a specific strategy of goal attainment before they begin this undertaking.

Transfer of Training

The effectiveness of any training program is dependent on external validity; that is, whether or not the skills taught in the training transfer to the performance setting (Goldstein & Ford, 2002). Training is often implemented for athletes to learn to control their level of arousal and to regain their composure during game settings. Training also helps athletes to reclaim the desired level of concentration necessary for successful performance. The training tasks need to contain both the physical and psychological
components that will occur in the competitive setting for performance to be predicted with any substantial degree of accuracy by practice performance (Shoenfelt, 1996). The tasks taught during training should be structurally similar to the tasks necessary during competitive performance, and the tasks should be correctly learned for positive transfer to occur (Shoenfelt, 1996). The actual competitive setting is something of a novelty to athletes compared to the practice setting; this difference can reduce performance in the transfer environment (Schmid, Peper, & Wilson, 2001). For full transfer to occur, athletes must be aware of the important elements of the practiced skills that should be transferred to the competitive setting.

Transfer requires both physical and psychological fidelity. It is not sufficient to have only similar physical characteristics of the training and transfer tasks; the mental activity accompanying those skills also has to be of like quality and content (Christina & Bjork, 1991).

The Present Study

The literature on mental skills training indicates that imagery, relaxation, automaticity, routine, behavior modeling, and focus all enhance performance of athletes in a variety of competitive situations. The purpose of this study was to evaluate a pre-season mental skills training program on serving for the 12 members of an NCAA Division I intercollegiate volleyball team. The program incorporated motor learning principles and established mental skills for performance enhancement. Key mental skills taught were relaxation, imagery, and attentional skills. A videotaped expert (i.e., the coach), who articulated the technical performance keys to effective, serving as he executed 10 “perfect” serves, was used for behavioral modeling of the desired
performance. Players utilized a three-phase routine for serving to increase automaticity of performance and to incorporate key mental skills learned during the program. Serve effectiveness during the season and self-efficacy were the criterion measures of interest. General volleyball self-efficacy and serve-specific self-efficacy were tested early in the training program and post-training. Ace to error statistics and ratings of serve effectiveness were recorded throughout the season.

The following hypotheses will be tested.

Druckman & Bjork (1991) established the importance of implementing a mental skills training program in order to effectively enhance performance. Researchers, (e.g., Driskell et al., 1994) have established the enhancement of performance through developing key mental skills.

Hypothesis 1: Utilization of the mental skills for serving taught in the training will be associated with an increase in serve accuracy.

Bandura (1997) emphasized the importance of self-efficacy for the ideal execution of a skill. Bandura (1997) described the importance of incorporating mental skill components to lead to higher self-efficacy for a specific task.

Hypothesis 2: Utilization of the mental skills taught in training will be associated with an increase in an athlete's serve-specific self-efficacy.

Further, researchers (Morin, 1996; Quiñones & Ehrenstein, 1997) also found that higher levels of self-efficacy will be followed by successful performance.

Hypothesis 3: Athletes who report high volleyball self-efficacy and high serve-specific self-efficacy will achieve a better serve performance.
Research has established a positive relationship between imagery and confidence (Abma, Fry, Li, & Relyea, 2002; Callow et al., 1998), which can lead to more effective performance.

Hypothesis 4: Athletes who report greater use of use imagery will have better serving performance than athletes who report less use of imagery.
Method

Participants

Participants were all 12 varsity female intercollegiate volleyball players at a mid-size southeastern university. These women ranged in age from 18 to 22 years. All participants were included in the data analyses with the exception of one player who was “red-shirted” and did not compete during the season.

Design

The present study utilized a within-subjects design. Because of the small number of players on the team, it was not feasible to divide the team into control and treatment groups. Each athlete experienced each component of the training at the same time as her teammates. The within-subjects design, also known as a repeated measures design, is useful when examining the transfer of training when performance is charted as a function of the treatment components. This sort of design is most functional when there are a small number of subjects, because it may help in reducing any error variance while simultaneously working to increase power (Keppel, Saufley, & Tokunaga, 1992).

Procedure

The Training Program. The training program took place pre-season in eight sessions over a two-week period immediately preceding the 2003 volleyball season. The program incorporated motor learning principles and established mental skills for performance enhancement. All five categories of cognitive-behavioral interventions (i.e., relaxation, imagery, mental preparation strategies, skill development strategies, and cognitive restructuring-coping strategies) identified by Druckman and Bjork (1991) were
included in the program. Key mental skills taught were relaxation, imagery, and attentional skills.

Day 1 consisted of an introduction to mental skills training and learning two relaxation techniques, progressive muscle relaxation and a deep breathing technique. Day 2 included rehearsing the relaxation techniques and an introduction to imagery. Day 3 included rehearsing the relaxation techniques, continued imagery training, and attentional focus training. The focus training consisted of teaching the athletes to broaden or narrow their focus, to attend to specific stimuli, and to block out other stimuli.

Day 4 was used to introduce the service routine and to incorporate behavior modeling. The technical performance keys identified for serving were palm in straight line to target; left foot pointing to target; toss in line with hitting shoulder; wrist locked; and follow through. A videotaped expert (i.e., the coach), who articulated the technical performance keys to effective serving (see Appendix A) as he executed 10 “perfect” serves, was used for behavioral modeling of the desired performance. The players viewed the videotape then mentally rehearsed a perfect service.

Players were taught a three-phase routine for serving to increase automaticity of performance and to incorporate key mental skills taught in the program (see Appendix B). Phase I of the routine included: (a) selecting the target zone, (b) relaxing, (c) setting a goal for pace, trajectory, and placement of the serve, and (d) imagery to visualize desired performance. Phase II included: (a) trusting the serve, (b) use of a serve trigger thought (e.g., palm to target), and (c) execution of the serve. Phase III included: (a) observing the outcome of the serve attempt, (b) if a good serve, reinforcing the performance through imagery; if a missed serve, correcting the error through imagery and letting go of the
error, and (c) moving on to the next point. Players were instructed to use the pre- and post-routines when serving during practices and scrimmages. A goal of .66 was set for ace to error ratio for scrimmages and subsequently for the season. Days 5, 6, 7, and 8 consisted of utilizing a relaxation technique, viewing the videotaped model, and mentally rehearsing a perfect serve.

During the two-week period in which the training occurred, players completed self-report instruments assessing volleyball self-efficacy, serve-specific self-efficacy, and the extent to which they were utilizing the mental skills taught in the training program. These assessments were also made on two occasions during the season.

**Self-Report Measures**

The Core Self-Evaluation Scale (Judge, Bono, & Thoresen, 2003) was used to measure self-efficacy (see Appendix C). Judge et al. indicated that core self-evaluations represented a broader and higher-order trait, which is a combination of four personality traits: a) self-esteem; b) generalized self-efficacy; c) neuroticism; and d) locus of control. The original Core Self-Evaluation Scale was used to assess general self-efficacy for volleyball. An adapted version, in which “serve performance” was substituted for “performance” for each item, was used to measure serve-specific self-efficacy (see Appendix D).

The Illinois Competition Questionnaire (Martens, Vealey, & Burton, 1990) was used to measure competitive anxiety during volleyball competitions (see Appendix E). The instrument was administered twice during the season.

The Mental Skills Opinion Questionnaire (MSOQ) was developed by Dr. Betsy Shoenfelt to assess how frequently the athletes were utilizing each component of the
mental skills training program. The MSOQ was administered on three occasions during the season. Four items were constant across administrations; three items varied to assess specific mental skills components. The three versions of the seven-item self-report instrument may be found in Appendix F, G, and H.

**Performance Measures**

Two criterion measures were utilized to evaluate the mental skills intervention, ace-to-error ratio for the season (AER; \( r > .66 \) was desired) and good serve percentage (GSP; defined as percent of serves in home matches that pull the opponent's setter off the net; \( r > .50 \) was desired).

A serve scored as effective for GSP measures requires a combination of events: a) the serve successfully reached the opponent's side of the court in the target zone; b) the recipient of the serve had difficulty handling the serve such that she was unable to pass effectively to the setter at the net; c) accordingly, the setter was pulled off the net to receive the pass from her teammates. The assistant coach recorded whether each serve in all home matches was effective. In addition, the number of aces and the number of errors were recorded for each match of the season for each player. Typically, volleyball teams use AER as the measure of serve performance. These measures were highly correlated \( (r = .85, p < .01) \). Both aces to error ratio and good serve percentage were utilized, as GSP was more sensitive than the traditional AER.
Results

Mental Skill Utilization and Serve Performance

Hypothesis 1, which states that utilization of the mental skills for serving taught in the training will be associated with an increase in serve accuracy, was addressed by correlating self-reported utilization of mental skills with serve accuracy and with ace-to-error ratio. A composite of all MSOQ items was calculated for each of the three administrations of the MSOQ. The preseason composite measure was not correlated with good serve performance \( (r = .36, p > .05, \text{n.s.}) \) nor with aces to errors \( (r = .15, p > .05, \text{n.s.}) \). The midseason composite measure was also not correlated with serve performance \( (r = .36, p > .05, \text{n.s.}) \) nor with aces to errors \( (r = .18, p > .05, \text{n.s.}) \). However, the MSOQ composite from the end of the season correlated \( (r = .90, p < .001) \) with GSP and \( (r = .66, p < .05) \) with AER. Further analyses were conducted to identify which mental skills were associated with serve performance. Two of the three end of season measures were significantly correlated with serve performance. The MSOQ item that assessed how often players practiced their serve using imagery was significantly correlated with percent of good serves \( (r = .82, p < .01) \) and with ace to error ratio \( (r = .63, p < .05) \). The MSOQ item that assessed how often players used a routine when serving correlated significantly with percent of good serves \( (r = .75, p < .01) \) and with the ace to error ratio \( (r = .60, p = .05) \). Thus, there was partial support for Hypothesis 1.

Mental Skill Utilization and Serve Self-Efficacy

Hypothesis 2, which states that utilization of the mental skills taught in training will be associated with an athlete’s serve-specific self-efficacy, was addressed by correlating self-reported utilization of mental skills with the serve-specific Core Self-
Evaluation Scale score. The analyses revealed that Hypothesis 2 was not supported (for analyses see Appendix I). The players’ use of the mental skills training package as measured by MSOQ items was not correlated with reported player serve-specific self-efficacy from any of the four administrations of the serve-specific self-efficacy measure.

Self-Efficacy and Serve Performance

Hypothesis 3, which states those athletes who report high self-efficacy and high serve-specific self-efficacy will achieve better serve performance, was addressed by correlating self-reports of self-efficacy using the Core Self-Evaluation Scale with serve accuracy.

Hypothesis 3 was not supported. None of the four measures of general self-efficacy nor any of the four measures of serve specific self-efficacy taken across the training and volleyball season were significantly correlated with serve performance as measured by the GSP or the AER measures. However, the correlations between the GSP measure and both preseason ($r = .47, p < .08, \text{n.s.}$) and the end of season ($r = .47, p = .08, \text{n.s.}$) serve-specific self-efficacy approached significance. The small sample size resulted in very low power for detecting a significant relationship between self-efficacy and serve performance.

Imagery Utilization and Serve Performance

Hypothesis 4, which states that athletes who report greater use of imagery will have better serving performance than athletes who report less use of imagery, was addressed by correlating self-reported use of imagery with serve accuracy. Support was found for Hypothesis 4. The end of the season MSOQ administration of reported use of
imagery was significantly correlated to both percent of good serves ($r = .82, p < .01$) and the ace to error ratio and ($r = .63, p < .05$).

**Serving Goals for the Season**

The team set a serving goal for the season of percentage of good serves of .5 (50%). The mean GSP across all servers for the season was .49 (SD = .07). Three players were at .49, one player was at .46, and one at .35. All other athletes were either at or above the .50 goal for the season.

**Competitive Anxiety and Serve Performance**

No hypotheses were offered concerning competitive anxiety. However, it was found that the first competitive anxiety measure was significantly correlated with GSP ($r = -.68, p < .05$), indicating those players with less competitive anxiety performed better. The second competitive anxiety measure was not correlated with GSP.
Discussion

A preseason mental skills training intervention for intercollegiate volleyball players was implemented. The primary objective for the program was to increase the accuracy of the serve as well as the players’ confidence in their serve. Multiple assessments were completed preseason and throughout the season to evaluate the effectiveness of the mental skills intervention. Actual serve performance was evaluated by the assistant coach.

The hypothesis that the mental skills training program would increase serve accuracy of athletes was partially supported. Players who frequently used the mental skills package practiced imagery while serving and often established a routine. These two behaviors were associated with increased serve performance and serve accuracy. The results are consistent with previous research on the effect of a mental skills training package and athletic performance (Erffmeyer, 1988; Driskel, et al., 1994; Feltz & Landers, 1983; Noel, 1980). The results are likewise consistent with Patrick and Hrycaiko (1998) that a combination of mental skills incorporated into the intervention helps to enhance player performance. In the present study, imagery and routine were associated with increased accuracy of the athletes’ serve. The results support Shoenfelt’s (2003) conclusion that imagery use leads to enhanced performance by athletes. The utilization of imagery in an athlete’s execution of a serve was associated with enhanced GSP and AER. Interestingly, significant results were found only in the last administration of the MSOQ, which was in the latter part of the volleyball season. It is likely that the athlete’s use of imagery throughout the season may have increased and/or the earlier results were not robust enough to yield significance with a small sample size. Similar to
the results in Callow et al. (1998), Porter (1990), and Ridley (1992), the results indicated imagery is associated with an athlete’s performance during competition.

The results indicate those who used a routine for their serve were rewarded with an increase in performance and accuracy. This conclusion lends further support to Singer (2002), who advocated a preperformance routine to help the athlete self-regulate his or her thoughts and anxiety. The results also support the research findings of Lobmeyer and Wasserman (1986), who utilized a preperformance routine for basketball players’ free throws in order to increase accuracy.

In this study, the author found no support for the use of a mental skills training program to increase a player’s serve specific self-efficacy. The results did not support the past research that found improved self-efficacy with the utilization of a mental skills intervention (Bandura, 1997; Kane et al., 1996). However, despite the findings, the researchers are still in agreement with Bandura (1997) that incorporating a mental skills component into the execution of a skill should lead to higher self-efficacy for a specific task. Perhaps it was due to the small sample size that the results were not significant.

This study also failed to find an increase in service performance for players who reported a high degree of self-efficacy. The results are in conflict with past research (Morin, 1996; Quiñones & Ehrenstein, 1997) that found an athlete’s increased level of self-efficacy facilitated more successful performance. The results did approach significance for the preseason and end of season measures. Again, the lack of significance may be attributed to a small sample size, as the correlations between GSP and self-efficacy approached significance. A larger sample size should be utilized, if possible, in future investigations.
The team set a serving goal for the season GSP at .5 (50%). Most of the players were at or near the .5 goal for the season. However, one player clearly failed to reach the season goal. It might be noted that this particular player switched to a jump serve for the season under study, resulting in the lowest serve performance of her four-year career. It is important for athletes and coaches to set goals to direct effort and facilitate performance. Locke and his colleagues (1981) suggested the effect of “goal setting on performance of a task is one of the most robust findings in psychological literature” (p. 145). Therefore, the teams should be strongly encouraged to generate goals that directly relate to successful performance.

At the beginning of the season, the researcher found that those with less competitive anxiety served better. However, the midseason measure of competitive anxiety did not correlate with serve performance. Again, our small sample size may have prevented us from finding a significant relationship. Singer (2002) noted that when anxiety escalates, the athlete is forced to become more aware of the situation, and therefore may become more attentive to the consequences of failed performance resulting in poor execution. It is important for athletes to learn how to control competitive anxiety to reach desired levels of performance.

A limitation of this study was the lack of statistical power due to the small sample size. Accordingly, the implications of the results of this study regarding the transfer of mental skills training to the performance setting must be viewed as tentative. One note when interpreting the results of the present study is the greater concern more for practical or clinical significance of the data rather than its statistical significance (Bryan, 1987). Loftus (1996) suggested that significance implies only that the null hypothesis is false,
but does not truly attend to the pattern of population means. Population mean patterns are important when making final scientific conclusions. The fact that the team as a whole demonstrated a level of serve percentage (i.e., .49) virtually equal to the season goal (i.e., .50) suggests that the players were serving well subsequent to the mental skills training program.

Another noteworthy limitation is the criteria measures. Neither measure was continuous nor were they sensitive. Serves were judged to be good or not in the GSP measure. The AER measure relied only on serves that were either aces or errors, ignoring many serves that put the ball in play. The measures were contaminated by factors such as the skill level of the opponent and context of the competitive situation. There was also potential unreliability in the GSP ratings of the assistant coach who judged each serve.

Despite these limitations, the researchers believe this study can be used as a point of reference for future research. Further performance enhancement research is much needed in the sport psychology field. Future research could employ a multiple-baseline design to better assess the effect of mental skills training on an athlete's performance. Mental skills programs could incorporate more components directed toward self-efficacy to better develop the construct.

Results of this study indicate that implementing a mental skills training program, using a combination of mental skills, was associated with increased serve performance. Specifically, the mental skills of imagery and routine were associated with increased serve performance during competitive situations.
References


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LADY TOPPER VOLLEYBALL
KEYS TO AN EFFECTIVE SERVE

1. The left foot (foot opposite the hitting hand) should be pointed at ___the target you want to serve to. If you are serving to left back, your foot should be pointed to left back. If you are serving to right back, your foot should be point right back.

2. The hitting arm/hand should be ___finishing in a straight line___.

3. The toss should be in line with ___your hitting shoulder___.

4. If the toss were to just drop and hit the floor, it should land ___a step or so in front of your body and in line with your hitting shoulder_____.

5. The wrist should be ___stiff___ and the ___palm/wrist___ (part of the hand) should be in line with ___the hitting shoulder and your body_____.

6. In the finish you should have ___palm___ (part of hand) pointed to ___target_____.

7. Two key cues for effective serving would be:

(1) ___Straight____ Line

(2) ___Palm_______ to Target
Develop a routine for your serve. A routine helps to:
- put you in control of the serve
- you concentrate
- you block out distractions
- increases your trust in your serve

Use the ABC’s of Serving to establish a Serving Routine.

**Area** – the Zone; placement
**Breathe** – Take a breath, relax, feel in control
**Commit** – Choose your serve; use imagery to see it and to feel it

**Do It** – Trust your serve; don’t think about it anymore at this point; rely on your automatic muscle memory to “just do it;” use your serve thought (“Palm to Target” and/or “Straight Line”) to trigger your serve

When serving, use two parts of your mind: the “Thinker” and the “Doer.”
- **The Thinker** – analyze, self-talk, set goals
- **The Doer** – motor memory; automatic performance

**The Serve Routine**

**Phase I: Thinker (ABC)**
- Select target zone (A)
- Relax – take a deep breath; be calm and in control (B)
- Set goal for the serve: pace/speed; trajectory; placement (C)
- Imagery – see and feel the serve (C)

**I. Phase II: The Doer (D)**
- Trust your serve (you have practiced so many repetitions (practice and imagery) that serving successfully should be very strong in your muscle memory)
- Use your serve thought “Straight Line” or “Palm to Target” to trigger your serve (you may also use another serve trigger that helps you (e.g., “Strong and Straight”), but your serve trigger should be consistent (i.e., use the same trigger all of the time)
- Execute – just do it; serve the ball (D); at this point do not think about the serve. Thinking about the serve disrupts the automatic performance; questioning creates doubt, decreases confidence, and slows reaction time. After you have served the ball, get ready for action.

**The Post-Serve Routine**

When the ball is dead:
- Observe the outcome of your serve
- Good Serve – reinforce the successful serve through imagery (repeat the serve in your imagery); feel good about your serve
- Missed Serve – correct the error; use positive imagery to correct errors; rehearse proper serving; let go of the error, forget about it
- Move On – focus on the 3 P’s, the Positive Present Performance; what you need to do right now to make your team successful (whether it is execute another serve or defense)

(After the competition is over, you can use imagery to review the match and reinforce good performance and correct errors.)
Lady Topper Volleyball
Self-Evaluation Scale

Instructions: Below are listed several statements about which you may agree or disagree. Using the response scale below, indicate your agreement or disagreement with each item by placing the appropriate number on the line preceding that item. There are no right or wrong answers to these items. Your honest feeling is the correct answer. No one other than Dr. Shoenfelt will see your individual responses. Coach Hudson and others will only see averages for the team as a whole.

<table>
<thead>
<tr>
<th>Item</th>
<th>Response Scale</th>
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<tbody>
<tr>
<td>1</td>
<td>Strongly Disagree</td>
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</table>

_____ 1. I am confident I get the success I deserve.
_____ 2. Sometimes I feel depressed.
_____ 3. When I try, I generally succeed.
_____ 4. Sometimes when I fail I feel worthless.
_____ 5. I complete tasks successfully.
_____ 7. Overall, I am satisfied with myself.
_____ 8. I am filled with doubts about my competence.
_____ 9. I determine what will happen in my life.
_____ 10. I do not feel in control of my success in my endeavors.
_____ 11. I am capable of coping with most of my problems.
_____ 12. There are times when things looks pretty bleak and hopeless to me.

Name:________________________________________ Date:________________________
**Lady Topper Volleyball**

**Serving Self-Evaluation Scale**

**Instructions:** Below are listed several statements about your **volleyball serve** with which you may agree or disagree. Using the response scale below, indicate your agreement or disagreement with each item by placing the appropriate number on the line preceding that item. There are no **right** or **wrong** answers to these items. Your honest feeling is the correct answer. No one other than Dr. Shoenfelt will see your individual responses. Coach Hudson and others will only see averages for the team as a whole.

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<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>Disagree</td>
<td>Neutral</td>
<td>Agree</td>
<td>Strongly Agree</td>
</tr>
</tbody>
</table>

_____ 1. I am confident I get the success I deserve when I serve.

_____ 2. Sometimes I feel depressed when I think about my serve.

_____ 3. When serving, when I try, I generally succeed.

_____ 4. Sometimes when I fail at serving I feel worthless.

_____ 5. I complete my serve successfully.

_____ 6. Sometimes, I do not feel in control of my serve.

_____ 7. Overall, I am satisfied with my serve.

_____ 8. I am filled with doubts about my serving competence.

_____ 9. I determine what will happen with my serve.

_____ 10. I do not feel in control of my success in my serving.

_____ 11. I am capable of coping with most of my serving problems.

_____ 12. There are times when my serve looks pretty bleak and hopeless to me.

Name: ____________________________     Date: __________________________
ILLINOIS COMPETITION QUESTIONNAIRE

**DIRECTIONS:** Below are some statements about how persons feel when they compete in volleyball. Read each statement and decide if you **HARDLY EVER**, or **SOMETIMES**, or **OFTEN** feel this way when you compete in sports and games. For each of the 15 statements, mark the circle that indicates your choice. **There are no right or wrong answers.** Do not spend too much time on any one statement. Remember to choose the word that describes how you **usually feel when competing in volleyball**.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Hardly Ever</th>
<th>Sometimes</th>
<th>Often</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Competing against others is fun.</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>2. Before I compete I feel uneasy.</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>3. Before I compete I worry about not performing well.</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>4. I am a good sport when I compete.</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>5. When I compete I worry about making mistakes.</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>6. Before I compete I am calm.</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>7. Setting a goal is important when competing.</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>8. Before I compete I get a queasy feeling in my stomach.</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>9. Just before competing I notice my heart beats faster than usual.</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>10. I like to compete in games that demand considerable physical energy.</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>11. Before I compete I feel relaxed.</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>12. Before I compete I am nervous.</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>13. Team sports are more exciting than individual sports.</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>14. I get nervous wanting to start the game.</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>15. Before I compete I usually get uptight.</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
</tbody>
</table>

Name: ___________________________ Date: ________________________
Appendix G

Lady Topper Volleyball: Mental Skills Opinion Questionnaire #1

Please respond to each question by marking the answer that best represents your honest opinion. No one other than Dr. Shoenfeldt will see your individual responses.

1. How confident are you that you can use imagery to see yourself execute a perfect serve?
   - Not at all confident
   - Somewhat confident
   - Confident
   - Very confident
   - Completely confident

2. How confident are you that you can use imagery to see yourself correct a performance error and see yourself performing perfectly?
   - Not at all confident
   - Somewhat confident
   - Confident
   - Very confident
   - Completely confident

3. How often do you practice your serve using imagery?
   - Daily
   - Every other day
   - Twice a week
   - Once a week
   - I do not practice my serve using imagery

4. How often do you use imagery when competing in a match?
   - Many times
   - Several times
   - Twice
   - Once
   - I use imagery to prepare before the match begins, but not during
   - I don’t use imagery for competition, not even to prepare

5. How often do you use a relaxation technique (1 Breath Relaxation/Muscle Relaxation) to gain composure when competing in a match?
   - Many times
   - Several times
   - Twice
   - Once
   - I use relaxation before the match begins, but not during
   - I don’t use a relaxation technique when competing

6. How often do you use a routine when you are serving?
   - Always
   - Frequently
   - Sometimes
   - Rarely
   - Never

7. How often do you stop your negative self-talk and replace it with self-talk (focusing on the Present Positive Performance) during a match?
   - Many times
   - Several times
   - Once or Twice
   - I use positive self-talk before the match begins, but not during
   - I don’t use positive self-talk when competing
Lady Topper Volleyball: Mental Skills Opinion Questionnaire #2

Please respond to each question by marking the answer that best represents your honest opinion. No one other than Dr. Shoenfelts will see your individual responses.

1. How confident are you that you can use imagery to see yourself execute a perfect serve?
   - Not at all confident
   - Somewhat confident
   - Confident
   - Very confident
   - Completely confident

2. How confident are you that you can use imagery to see yourself correct a performance error and see yourself performing perfectly?
   - Not at all confident
   - Somewhat confident
   - Confident
   - Very confident
   - Completely confident

3. How often do you practice your serve using imagery?
   - Daily
   - Every other day
   - Twice a week
   - Once a week
   - I do not practice my serve using imagery

4. How often do you use imagery when competing in a match?
   - Many times
   - Several times
   - Twice
   - Once
   - I use imagery to prepare before the match begins, but not during
   - I don’t use imagery for competition, not even to prepare

5. How often do you use a relaxation technique (1 Breath Relaxation/Muscle Relaxation) to gain composure when competing in a match?
   - Many times
   - Several times
   - Twice
   - Once
   - I use relaxation before the match begins, but not during
   - I don’t use a relaxation technique when competing

6. How often do you use a routine when you are serving?
   - Always
   - Frequently
   - Sometimes
   - Rarely
   - Never

7. How close is your serving routine to the ABCD routine (Area/zone; Breath/relax; Commit/imagery; Just Do It/execute your serve)?
   - I use the ABCD routine
   - I use parts of the ABCD routine (Which parts: ____________________________)
   - I use my own routine that is different from the ABCD routine.
   - I don’t use a routine when I serve
Appendix G

Lady Topper Volleyball: Mental Skills Opinion Questionnaire #3

Please respond to each question by marking the answer that best represents your honest opinion. No one other than Dr. Shoenfelts will see your individual responses.

1. **How confident are you that you can use imagery to see yourself execute a perfect serve?**
   - [ ] Not at all confident
   - [ ] Somewhat confident
   - [ ] Confident
   - [ ] Very confident
   - [ ] Completely confident

2. **How confident are you that you can use imagery to see yourself correct a performance error and see yourself performing perfectly?**
   - [ ] Not at all confident
   - [ ] Somewhat confident
   - [ ] Confident
   - [ ] Very confident
   - [ ] Completely confident

3. **How much control do you have when you use imagery to improve your volleyball skills?**
   - [ ] I do not use imagery to work on my volleyball skills
   - [ ] No control over image
   - [ ] Very hard to control image
   - [ ] Moderate control over image
   - [ ] Better than average control over image
   - [ ] Complete control over image

4. **How often have you practiced your serve using imagery?**
   - [ ] Daily
   - [ ] Every other day
   - [ ] Twice a week
   - [ ] Once a week
   - [ ] I do not practice my serve using imagery

5. **How often do you use a relaxation technique (1 Breath Relaxation/Muscle Relaxation) to gain composure when playing/practicing volleyball?**
   - [ ] Many times
   - [ ] Several times
   - [ ] Twice
   - [ ] Once
   - [ ] I use relaxation before the match begins, but not during
   - [ ] I don’t use a relaxation technique when competing

6. **How often do you use a routine when you are serving?**
   - [ ] Always
   - [ ] Frequently
   - [ ] Sometimes
   - [ ] Rarely
   - [ ] Never

7. **How close is your serving routine to the ABCD routine (Area/zone; Breath/relax; Commit/imagery; Just Do It/execute your serve)?**
   - [ ] I use the ABCD routine
   - [ ] I use parts of the ABCD routine (Which parts: ______________________)
   - [ ] I use my own routine that is different from the ABCD routine.
   - [ ] I don’t use a routine when I serve
Correlations Between the Mental Skills Opinion Questionnaire Administrations and Total Serve-Specific Self-Efficacy

<table>
<thead>
<tr>
<th>Administrations</th>
<th>SSES Preseason</th>
<th>SSES Midseason (1)</th>
<th>SSES Midseason (2)</th>
<th>SSES End of Season</th>
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Note: p > .05 for all correlation coefficients.