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Arousal imagery effects on competitive state anxiety and performance of the soccer penalty kick

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**Arousal Imagery Effects on Competitive State Anxiety
and Performance of the Soccer Penalty Kick**

**A Thesis Presented
to the
School of Kinesiology
Lakehead University**

**In Partial Fulfilment
of the Requirements for the
Degree of Master of Science
in
Applied Sport Science and Coaching**

**by
Matthew Light**

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Abstract

Some athletes perceive competitive state anxiety as unhelpful and negative to performance while it energizes and excites others. Perceptions of anxiety affect motor performance, consequently it is important to develop strategies which are able to modify athletes negative perceptions. Imagery is used as a common intervention for preparing athletes for performance. Its motivational function refers to images related to physiological and emotional arousal. Most imagery research has primarily been implemented for skill development/learning of motor skills, and has not investigated the effects of motivational arousal imagery on competitive state anxiety. The aims of this study were to determine the effects of an 8 week imagery intervention based on the motivation general arousal element of Paivio's (1985) analytical framework of imagery effects in: (a) modifying perceptions of anxiety from negative to positive, and (b) improving performance of the penalty kick. Using a treatment (imagery) and no treatment (no imagery) design, two male and two female representative youth soccer teams (N = 46) completed a modified version of the Competitive State Anxiety Inventory-2 (CSAI-2D) five minutes before taking five penalty kicks. The CSAI-2D assesses both intensity and direction (debilitative-facilitative) of the state anxiety response. Participants (n = 28) who reported debilitative state anxiety as indicated by the CSAI-2D were then allocated to imagery (n = 14) and no imagery (n = 14) groups. Debilitative state anxiety was assessed using CSAI-2D directional scores. Individuals who scored less than 36 on cognitive or somatic directional scales were considered debilitative. Following the 8 week intervention participants were again assessed on penalty kick performance. Two-way analysis of variance (Group x Time) with repeated measures on the

second factor revealed no significant interactions for cognitive anxiety; somatic anxiety; or self-confidence intensity and direction subscales. Main effects were revealed for cognitive anxiety direction ($F_{(1,27)} = 6.68, p < .05$) and self-confidence intensity ($F_{(1,27)} = 4.54, p < .05$). The analysis was unable to demonstrate performance effects arising from imagery or no imagery exposure. This study indicates that using motivational arousal imagery may not be a compatible treatment for restructuring negative interpretations of state anxiety towards taking soccer penalty kicks.

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Introduction

Sport is characterized by a demand to perform at optimal levels in pressure situations. Athletes must learn to cope with the anxiety that often accompanies their preparation for competition and performance during competition. There is a need to have strategies to control anxiety and to optimize performance. One such strategy that has been proposed is the use of mental imagery (Vadocz, Hall, & Moritz, 1997). Unfortunately, the exact nature of the relationship between imagery and anxiety has received limited examination.

Competitive State Anxiety

The ambiguities in previous anxiety research may be partially due to the oversimplified, unidimensional view of anxiety upon which research was based. Researchers examining the relationship between anxiety and athletic performance now focus on a multidimensional conception of anxiety (Borkovec, 1976; Davidson & Schwarz, 1976; Liebert & Morris, 1967), with the anxiety response being separated into cognitive and somatic components. Morris, Davis, and Hutchings (1981) defined somatic anxiety as “one’s perception of the physiological-affective elements of the anxiety experience, that is, indications of autonomic arousal and unpleasant feeling states such as nervousness and tension” (p. 541). Cognitive anxiety was defined as “the cognitive concerns about oneself, the situation at hand and potential consequences” (Morris et al., p. 541). Multidimensional anxiety research was largely influenced by the work of Martens, Burton, Vealey, Bump, and Smith (1990) who developed the Competitive State Anxiety Inventory -2 (CSAI-2), which measures cognitive and somatic anxiety plus self-confidence. Subsequent competitive anxiety research using the CSAI-2 has provided evidence to support the separation of cognitive and somatic

anxiety components. Studies indicate that they have different antecedents (Gould, Petlichkoff, & Weinberg, 1984; Jones, Swain, & Cale, 1990, 1991), different temporal characteristics (Gould et al., 1984; Jones & Cale, 1989a; Jones et al., 1991; Martens, Burton, et al., 1990), and different performance consequences (Burton, 1988; Gould, Petlichkoff, Simons, & Veveva, 1987; Jones & Cale, 1989b; Parfitt & Hardy, 1993).

Some investigators have argued that this research is based on a somewhat limited dimension of the anxiety response (Jones, 1991, 1995; Parfitt, Jones, & Hardy, 1990). The CSAI-2 essentially measures the intensity of particular anxiety symptoms or cognitive intrusions, but does not measure what might be referred to as the “directional” perceptions of the symptoms; that is the nature of the individuals interpretations of those symptoms in terms of whether the interpretations are positive or negative in relation to upcoming performance. The intensity-alone approach to measuring competitive anxiety has been most prevalent in sport psychology literature due to anxiety being viewed largely as negative and detrimental to performance. Research indicates that this is not always the case and that anxiety can have positive effects. Parfitt and Hardy (1993) noted that improvements in pattern search were associated with elevated cognitive anxiety in a sample of basketball players. Jones and Cale (1989b) also reported a positive relationship between perceptuo-motor speed and somatic anxiety in hockey players.

Many stress based psychological theories have suggested that investigators need to examine the cognitive appraisal of the anxious situation in order to accurately predict the effects on performance (Carver & Scheier, 1988; Lazarus, 1966). The importance of differentiating between facilitating and debilitating dimensions of the anxiety response has

existed in test anxiety research for a number of years. Alpert and Haber (1960) discriminated between debilitating and facilitative anxiety using a scale which measured both types of anxiety (i.e., the Achievement Anxiety Test) and noted that the scale accounted for more of the variance in academic performance than a conventional scale measuring debilitating anxiety. Subsequent work in the test anxiety literature (e.g., Carrier, Higson, Klimoski, & Peterson, 1984; Couch, Garber, & Turner, 1983) and more recently in the sporting environment (e.g., Murray, 1989; Nordell & Sime, 1993; Wiggins & Brustad, 1996) has increasingly reported a positive relationship between favourable perceptions of anxiety and performance, and have postulated that positive perceptions of anxiety and positive effect are each related to proficient performance.

Lazarus' (1966) concept of cognitive appraisal as the process of categorizing all facets of the situation (internal or external in origin) with respect to its significance for well-being has been adopted by several sport psychologists (Rotella & Learner, 1993; Smith, 1980). Appraisal-related processes can significantly affect the reaction of athletes to sport related events. Vallarand (1987) indicated that it is largely the perception of the event that dictates which emotion will be experienced. The nature and meaning of a situation is associated with threat and challenge appraisals (Lazarus, 1966, 1981; Lazarus and Folkman, 1984). The perception of the demands of a situation as threatening or challenging interacts with the athletes perceptions of their ability to meet the demands of the athletic situation. In perceived facilitative ("challenge") situations coping resources are seen as adequate, conversely in debilitating ("pressure") situations the demands of the task outweigh the athletes perceived ability to cope. This model suggests that in order to predict the beneficial or harmful effects of

competitive anxiety on performance each athletes appraisal of the situation must be accurately assessed.

Jones and Swain (1992) incorporated a “directional” scale into the context of the CSAI-2, by adding a debilitating-facilitative Likert scale to each item creating the CSAI-2D, to more accurately measure the direction or appraisal of anxiety by each individual. Jones (1991) and colleagues have begun to test directional effects of anxiety on performance by adopting a modified version of Carver and Scheier’s (1988) control-process model of anxiety and performance. In this model, anxiety is hypothesized to have the capacity to debilitate and facilitate performance depending upon the individual’s expectancy (favourable versus unfavourable) of being able to cope with the anxiety and to complete the action. Performance is enhanced provided the athlete maintains a favourable expectancy regarding goal attainment. Support for the distinction between “intensity” (i.e. level) and “direction” (i.e. debilitating /facilitative) of competitive anxiety symptoms using the CSAI-2D has been supplied in a growing number of investigations in the sport psychology literature.

Jones and Swain (1992) used the CSAI-2D to examine intensity and direction dimensions of competitive state anxiety as a function of performance level. They found no differences on intensity of cognitive anxiety or somatic anxiety, or on direction of somatic anxiety between high and low competitive groups. However, as hypothesized, the highly competitive group reported their cognitive anxiety as more facilitative and less debilitating than the low competitive group. Jones, Swain, and Hardy (1993) examined relationships between good and bad performers in a sample of female gymnasts. The results indicated no differences between good and bad performance groups on cognitive and somatic anxiety

intensity scores, or on somatic anxiety direction scores. However, the good performance group reported their cognitive intensity as being more facilitating and less debilitating to performance than the poor performance group.

Other work has focused on differences between elite and non-elite athletes. Jones, Hanton, and Swain (1994) indicated no differences in the intensity of cognitive and somatic anxiety between the two groups, the elite performers interpreted both anxiety states as being more facilitative to performance than the non-elite swimmers. Interestingly, there were significantly more facilitators (85%) than debilitators (15%) in the elite group ($p < .01$) and more debilitators (53%) than facilitators (47%) in the non-elite group ($p < .01$). Subsequent studies involving elite and non-elite athletes have indicated that elite athletes reported both low and high anxiety intensity levels as more facilitative than non-elite athletes (Jones & Swain, 1995; Swain & Jones, 1996). Furthermore, CSAI-2D cognitive and somatic directional scores were found to be better predictors of performance than intensity scores (Swain & Jones, 1993), and competitive swimmers with positive expectations reported their precompetition cognitive and somatic anxiety as facilitative (Jones & Hanton, 1996).

Recent research in applied settings suggests that the addition of a "directional" measure to the CSAI-2, can be used successfully to match athletes with debilitating anxiety problems to the appropriate cognitive or somatic intervention. Two intervention studies examined the effects of various anxiety reduction techniques with soccer players indicating debilitating state anxiety (Maynard, Hemmings, & Warwick-Evans, 1995; Maynard, Smith, & Warwick-Evans, 1995). Results indicated that the reduction in anxiety intensity levels via relaxation techniques were associated with more facilitative interpretations of the

precompetition symptoms and increased self-confidence. Hanton and Jones (1999a) examined the effects of a multi modal intervention on elite swimmers. Content of the intervention consisted of goal setting, imagery and self-talk, and was based on Hanton and Jones (1999b) interviews and inductive analysis of elite swimmers. These elements emerged as particularly important in the maintenance of facilitative interpretations by the swimmers. Results indicated that participants who had reported debilitating interpretations of cognitive and somatic symptoms pre-intervention, now reported facilitative interpretations post treatment, also performance improvements were demonstrated. The multi modal nature of the intervention does not allow for inferences about which part of the treatment contributed most to behavioural change. These initial findings suggest that directional anxiety effects may be critical predictors of subsequent performance results, and that a modified version of the CSAI-2, the CSAI-2D, is a valid means of assessing directional anxiety in applied settings.

The somatic anxiety component, as measured by the CSAI-2D, represents the perceived affective-autonomic response of an individual rather than the actual physiological reactions. Concomitant psychological and physiological measures are advocated in competitive anxiety research (Hatfield & Landers, 1983) as a broader approach to measures of self-reported anxiety alone. Herd (1991) indicated that the cardiovascular response to psychological anxiety, as indexed by heart rate, may be superimposed on the physiological responses to exercise in competitive sport (Baron et al., 1992; Hanson, 1966). Early research into directional effects attempted to identify physiological indicators. Levinson (1992) analyzed cardiac markers for positive and negative emotions, and Boutcher and Zinsser (1990) found differences in heart rate deceleration in successful and unsuccessful golf putting.

Recent enquiry investigating differences in imagery manipulated appraisal using the CSAI-2D indicated that heart rates tended to be higher in debilitating pressure-orientated appraisals than more facilitative challenge orientated appraisal situations although not significantly (Hale & Whitehouse, 1998). In addition, a wealth of anxiety-performance research has recorded significant performance affects associated with changes in physiological arousal measured by heart rate (Fenz & Epstein, 1968; Idzikowski & Baddeley, 1983) which would further support an argument for assessing physiological arousal as well as self-report measures of anxiety (Parfitt, Hardy, & Pates, 1995).

Studies using the CSAI-2D support the notion that competitive anxiety is not necessarily debilitating, and emphasize the need to distinguish between intensity and direction dimensions of competitive anxiety symptoms. The more elite and better performers in competition interpreted the directional perception of their anxiety symptoms as more facilitative compared to less elite or poorer performers, despite no differences in anxiety intensity levels. Intervention studies using the CSAI-2D have used only elite performers to demonstrate treatment effects. Research by Jones and colleagues (1994) indicates the need for psychological strategies to help non-elite athletes interpret their anxieties as being facilitative to future performance.

Imagery

Many athletes report using imagery in the hope of improving their athletic performance. Moreover, experimental research (Hall, 1985) has indicated that imagery rehearsal, relative to no-imagery control conditions can improve specific perceptual-motor skills. Rushall and Lippman (1998) point out that imagery is usually implemented for two

different intentions in physical performance endeavors; skill development/learning and competition performance preparation. They note that different procedures and elements are associated with each purpose.

The effectiveness of imagery training has been examined using a variety of sports skills, e.g. basketball free-throws (Hall & Erffmeyer, 1983) and ski racing (Suinn, 1972). Most imagery research dealing with motor performance has been with discrete tasks such as dart throws (Epstein, 1980) or golf putts (Woolfolk, Murphy, Gottesfeld, & Aitken, 1985), and has focused on the growth and mastery of skill elements or adapting a skill to a specific circumstance. Generally speaking given sufficient training, imagery can have a facilitative effect on motor performance (Oxendine, 1969).

A major difference between learning skills and performance preparation involves arousal. Performance preparation focuses on factors that can enhance performance such as motivation or activation. One form of preparation is to achieve an appropriate level of arousal or excitedness for a particular competitive task. Although arousal is usually treated as an energizing factor, Thayer (1978) proposed that it has two dimensions: the degree of focus of intent (a tension-placidity dimension) and the usual energizing attribute (an energy-sleep dimension). It has been suggested that both dimensions of arousal should be employed in order to optimize the effectiveness of performance preparation (Rushall, 1992; Rushall & Potgieter, 1987). Rushall and Lippman (1998) point out that “athletes and other performers should intensify their attentional focus, thus harnessing tension needed to control energizing arousal and maintain positive self-efficacy, while also exciting their physiologies for maximum performances” (p. 66).

Paivio (1985) suggests that mental imagery plays both a motivational and cognitive role in mediating behaviour, each capable of being targeted toward either general or specific behavioural goals. The relations are represented by a 2 by 2 orthogonal model with the motivational-cognitive contrasts as one dimension and the general-specific contrast as the other (see Figure 1). The functional distinctions are reflected in different imagery content. Motivational imagery at a general level can represent emotion-arousing situations by creating an appropriate mood or arousal state for the activity, while motivational general specific imagery represents goals and goal oriented behaviours, such as seeing oneself winning an event, and receiving a medal, without necessarily engaging cognitive processes aimed at directly improving performance. Cognitive imagery can be focused exclusively at a general level on performance-related aspects such as game strategies or tactics, or at a specific level, imagery related to improving specific motor skills. In summary, imaging a properly executed penalty kick may improve a soccer player's performance through cognitive mechanisms, whereas imaging the ball flying into the net and the crowd cheering may enhance performance through improved self-confidence (i.e. motivational mechanism).

		Imagery Function	
		Motivation	Cognitive
Specific	Goal Orientated Responses	Skill	
General	Arousal (and Mastery)*	Strategies	

* based on study by Hall, Mack, Paivio, and Hausenblas (1998).

Figure 1 Paivio's Analytic Framework of Imagery Effects (1985).

Recently, Hall, Mack, Paivio, and Hausenblas (1998) suggested that motivation general imagery has two components. Motivation general-arousal (MG-A) which relates to imagery associated with arousal and emotions, and motivation general-mastery (MG-M) which relates to imagery associated with being in control, mentally tough, and confident. If the imagery-driven arousal is in a general form indicating that an individual is physiologically excited but, for some reason cannot direct the energetic component, then energy will not be focused effectively. However, if arousal is specific, then energy can be directed toward some goal, and the likelihood of achieving a particular performance outcome may be enhanced. Thus, the motivational value of imagery depends on the ability of the individual to channel and direct arousal in a productive manner (Rushall, 1991).

Most imagery research to date has focused on the cognitive function of imagery, specifically as a technique for enhancing skill development and performance, with results being generally positive (Corbin, 1972; Denis, 1985; Hall, 1985; Rodgers, Hall, & Buckolz, 1991). However, following Paivio's (1985) contentions that imagery also operates on a motivational level, researchers have taken interest in examining this function of imagery. Experimental manipulations of imagery have produced results that support the motivational function of imagery. Hall, Toews, and Rodgers (1990) indicated that athletes who were given skill-oriented and goal-oriented instructions to image a successful performance of a simple motor task voluntarily practise harder and longer than a control group (cited in Hall et al., 1998). Martin and Hall (1995) instructed beginner golfers to practise by first imaging performance alone (a perfect stroke) or performance plus a successful outcome (the golf ball rolling into the hole), followed by physical practise sessions. The results indicated that the imagery

subjects spent more time practising, had more realistic expectations of themselves, and set higher goals than golfers in a non-imagery control group. These results are consistent with Paivio's (1985) suggestions regarding goal-orientated responses.

Athletes regardless of skill level report using imagery extensively (Barr & Hall, 1992; Hall, Rodgers, & Barr, 1990). However, they do not always use cognitive and motivational imagery to the same extent. For example, Salmon, Hall and Haslam (1994) investigated the use of imagery by soccer players, using the Imagery Use Questionnaire for Soccer Players. It was based on the original version of Hall et al. (1990) Imagery Use Questionnaire, and in part on Paivio's (1985) framework of how imagery functions in motor skills. They noted that players responded with the highest rating for the motivation general cell, suggesting that they use imagery to energize themselves to play and practise the game of soccer. One drawback of the study was that players were only asked if imagery motivated them, but did not assess whether they used this type of imagery to optimize their level of anxiety. This study indicates that motivational imagery is used extensively by soccer players.

The relationship between motivational use of imagery and competitive anxiety has only recently been examined. Vadocz et al. (1997) explored the relationship between imagery use, imagery ability, competitive state anxiety and performance of junior roller skaters. The Movement Imagery Questionnaire (MIQ-R), the Sports Imagery Questionnaire (SIQ), and the CSAI-2 were completed. Results indicated that motivational arousal imagery was a significant predictor of cognitive state anxiety. Athletes using this type of imagery reported higher levels of cognitive anxiety. The authors point out that these findings might be what is expected considering the content of the motivation general arousal items in the SIQ (e.g. "When I

image a competition, I feel myself getting excited” and “I imagine the stress and anxiety associated with competing”). Competitive state anxiety can be both debilitating and facilitative (Jones, 1995). The authors suggest that if athletes were experiencing debilitating competitive state anxiety, using motivation general arousal imagery might make the situation worse. This may pertain to the energizing role of motivational arousal imagery to psych-up an athlete. Consequently, if athletes perceive their anxiety as already debilitating, exciting their physiologies further may not help them to interpret their future anxiety as facilitative to performance. In contrast, if athletes are having difficulty getting psyched up for an event or were experiencing facilitative competitive anxiety, using motivation general arousal imagery might be beneficial. These contentions have implications for the content of imagery of athletes who are trying to perceive their state anxiety symptoms as facilitative in competitive situations.

Recent enquiry has indicated that imagery may be a means of modifying athletes' perceptions of anxiety. Page, Sime, and Nordell (1999) hypothesized that after exposure to the imagery program participants would perceive their anxiety as more positive in effect. Using a switched replication design intercollegiate swimmers were randomly exposed to one imagery session. Imagery content contained largely motivational imagery although some cognitive imagery was included. Participants were administered the CSAI-2 and the Competitive Anxiety Perception Scale (CAPS) 24 hours and 1 hour prior to and following the imagery session. Results indicated non-significant changes in state anxiety intensity scores on the CSAI-2, but a significant positive improvement on the CAPS. These results suggest that perceptions of anxiety may be modified by imagery.

Theory of Imagery Effects

Lang's (1979) bio-informational theory of emotional imagery, utilizes an information-processing model. The model begins with the assumption that an image is a functionally organized, finite set of propositions stored by the brain. The image is also believed to contain a motor program containing instructions for the imager on how to respond to the image; it is thus a template for overt responding.

The model states that a description of an image contains two main types of statements: stimulus propositions and response propositions. Stimulus propositions are statements that describe the content of the scenario to be imaged. They can be sub-divided into two types of information (Lang, 1984). The first type of information includes the descriptive referents pertaining to elements of the external environment. In shooting a soccer penalty kick for example, the stimulus information might include crowd noise, the sight of the players around the penalty area, or the feel of the ball as you place it on the penalty spot. The second type involves semantic elaboration relevant to the event, such as "this game is important", "the scores are level", and "this is the final minute of the game". Response propositions are statements that describe the imager's response to the particular scenario. Thus responses in the penalty kick example might include a pounding heart, increased perspiration, feelings of anxiety, as well as the sight of the ball flying into the net.

A variety of psychophysiological studies indicate that imagery is accompanied by an efferent outflow which reflects the content of the image (e.g. Hale, 1982; Lang, 1979). The greater the magnitude of these physiological responses during imagery, the greater will be the accompanying changes in behaviour (Lang, Melamed, & Hart, 1970). Also imagery

instructions that contain response propositions elicit far more physiological responses than do imagery instructions that contain only stimulus propositions (Hecker & Kaczor, 1988; Lang, Kozak, Miller, Levin, & McLean, 1980). The important practical implication of these proposals is that imagery scripts should include both stimulus and response propositions. Cuthbert, Vrana, and Bradley (1991) have concluded that it is necessary to have a good conceptual match between information in the image prompt and that stored in memory in order to obtain appropriate physiological concomitants. This match typically occurs when an event is a personally relevant emotional situation.

A recent study by Hale and Whitehouse (1998) attempted to manipulate the athlete's facilitative or debilitating appraisal (direction) of competitive state anxiety. Imagery-based interventions, using Lang's (1979) bio-informational model were used in order to study the effects of subsequent anxiety intensity and direction. The CSAI-2D and heart rate were used to measure the anxiety response. Soccer players were relaxed using progressive relaxation and underwent an imagery-based video and audio manipulation of their appraisal. Players were asked to imagine taking a hypothetical game winning penalty kick, under either a "pressure" or "challenge" appraisal emphasis. Results indicated that in the "challenge" appraisal condition cognitive and somatic anxiety intensity scores were lower than the "pressure" situation. Also players perceived the "challenge" situation as more facilitative for cognitive and somatic anxiety than the "pressure" condition. Finally, heart rate was found to be higher in the "pressure" situation, although not significantly. The authors suggest that athletes can be taught how to change potentially debilitating thoughts, to more beneficial cognitions before they perform. Clearly more research is required before these initial findings can be generalized

to applied sport psychology interventions.

Relaxation and Imagery

Wolpe's (1973) work on systematic desensitization in therapeutic settings has been a major source of information in the study of relaxation in combination with imagery. This procedure employed covert rehearsal (imagery) of a feared stimulus situation, paired with deep muscle relaxation (Jacobson, 1938) to counter conditioned phobic responses. Evidence indicates that the effectiveness of this treatment is dependent upon strength of the imaged stimulus to generate a response that represents the actual event (Lang et al., 1970).

The role of imagery and other cognitive processes have also been implicated in the maintenance and regulation of anxiety. Borkovec (1976) analyzed fear reactions as the interaction between cognitive, physiological, and instrumental components of anxiety. The analysis suggests that the physiological component of a fear response may be accompanied by aversive imagery of the fear situation. This aversive arousal and aversive imagery may be reduced by cognitive avoidance, for example thinking about an irrelevant topic. Relaxation on the other hand may reduce physical arousal with which the aversive imagery are associated. That is, the person can image a fear inducing scene under relaxation when physiological cues for avoidance responses are reduced.

Beyond the therapeutic value of employing relaxation procedures to reduce anxiety, it has been typically presumed that relaxation will facilitate vividness and control of imagery by reducing distracting stimuli, aiding in recall or clarifying the visual representation of anxiety-producing stimuli (Bauer & Craighead, 1979; Gray, Haring, & Banks, 1984; Lang, 1977). However, this contention has not been supported by empirical data. Rehm, Mattei, Potts, and

Skolnick (1974), for example, indicated that image clarity actually decreased following relaxation. Also Hamberger and Lohr (1980) indicated that relaxation training did not facilitate imagery controllability any more than an information/placebo condition.

A similar procedure to systematic desensitization has been developed by Suinn (1976), called visuomotor behaviour rehearsal (VMBR). VMBR employs relaxation followed by imagery of an upcoming event or competition, usually one that has caused some anxiety. Suinn (1976) contends that mentally rehearsing a behaviour with this approach produces realistic and vivid imagery. Also development of rehearsal conditions that closely replicate those of the performance environment are necessary to facilitate transfer of training. VMBR has been shown to enhance performance in experimental investigations (Hall & Erffmeyer, 1983; Noel, 1980; Weinberg, Seabourne, & Jackson, 1981).

Researchers have also examined the effect of arousal and relaxation instructions prior to the use of imagery. Gray et al. (1984) using a case study design, indicated that arousal instruction and the control sessions were associated with higher ratings of imagery vividness and confidence compared to a relaxation condition. Ratings of imagery controllability did not vary in the study. Using skin conductance as a measure of physiological arousal, the authors noted that arousal increased during mental practice regardless of the arousal manipulation used. Also of importance was the effect of the arousal intervention on efficacy expectations. Using a percentage grading system used by the coach, the subject was asked to estimate the grade he would obtain if playing in his immediate mental state. The subject estimated the highest level of performance during the arousal session, and was also more confident. The higher level of arousal may have been more closely associated with perceived desirable levels

of arousal for optimal performance, thus enhancing the belief the performance would improve. The authors note that relaxation instructions may actually imply to some athletes that arousal during mental rehearsal will be detrimental, signaling a loss of control over physiological processes. The possibility also exists that the effect of mental rehearsal on efficacy expectations is somewhat independent of any arousal/relaxation induction. Clarification of these issues awaits further investigation by researchers.

Finally, Weinberg, Seabourne, and Jackson (1987) extended the study of Gray et al. (1984), by including forty five subjects in the study. Also by examining the type of induction and actual performance measures. Results were in line with those of Hamberger and Lohr (1980) and Gray et al. (1984) in that vividness and controllability did not differ as a function of arousal vs relaxation instructions. This occurred despite the fact that both groups were moderately successful in achieving increases in arousal and relaxation respectively. The authors suggest that maybe there is a range of arousal under which image controllability and vividness are not adversely affected, or at least differentially affected.

The results of these investigations call into question the belief that relaxation is needed before employing imagery, especially if image clarity, controllability, and performance are to be maximized. The motivation general function of imagery according to Paivio (1985) refers to imagery that is designed to "turn anxiety into energy". Research is required to develop imagery programs without prior relaxation strategies, which enable athletes to use their anxious energies to focus more clearly and with greater clarity on tasks or situations that have personal meaning, with the aim of producing positive interpretations of the original anxiety inducing situation.

Soccer and Penalty Kick

Regardless of the exact nature of the anxiety experienced by the athlete (i.e. cognitive, somatic, or both), the characteristics of the situation in which the athletes interact still requires identification (Spielberger, 1989). Specific situations in team sports, such as the penalty kick, are seen to heighten competitive anxiety because the potential for social evaluation is great (Scanlan, 1984). This may be one reason why one out of every four penalty kicks are missed (Vogelsinger, 1981). When penalty kicks are awarded the action often stops abruptly and/or becomes highly focused, leaving the athlete to execute a skill alone. In these situations the opportunity to diffuse performance responsibility among teammates is minimized (Martens, Vealey, & Burton, 1990). The penalty kick is also regarded as a closed skill, with limited environmental influences affecting the outcome. As a situation becomes less affected by environmental influences, the likelihood of experiencing anxiety is increased, since the athletes must assume virtually all responsibility for the outcome (Dunn & Nielsen, 1996).

The penalty kick is widely considered to be a psychological rather than mechanical skill, and success a function of optimum arousal and focus or concentration (Geisler & Leith, 1997). Struck with power, the ball crosses the goal line within a half second, while the average goalkeeper's reaction time combined with movement time to the far post is just under two seconds (Miller, 1996). The optimal place to kick a penalty, therefore, is on the ground as close as possible to the goalpost (Bar-Eli & Friedman, 1988). This gives the goalkeeper the almost impossible task of saving the ball.

Soccer has become a more defensive game and matches are often low scoring.

Subsequently, penalty kicks within regulation time have increased in significance and penalty

shootouts to decide outcomes are more prevalent. To illustrate, there were no penalty shootouts in World Cup history prior to 1982. Since then shootouts have been a part of every World Cup tournament and the 1994 championship final was in fact decided in this manner. In World Cup history the percentage number of penalties converted from the 1st to the 120th minute (including extra-time) was 84.7%, whereas the percentage of penalties converted in shootouts (penalties kicks after extra-time) was 78.6%, with the shootouts occurring in the knockout stages of the competition (Federation Internationale de Football Association, 1998). These percentages may seem high, but only one penalty miss in a shootout can result in the team losing the game.

Purpose

The purpose of this study was to examine the effects of an 8 week imagery intervention program, via a treatment (imagery) or no treatment (control) design, on competitive state anxiety. The investigation was directed at restructuring competitive soccer players debilitating interpretations of their competitive state anxiety to facilitative interpretations. The intervention was based on the motivation general arousal element of Paivio's (1985) analytical framework of imagery effects. The motivational function refers to images related to general physiological and emotional arousal. In an effort to gain a more complete picture of the anxiety response, participant's heart rate was also examined. Based on the findings of Jones et al. (1993) it was expected that more facilitative interpretations would be associated with better performance of the soccer penalty kick.

Method

Participants

Two male and two female representative soccer teams ($N = 46$) with 10 to 13 players per team were contacted and invited to participate in the study. Soccer players ranged in age from 13 to 18 years ($M = 15.29 \pm 1.46$) and played in a competitive soccer league in Northwestern Ontario. All participants who volunteered to participate in the study were informed of the general purpose of the study, completed a consent form (see Appendix A), and the CSAI-2D scale (see instrumentation section).

Participants ($n = 28$) who interpreted their competitive state anxiety as being debilitating to performance of the penalty kick were involved in the study. Debilitative state anxiety was assessed using CSAI-2D directional scores. Individuals who scored less than 36 on cognitive or somatic directional scales were considered debilitating. Participants ($n = 18$) with state anxiety directional scores greater than 36 (facilitative) also participated in the study so as not to single out players for special attention. Data collected from the facilitative participants was not used in this study.

From the initial sample of 46 individuals, 28 indicated debilitating anxiety; 13 males and 15 females. One male ($n = 7$) and one female ($n = 7$) team were assigned to the imagery group. The other male ($n = 6$) and female ($n = 8$) teams were assigned to the no imagery group.

Procedure

Provision of General Information

One week prior to the start of the study, participants were given a cover letter (see

Appendix A) and told that the purpose of the study was to examine their perceptions on taking penalty kicks. The procedure for taking the penalty kicks was explained (see performance procedure). Players were asked not to practise penalty kicks outside of their team practices and games.

Initial Testing

One week after the provision of general information teams were tested independently and on separate occasions on an outdoor grass soccer pitch with a full size soccer goal. Prior to performance measures being taken, players were fitted with a heart rate monitor and watch receiver. Participants then waited quietly for five minutes. During this time baseline sitting and standing heart rate measures were recorded. Players were informed that the penalty kicks would take the form of a shoot-out competition and that individual and team performances would be compared. One shoot-out competition was complete after all players had taken one penalty kick. Teams played five separate shoot-out competitions. Players were informed of the result of each separate shoot-out before starting the next. After five minutes and before performing the penalty kicks the CSAI-2D was administered. Participants were then numbered and divided into two equal groups of four or five players for the shoot-out competition.

Players from alternating groups took penalty kicks until all players had performed five kicks each. They sat on opposite sides of the D on the eighteen yard line (see Figure 2). The goalkeeper stood in between the goal posts and on the goal line. Participants were encouraged to verbally support their team. Before getting up to take the penalty kick, participants were asked their heart rate by the researcher and the data recorded. Participants then placed the ball on the penalty spot. The participants were again asked their heart rate. The researcher was

positioned on the goal-line to the side of the goal to assess if the ball crossed the goal-line. A whistle was the signal for the player to take the kick. After the kick the participant sat down again. The task consisted of taking five penalty kicks the results of which were recorded for further analysis. All kicks were performed towards the same goal with the same goalkeeper. A goal was deemed to have been scored when the whole of the ball had crossed the goal-line, in between the goal posts and underneath the crossbar.

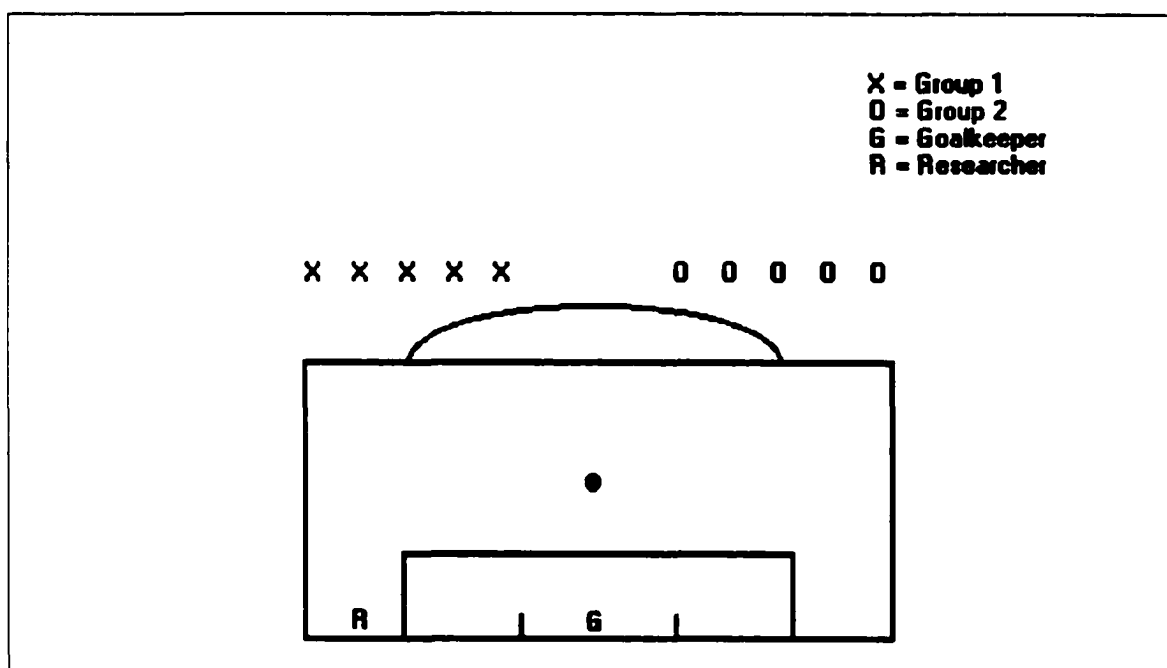


Figure 2 Penalty kick set-up.

Treatment Administration

One week after all four teams had completed the initial testing, the two teams involved in the imagery group attended separate briefing sessions at which the general description of the intervention program was described. A detailed information pack which included an imagery script (see Appendix B) and one audio tape were provided for all participants to guide them through the 8 week intervention. Teams were then administered the MIQ-R (see

instrumentation section) at the site. The MIQ-R questions were read to participants and demonstrated by the researcher to ensure that instructions were understood and that movements required to complete the questionnaire were done correctly. The two teams in the no imagery group were asked to continue their regular practices and games.

Final Testing

Due to inclement weather teams were tested independently, on an indoor artificial soccer pitch using a goal which was smaller and the distance to the goal proportionally closer following the 8 week program. The same procedure was used as in the initial test. Prior to taking performance measures the MIQ-R was administered to the imagery group. For performance measures the imagery treatment group was asked to imagine being ready to perform the penalty kicks and to use a “challenge” appraisal toward the situation. No additional instructions were given to the control group. Following the conclusion of the penalty kicks, participants in the imagery and no imagery groups were given separate social validation questionnaires which contained information relating to the study (see Appendix C). General procedures of the study are outlined in Table 1.

Instrumentation

Competitive State Anxiety

Competitive state anxiety was assessed using a modified version of the CSAI-2 (Martens, Burton, et al., 1990) which is a self-report psychometric inventory consisting of 27 items. The CSAI-2 measures the “intensity” dimension of the anxiety response and consists of three subscales; cognitive anxiety, somatic anxiety, and self-confidence. Each subscale includes 9 items. Examples of cognitive anxiety items include, “I am concerned about this

Table 1 Outline of the Procedure for the Imagery and No Imagery Groups.

General Procedures for the Study

	Provision of general Information (week 1)	Initial Testing (week 2)	8 Week Intervention (weeks 3 to 10)	Final Testing (week 11)
Imagery Group	<ul style="list-style-type: none"> - Cover letter given - Participants informed of the purpose of the study - Experimental procedure explained - Written consent obtained 	<ul style="list-style-type: none"> - Heart rate monitors fitted and baseline sitting and standing heart rate recorded - CSAI-2D given - Teams divided into groups of 4 or 5 players - 5 penalty shoot-outs performed 	<ul style="list-style-type: none"> - Week 3. Briefing session to give out imagery scripts and audio tapes. MIQ-R given - Weeks 4 through 10 met with researcher every 2 weeks to monitor progress 	<ul style="list-style-type: none"> - MIQ-R given prior to testing - Initial testing procedure followed - Social validation questionnaire given
No Imagery Group	<ul style="list-style-type: none"> - As above 	<ul style="list-style-type: none"> - As above 	<ul style="list-style-type: none"> - Weeks 3 through 10 met with researcher every 2 weeks to discuss how their season was progressing 	<ul style="list-style-type: none"> - Procedure same as initial testing - Social validation questionnaire given

competition” and “I am concerned about performing poorly.” Somatic anxiety items include “I feel nervous” and “My body feels tense.” Self-confidence items include “I am confident about performing well” and “I am confident I can meet the task.” Each participant is asked to rate the intensity with which each symptom is being experienced on a scale from 1 (not at all) to 4 (very much so). Possible intensity scores on each subscale range from 9 to 36.

A separate scale developed by Jones and Swain (1992) that relates to the “direction” of participants anxiety (CSAI-2D) was used in conjunction with each of the CSAI-2 items. Each participant rates the extent to which the intensity of each symptom, at the moment, would be either facilitative or debilitating to subsequent performance on a scale from 1 (very debilitating) to 7 (very facilitative). At the time of administering the inventory, participants were reminded that debilitating meant “a hindrance” and that facilitative meant “helpful,” to assist understanding of the questionnaire. Possible directional scores on each subscale ranged from 9 (extremely detrimental) to 63 (extremely helpful), with a score of 36 representing no perceived effect (see Appendix D).

Heart Rate

To obtain a more complete picture of the somatic anxiety response, heart rate was measured using a Polar Heart Rate Monitor®. The monitor was attached to the chest by a band and a watch receiver was worn on the wrist. Participants indicated their heart rates via the watch receiver. Baseline and pre-performance heart rate scores were recorded for participants sitting and standing.

Control Measures

Movement Imagery Questionnaire-Revised (MIQ-R). The MIQ-R is a revision of the

original MIQ (Hall, Pongrac, & Buckolz, 1985) which has been used extensively as a movement imagery ability test (e.g., Blair, Hall, & Leyshon, 1993; Goss, Hall, Buckolz, & Fishburne, 1986; Hall, 1985; Martin & Hall, 1995). Some weaknesses of the original MIQ were the length of time it took some participants to complete and their reluctance to perform all of the items on the questionnaire. The MIQ-R (Hall & Martin, 1997) was employed to assess visual and kinesthetic imagery ability at preintervention and postintervention. An individual's ability to utilize imagery can be improved through training. Assessment of movement imagery ability has been advocated as a key component in the development of imagery programs (Janssen & Sheikh, 1994).

The inventory consists of eight items designed to measure the visual and kinesthetic imagery of movement. Each item in the questionnaire involves executing a movement, which is specifically described. A variety of relatively simple arm, leg, and whole body movements are incorporated in the MIQ-R. Movements were demonstrated by the researcher and repeated by participants for each item. Completing an item on the questionnaire required several steps. First, the starting position for a movement is assumed. Second, the movement is produced as described. Third, the starting position is re-assumed, and finally, the movement is imaged (no movement is actually performed). The imager then assigns a value from a 7-point Likert scale indicating the ease or difficulty with which the movement was imaged; a low rating indicates that a movement is hard to image; a high rating indicates that a movement is easy to image (see Appendix E).

Social validation questionnaire. Social validation to assess participant reactions to treatment procedures and experimental outcomes has been advocated by Kazdin (1978). Participants

were given a questionnaire after the final testing which asked whether they enjoyed and knew the purpose of the study as well as questions relating to whether they perceived their cognitive, somatic, and self-confidence direction level has altered during the study. Participants in the imagery group were also asked if they adhered to the program and the effectiveness of the imagery tapes (see Appendix C).

Treatment

Imagery Group

The 8 week imagery intervention was based on research in sport psychology and included stimulus and response propositions (Lang, 1979), internal and external imagery perspective (Murphy, 1994), emphasis on vividness and controllability (Murphy & Jowdy, 1992), and images of competition arousal (Vadocz et al., 1997).

Weeks 1 and 2 included imaging familiar objects and situations to enhance vividness and controllability of images; week 3 involved imaging familiar objects and situations from an internal and external perspective; week 4 included imaging familiar objects and soccer related situations; restructuring negative outcomes into positive ones based on actual past experiences; and feelings associated with positive outcomes which they had actually experienced. Weeks 5 through 8 focused on stimulus and response propositions. The word “challenge” was used as an appraisal for all imaged situations. Imagery content included typical thoughts and feelings experienced before and during soccer matches, and was based on arousal imagery of personal experiences. Other images included taking penalty kicks and rationalizing these from a facilitative perspective. The researcher met every 2 weeks with the participants throughout the study. Participants were asked to practise at least 3 times a week,

for 8 weeks.

No Imagery Group

The no imagery group met with the researcher every 2 weeks to talk about how their season was progressing. They were asked to continue to prepare for regular practices and games as they had previously.

Results

The means and standard deviations for each of the CSAI-2D subscales in each intervention group preintervention and postintervention are presented in Table 2. Scores for the intensity subscale of the CSAI-2D range from 9 to 36. The higher the score, the greater the cognitive or somatic state anxiety or the greater the state self-confidence. Scores for the directional subscale range from 9 to 63. Scores below 36 represent debilitating interpretations of the anxiety intensity for each subscale; a score of 36 represents no perceived effect; and scores above 36 represent facilitative interpretations.

Effects of the Imagery Intervention

Differences between the imagery and no imagery groups on levels of cognitive and somatic state anxiety, self-confidence and performance over the period of the intervention were computed using a 2 (imagery/no imagery) x 2 (pre/post) mixed factorial ANOVA with repeated measures on the last factor.

No significant interactions or main effects were revealed for somatic anxiety direction or self-confidence direction. A significant main effect for time ($F_{(1, 27)} = 6.68, p < .05$) was observed for cognitive anxiety direction (see Figure 3). The result indicated that cognitive anxiety direction scores increased from pretest to posttest for both the imagery and no imagery groups.

No significant interactions or main effects were revealed for cognitive anxiety intensity or somatic anxiety intensity at $p < .05$. The time main effect for cognitive anxiety intensity, however, was approaching significance at $p < .06$ level ($F_{(1, 27)} = 3.779, p < .06$). A significant main effect for time ($F_{(1, 27)} = 4.54, p < .05$) was observed for self-confidence intensity (see

Table 2 Means and Standard Deviations for the CSAI-2D Subscales and Performance.

CSAI-2D Subscales and Performance	Preintervention		Postintervention	
	M	SD	M	SD
Imagery group (n = 14)				
Cognitive anxiety intensity	21.07	5.66	17.93	6.75
Somatic anxiety intensity	16.50	3.90	18.00	7.25
Self-confidence intensity	23.79	4.46	24.64	5.85
Cognitive anxiety direction	29.86	10.32	36.14	13.76
Somatic anxiety direction	33.86	10.93	38.00	12.56
Self-confidence direction	40.14	9.29	42.36	13.29
Goals scored	2.71	0.91	3.43	1.09
No imagery group (n = 14)				
Cognitive anxiety intensity	21.86	6.33	20.21	5.29
Somatic anxiety intensity	17.00	6.16	15.36	4.45
Self-confidence intensity	24.43	5.67	27.21	5.32
Cognitive anxiety direction	28.71	9.19	34.00	9.63
Somatic anxiety direction	39.29	10.17	37.64	10.55
Self-confidence direction	44.07	10.42	42.86	9.74
Goals scored	2.57	1.16	2.36	1.39

Figure 4). This indicated that self-confidence increased from pretest to posttest for both the imagery and no imagery groups. The results of the ANOVAs are presented in Table 3. No significant interaction or main effects were found for goals scored at the $p < .05$ level although the interaction effect was approaching significance ($F_{(1,27)} = 3.328, p < .08$).

Anxiety-Performance Relationship

Pearson product-moment correlations for the dependent variables are shown in Table

4. The intercorrelations between the composite CSAI-2D subscales and the performance

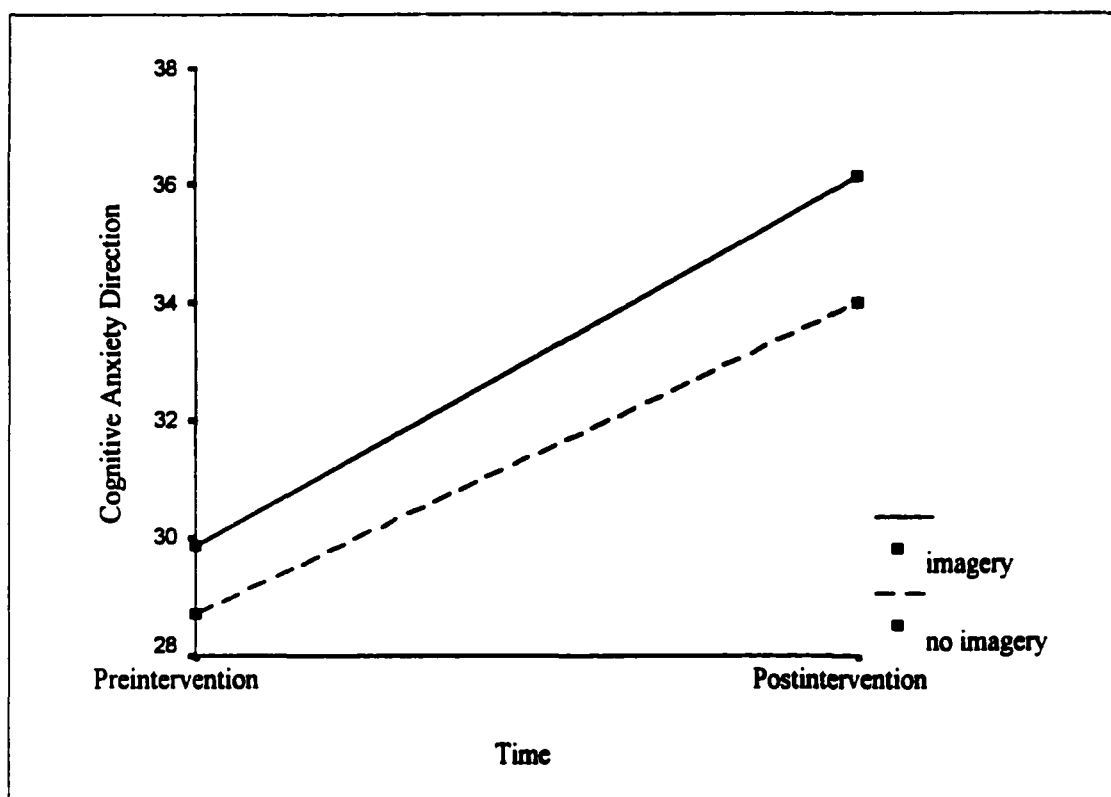


Figure 3 Cognitive anxiety direction across time.

measure of goals scored were examined. The CSAI-2D components indicated weak correlations with immediate performance as measured by penalty kick scores (range = .06 to -.34).

Cognitive anxiety intensity and somatic anxiety intensity were positively correlated with each other (range = .58 to .67) and negatively correlated with the self-confidence directional subscale preintervention and postintervention (range = -.27 to -.53). Self-confidence intensity was negatively correlated with cognitive and somatic anxiety intensity preintervention and postintervention (range = -.48 to -.54), but was positively correlated with all three direction subscales (range = .16 to .66). All directional subscales were positively correlated with each other (range .00 to .74).

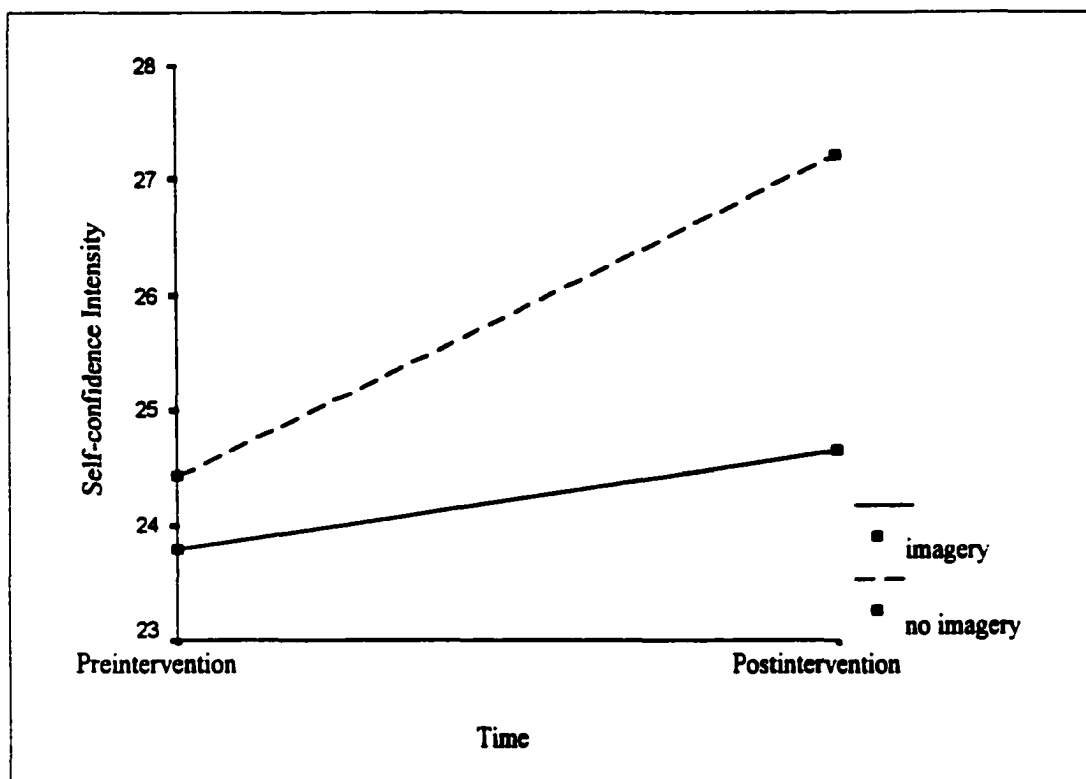


Figure 4 Self-confidence intensity across time.

Correlations between the intensity subscales of the CSAI-2D were similar to those reported by Martens, Burton, et al. (1990). The authors indicated that the correlations between cognitive and somatic subscales ranged from .49 to .77; between cognitive anxiety and self-confidence from -.44 to -.84; and between somatic anxiety and self-confidence from -.54 to -.66.

Heart Rate Change

Baseline resting heart rate measures for sitting and standing were recorded. In addition sitting and standing heart rate was recorded before each penalty kick preintervention and postintervention. Heart rate change scores (baseline resting heart rate minus pre-penalty kick heart rate) for both sitting and standing were calculated for each penalty kick. Heart rate

change scores were then collapsed (heart rate change score summed for penalties 1 through 5 divided by 5) to give a mean heart rate change score for sitting and standing preintervention and postintervention (see Table 5). To examine the effect of treatment and time on heart rate a 2 (imagery/no imagery) x 2 (pre/post) mixed factorial ANOVA with repeated measures on the last factor was computed. No significant interaction or main effects were indicated for sitting or standing heart rate measures.

Heart Rate and Perceived Somatic Anxiety Relationship

Correlations between the physiological measure of heart rate and perceived somatic anxiety intensity measured by the CSAI-2D were examined. Moderate correlations were reported for sitting heart rate preintervention ($r = 0.432, p < .05$) and postintervention ($r = 0.386, p < .05$). Standing heart rate correlations were not significant.

Control Measures

Social Validation Questionnaire

Participants were asked questions relating to their perceptions of the study and their feelings regarding taking penalty kicks. In addition the imagery group provided answers relating to the imagery intervention. Participants' responded on a 7-point Likert scale or to open ended questions (see Appendix C).

Participants indicated that they had enjoyed taking part in the study ($M = 6.21$). They also thought the purpose of the study was to examine penalty kick performance. Penalty kicks were practised by players in both groups on average only 2 or 3 times outside of training sessions and games during the course of the study.

Questions were asked relating to players feelings about taking penalty kicks. Both the

Table 3 Analysis of Variance for CSAI-2D Subscales and Performance.

CSAI-2D Subscales	F	p
Cognitive anxiety intensity		
Group	0.371	.548
Time	3.779	.063
Group x Time	0.639	.431
Somatic anxiety intensity		
Group	2.133	.156
Time	0.004	.948
Group x Time	0.345	.562
Self-confidence intensity		
Group	1.272	.270
Time	4.539	.043 *
Group x Time	0.769	.389
Cognitive anxiety direction		
Group	0.050	.825
Time	6.684	.016 *
Group x Time	0.227	.638
Somatic anxiety direction		
Group	2.100	.159
Time	0.392	.537
Group x Time	0.473	.498
Self-confidence direction		
Group	0.508	.482
Time	0.043	.837
Group x Time	0.451	.508
Goals scored		
Group	2.743	.110
Time	0.795	.381
Group x Time	3.328	.080

Note. * $p < .05$.

Table 4 Intercorrelations Between the Composite CSAI-2D Subscales and Performance.

Dependent Variables	Cog. Anx. Int.	Som. Anx. Int.	Self-Con. Int.	Cog. Anx. Dir.	Som. Anx. Dir.	Self-Con. Dir.	Goals Scored
Cog. Anx. Intensity							
Pre	--	.58 **	-.54 **	.19	.04	-.37	-.08
Post	--	.67 **	-.52 **	.27	-.18	-.27	-.34
Som. Anx. Intensity							
Pre		--	-.48 **	.02	-.34	-.53 **	-.17
Post		--	-.51 **	-.09	-.42 *	-.41 *	-.11
Self-Con. Intensity							
Pre			--	.16	.19	.66 **	-.06
Post			--	.28	.36	.59 **	.04
Cog. Anx. Direction							
Pre				--	.004	.11	.06
Post				--	-.71 **	.54 **	-.04
Som. Anx. Direction							
Pre					--	.25	-.07
Post					--	.74 **	-.07
Self-Con. Direction							
Pre						--	-.01
Post						--	-.01

Note. Cog. Anx. = cognitive anxiety. Som. Anx. = somatic anxiety. Self-Con. = self-confidence.

* $p < .05$, two tailed. ** $p < .01$, two tailed.

imagery ($M = 3.57$) and no imagery ($M = 3.71$) groups indicated they were less nervous taking penalty kicks at the end of the study compared to the beginning. Also, both groups (imagery $M = 4.79$; no imagery $M = 5.17$) indicated that they thought more positively about taking penalty kicks at the end of the study. Players were asked if they felt mentally and

Table 5 Mean Heart Rate Change Scores.

Variable	Preintervention		Postintervention	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Imagery group (n = 14)				
Sitting heart rate change	4.94	7.99	2.78	4.68
Standing heart rate change	17.04	11.42	14.42	7.11
No imagery group (n = 14)				
Sitting heart rate change	3.41	16.46	0.70	9.43

physically “charged” or “flat” before taking the penalty kicks. Both groups (imagery $M = 5.07$; no imagery $M = 5.21$) indicated they felt charged just before taking the kicks. No significant differences emerged between groups for any of these questions. Players in the imagery group felt more confident about taking penalty kicks than the no imagery group ($t_{(26)} = 2.865, p < .01$).

The imagery group was also asked questions relating to the imagery intervention. Participants indicated that they thought imagery was a worthwhile activity ($M = 4.79$) and they would recommend its use to other athletes ($M = 4.79$). Players reported imaging from an “inside view” ($M = 3.00$) more than a “video view”. Finally, participants indicated that they listened to the audio cassette on average 2.29 times per week.

MIQ-R

Scores for visual and kinesthetic imagery ability range from 4 to 28. The higher the

score the greater the ability. Means and standard deviations for visual and kinesthetic imagery ability are shown in Table 6. These scores are lower than those reported in previous studies using the MIQ-R with undergraduate university students and elite roller skaters (Hall & Martin, 1997; Vadocz et al., 1997). Participants in the imagery group indicated no significant difference in visual imagery ability or kinesthetic imagery ability from preintervention to postintervention.

Table 6 Means and Standard Deviations for Visual and Kinesthetic Imagery Ability.

Variable	Preintervention		Postintervention	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
Imagery group (n = 14)				
Visual imagery ability	21.14	5.76	21.36	5.77
Kinesthetic imagery ability	19.93	4.87	20.79	4.21

Discussion

The primary aim of the study was to investigate if an imagery intervention based on motivation arousal imagery would affect the directional perceptions of competitive soccer players who indicated debilitating state anxiety according to the CSAI-2D on performance of the soccer penalty kick. The findings indicated that the intervention was unable to alter soccer players' directional perceptions of the state anxiety response. The change over time for cognitive anxiety direction indicated that the mean scores increased by 6.28 in the imagery group and by 5.29 in the no imagery group over the course of the intervention. Also the change over time for self-confidence intensity indicated that the mean scores increased by 0.85 in the imagery group and by 2.78 in the no imagery group. A possible suggestion for the changes in cognitive anxiety direction and self-confidence intensity postintervention may be that the penalty kicks were taken indoors on artificial turf, with the goal being smaller and the distance to the goal proportionally closer. Anecdotal evidence from participants suggests that the penalty kicks may have been perceived to be easier to perform by both groups. Comments included "it's easier to score indoors because I am closer" to "when I kick on artificial turf I don't scuff my shots." Interestingly, although no statistical difference emerged for self-confidence on the CSAI-2D, the results of the validation check questionnaire following the completion of the study indicated that participants in the imagery group felt more confident ($p < .01$) about taking penalty kicks postintervention compared to the no imagery group. This may be because they scored fifteen more goals relative to their own performance.

Based on Jones and colleagues (1993) study it was expected that penalty kick performance would improve with more facilitative interpretations of the anxiety response.

Although no significant performance differences were indicated ($p < .08$), the imagery group did score more goals (48) than the no imagery group (33) postintervention. This descriptive data hints that the differences indicated may be meaningful considering the low scoring nature of many soccer matches and the prevalence of penalty shoot-outs in soccer competitions. An explanation for the nonsignificant differences in performance could be that the performance measure used may have lacked the precision necessary to demonstrate accurately the subtle influence of anxiety on performance. Eysenck (1984, 1992) proposed that anxiety affects information processing efficiency to a greater extent than performance effectiveness, meaning global performance measures commonly employed may not be sufficiently sensitive to allow detection of anxiety effects. Consequently, the development of reliable and sensitive performance measures are advocated. One possibility developed by Sonstroem and Bernardo (1982) uses intraindividual performance measures that control for differences in skill level by comparing current performance to average or best previous performance. This performance measure has been successfully utilized in competitive anxiety research (Burton, 1988; Swain & Jones, 1996) and could be adapted to soccer to provide a composite of overall playing performance. For example, the measures could include percentage of passes completed to teammates; shots/attempts on goal; shots stopped; successful tackles; and successful defensive clearances. It was not possible to examine this intraindividual measure in the present study since a minimum of three separate performance measures are required for such analysis.

In examining physiological and psychological measures of the anxiety response, weak correlations were indicated for sitting heart rate and no significant correlations for standing heart rate. Deffenbacher (1980) suggested that the perceived physiological response (e.g.,

somatic anxiety) and physiological response (e.g., heart rate) should not be interpreted as the same response because they affect performance differently. Other studies have also indicated no significant correlations between cardiovascular parameters and psychological measures of somatic anxiety response using contrived competition and a relatively novel motor task (Karteroliotis & Gill, 1987; Yan Lan & Gill, 1984). It would seem that perceived physiological arousal (somatic anxiety) and actual physiological arousal are separate variables that may not be related in competitive settings. If each of these indexes is independent and affects performance differently they must be examined simultaneously in order to understand the nature and effect of state anxiety.

The small sample size and the lack of previous research relating to motivational arousal imagery in sports settings limit the generalization of the results. However, findings follow the predictions of Valdocz et al. (1997) suggesting that those athletes who indicate debilitating competitive state anxiety may not be able to change their directional perceptions by engaging in motivational arousal imagery. Non-elite soccer players who indicate their state anxiety as being debilitating may need to use more motivational mastery imagery related to increasing self-confidence to change their directional perceptions for taking soccer penalty kicks.

Hale and Whitehouse (1998) indicated that an optimistic challenge orientation as opposed to a negative pressure appraisal leads to increases in facilitative measures of state anxiety and self-confidence. This study supports these predictions with mean directional scores increasing in the imagery group to more facilitative interpretations from preintervention to postintervention (mean range 36.14 to 42.36). Caution must be taken however, because

cognitive anxiety direction scores in the no imagery group also increased across time but were still interpreted as debilitating by participants. Directional change could have resulted from environmental differences in penalty kick performance as discussed earlier. A score of 36 on the CSAI-2D represents no perceived effect, indicating the athletes had neither debilitating nor facilitative interpretations of their anxiety intensity toward subsequent performance.

Directional mean scores postintervention can be interpreted as only slightly more helpful to subsequent performance and viewed with caution. Increases in cognitive and somatic anxiety directional scores from debilitating to facilitative supports research (Carver & Scheier, 1988; Jones, 1995; Lazarus & Folkman, 1984) which downplay the emphasis on anxiety as a purely negative concept which hinders performance, and hypothesize that it is critical to also examine the individual's perception of the competitive situation to see whether anxiety is perceived as beneficial or harmful.

Performance preparation imagery ordinarily applies to tasks that are fully automated and can be used by athletes to achieve an optimum level of arousal or excitedness. Highly developed skills once achieved leave attentional resources available for other uses (Norman & Shallice, 1986). For elite performers it may be unnecessary for them to attend to performance components of a skill such as the penalty kick. However, for the non-elite athletes used in this study, their relatively low skill level could mean that their kicking mechanics have not yet been fully automated. Anecdotal evidence from some participants would seem to support this statement, with comments indicating they sometimes scuffed their foot when kicking the ball. Therefore, it is possible that participants were using both cognitive specific and motivational arousal imagery. For example players could have been attending to performance components

of the penalty kick whilst imaging as well as using arousal imagery. Their use of imagery via a cognitive specific mechanism (i.e. improving motor performance) as well as a motivational general arousal mechanism, may account for the increase in goals scored by the imagery group compared to the no imagery group at postintervention, and the non-significant changes in directional anxiety scores.

It is possible that exposure to only an 8 week imagery intervention may not be long enough. Although some studies promote 8 weeks as adequate, others encourage season-long imagery programs (Vealey & Walters, 1994). Indeed there has been limited research indicating the optimal number of imagery sessions necessary for athletes to exhibit significant directional changes in competitive state anxiety. Page et al. (1999) indicates that there might be a “point of diminishing returns” at which imagery programs become less effective or unnecessary. This would be useful information for the sport psychologist in enabling them to use different interventions at different points in the season.

The findings from the MIQ-R revealed similar patterns for visual and kinesthetic imagery ability with mean scores increasing over the duration of the study. Indeed many authors have reported that imagery becomes more effective when practised (Moritz, Hall, Martin, & Vadocz, 1996; Orlick & Partington, 1988; Suinn, 1980; Vadocz et al., 1997). These results are similar to the findings of Salmon et al. (1994) indicating that soccer players use visual and kinesthetic imagery with relatively equal frequency. The authors point out that soccer players place a good deal of importance on being able to feel the ball on contact with their foot during the game. This finding would seem to extend to the taking of penalty kicks where an accurate ball strike may be critical to scoring a goal.

Individual differences in imagery ability is one important factor influencing the use of imagery (Hall, Buckolz, & Fishburne, 1992). Measurements monitoring the vividness and controllability of images are advocated in imagery research (Hall & Martin, 1997). A limitation of the MIQ-R is that it only measures the ease of imagery. The success of imagery procedures is determined by the ability to form and control images. If the athlete can produce vivid images but is unable to control them, the chances of effective imagery use are diminished (Sheikh, Sheikh, & Moleski, 1994). Researchers may want to use self report questionnaires which address both vividness and controllability of images.

Research concerning the effect of internal/external imagery perspective is contradictory (Murphy, 1994). Some studies have indicated that athletes use internal and external imagery with equal frequency (Meyers, Cooke, Cullen, & Liles, 1979; Mumford & Hall, 1985). Others have indicated that elite athletes especially, tend to use an internal perspective (Barr & Hall, 1992; Mahoney & Avenier, 1977; Mahoney, Gabriel, & Perkins, 1987). Soccer players in this study indicated a preference for the internal imagery perspective supporting the findings of Salmon et al. (1994). This finding may have been expected considering the importance soccer players place on sensory feedback from the body's movements.

Research by Jones (1991) and Jones et al. (1993) indicates that it may not be realistic for pre-performance anxiety measures to predict actual performance to any great extent. The authors point out that anxiety research to date has been unable to predict a large percentage of performance variance. Maybe it is over optimistic to expect that performance will be predicted to any degree by a measure of anxiety acquired five minutes previously. Anxiety levels during

performance are more likely to be better predictors of performance (Jones et al., 1993). A challenge confronting researchers therefore, is to develop methods of examining competitive state anxiety during performance. Potential possibilities include psychophysiological measures (Mckay, Selig, Carlson, & Morris, 1997) and short self report measures, for example The Sport Grid (Raedeke & Stein, 1994) and The Anxiety Rating Scale (Cox, Russell, & Robb, 1998).

Participants also indicated that they did not listen to the audio cassette three times a week as instructed. Shambrook and Bull (1999) suggested that potential reasons for the lack of success in athletes adhering to programs are 1) client characteristics and 2) the mode of service delivery to the performer. Cogan and Petrie (1995) evaluated a season long intervention with gymnasts and reported participants ratings of perceived usefulness of different aspects of the intervention. They noted that of the eleven elements in the intervention, areas perceived to be least helpful were those requiring independent utilization of the psychological skills training including 'practising relaxation on own'. Other areas of the intervention were group sessions with direct input from consultants. This difference suggests that the mode of training associated with psychological preparation may have an influence upon successful adherence. It may be that young non-elite athletes in team sports require structured group supervision before embarking on individualized mental training programs, to educate them about the content and nature of psychological skills training and to reinforce the benefits of adherence to programs. These recommendations may result in an increased perceived value of entering into, and adhering to programs, due to an increased perceived value of beginning, and continuing, to utilize the strategies. Researchers implementing

interventions or programs may need to adapt treatment procedures depending on the sport (team vs individual) and participants (elite vs non-elite). Further research is advocated to identify antecedents of successful delivery and adherence to interventions.

Significant differences in heart rate response in the imagery group compared to the no imagery group may have been expected considering that Lang's (1984) bio-informational theory of emotional imagery uses stimulus-response propositions to elicit an efferent outflow which is accompanied by a physiological response. The specific response of the individual's physiological system to particular response propositions is determined by the individual's past experiences. It is possible that the imagery instructions were not relevant to the personal experiences of some players. Lang (1984) points out that affective behaviour changes depends on the generation of relevant stimuli. Also, previous penalty kick experience for most of the participants would probably have been limited because teams generally have only one penalty taker on the team, limiting the number of personal experiences the participants would have had to draw upon. Heart rate response may also be related to the nature of the task. Specifically, individuals may have had little interest in the outcome of the competition even though they indicated their anxieties to be debilitating in the contrived situation. Maybe the setting did not create tension levels similar to those that athletes' experience prior to an actual game situation.

Lastly, heart rate may be too variable as a momentary measure and other types of heart rate measures should be analyzed to provide a clearer picture (Boutcher & Zinsser, 1990). Future research could examine somatic anxiety and a more sensitive measure of heart rate, for example beat to beat intervals (Malik, 1996). In addition more sensitive physiological indices

are recommended in future designs which examine intensity and directional components of competitive anxiety (Hale & Whitehouse, 1998).

Suggestions for Future Research

The representative soccer played by under 15 and under 18 soccer players in Northwestern Ontario can be classified as non-elite. Jones and Swain (1995) suggest that if non-elite performers perceive their anxiety as debilitating, they may benefit from relaxation or some strategy that would reduce the intensity of the anxiety symptoms. This reduction would perhaps permit the non-elite athletes to interpret their thoughts and feelings as more suitable and reflect a more appropriate state of readiness for an individual of that ability. Therefore, further research may be required to examine the benefits of intensity reduction strategies versus cognitive restructuring programs with non-elite athletes.

Some researchers contend that perceptions of anxiety (facilitative/debilitative) are not independent constructs but are mislabeled measurements of self-confidence (Burton & Naylor, 1997). If these contentions are true maybe less confident athletes should use imagery to build their self-confidence. Moritz et al. (1996) indicated that those athletes high in self-confidence used more motivational mastery imagery which included images of being in control and/or mentally tough in difficult situations, than those with less self-confidence. Given this relationship athletes low in self-confidence should be encouraged by sports psychologists to use mastery imagery. Examples of its use could be for athletes to regain confidence after an injury or after a decline in performance. The specific content and timing of such imagery warrants further research.

Penalty shootouts occur at the end of 120 minutes of play. The average player will

have covered over 12,000 meters (Barbour, 1992). Fatigue is one factor that could influence penalty shot performance. Interventions using motivational arousal imagery may be beneficial to athletes needing to re-energize themselves after exhaustive efforts although these effects have yet to be examined by researchers. Soccer coaches have generally selected penalty takers, especially those in shootout competitions on the basis of their confidence and willingness. Essentially these shooters are self selected. Until further research is carried out coaches should continue to select players on this basis.

Arousal imagery research using Lang's (1984) bio-informational theory in sporting environments is limited. To provide instructions that are personally relevant to athletes there may be a need for researchers to provide individualized imagery scripts via interviews, which explore the athletes verbally reported experiences. Indeed, another possible approach to examining arousal imagery effects would be to employ a single subject, multiple baseline design. As shown in the present study, between group designs are difficult to conduct (e.g. small sample size, limited length of the intervention). Other individual difference variables including vividness and controllability of arousal imagery provided numerous research opportunities. The success of arousal imagery may depend for example, on the extent to which vividness of reported images and affective intensity interact. High imagers may provide very detailed descriptions of stimulus elements which affect the pattern of response propositions. Many of these responses are measurable during the imagery experience, providing additional psychophysiological avenues for research. Lang (1979) points out that higher levels of arousal may prompt response disorganization and a reduction in sensory discrimination (i.e., vividness and control). For some high imagers this may result in arousal

levels where they perceive their former facilitative directional perceptions of anxiety as now being detrimental to future performance. The goal for sports psychologists is to develop individualized programs which take into account the demands imposed upon the performer including the nature of the sport and its relationship to practice and competition environments.

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Appendices

Appendix A

Participant Consent Form and Cover Letter



I _____ have read and understood the cover letter of the research study entitled "The effects of different training programs on soccer players perceptions and performance of taking soccer penalty kicks" by Matthew Light.

I agree to participate in the research study. I understand that I will be required to wear a heart rate monitor around my chest when I take penalty kicks. This procedure will take place at the beginning and end of the study. I may also be asked to listen to an audio cassette and/or answer questionnaires related to the study during the 8 week period.

I understand that I may withdraw from the study any time, even after signing this form, and that all information I provide will be summarized so no individual data is reported.

Signature of Participant

Date



Dear Player,

I am studying for a Graduate Masters Degree under the supervision of Dr. Joey Farrell at the School of Kinesiology, Lakehead University. I am interested in studying the effects of different training programs on soccer players perceptions and performance of taking soccer penalty kicks.

Soccer matches are often low scoring, subsequently penalty kicks in regulation time have increased in significance and penalty shoot-outs are more common. The penalty kick is described as a relatively simple mechanical skill, yet few players volunteer to take them.

The purpose of the study is to investigate if soccer players perceptions of taking penalty kicks can be changed through an 8 week training program.

In order to assess your perception and performance of penalty kicks, you will be required to perform 5 penalty kicks in a simulated penalty shoot-out, with your team-mates. To assess your perceptions of the penalties, you will be required to fill in a questionnaire about how you are feeling just prior to the taking of the kicks and wear a heart rate monitor around your chest. This procedure will take place at the beginning and end of the study.

During the training period you may be asked to listen to an audio cassette and/or answer questionnaires which are designed to monitor your progress. All answers from the questionnaires are completely anonymous. All information collected via the questionnaires will be coded and analyzed. Data will be stored by Dr. Joey Farrell at the School of Kinesiology for 7 years. No individual will be identified in any report of the results. The findings of the study will be made available to you at your request upon completion of the study.

Feel free to contact me if you have any further questions relating to the study.

Yours sincerely,

**Matthew Light
(Masters student)
(Telephone number: 767 2124)**

Appendix B

Imagery Script

Week 1

This session requires you to sit in front of a flat surface, on which you can place your hands, or you can put your hands on your thighs. Place your hands flat, face down in front of you. Open your eyes if they are closed, and look down at your hands... Look at the shapes... Close your eyes, and try to recall the image that you could see. If you have no image open your eyes and look again, look at the shapes and imagine the spaces between your fingers and thumbs. Close your eyes and think of the spaces.

Keep your eyes closed, and turn one hand over, so that the palm faces upwards... Imagine what you will see when you open your eyes... Then open your eyes and have a look... Now join the tips of your forefinger and thumbs together with your hands still flat on the surface in front of you... Look at the shapes between your fingers and thumbs... Study the shapes... Close your eyes and recall the shape.

Now stretch your fingers and thumbs apart, so that your palms come closer together... Your palms should still be flat on the surface in front of you, but your fingers and thumbs are stretched apart... Image the new shape between your hands...and then open your eyes and confirm what you see.

Close your eyes, relax your hands, draw the thumbs closer to your fingers so that your thumbs are almost touching your forefingers... Imagine what you will see... Open your eyes and check... Sometimes you will be surprised by the difference between what you expected and what you get... Another way you can make a familiar shape with your hands is by interlocking your fingers in front of you, and grasping your hands together... Then lifting one finger at a time, and imagining what the shape will be in front of you when you open your eyes. You can try that exercise now, and as you do it you will realize that you are using clues from what you are feeling to tell you what to expect to see.

Lets go onto some other familiar objects... Imagine sitting at a dining table looking at the place settings... See the knife and fork and spoon, and now see if you can add another knife to your place setting... See a glass in front of you to have a drink from... Now see if you can place all the cutlery down on the table, not set, just lying one next to the other. Try and see those shapes, then re-lay the table.

Now leave the table, and imagine yourself stood in the clothes you are wearing today... Try to see the colors... Now see the clothes laid out without anybody in them... Now imagine your favorite soccer kit, all clean and prepared and ready. It's laid out just waiting for you to use it... Now imagine that you have put it on and your wearing it... Try to imagine the clothes as you would see them looking down at them whilst your wearing them... Look down at your feet, the shoes you wear... Look down at your legs... and come up towards your waist... Look at your arms... You should get a picture of yourself ready to compete.

Some of you will find it difficult to get clear images to start with, some of you will find it very difficult.

If you are having a lot of difficulty creating images of familiar objects and of yourself, try to imagine other familiar objects in your room... try to picture what they will look like when you open your eyes.

This is the finish of the first session, please try to repeat this session at least three more times this week.

Week 2

When you are ready, imagine a ball, try to get a nice clear image of it, in front of you. Try make the ball move up, now make it move back down, try make it move left, and now right. Put it back in the middle... Leave the ball for a moment, and rehearse the following sequence, left, left, right, left... that's left, left, right, left. Now fetch the ball back, put it in the middle, and as you say the sequence, make the ball move in the same way. Left, left, right, left. Now I want you to do that again, but this time with your own sequence, make up your own sequence of movements and rehearse it, fetch the ball back, and make it move as you say the sequence (Pause).

You can use this combination of visual imagery and self talk to practice any sequence of movements you want. As you get better at it you will also be able to use it in more subtle ways, to suggest how you want to feel at different moments in time, instead of just what you want to do.

Now fetch the ball back to the middle again, and draw two more balls, one on each side of it, so you can see three balls in a straight line... Try to make the middle ball come towards you, by making it bigger relative to the other two... Now make it go away from you by making it go smaller relative to the other two... if you are becoming quite skillful at this, you can make the balls bounce up and down (Pause).

Will leave the balls now, stretch out a hand in front of you, as if you are placing it on a wall, hold it with your fingers pointing upwards, and slightly apart... Close your eyes, now rotate your hand by raising your elbow, so that the fingers move into a horizontal position... Imagine what it will look like when you open your eyes. Will your thumb be pointing down or up? If you think that your thumb will be pointing up, rotate your hand until it is pointing down, and if you think that your thumb will be pointing down, rotate your hand so that your thumb is pointing up. Open your eyes to confirm what you expect.

Hold the other hand out instead, and without looking at it, or moving your hand, move the image across the midline of your body, until your hand would be opposite your other shoulder, and the arm that you are not using... You can feel the difference between the imaged

hand, which has moved across in front of your face, and the real hand... Now make them the same, by moving your hand across to the image... Then image the hand move back to where it originally was, don't actually move your hand yet, but move it up instead... Now move your hand directly back to where you are imagining it to be.

Put both hands down in front of you, or on your thighs. Imaging your right hand stretched out in front of you. Imagine moving it to the left... Imagine moving it up... Imagine moving it to the right... Now reach out with your right hand, and place it where you imagined it to be.

You can play these mental rehearsal games at any time, and you should do so to develop your skill. This is the finish of the second session, please try to repeat this session at least three more times this week.

Week 3

Pick out an object in the room in which you are sat. One with which you are very familiar. Look at it, close your eyes and image it... when you've got an image try to imagine what the object will look like from the other side... Pick another object, and repeat the process... Now picture the whole room with all the furniture in it... Imagine yourself walking to the corner of the room, that is on your right... and see your view of the room change as you walk... when you get there, try and hold the image... Now walk to the corner of the room on your left, and imagine what the room looks like from there... If you have difficulty, stand up and actually walk to the corner of the room. Look at it, and then go back and repeat the exercise (Pause).

OK sit down again and make yourself comfortable. We want to extend this idea, to see players performing movements, that you are familiar with in soccer.

Let's try it now... Pick a movement which occurs regularly in soccer... The image that you are watching this movement on a television screen... An image of somebody else doing the movement, or yourself doing the movement, as somebody else would see you... Some of you will find it quite difficult to get images like this, don't worry because we are going to see a different sort of image, that you will find much easier to get in a moment... Essentially there are two different kinds, you can see images from the first person perspective, that's as you would if you did the movement, or you can see images from a third person perspective, that as you would see somebody else doing the movement like watching a video of the movement.

Pick another technique from your sport... Shut your eyes, and try to see a figure perform that technique on your television, from a third person perspective... Now lets change the perspective. Think of a technique you are familiar with from your sport. It can be the same technique or it can be another one... Try to image what you see whilst you are actually performing that technique... Look at it from your own point of view, the first person

perspective...

If you are having difficulty with a sporting technique, imagine yourself tying your shoe laces, that's something most people do almost everyday, and you should have less difficulty with that sort of activity, than with techniques which you are less familiar with.

In contrast a third person perspective, of someone tying their shoe laces, is often very difficult. You might find that it helps to imagine a parent tying a young child's shoe laces. You can perhaps try that... Compare that image, with the image that you get when tying your own shoe laces... Try imagining tying your own shoe laces very fast...

Now go back to your sporting technique. Go through it at the normal speed, then go through it speeded up... Finally, go through it again in slow motion... Essentially this perspective is about what it looks like to be actually doing the technique. With practice you will also be able to feel what it is like to be doing it. As you get better those feelings become more important, and more realistic... When you imagine a figure from a third person perspective, you may also begin to move, along with that figure performing the technique... No matter what type of visual images you use in your mental rehearsal, if you combine these images, with feeling images, then your mental rehearsal will become a very powerful tool.

This is the finish of the third session, please try to repeat this session at least three more times this week.

Week 4

You should be sitting in front of a table, with an object such as a pencil or small ball, that you can roll along the table top. Place the object on the table in front of you, but to one side of the table, in such a way that you can roll it towards the edge of the table, by your right hand...

Roll the object towards the edge of the table, and watch it fall off the edge... Pick it up, place it back where it started, and close your eyes. Recall what happened... You should be able to get an image of the object rolling across the table, and falling off to the floor. Now imagine the object rolling towards the edge of the table, but just before it gets there, imagine putting out a hand to stop it rolling over the edge... Imagine it again... Feel pleased that you have been successful in stopping the object from rolling off the table... Now do it. Roll the object, but before it gets to the edge, place your hand in such a position, that you can stop it from rolling off the edge of the table.

Now review what happened... Go over it in your mind, and see exactly what you did... Now I'd like you to go over it again in your mind, but this time I want you to restructure what happened... Instead of stopping the object before the edge, imagine yourself catching the object, after it drops off the table, but before it hits the floor... Imagine the movements that

you would have to make to do this.

Now place the object about 30 centimeters in from the edge of the table, and start it rolling towards the edge... When its gone over the edge, catch it before it hits the ground... Go over that again in your imagination, and this time reward yourself for successfully imagining and carrying out the task.

Now I want to turn your mind to a past soccer performance. I would like you to recall an image, as vividly as possible. The sequence of events that took place in a particularly unsuccessful episode or performance. The sort of disaster that we all have and don't want to repeat... Let the sequence of events develop to there natural conclusion... You will have worked out went wrong, and the things that you did wrong, now re-run it, imagine yourself doing it again, but just before the moment you did something wrong, restructure the action, put it right, and take it to a successful conclusion. When you get to that successful conclusion, reward yourself, you did well. Go through it again, this time performing the action in your mind without a mistake...

If you are having some difficulty with that, and you find you still see yourself making the mistake, just stop the action, go back a little while, back to the decision point that came just before the actual mistake, and go on from there. Try it several times, until you can get the perfect image.

Imaging poor performances is not good for your confidence, keep practicing positive images, and restructuring the negative ones. This is the finish of the fourth session, please try to repeat this session at least three more times this week.

Week 5

When you are ready, imagine warming up before the game. See yourself stretching and warming up with your team-mates. This is an important game because it will decide who goes to the top of the league. You can feel your heart pounding against your chest. You feel nervous but at the same time you feel energized and ready to perform, this is a challenging situation.

Now think about a great through-ball pass you have made to a team-mate. Picture the opposition players around you as you play the ball through the gap. This is an important pass because the game is level, and it gives your team a chance to score. The pass is difficult but challenging. You are breathing hard from the intense game, but you still feel energized.

If you are having difficulty with this scene, go back to the point that things started to go wrong and start from this point with a positive outcome.

Now think about a corner kick you have been asked to take. The kick is from your

favorite side of the pitch. You can feel the wind in your face. Picture your team-mates in the penalty area waiting for the kick. You have decided where the kick will go, and are confident in your ability to deliver the kick. These are the final minutes of the game and the score is tied. Your legs are tired and heavy, and your heart is beating fast. Try to feel the ball leave your foot as you deliver the cross to the player you have picked out. Feel pleased to have delivered such a good cross.

Take a few moments, begin to think about an excellent shot that you have made on goal, either in a practice or in a game situation. Picture the other players around you, both your team-mates and the opposition. This was an important game to you, the outcome of your shot is very important to the outcome of the game. You are tired and your legs are heavy. You still have enough energy to shoot the ball. Try to feel what it was like when you kicked the ball. You now see it fly into the back of the net. Think of the emotions you felt after you had scored, picture your team-mates coming to congratulate you as you celebrate.

When you play a game or practice this week try to mentally image some of these situations. This is the end of the fifth session, please try to repeat this session at least three more times this week.

Week 6

When you are ready, imagine yourself getting ready for a big game. You are warming up for the game, running with the ball on your feet as you run. This game is important but you are ready for it. Feel the energy in your body... you are energized and ready to play, you feel excited and you can feel your heart pumping. You are ready for the challenge ahead.

Take a few moments to imagine yourself feeling the way you would like to feel when you play soccer... notice your team-mates preparing, also note the playing conditions, what sort of day is it? These big games are enjoyable situations, they are a challenge, you are nervous but ready to play.

If you are having problems imaging yourself in a positive frame of mind for the big game, tell yourself that this is a challenge, no pressure is involved. The feelings you have are natural in these situations and you will play your best by feeling this way.

Picture yourself dribbling the ball towards the opponents goal. The ball is next to your feet, and you see the last defender between you and the goalkeeper, he is standing in front of you. The scores are level, and this would be a good time to score. As you get closer to the defender you feel your legs getting heavier and you are almost out of breath.

As you near the defender you see him stick out a leg to tackle you. Picture yourself pushing the ball around the defender and running after the ball. The defender however, has caught the back of your boot. Try to feel the defenders foot on yours. You then fall to the

ground hard, feel yourself get winded by the fall, you feel out of breath for a few seconds.

The free-kick has been given to you just outside of the penalty area, straight on to the goal. Your team-mates want you to take the kick. They are confident in your ability. You see the wall in front of you, there are five defenders. You have the choice of which side of the goal you are going to shoot. You have decided, and will not change your mind. It is the last five minutes of the game and the score is level. Your legs feel tired and your breathing is heavy. All of your team are counting on you. You say to yourself that this is a challenge, there is no pressure. Say this again before you picture yourself kicking the ball.

The ball leaves your foot and from the feel of the kick you know it is going into the back of the net. You hear the ball hit the netting in the goal, and see your fellow team-mates come to congratulate you. Your heart is beating hard and you now feel energized and ready to continue with the game. Well done.

Try to picture another situation in which you have had some success, picture the scene in detail. Where are you standing, and the other players around you? How important is the game, and how are you feeling? Be positive, say to yourself that this situation is a challenge and that no pressure is involved.

When you play a game or practice this week try to mentally image some of these situations Say the word "challenge" to yourself when you imagine a difficult situation. This is the end of the sixth session, please try to repeat this session at least three more times this week.

Week 7

When you are ready, I want you to imagine you are playing in an important game, and you are losing by one goal, with ten minutes left in the game.

Imagine looking at a team-mate who has dribbled the ball into the penalty area, and is about to shoot on goal. You are behind the play and you are sprinting towards the penalty area incase the ball gets passed back to you. You can feel your heart pounding and you are breathing heavily.

Picture your team-mate who has been tackled from behind, just before he shoots. You hear the referee blow the whistle hard, and see him point to the penalty spot. Your heart beats even faster now because you know that you are the teams penalty taker. You are excited about the chance to take the kick and you say to yourself that this is a challenging situation.

Picture the goalkeeper on his line, and the other players lined up along the eighteen yard line. See yourself pick up the ball and place it on the penalty spot... try to feel the texture of the ball in your hands. Tell yourself that this is a challenging situation, which you can cope

with. Your heart feels like it is about to come out of your chest, and you have butterflies in your stomach. Tell yourself that these are natural feelings in this situation, and that this level of energy is good for you.

Imagine stepping back from the ball a few paces, and looking at the referee as he blows his whistle. You have already decided where you are going to shoot the ball in the goal, and you are not going to change your mind. Tell yourself that this is an important kick and that this is a challenging situation. Your legs feel a little heavy, but this is natural.

Now picture yourself running up to the ball. Shoot the ball where you had pictured it would go. See the goalkeeper dive for the ball in the same direction that you have shot the ball. He cannot reach it because you have placed the ball so accurately in the goal. As the ball hits the back of the net, you are relieved and happy. Your team-mates come to congratulate you.

Now choose a similar scene which may or may not have happened to you in the past, which involves a penalty kick. Try to get a vivid picture of the situation. Try to remember your feelings associated with this situation. Remember try not to picture a negative result. If you do then go back to the point when this happened and re-structure the scene so a positive result occurs. Say to yourself that this is a challenge situation.

This is the end of the seventh session, please try to repeat this session at least three more times this week.

Week 8

When you are ready, imagine that the game has finished and extra-time has been played in the match. Picture the scene when the referee blows the whistle for the end of the match. Players fall to the ground with exhaustion. You are tired from the long game, and your legs are heavy.

A penalty shoot-out is necessary to decide the outcome of the game. You see your coach approach you and ask you to take one of the kicks. You agree, this will be a challenge for you. Your body is tired but you feel energized at the thought of taking one of the penalties.

You sit in the center circle with your team-mates around you. You will shoot last in the rotation of players on your team. As the time approaches for you to take your penalty, you keep saying to yourself that no pressure is involved, this is a challenge situation. You see other players take their penalties. Some score, some miss. You are concentrating on how you will take your kick, and on the positive feelings that you have.

Imagine walking from the center circle to the penalty area. You can see the referee and

the goalkeeper ready. The scores are level, and your team will win if you score this goal. As you walk your heart rate increases, your palms of your hands are sweaty and the butterflies are racing around your stomach.

You place the ball on the penalty spot, feel the texture of the ball in your hands. Imagine stepping back from the ball a few paces, and looking at the referee as he blows his whistle. You have already decided where you are going to shoot the ball in the goal, and you are not going to change your mind. Tell yourself that this is an important kick and that this is a challenging situation. Your legs feel a little heavy, but this is natural.

Now picture yourself running up to the ball. Shoot the ball where you had pictured it would go. See the goalkeeper dive for the ball in the wrong direction. He cannot reach it because you have placed the ball so accurately in the goal. As the ball hits the back of the net, you are relieved and happy. Your team-mates rush to congratulate you.

Remember, try not to picture a negative result. If you do then go back to the point when this happened and re-structure the scene so a positive result occurs. Say to yourself that this is a challenge situation.

This is the end of the eighth and final session, please try to repeat this session at least three more times this week. Thank you for taking part in the imagery sessions.

Appendix C

Social Validation Questionnaires

Evaluation Questionnaire

Thank you for filling out this questionnaire. It asks you questions about your perceptions of the study and the imagery program.

Please circle the number that most accurately reflects your answer to the questions.

		Not at all						Very much so
1.	Did you enjoy taking part in the study?	1	2	3	4	5	6	7
2.	Do you think that the imagery study was worthwhile for you?	1	2	3	4	5	6	7
3.	Would you recommend using imagery to other athletes?	1	2	3	4	5	6	7

4. Were you more or less nervous at taking penalty kicks now than at the beginning of the study?

1	2	3	4	5	6	7
Less Nervous			No Change			More Nervous

5. Were you thinking more or less positively about taking penalty kicks now than at the beginning of the study.

1	2	3	4	5	6	7
Less positively			No Change			More positively

6. Do you think that you are more or less confident at taking penalties now than at the beginning of the study?

1	2	3	4	5	6	7
Less Confident			No Change		More Confident	

7. When you were using the imagery did you see yourself from the outside (as if watching a video) or from the inside (as if you are actually inside yourself performing).

1	2	3	4	5	6	7
Inside view			Half and half		Video view	

8. How did you feel just before taking the penalty kicks?

1	2	3	4	5	6	7
Mentally and physically flat				Mentally and physically charged		

9. How many different times did you practice penalty kicks outside of your training sessions or games? (Please tick box)

- | | | |
|-------------------------------|-------------------------------|---------------------------------------|
| <input type="checkbox"/> Zero | <input type="checkbox"/> 5-6 | <input type="checkbox"/> More than 10 |
| <input type="checkbox"/> 1-2 | <input type="checkbox"/> 7-8 | |
| <input type="checkbox"/> 3-4 | <input type="checkbox"/> 9-10 | |

10. On average how many times a week did you listen to the audio cassette?

11. What did you think was the purpose of the study? (Please answer in the space below)

Evaluation Questionnaire

Thank you for filling out this questionnaire. It asks you questions about your perceptions of the study and the penalty kicks.

Please circle the number that most accurately reflects your answer to the questions.

1. Did you enjoy taking part in the study?

1	2	3	4	5	6	7
Not at all			Very much so			

2. Were you more or less nervous at taking penalty kicks now than at the beginning of the study?

1	2	3	4	5	6	7
Less Nervous		No Change		More Nervous		

3. Were you thinking more or less positively about taking penalty kicks now than at the beginning of the study.

1	2	3	4	5	6	7
Less Positively		No Change		More Positively		

4. Do you think that you are more or less confident at taking penalty kicks now than at the beginning of the study?

1	2	3	4	5	6	7
Less Confident		No Change		Very Confident		

5. How did you feel just before taking the penalty kicks?

1 2 3 4 5 6 7

Mentally and
physically
flat

Mentally and
physically
charged

6. How many different times did you practice penalty kicks outside of your training sessions or games? (Please tick box)

- Zero 5-6 More than 10
- 1-2 7-8
- 3-4 9-10

7. Did you use any other training materials from another team which took part in the study?

- Yes No

If yes please specify _____

8. What did you think was the purpose of the study? (Please answer in the space below)

Appendix D

The CSAI-2D Questionnaire

CSAI-2D Self Evaluation Questionnaire

Name: _____

Date: _____

Directions: A number of statements that athletes have used to describe their feelings before competition are given below. The Questionnaire is divided into 2 sections. Read each section and then circle the appropriate number on the scale from 1 to 4 to indicate how you feel right now-at this moment. Then, for each statement, circle an appropriate number on the scale from 1 to 7 to signify how helpful or unhelpful you perceive your response to be. There are no right or wrong answers. Do not spend too much time on each statement.

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

Scoring the CSAI-2D

There are two response dimensions on this questionnaire. The intensity dimension (1 to 4 Likert scale) and directional dimension (1 to 7 Likert scale). Subscales for both dimensions consist of cognitive anxiety, somatic anxiety, and self-confidence. Each subscale includes 9 items. Scores on the intensity dimension should fall between 9 and 36 and for the directional dimension between 9 and 63 (a score of 36 on the directional dimension represents no perceived effect). For each of the dimensions add up the responses for cognitive anxiety, somatic anxiety, and self-confidence subscales as follows:-

Cognitive anxiety: Items numbered 1, 4, 7, 10, 13, 16, 19, 22 and 25

Somatic anxiety: Items numbered 2, 5, 8, 11, 17, 20, 23 and 26

so Also include item 14 but reverse the scoring for the intensity dimension that 1 = 4, 2 = 3, 3 = 2, and 4 = 1.

Self-confidence: Items numbered 3, 6, 9, 12, 15, 18, 21, 24 and 27

Appendix E

The Movement Imagery Questionnaire - Revised (MIQ-R)

Instructions

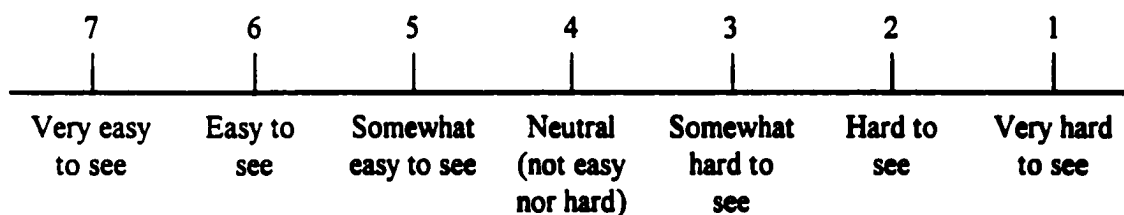
This questionnaire concerns two ways of mentally performing movements, which are used by some people more than by others, and are more applicable to some types of movements than others. The first is attempting to form a visual image or picture of a movement in your mind. The second is attempting to feel what performing a movement is like without actually doing the movement. You are requested to do both of these mental tasks for a variety of movements in this questionnaire, and then rate how easy/difficult you found the task to be. The ratings that you give are not designed to assess the goodness or badness of the way you perform these mental skills. They are attempts to discover the capacity individuals show for performing these tasks for different movements. There are no right or wrong ratings or some ratings that are better than others.

Each of the following statements describe a particular action or movement. Read each statement carefully and then actually perform the movement as described. Only perform the movement a single time. Return to the starting position for the movement just as if you were going to perform the action a second time. Then depending on which of the following you are asked to do, either 1) form as clear and vivid a visual image as possible of the movement just performed, or 2) attempt to feel yourself making the movement just performed without actually doing it.

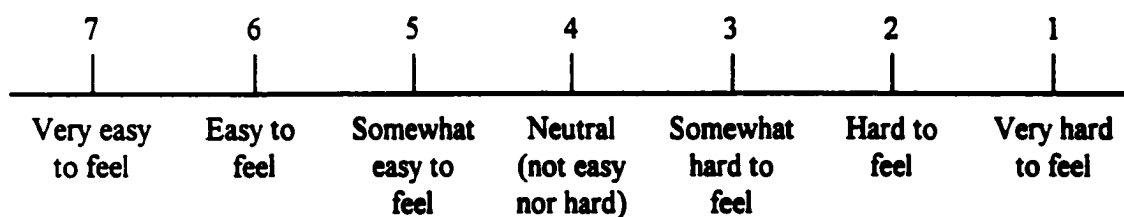
After you have completed the mental task required, rate the ease/difficulty with which you were able to do the task. Take your rating from the following scale. Be as accurate as possible and take as long as you feel necessary to arrive at the proper rating for each movement. You may choose the same rating for any number of movements "seen" or "felt" and it is not necessary to utilize the entire length of the scale.

RATING SCALE

Visual Imagery Scale



Kinesthetic Imagery Scale



1. **STARTING POSITION:** Stand with your feet and legs together and your arms at your sides.
- ACTION:** Raise your right knee as high as possible so that you are standing on your left leg with your right leg flexed (bent) at the knee. Now lower your right leg so that you are again standing on two feet. Perform these actions slowly.
- MENTAL TASK:** Assume the starting position. Attempt to **feel** yourself making the movement just performed without actually doing it. Now rate the ease/difficulty with which you were able to do this mental task.
- RATING:** _____
2. **STARTING POSITION:** Stand with your feet slightly apart and your hands at your sides.
- ACTION:** Bend down low and then jump straight up in the air as high as possible with both arms extended above your head. Land with your feet apart and lower your arms to your sides.
- MENTAL TASK:** Assume the starting position. Attempt to **see** yourself making the movement just performed with as clear and vivid a visual image as possible. Now rate the ease/difficulty with which you were able to do this mental task.
- RATING:** _____
3. **STARTING POSITION:** Extend the arm of your non dominant hand straight out to your side so that it is parallel to the ground, palm down.
- ACTION:** Move your arm forward until it is directly in front of your body (still parallel to the ground). Keep your arm extended during the movement and make the movement slowly.
- MENTAL TASK:** Assume the starting position. Attempt to **feel** yourself making the movement just performed without actually doing it. Now rate the ease/difficulty with which you were able to do this mental task.
- RATING:** _____
4. **STARTING POSITION:** Stand with your feet slightly apart and your arms fully extended above your head.
- ACTION:** Slowly bend forward at the waist and try and touch your toes with your fingertips (or if possible, touch the floor with your fingertips or hands). Now return to the starting position, standing erect with your arms extended above your head.
- MENTAL TASK:** Assume the starting position. Attempt to **see** yourself making the movement just performed with as clear and vivid a visual image as possible. Now rate the ease/difficulty with which you were able to do this mental task.
- RATING:** _____

5. **STARTING POSITION:** Stand with your feet slightly apart and your hands at your sides.
- ACTION:** Bend down low and then jump straight up in the air as high as possible with both arms extended above your head. Land with your feet apart and lower your arms to your sides.
- MENTAL TASK:** Assume the starting position. Attempt to **feel** yourself making the movement just performed with as clear and vivid a visual image as possible. Now rate the ease/difficulty with which you were able to do this mental task.
- RATING:** _____
6. **STARTING POSITION:** Stand with your feet and legs together and your arms at your sides.
- ACTION:** Raise your right knee as high as possible so that you are standing on your left leg with your right leg flexed (bent) at the knee. Now lower your right leg so that you are again standing on two feet. Perform these actions slowly.
- MENTAL TASK:** Assume the starting position. Attempt to **see** yourself making the movement just performed without actually doing it. Now rate the ease/difficulty with which you were able to do this mental task.
- RATING:** _____
7. **STARTING POSITION:** Stand with your feet slightly apart and your arms fully extended above your head.
- ACTION:** Slowly bend forward at the waist and try and touch your toes with your fingertips (or if possible, touch the floor with your fingertips or hands). Now return to the starting position, standing erect with your arms extended above your head.
- MENTAL TASK:** Assume the starting position. Attempt to **feel** yourself making the movement just performed with as clear and vivid a visual image as possible. Now rate the ease/difficulty with which you were able to do this mental task.
- RATING:** _____
8. **STARTING POSITION:** Extend the arm of your non dominant hand straight out to your side so that it is parallel to the ground, palm down.
- ACTION:** Move your arm forward until it is directly in front of your body (still parallel to the ground). Keep your arm extended during the movement and make the movement slowly.
- MENTAL TASK:** Assume the starting position. Attempt to **see** yourself making the movement just performed without actually doing it. Now rate the ease/difficulty with which you were able to do this mental task.
- RATING:** _____

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UMI

Scoring the Movement Imagery Questionnaire (MIO-R)

The Movement Imagery Questionnaire measures visual imagery ability and kinesthetic imagery ability on a 1 to 7 Likert scale. Scores for both components should range from 4 to 28. For each component add up the following items:-

Visual imagery ability: Items numbered 2, 4, 6 and 8

Kinesthetic imagery ability: Items numbered 1, 3, 5 and 7