An exploration of imagery type and imagery ability and their impact on goal setting and self-confidence in sport settings

by

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CHAPTER 1. INTRODUCTION

Athletes' use of mental strategies to enhance their athletic performances has grown throughout the past decades. One of the primary strategies used by performers, coaches, and sport psychologists to boost performance has been imagery. Imagery is defined as "all of those quasi-sensory or quasi-perceptual experiences of which we are self-consciously aware and which exist for us in the absence of those stimulus conditions that are known to produce their genuine sensory or perceptual counterparts" (Richardson, 1969). Various models/approaches have been utilized and posited through research attempting to discover how imagery impacts performance and other outcome variables (e.g., sport self-confidence and goal setting). Paivio (1985), in his pioneering work, proposed that imagery can have either cognitive (e.g., rehearsing a specific skill) or motivational (e.g., imagining accomplishing a goal) functions. Five types of imagery were created within this model: Cognitive Specific (CS), Cognitive General (CG), Motivational Specific (MS), Motivational General-Arousal (MG-A), and Motivational General-Mastery (MG-M). Pavio (1985) further explained that the content of the imagery effects whether cognitive or motivational response systems are activated. The implications of Paivio's (1985) research are abundant, as subsequent studies have sought to understand imagery type and the impact that imagery type has on numerous outcome variables.

While imagery type (cognitive and motivational) has become increasingly important in understanding and applying imagery in an athletic setting, inherent imagery ability of individuals has gained little interest as a topic. Imagery ability, intuitively, is an important dimension when looking into imagery effectiveness in general. Studies have shown that a person's ability to imagine physical movements associates with improved athletic
performance (Orlick & Partington, 1988; Vadocz, Hall, & Moritz, 1997). Also, athletes with high imagery ability have shown more performance improvement than those with low imagery ability (Goss, Hall, Buckholz, & Fishburne, 1986). Martin, Moritz, and Hall (1999) stated that imagery ability may moderate "the effects of imagery use on outcome" and they advised future research to further examine the moderating characteristics of imagery ability.

The present study will follow the recommendations of Martin et al. (1999) and examine relationships between type of imagery used and imagery ability with two of Martin et al.'s (1999) predicted outcomes in sport training situations. First, an examination into the MS and MG-M imagery types and whether they facilitate the goal setting process (MS) and increase sport self-confidence (MG-M) will occur. These imagery types and their predicted outcomes will be the focus of this study because goal setting and sport self-confidence can be measured less intrusively than the predicted outcomes of the three other imagery types (e.g., CS and skill learning, and CG and strategy learning). The outcome variables of goal setting and sport self-confidence are also of practical importance to the investigator given the nature of the investigator's work with university level athletes in these two milieus. In addition, the role of imagery ability as a moderator between the type of imagery used and the outcome variables of setting goals and sport self-confidence will be investigated. Imagery ability as a topic has been addressed sparingly in imagery research (Murphy, 1994), therefore, its potential importance in relation to imagery use and imagery effectiveness needs to be better understood.

The following results are expected: First, of the five imagery types, MS imagery will be most highly correlated with goal setting. Second, MG-M imagery will be more highly correlated with sport self-confidence than any other imagery type. Third, imagery ability will
moderate the relationships between MS imagery and goal setting and MG-M imagery and sport self-confidence.
CHAPTER 2. LITERATURE REVIEW

Overall, there has been an abundance of research dedicated to imagery in the athletics performance domain, and a number of areas will be covered in this review. Within imagery literature much of the material has focused on the type of imagery employed (cognitive and motivational) (Pavio, 1985) and imagery perspective utilized (internal vs. external) (Mahoney & Avener, 1977; Salmon, Hall, & Haslam, 1994). While imagery type and perspective have garnered much attention, other areas have also been researched. There has been a focus on the sensory imagery experience (visual vs. kinesthetic) (Cumming & Ste-Marie, 2001; Hall, Rodgers, & Barr, 1990; Holmes & Collins, 2001; Murphy, 1994) and the imagery ability (vividness and controllability) of athletes (Hall et al., 1990; Murphy, 1994). Imagery ability and the two imagery sensory experiences deal with the production of optimal sensory experiences in imagery and the way or the manner in which individual differences can play a role in the image production process. Image outcome (positive vs. negative) (Woolfolk, Parrish, & Murphy, 1985) has also been manipulated as a way of exploring the impact of an imagery practice. Research has also looked into the application of imagery, looking at its use in connection with relaxation techniques (Weinberg, Seabourne, & Jackson, 1987; Woolfolk et al., 1985) and as a means of lessening anxiety (Martin et al., 1999). A variety of topics directly within the competitive setting have also been explored: skill level of the athletes and how this effects imagery (Barr & Hall, 1992; Blair, Hall, & Leyshon, 1993), temporal patterning of imagery utilization (time of season and practice vs. competition) (Hall et al., 1990; Munroe, Hall, Simms, & Weinberg, 1998); and type of sport (team vs. individual) (Munroe et al., 1998).
Paivio (1985) was the first individual to assert that imagery could have a cognitive role (i.e., focused on skills and strategies in performance) as well as a motivational purpose (i.e., focused on goal achievement and feelings associated with the achievement). Hall, Mack, Paivio, and Hausenblaus (1998) took Paivio’s theory and original model and created a taxonomy, and the Sport Imagery Questionnaire (SIQ; Hall et al., 1998), based on their classification of images. This taxonomy is comprised of subcategories of cognitive and motivational imagery, and allows for a more specific comprehension and examination of imagery use. Hall et al. (1990) separated imagery into the following five categories:

- **Motivational-Specific (MS):** Imagery that represents specific goals and goal-oriented behaviors, such as imagining oneself winning an event, standing on a podium receiving a medal, and being congratulated by other athletes for a good performance.

- **Motivational General-Mastery (MG-M):** Imagery that represents effective coping and mastery of challenging situations, such as imagining being mentally tough, confident, and focused during a competition.

- **Motivational General-Arousal (MG-A):** Imagery that represents feelings of relaxation, stress, arousal, and anxiety in conjunction with sport competition.

- **Cognitive Specific (CS):** Imagery of specific sport skills such as penalty shots in hockey or double axels in figure skating.

- **Cognitive General (CG):** Imagery of the strategies related to a competitive event, such as imaging the use of full-court pressure in basketball or a baseline game in tennis (Martin et al., 1999).
The five types of imagery are functionally orthogonal, meaning that it is possible to engage in one type of imagery alone, and it is also conceivable that athletes could use multiple types of imagery concurrently.

Until Paivio's (1985) addition of the motivational component of imagery, imagery research and application had been centered on the cognitive aspects of skill development and performance. In general, imagery has been proven effective in many studies to facilitate the development and performance of skills (Feltz & Landers, 1983; Hall, 1985; Murphy, 1994; Richardson, 1967a; 1967b). With the notion that imagery can have motivational functions, studies have examined the motivational components of the imaginal experience. Haslem (1994) reported that soccer players tended to use imagery more to motivate themselves for games and practices, and this was done through goal-oriented and successful performance images. Woolfolk et al. (1985) found that imagining a positive, desired outcome prior to athletic performance influenced performance more than imagining specific movements of the skill involved in the performance. Using imagery to help develop skills and strategies (the cognitive dimension of Paivio's model) has also been found successful in a variety of studies (Hall, 1985; Rodgers, Hall, & Buckholz, 1991). Overall, a number of recent studies concur that both motivational and cognitive imagery can positively impact athletic performance. While imagery can be both motivational and used to maintain and learn skills (cognitive), research has discovered a number of variables that may moderate the imagery/performance-outcome relationship.

A large number of studies have focused on performers' use of imagery via internal (first person) or external (third person) perspectives. The internal perspective calls for performers to view images as though the images are inside of their body and experiencing the
sensations of performance in great detail (i.e., seeing, hearing, tasting, feeling, and smelling) (Cumming & Ste-Marie, 2001; Fanning, 1988). An external perspective means that the individual views the images as if s/he is watching videotape of herself or himself performing. The effectiveness of each of these imagery viewpoints on performance has been examined in recent research. Initially, numerous studies showed that athletes who used an internal imagery perspective were more successful than those using an external perspective (Mahoney & Avener, 1977; Mumford & Hall, 1985; Orlick, 1990). Other studies, such as Epstein’s (1980) and Highlen and Bennett’s (1979) found no differences between the imagery perspective employed and performance success.

Imagery perspective studies examined whether different viewpoints would potentially have more favorable effects on performance. It was theorized that the internal perspective was more powerful because it enabled the performer to access all of their sensations, while those using an external perspective could only access visual information (Barr & Hall, 1992). This notion has since been ratified, and it has been shown that performers are able to engage all of their senses through both an internal and external imagery perspectives (Gordon, Weinberg, & Jackson, 1994; White & Hardy, 1995). The literature has shown that imagining via either perspective can be a characteristic of successful athletes and that all senses can be accessed through either imagery perspective. In relation to these findings studies have examined whether different perspectives would be more suitable for certain skills.

Hardy (1997) proposed that the more technical a skill and the more it relied on proper, complex form, the more an external imagery perspective would become beneficial. In contrast, skills that are less complex and less form-based would be more amenable to an internal perspective. Various studies confirmed Hardy’s (1997) theory and in tasks such as
gymnastics performances and karate, which entail complex movements, an external imagery perspective was more beneficial to performance (Hardy & Callow, 1999). Cumming and Ste-Marie (2001) recently, though, found external imagery no more beneficial than internal imagery for performers of synchronized skating skills (comprised of highly complex tasks). Cumming and Ste-Marie (2001) also found that imagery perspective had no influence on whether imagery had cognitive or motivational functions. Overall, the present research on imagery perspective shows much ambiguity regarding perspective use by successful athletes. There is also little clarity regarding which perspective incorporates more senses, and if either imagery viewpoint is a better fit for certain skills and sports. From an application standpoint, it appears that imagery perspective should be based, above all else, on the performer’s preference, therefore, accounting for individual differences (Hall, 1997).

As alluded to previously, it is important that the imagery employer has the ability to create an imaginal experience that closely replicates the actual physical experience. Two types of imagery, kinesthetic and visual, have emerged and they offer a distinction between the sensory experiences possible through imagery. Kinesthetic imagery is defined as “the type of imagery that involves experiencing all the same sensations as when performing the actual movement” (Cumming & Ste-Marie, 2001). This type of imagery is seen typically through the internal perspective and has also been labeled “motor imagery” (Holmes & Collins, 2001). Hall et al. (1990) found that athletes in their study all used kinesthetic imagery and the athletes found kinesthetic imagery to be as important as visual imagery. Additionally, Hall et al. (1990) theorized that kinesthetic imagery might be more important for closed skill tasks. Numerous studies (Barr & Hall, 1992; Mahoney, Gabriel, & Perkins,
1987) have found a positive correlation between skill level of athletes and use of kinesthetic/internal imagery.

Visual imagery deviates from kinesthetic imagery as it relies primarily on feedback from one sense: vision. Visual imagery is often aligned with an external perspective as the performer views herself or himself engaging in a task. In general, visual imagery is seen as being limited because it fails to replicate the performance setting which contains a wealth of sensory stimuli (Epstein, 1980). The research done regarding kinesthetic and visual imagery shows that it is important that imagery users incorporate as many senses into the experience as possible, therefore, closely simulating the actual, physical performance.

Because the use of imagery appears to be most efficacious when multiple senses are present, it would seem reasonable that individuals would vary in their ability to imagine in sensory detail and in their ability to imagine. Studies have measured two areas that attempt to define users' "natural talent" for imagery: vividness and controllability. Vividness is the clarity and reality that is experienced during imagery, while controllability is the person's ability to direct the content of the image as desired or required by an imagery script (Murphy, 1994). Results have shown, as would be expected, that as a person's imagery ability increases, the impact that imagery has on performance and learning also increases (Goss et al., 1986). Murphy (1994) suggests that individual differences, seen through people's imagery vividness and controllability, are important when examining the impact of imagery on performance and other areas. Murphy (1994) also points out that this is an area that is neglected and not controlled for in many imagery studies.

Another moderating variable, which also falls into the individual differences milieu, that research has uncovered is the skill level of the athletes. Skill level (i.e., experience
and/or expertise in a sport) has been shown to impact imagery use and effectiveness. Barr and Hall (1992) found that novice rowers used imagery less and had less structure in their imagery sessions in comparison to elite rowers. Novice rowers also imagined themselves executing their task incorrectly more than elite rowers did. Blair et al. (1993) discovered that novice and skilled soccer players both saw improvements in a speed and accuracy task after imagery. These findings contradict those that found that imagery was more effective for novice performers (Wrisberg and Ragsdale, 1979), and those that found imagery to have the most impact when people had less experience in a task (Suinn, 1983). In general, a number of studies have found that the higher the skill level the more imagery was employed (Barr & Hall, 1992; Hall et al., 1990; Salmon et al., 1994). These findings show that there appears to be a positive correlation between skill level and imagery use, with skill level potentially moderating the performer-imagery use relationship as well as the performer-imagery effectiveness relationship.

While individual differences can moderate the relationship of imagery and numerous outcome variables, performers who imagined different performance results (i.e., they imagined either a positive or a negative outcome) showed performance outcome differences. Powell’s (1973) seminal work in this area looked into the differences between a positive imagery group and a negative imagery group in a dart-throwing task. Powell (1973) found that the group who imagined the positive outcomes performed significantly better on the task in comparison to the negative imagery group. These findings were replicated by Woolfolk et al. (1985), who also found that individuals who imagined negative outcomes performed more poorly than those did who imagined positive outcomes or used no imagery. While only a few
projects have examined negative imagery in comparison to positive imagery, these sparse results agree that image outcome does influence the effectiveness of imagery.

Thus far this review has shown that there are different types of imagery (i.e., cognitive and motivational) and that a number of moderating variables exist in the imagery-performance linkage (e.g., athlete skill level, imagery perspective, imagery ability). Another body of imagery research has focused on imagery and its influence on arousal and anxiety. Imagery has been found to be effective in both producing emotional arousal and reducing energy levels (Hecker & Kaczor, 1988; Orlick, 1990; White & Hardy, 1998). Hecker and Kaczor (1988) found that athletes' heart rates increased significantly when engaged in imagery sessions focused on reproducing bodily sensations (MG-A imagery). Gymnasts and rowers also used this type of imagery (MG-A) as a "psyching-up" strategy prior to performance (Barr & Hall, 1992; Hall et al., 1990). It appears as though athletes use imagery, and in particular motivational imagery, to help increase energy prior to competition, and that imagery is successful in producing arousal. Imagery has been shown to be just as effective in lowering arousal when athletes desired this effect. Imagining one's self in a safe and relaxing place is a common strategy (also MG-A imagery), as well as imagining being in the competition setting in a relaxed state has also been used (Orlick, 1990; Vadocz et al., 1997).

Related to arousal, imagery has been used to attempt to lower stress in competitive situations. A few studies have examined whether imagery can help in lowering anxiety but there has been little data supporting any attenuation of anxiety due to imagery implementation (Vadocz et al., 1997). Imagery has, though, been useful in lowering anxiety when used in concert with stress inoculation training (SIT; Meichenbaum, 1985) and other modes of relaxation training (Cogan & Petrie, 1995; Kerr & Leith, 1993). While imagery
research has defined the different types of imagery (cognitive vs. motivational), individual differences in imagery, and imagery as it relates to arousal and anxiety, there are some additional potential moderating variables inherent to the athletics setting that have been explored.

Athletes’ use of imagery and the variation of imagery over the course of a season has been examined (Martin et al., 1999; Munroe et al., 1998). Performers’ needs often change in accordance with the period of the season (i.e., training period vs. competition). For instance, during a training phase it would seem plausible that CS imagery would be used with greater frequency as performers refine their skills. It would also seem reasonable to predict that during a competition phase, athletes would utilize MG-M imagery more because competition requires such things as mental toughness and confidence. Studies found that athletes tended to use imagery more often in association with competition than with training and practice (Barr & Hall, 1992; Hall et al., 1990). Munroe et al. (1998) were the first to specifically investigate whether Paivio’s dimensions of imagery differed over the course of playing seasons. Their examination of 350 athletes and 10 teams found that, overall, MS and CG imagery increased as athletes were further involved in competition and that imagery use changed in all sports over the course of a season. While there is a dearth of literature (one study) that has examined the specific changes in imagery use during athletic seasons, it is possible that there are some types of changes in performers’ imagery utilization. It is also clear, though, that further investigation needs to be done in this area.

In addition to the phase of the season, differences in the type of sport/activity that performers engage in has been examined in relation to imagery use. Hall et al. (1998) looked at team sport athletes in comparison to individual sport performers and found that team sport
athletes used MS and MG-M imagery more frequently. Contrary to these findings, Munroe et al. (1998) found no significant differences between imagery use and membership on team versus individual sport. Thus far, results in this area are ambiguous and it is unclear whether there are any systematic differences in imagery usage due to the nature of the sport (i.e., team vs. individual). While this review has focused thus far on imagery research, it is also necessary to briefly summarize both goal setting and sport self-confidence literature and their importance in athletics.

Goal setting is one of the most widely used and effective techniques for enhancing performance both inside and outside of the sport setting. In industrial and organizational literature, a fundamental hypothesis that has been supported in 93% of the literature reviewed by Locke and Latham (1990) is that specific, challenging goals lead to an increase in task performance. These findings are less clear in the sport setting, with equivocal findings in the goal setting areas of goal specificity, goal difficulty (whether difficulty of the goal impacts performance), and goal proximity (short-term and long-term goals) (Weinberg, 1992). A meta-analysis by Kyllo and Landers (1995) found many methodological problems in a random sample of the goal setting literature. Specifically, the studies examined in the meta-analysis possessed unacceptable power, thereby enhancing the probability of committing a Type II error. Kyllo and Landers (1995) then analyzed 36 studies of goal setting in athletics and found that goal setting is, in fact, a useful technique for improving performance. Also, setting goals that are moderately difficult and setting both short- and long-term goals increased the effectiveness of the goal setting practice. Kyllo and Landers' (1995) study helped clarify the positive impact of goal setting on performance in an athletic setting. A recent descriptive study echoes Kyllo and Landers' (1995) findings, showing that in a sample
of 328 Olympic athletes all of the athletes set goals and all of the athletes perceived their goals to be highly effective in enhancing performance (Weinberg, Burton, Yukelson, & Weigand, 2000).

The notion that confidence positively impacts performance is widely accepted, therefore, a cursory look into this area will occur in this review. Studies in sport and exercise have historically pointed to a positive correlation between confidence/positive expectations and performance (Jones, Hanton, & Swain, 1994; Mahoney & Avener, 1977; Nelson & Furst, 1972). Believing that one’s abilities are adequate to achieve success and expecting to perform well usually leads to increase performance. Weinberg and Gould (1999) also point out that it is possible to be overly overconfident. Overconfidence can impair performance because the heightened belief in ability may decrease preparation. The problem of overconfidence, though, is much less an issue than underconfidence (Weinberg and Gould, 1999).

The present review has reported the primary findings within imagery research as well as the main areas that have been examined to date. This study seeks to extend the knowledge in the areas of imagery type (cognitive vs. motivational) and imagery ability as they relate to imagery employment and the variables of goal setting and sport self-confidence. To reiterate this project’s specific intent, the investigator will examine the MS and MG-M types of imagery and their impact on two outcome variables within a training setting: goal setting and self-confidence. These imagery types and their outcomes will be investigated because the goal setting and sport self-confidence constructs are measured non-intrusively and are of practical importance to the investigator. Additionally, this study will focus on whether imagery ability changes the relationship between type of imagery used and the outcome variables of setting goals and sport self-confidence.
After reviewing the imagery research the following results are expected in this study. First, there will be a positive correlation between the use of MS imagery and the setting of goals. Additionally, MS imagery will be more positively correlated with goal setting than any other imagery type. Second, a positive correlation is also expected between MG-M imagery use and sport self-confidence, with MG-M imagery also being more positively correlated with sport self-confidence than any other imagery type. Both of these hypotheses are rather straightforward as MS imagery revolves around achieving desired goals, therefore, more adherence to goal setting seems reasonable. MG-M imagery incorporates imagining being confident and coping effectively during challenging situations, thus, higher self-confidence is expected. While the expected outcomes seem obvious, these relationships have only been proposed and are untested and unproven (Martin et al., 1999). Third, athletes with higher imagery ability should engage in more goal setting and also have higher self-confidence in comparison to the athletes with lower imagery ability (i.e., a positive correlation between imagery ability and goal setting and self-confidence is anticipated). This third and final hypothesis is plausible because those who have higher imagery ability are better equipped to imagine effectively. Since there is a positive relationship between imagery and performance it is likely that those with superior imaginations will partake in more goal setting and have higher sport self-confidence in comparison to athletes with lower imagery ability.
CHAPTER 3. MATERIALS AND METHODS

Participants

A total of 100 (50 male and 50 female), elite level athletes from two collegiate Division I athletics programs participated in the present study. Participants ranged in age from 18 to 23 years of age, and all of the athletes were college students and active members of an intercollegiate athletics team. The athletes came from six different sports, three female and three male teams: women’s volleyball (n=10), women’s soccer (n=12), women’s swimming (n=28), men’s track (n=3), football (n=23), and baseball (n=24). Initial contact with the athletes was made through the team’s head coach. Packets of questionnaires were given to each team’s coach for distribution to their respective team members. Each coach collected the packets of questionnaires and returned them to the investigator. Four of the teams, women’s volleyball, women’s soccer, women’s swimming, and football were not in the competitive phase of their seasons, while men’s track and baseball did complete the questionnaires during the competitive portion of their seasons. All of the athletes completed the questionnaires independently, outside of a practice and competitive setting.

Instruments

Movement Imagery Questionnaire. The revised version of the Movement Imagery Questionnaire (MIQ-R; Hall & Martin, 1997) was used to assess imagery ability. This inventory consists of eight items where participants are requested to image either visually or kinesthetically and then to assign a value from a 7-point Likert type scale the ease or difficulty with which the movement was imaged. A low rating indicates that a movement is hard to image, while a high rating indicates that a movement is easy to image.
The MIQ-R is a revision of the original MIQ (Hall, Pongrac, & Buckholz, 1985), which has been used extensively as a movement imagery ability test. The MIQ yielded alpha coefficients of .87 for the visual scale and .91 for the kinesthetic scale. Further research by Aatienza, Belaguer, and Garcia-Merita (1994) found internal consistencies of .89 for the visual scale and .88 for the kinesthetic scale. Test-retest coefficient was found by Hall et al. (1985) to be at .83 for a 1-week interval. Correlations between the MIQ and MIQ-R have been reported at $r = -.77, -.77, and -.87$ for visual, kinesthetic, and overall imagery ability. The negative direction of the correlation is due to a scale reversal: In the original MIQ, a low rating indicated that a movement was easy to image.

*Sport Imagery Questionnaire.* The Sport Imagery Questionnaire (SIQ; Hall, Mack, Paivio, & Hausenblaus, 1998) was used to assess imagery type usage. This 30-item self-report questionnaire has athletes rate on a 7-point Likert type scale (1 = rarely and 7 = often) how often they employ five different types of imagery. These imagery subscales include cognitive general (CG; e.g., strategies of play), cognitive specific (CS; e.g., perfectly executed sports skills), motivation general-mastery (MG-M; staying focused and working through problems), motivation general-arousal (MG-A; the arousal, stress, and anxiety that may accompany performance), and motivation specific (MS; specific goals and outcomes). Research has shown that the SIQ has acceptable internal consistency estimates for the subscales, with alpha coefficients ranging from .70 to .88 (Hall et al., 1998). Furthermore, all items were found to load on their appropriate subscale (factor) above the criterion level (.40).

*The Carolina Sport Confidence Inventory.* The Carolina Sport Confidence Inventory (CSCI; Manzo, Silva, & Mink, 2001) was used to assess the athletes’ levels of sport self-confidence. This is a 13-item self-report questionnaire that has athletes respond to sets of
opposite statements regarding their self-confidence in a sport situation. Each of the 13 items on the scale require an answer of either “very true for me” or “somewhat true for me” to one of the opposite statements (e.g., “I believe that I can be good at sports if I work hard enough,” or “I feel that no matter how hard I work I will not be good at sports.”). Factor analysis of the CSCI shows that there are two factors represented in the scale: perceived competence and dispositional optimism. The internal consistency for perceived competence and dispositional optimism were .92 and .86 respectively. The test-retest reliability of the CSCI was .94 after three weeks, and .94 for the perceived competence and .78 for the dispositional optimism factor (Manzo et al., 2001).

Questions concerning goal setting, imagery use, and performance accomplishments were contained on a participant questionnaire. Goal setting was assessed through the participants’ responses to two questions. First, the participants reported the frequency of their goal setting practice. Second, athletes stated how often they referred to the goals that they set for themselves. Answers were scored on a 7-point Likert type scale with possible responses ranging from: 1-“Never,” 4-“I’m Not Sure,” and 7-“Very Often.” The specific questions are as follows: 1) “How often do you set goals in relation to your sport?” 2) “How often do you refer to the goals that you have set?” A total goal score was obtained by combining the athletes’ score on the goal setting question with their score on their reference to their goals. This total score was used as their goal setting score.

Since Martin et al. (1999) state the predicted outcome of MS imagery as “facilitating the setting of process, performance, and outcome goals,” this study examined the fundamental process of setting goals, and looked into whether MS imagery relates to the actual setting of and adherence to goals.
In addition to MIQ-R, SIQ, CSCI, goal setting information, and imagery use, participants supplied demographic data including social security number, year of eligibility, age, ethnicity, sport, and number of years of participation in their sport.

Procedures

Participants completed the MIQ-R, SIQ, CSCI, goal setting questions, and demographic questions during a training situation of their season. This means that athletes who were in their competitive season as well as athletes who were not presently in their competitive season were used in the study. Martin et al. (1999) define a training situation as being “in training periods between competitive events,” therefore, a training period can be at any point except immediately pre- or post-competition. The investigator contacted the coaches of the athletics teams that were chosen to participate. The coaches were asked to have the athletes complete the questionnaires before or after a practice session. Modified informed consent was used. It was explained to the athletes that participation in the experiment is voluntary, that confidentiality is assured, and that they could discontinue their participation at any point of the process. An instruction sheet notified the participants that they were going to complete three instruments and a questionnaire as part of the experiment.

Each athlete received a folder containing an instruction sheet, informed consent information, a demographics questionnaire, the MIQ-R, SIQ, and the CSCI. Upon completion of the questionnaires, the folders were collected by each team’s coach and were returned to the investigator.

Design and Analysis

Groups were examined according to their differences in type of imagery use and imagery ability. Across all of the hypotheses the dependent variables were goal setting
practices and self-confidence in a sport situation. Through examining differences in imagery type usage and imagery ability, correlations between these differences and the outcome variables of goal setting and sport self-confidence were investigated.

Descriptive statistics including means and standard deviations were used to examine the types of imagery that athletes used, and how much the athletes used imagery. The data were then examined by using two linear regression analyses. This allowed the independent variables (imagery types and imagery ability) to be viewed in isolation and interdependently with other variables as they related to the dependent variables of goal setting and sport self-confidence.
CHAPTER 4. RESULTS

The demographic characteristics of the participants are presented in Table 1. All of the athletes were collegiate performers, hence there was homogeneity regarding their level of competition. However, 69% of the participants were either freshman or sophomore student-athletes at their respective university. This means that there is potentially some sport-experience differences in this participant population. Four team sports accounted for 69% of the total sample, with 47 male athletes and 22 female athletes representing team sports. While there is a notable disparity between male and female team athletes, the disproportion regarding gender in the individual sport athletes is more problematic as 28 of the 31 individual sport participants came from the women’s swimming team. Therefore, there was little data gathered from male, individual sport athletes. Although there was equality regarding the participants’ gender, there was an imbalance in reference to team and individual sport participation. Ethnically, the sample was 83% Caucasian, 12% African-American, 2% Hispanic-American, and 3% Other. Since this study was comprised of athletes from two universities, reporting the ethnic representation within this sample was not possible. However, the ethnic makeup was representative of the overall student-athlete population at the university that included 76% of the study’s participants.

Overall, the sample was uneven in the distribution of athletes across classification (year in school), type of sport (team or individual), and gender in team and individual sports. Due to these inequalities, caution must be used when interpreting and generalizing these results.
Table 1. Participant Characteristics by sport, year, ethnicity, and gender

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<tbody>
<tr>
<td>Football</td>
<td>23</td>
<td>9</td>
<td>9</td>
<td>3</td>
<td>2</td>
<td>10</td>
<td>11</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>23</td>
</tr>
<tr>
<td>Baseball</td>
<td>24</td>
<td>7</td>
<td>11</td>
<td>3</td>
<td>3</td>
<td>23</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>24</td>
</tr>
<tr>
<td>Soccer</td>
<td>12</td>
<td>7</td>
<td>4</td>
<td>1</td>
<td>0</td>
<td>11</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>12</td>
<td>0</td>
</tr>
<tr>
<td>Volleyball</td>
<td>10</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>0</td>
<td>9</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>Swimming</td>
<td>28</td>
<td>8</td>
<td>8</td>
<td>6</td>
<td>6</td>
<td>27</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>28</td>
<td>0</td>
</tr>
<tr>
<td>Track</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>34</td>
<td>35</td>
<td>18</td>
<td>13</td>
<td>83</td>
<td>12</td>
<td>2</td>
<td>3</td>
<td>50</td>
<td>50</td>
</tr>
</tbody>
</table>

(100%) (34%) (35%) (18%) (13%) (83%) (12%) (2%) (3%) (50%) (50%)
Table 2. Means and standard deviations of goal setting, MIQ, CSCI, SIQ types and total

<table>
<thead>
<tr>
<th></th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal Total</td>
<td>11.0</td>
<td>2.3</td>
</tr>
<tr>
<td>MIQ</td>
<td>43.4</td>
<td>7.8</td>
</tr>
<tr>
<td>CSCI</td>
<td>41.2</td>
<td>5.0</td>
</tr>
<tr>
<td>CS</td>
<td>29.5</td>
<td>5.7</td>
</tr>
<tr>
<td>CG</td>
<td>29.7</td>
<td>5.2</td>
</tr>
<tr>
<td>MS</td>
<td>27.1</td>
<td>8.0</td>
</tr>
<tr>
<td>MG-A</td>
<td>30.4</td>
<td>5.5</td>
</tr>
<tr>
<td>MG-M</td>
<td>33.8</td>
<td>5.8</td>
</tr>
<tr>
<td>SIQ Total</td>
<td>30.1</td>
<td>4.8</td>
</tr>
</tbody>
</table>

Initially, the internal consistency of the subscales of the SIQ, CSCI, and MIQ were evaluated. The five imagery type subscales of the SIQ yielded alpha coefficients ranging from .72 through .88. Specifically, the alpha coefficients were .82 (CS), .72 (CG), .88 (MS), .75 (MG-A), and .85 (MG-M). The two subscales in the CSCI, dispositional optimism and perceived competence, displayed alpha coefficients of .75 and .73. The MIQ and its two subscales, kinesthetic imagery ability and visual imagery ability, showed alpha coefficients of .85 and .87. Overall, the internal consistencies found across the three scales and nine subscales verified that there was reliability found within the scales used in this study as .70 represents an acceptable alpha (Nunnaly, 1978).

Table 2 shows the means and standard deviations of goal setting score, MIQ score, CSCI score, the imagery type scores, and SIQ total score. In this sample MG-M imagery was used by these athletes more than any other imagery type (M = 33.8, S.D. = 5.8). While MG-M was used the most, MS imagery type was used the least by the participants (M = 27.1, S.D. = 8.0). Overall, the athletes used the motivational types of imagery (MS, MG-A and
Table 3. Regression analysis of imagery type with goal setting

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE</th>
<th>Beta</th>
<th>T</th>
</tr>
</thead>
<tbody>
<tr>
<td>CG Imagery</td>
<td>.15</td>
<td>.04</td>
<td>.35</td>
<td>3.66*</td>
</tr>
<tr>
<td>(constant)</td>
<td>6.47</td>
<td>1.26</td>
<td>5.15</td>
<td></td>
</tr>
</tbody>
</table>

R square = .12  F = 13.41, P<.00

*P<.00

MG-M) more in comparison to the cognitive imagery types (CS and CG) despite MS imagery being used the least. The averaged mean of the reported use of motivational types of imagery is 30.4 and the averaged mean of the reported use of cognitive types of imagery is 29.6. Table 5 (in Appendix D) shows the breakdown of imagery use by the team affiliation. Tables 6 and 7 display imagery type use by year in school (Table 6), ethnicity (Table 7), and gender (Table 7).

The first hypothesis posited that there would be a positive correlation between MS imagery and goal setting and that MS imagery would be related most strongly, in a positive manner, to athletes’ goal setting. The results, seen in Table 3, showed that MS imagery was not significantly correlated with goal setting as the only factor that loaded in the regression equation was CG imagery. This finding does not support, in the present population, Martin et al.’s (1999) proposed relationship between MS imagery and goal setting as CG imagery type had the only significant correlation with goal setting.

The second hypothesis stated that MG-M imagery would be the imagery type with the strongest positive correlation with sport self-confidence. The results of a linear regression revealed that MG-M imagery was, in fact, the imagery type that was most strongly correlated with sport self-confidence (r = .55) (Table 4). This finding supports Martin et al.’s (1999)
Table 4. Regression analysis of imagery type with sport self-confidence

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE</th>
<th>Beta</th>
<th>T</th>
</tr>
</thead>
<tbody>
<tr>
<td>MG-M Imagery</td>
<td>.48</td>
<td>.07</td>
<td>.55</td>
<td>6.59*</td>
</tr>
<tr>
<td>(constant)</td>
<td>25.07</td>
<td>2.50</td>
<td>10.00</td>
<td></td>
</tr>
<tr>
<td><strong>R square</strong></td>
<td>.31</td>
<td></td>
<td></td>
<td>43.45, P&lt;.00</td>
</tr>
</tbody>
</table>

*P<.00

Theorized relationship between MG-M imagery and sport self-confidence for this study’s population.

Also examined were imagery ability and its relationship with MS imagery and goal setting, and MG-M imagery and sport self-confidence. Martin et al. (1999) asserted that imagery ability might moderate the previously stated relationships. This study found no evidence to support the role of imagery ability as a moderator. The correlations between imagery ability and sport self-confidence (r = .22) and goal setting (r = .19) were not significant.
DISCUSSION, SUMMARY AND CONCLUSIONS

The purpose of this study was to examine the relationships between the five imagery types and imagery ability with goal setting and sport self-confidence. Martin et al. (1999) theorized that each of the five imagery types should be associated with specific effects/outcomes within a sport setting. Specifically, this study explored two of Martin et al.'s (1999) predictions. First, that MS imagery would significantly related to the setting of goals. Second, that MG-M imagery would relate to an athlete's self-confidence. Additionally, Martin et al. (1999) stated that imagery ability "may moderate each predicted outcome." All three of these relationships were explored and this study represents an initial inquiry into Martin et al.'s (1999) model of the effects of imagery across various sport situations.

The study found that only one of Martin et al.’s (1999) three proposed relationships existed with the participants studied: The athletes’ use of MG-M imagery was significantly correlated with scores on the CSCI measure (sport self-confidence). MS imagery, though, did not significantly relate to goal setting, and imagery ability was also not associated with either goal setting or sport self-confidence.

The finding that MS imagery did not significantly relate to goal setting and goal related practices was surprising due to the content of the statements contained in the SIQ’s MS subscale. Each of the six statements revolves around the achievement of specific external rewards associated with positive performances. Two examples of the statements contained in this subscale are, “I imagine the audience applauding my performance,” and “I imagine myself winning a medal” (complete scale in Appendix A). Since athletes’ scores on the MS subscale reflect their focus on, and/or cognizance of, performance outcomes, it would seem likely that goal setting would be related to MS imagery. Contrary to this plausible association
between the MS subscale to goal setting, MS imagery was the imagery type subscale that had the smallest correlation with goal setting. The only significant correlation that the athletes in the present sample showed was between CG imagery and goal setting. While these findings regarding MS imagery and goal setting appear counterintuitive, there are some possible reasons why there was no significant relationship found.

One reason is in the measurement of goal setting practices. At this time in the sport psychology domain, there is no instrument that measures the types of goals that athletes set. Martin et al. (1999) specifically stated that MS imagery should "facilitate the setting of process, performance, and outcome goals." Because no goal type measurement exists, it is not possible for this study, or any study, to accurately assess Martin et al.'s (1999) statement. To fully understand the relationship of MS imagery with process, performance, and outcome goals, a valid and reliable measure must be constructed. This study assumed that face-valid questions assessing amount of goal setting and the frequency of referring to goals would sufficiently satisfy Martin et al.'s (1999) statement regarding MS imagery type's predicted effects/outcomes, an assumption that is potentially spurious. Another potential issue is that the present sample is made up primarily of team sport athletes. Hall et al. (1998) found that team sport athletes use MS and MG-M imagery more than individual sport athletes, while Munroe et al. (1999) found that no relationship between type of sport and imagery use existed. Thus far, these are the only two studies that have looked into differences in imagery use across type of sport. Hall et al.'s (1998) study points to the fact that there may be differences in the way athletes in team and individual sports use imagery – particularly regarding MS and MG-M imagery. Results in the present study failed to support Hall et al.'s (1998) results as MS imagery was used the least among the athletes. Still, given that there
was inequality between team and individual athletes in this study, there is potential that this impacted this study’s findings.

This study did support the suggestion that MG-M imagery is significantly related to sport self-confidence. Also, MG-M imagery was the only imagery type subscale that was significantly correlated with sport self-confidence. This finding was expected because the content of the MG-M subscale in the SIQ imagery related to an athlete performing well in challenging situation. Unlike the situation with goal setting, there are numerous instruments that measure self-confidence and self-efficacy in the sport performance area. Having an instrument to measure the construct of sport self-confidence may have facilitated the confirmation of the relationship between MG-M imagery and sport self-confidence. Also, MG-M imagery was the imagery type that was the most used by this sample, a finding that agrees with Hall et al.’s (1998) results. The significant correlation between MG-M imagery and sport self-confidence provides support, in this sample, of Martin et al.’s (1999) expected relationship between these two variables. Further investigation is required in this area due to the large percentage of team sport athletes in this sample. If Hall et al.’s (1998) discovery that team athletes are more prone to utilizing MS and MG-M imagery is accurate, then this could confound the present findings regarding the relationship between MG-M imagery and sport self-confidence.

In addition to examining the relationships of two imagery types to goal setting and sport self-confidence, imagery ability and its moderating potential was explored. In both relationships, MS imagery and goal setting and MG-M imagery and sport self-confidence, imagery ability was not a significant moderator. Also, imagery ability was not significantly related to amount of imagery use. These findings were counter to Goss et al.’s (1986)
discovery that imagery ability impacts performance and learning. While neither goal setting nor sport self-confidence are performance variables, they are related to athletes’ performances and it would be expected that imagery ability would be related to both variables (Jones, Hanton, & Swain, 1994; Kyllo & Landers, 1995; Mahoney & Avener, 1977; Nelson & Furst, 1972). It would also be expected that persons who imagine more effectively would engage in more imagery, but no such relationship existed in this sample. The dearth of imagery ability literature curtails this study’s ability to explain and understand the existence of small, insignificant relationships between imagery ability and goal setting, sport self-confidence, and amount of imagery use. Perhaps goal setting and sport self-confidence are sufficiently tangential from performance and learning disabling them from being impacted by imagery ability. More perplexing is the lack of accord between imagery ability and amount of imagery use. This area has not been examined in any sport performance research to date and an increased understanding of the nature of this relationship would be fruitful.

Overall, the results of this research provide an initial look into the relationships of two imagery types (MS and MG-M) and imagery ability to the outcomes of goal setting and sport self-confidence. The data in this study suggest that MS imagery is not related to goal setting, MG-M imagery is related to sport self-confidence, and imagery ability is related to neither goal setting nor sport self-confidence. Despite these findings more inquiry into these relationships is needed. The dominance of team athletes within the study’s sample limits generalization of the results. The gender disparity across team sport athletes and individual sport athletes also may limit generalizing the findings around the relationships discovered in the present study. This study represents an early step into understanding the imagery types and imagery ability as they relate to sport-specific outcomes. Some directions for future
research include replication of this study with a balanced sample of team sport and individual
sport members. There is also a dire need for valid and reliable measurement of the types of
goals that athletes are setting in training, competitive, and rehabilitative settings. Without
improved instrumentation in this area our understanding will not improve.
APPENDIX A: INSTRUMENTS
The Carolina Sport Confidence Inventory

Instructions

Following are statements that allow people to describe themselves. First, decide which statement best describes you. Second, go to that side of the statement and check if it is "somewhat true" or "very true" for you. Please check only one box.

<table>
<thead>
<tr>
<th></th>
<th>Very True For Me</th>
<th>Somewhat True For Me</th>
<th></th>
<th>Somewhat True For Me</th>
<th>Very True For Me</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>☐</td>
<td>☐</td>
<td>OR</td>
<td>I feel I am really good at many sports</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>☐</td>
</tr>
<tr>
<td>2.</td>
<td>☐</td>
<td>☐</td>
<td>OR</td>
<td>I think of the bad things that might occur when I play sports</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>☐</td>
</tr>
<tr>
<td>3.</td>
<td>☐</td>
<td>☐</td>
<td>OR</td>
<td>In the company of my peers I feel that I am not always one of the best when it comes to joining sports activities</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>☐</td>
</tr>
<tr>
<td>4.</td>
<td>☐</td>
<td>☐</td>
<td>OR</td>
<td>I feel that I am among the best in my peer group when it comes to athletic ability</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>☐</td>
</tr>
<tr>
<td>5.</td>
<td>☐</td>
<td>☐</td>
<td>OR</td>
<td>I feel that if something can go wrong for me during sports activities, it will go right for me during sports activities, it will</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>☐</td>
</tr>
<tr>
<td>6.</td>
<td>☐</td>
<td>☐</td>
<td>OR</td>
<td>I feel that things will never work out the way I wanted them to, during sporting activities</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>☐</td>
</tr>
<tr>
<td></td>
<td>Very True For Me</td>
<td>Somewhat True For Me</td>
<td></td>
<td>Somewhat True For Me</td>
<td>Very True For Me</td>
</tr>
<tr>
<td>---</td>
<td>------------------</td>
<td>---------------------</td>
<td>---</td>
<td>---------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>7.</td>
<td></td>
<td></td>
<td>OR</td>
<td>I am among the most confident when it comes to taking part in sporting activities</td>
<td></td>
</tr>
<tr>
<td></td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td></td>
<td></td>
<td>OR</td>
<td>I feel that the worst is yet to come in sporting activities</td>
<td></td>
</tr>
<tr>
<td></td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td></td>
<td></td>
<td>OR</td>
<td>I always seem to be among the quickest when it comes to learning a new sport skill</td>
<td></td>
</tr>
<tr>
<td></td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td></td>
<td></td>
<td>OR</td>
<td>I feel that things will often go my way in sporting activities</td>
<td></td>
</tr>
<tr>
<td></td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td></td>
<td></td>
<td>OR</td>
<td>I have trouble during sporting activities seeing the &quot;light at the end of the tunnel&quot;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td></td>
<td></td>
<td>OR</td>
<td>I sometimes hold back and am not usually the first to join in sports activities</td>
<td></td>
</tr>
<tr>
<td></td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td></td>
<td></td>
<td>OR</td>
<td>I believe that if you work hard enough you will attain your sports goals</td>
<td></td>
</tr>
<tr>
<td></td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td></td>
</tr>
</tbody>
</table>
Movement Imagery Questionnaire

Instructions

Each of the following statements describe a particular action or movement. Read each statement carefully then actually perform the movement as described. Only perform the movement a single time. The depending on which of the following you were 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 task rate the ease/difficulty with which you were able to do the task. Take your rating from the following scale.

Rating Scale

<table>
<thead>
<tr>
<th>7</th>
<th>6</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very easy to see</td>
<td>Easy to see</td>
<td>Somewhat easy to see</td>
<td>Neutral (not easy nor hard)</td>
<td>Somewhat hard to see</td>
<td>Hard to see</td>
<td>Very hard to see</td>
</tr>
</tbody>
</table>

1. Starting Position

Stand with your feet and legs together and your arms at your sides.

Action
Raise you right knee as high as possible so that you are standing on your left leg with your right knee bent at the knee. Now lower your right leg so that you are 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 your arms at 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. 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 to touch your toes with your fingertips. 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 arms to your sides.

**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: __________

6. **Starting Position**

Stand with your feet and legs together and your arms at your sides.

**Action**

Raise you right knee as high as possible so that you are standing on your left leg with your right knee bent at the knee. Now lower your right leg so that you are standing on two feet. Perform these actions slowly.

**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: ________

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 to touch your toes with your fingertips. 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 without actually doing it. 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. 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: ________
**Sport Imagery Questionnaire**

**Instructions**

Read each statement below and fill in the blank with the appropriate number from the scale provided to indicate the degree to which the scale applies to you when you are practicing or competing in your sport. There are no right or wrong answers, so please answer as accurately as possible.

<table>
<thead>
<tr>
<th>Rarely</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>Often</th>
<th>7</th>
</tr>
</thead>
</table>
1. I make up new plans/strategies in my head. _____
2. I image the excitement of winning a championship. _____
3. I image giving 100% during an event/game. _____
4. I can re-create in my head the emotions I feel before I compete. _____
5. I image alternative strategies in case my event/game plan fails. _____
6. I imagine myself handling the stress and excitement of competitions and remaining calm. _____
7. I imagine other athletes congratulating me on a good performance. _____
8. I can consistently control the imager of a physical skill. _____
9. I image each section of an event/game (e.g., offense and defense, etc.). _____
10. I image the atmosphere of receiving a medal. _____
11. I can easily change the image of a skill. _____
12. I image the audience applauding my performance. _____
13. When imaging a particular skill, I consistently perform it perfectly in my mind. _____
14. I image myself receiving a medal. _____
15. I image the stress and anxiety associated with competing. _____
16. I image myself continuing with my game/event plan, even when performing poorly. _____
17. When I image a competition, I feel myself getting emotionally excited. _____
18. I can mentally make corrections to physical skills. _____
19. I imagine executing entire plays/programs/sections just the way I want them to happen in an event/game. _____
20. Before attempting a particular skill I imagine myself performing it perfectly. _____
21. I imagine myself being mentally tough. _____
22. When I image an event/game that I am to participate in, I feel anxious. _____
23. I image myself appearing self-confident in front of my opponents. _____
24. I imagine the excitement associated with competing. _____
25. I imagine myself being interviewed as a champion. _____
26. I image myself to be focused during a challenging situation. _____
27. When learning a new skill, I imagine myself performing it perfectly. _____
28. I imagine myself being in control in difficult situations. _____
29. I imagine myself successfully following my event/game plan. _____
30. I image myself successfully working through tough situations. _____
APPENDIX B: PARTICIPANT QUESTIONNAIRE
Participant Questionnaire

1) *Last 6 Digits of Social Security #: _____ - _______

2) Ethnicity: ___ Asian-American; ___ African-American; ___ Hispanic-American
   ___ Caucasian; ___ Native-American; ___ International Student
   ___ Other

3) Gender: ___ Male; ___ Female

4) Sport: ________________________

5) Year of Eligibility: ___ Freshman; ___ Soph.; ___ Junior; ___ Senior; ___ 5th yr.

6) Age: ______

7) Number of years participating in your present sport (over your lifetime): ______

8) How often do you think about, or imagine, your sport (circle one)?

   NEVER                      VERY OFTEN
   1  2  3  4  5  6  7

9) How often do you set goals in relation to your sport (circle one)?

   NEVER                      VERY OFTEN
   1  2  3  4  5  6  7

10) How often do you refer to the goals that you’ve set (circle one)?

    NEVER                      VERY OFTEN
    1  2  3  4  5  6  7

11) When setting goals, how often are the goals set as part of an instructed and/or organized goal
    setting activity (circle one)?

    NEVER                      VERY OFTEN
    1  2  3  4  5  6  7

12) How often do you personally experience success in your sport (circle one)?

    NEVER                      VERY OFTEN
    1  2  3  4  5  6  7
APPENDIX C: STUDENT-ATHLETE CONSENT LETTER
Student-Athlete Consent Letter

I, ____________________________, agree to participate in the research study being conducted by Aaron Quinn, M.S., under the direction of Richard Engelhorn, Ph.D.

PURPOSE:
The purpose of the research is to examine imagery use and its impact on goal setting and self-confidence.

PROCEDURES AND DURATION:
In this program you will complete several brief questionnaires related to imagery, self-confidence, and goal setting. Your participation is expected to last 30-40 minutes.

RISKS OR DISCOMFORTS:
It seems unlikely that you will experience any discomfort answering questions related to imagery, goal setting, and self-confidence. If you are uncomfortable, you may discontinue participation at any time without penalty to yourself or your team or pressure from coaches or other team members.

CONFIDENTIALITY:
Your questionnaire responses will be completely confidential. There will be no identifiers associated with any of your data. Participation is completely voluntary. I understand that refusal to participate will involve no penalty to myself or my team. I have read the above consent form and have had the information explained to me by the principal investigator and agree to participate in the prevention program research. If you have any questions and/or concerns regarding this research please call Aaron Quinn @ 294-1302 or Dr. Engelhorn @ 294-8131.

Signature of research participant ____________________________ Date ____________________________
Table 5. SIQ, Goal, CSCI, and MIQ means and standard deviations by sport

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Table 6. SIQ, Goal, CSCI, and MIQ means and standard deviations by year

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Table 7. SIQ, Goal, CSCI, and MIQ means and standard deviations by ethnicity and gender

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