The Impact of Mental Imagery on the Confidence of Student-Athletes

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Abstract

Ten student-athletes at a NCAA Division III liberal arts college in the Midwest began this study, and seven completed the intervention in full. The purpose of the study was to examine whether weekly use of motor imagery would enhance the athletes’ levels of confidence in their sport. Following a six-week intervention period during which the participants engaged in imagery sessions on their own and with the researcher, the majority of athletes scored higher on a measurement of sport confidence than they had prior to the intervention. In addition, all athletes responded that they had experienced an enhancement of their confidence and that they planned to continue their use of motor imagery in the future.
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Chapter I: Introduction

Coaches have always been in search of ways to give their athletes any type of extra advantage over other teams and athletes. One such edge that has been the focus of much research has been the enhancement of athlete confidence due to the potential effects that heightened confidence might have on performance. Following a review of recent literature, it was determined that one way to potentially improve athletes’ confidence levels was to have them engage in regular use of motor imagery. This project, therefore, set out to study the possible relationship between imagery use and sport confidence in a small group of collegiate athletes.

Statement of Problem

The purpose of this project was to determine whether weekly use of motor imagery exercises by track athletes at a NCAA Division III liberal arts college would enhance those athletes’ levels of confidence in their sport, as measured by Vealey’s (1986) Trait Sport Confidence Inventory. The research questions were:

1. How did the professional literature define motor imagery in the context of athletics?
2. What were the potential benefits to confidence of athletes performing imagery exercises, according to the research?
3. Why, based on the literature reviewed, was confidence in sport important to an athlete?
4. Did the implementation of regular motor imagery exercises enhance athletes’ confidence in their sport?

The focus of the project and the associated research questions were justified and founded in the findings of recent literature.
Justification

Many studies have been conducted concerning the effects of self-confidence on athletic performance. In recent literature, published studies by Craft, Magyar, Becker, and Feltz (2003) and Mamassis and Doganis (2004) both found that of the indices measured by the Competitive State Anxiety Inventory-2 (CSAI-2), self-confidence was the one that best predicted performance in athletic events. Bandura (1997), considered to be an expert on self-efficacy and related topics such as confidence, concluded that while self-efficacy was not a substitute for physical talent, it was surely one of the co-determinants of athletic prowess and that in contests of evenly-matched opponents, “Perceived efficacy emerges as the sole determinant of overtime performance” (p. 383). It would appear, therefore, that while a coach’s primary job has always been to instruct athletes on the finer points of the sport itself, one of the most helpful things a coach has been able to do for the athletes’ overall performance has been to find ways to improve their self-confidence and self-efficacy.

Upon closer investigation into sources of sport self-confidence, it was apparent that mental preparation and, more specifically, motor imagery were major determinants of athletes’ levels of sport confidence (Cumming, Olphin, & Law, 2007; Hays, Maynard, Thomas, & Bawden, 2007; Thomas, Maynard, & Hanton, 2007; Short & Short, 2005). This project was conducted in order to determine if the use of motor imagery exercises had any effect on the enhancement of athletes’ levels of confidence in their sport. The goal was to develop a mental imagery routine that could be helpful to any coach or individual athlete so that the athletes might become more confident, and therefore more successful, in their athletic endeavors, now and in the future. Of course, due to factors inherent to the nature of this project, certain limitations did exist.
Limitations and Appropriate Use of Results

This action research project was conducted at a NCAA Division III liberal arts institution in the Midwest. The participants were few in number, gathered from the track and field team on a volunteer basis, which might have affected the validity of the results. In addition, the duration of the motor imagery exercises and the study was less than eight weeks during the preseason of the track and field season, which limited the amount of time to gather data. Due to these limitations, the results of this study may not be applicable for other coaches or athletes at other institutions or athletic organizations. In addition, some terms used in this project were specifically defined, and the understanding of such terms would be vital to the understanding of the project as a whole.

Definition of Terms

Listed below are some terms and definitions used by the researcher throughout the project:

1. **NCAA Division III (D-III):** A classification of the National Collegiate Athletics Association, D-III colleges and universities are those institutions that do not offer athletic scholarships. The largest of the three NCAA classifications in terms of numbers of schools, D-III institutions view athletics as non-revenue extracurricular opportunities for their undergraduates (National Collegiate Athletics Association [NCAA], 2010).

2. **Motor Imagery:** For the purposes of this study, the researcher was only interested in sport motor imagery. There are five major classifications of sport motor imagery (Hall, Mack, Paivio, & Hausenblas, 1998):
   a. **Cognitive Specific (CS):** The imaging of particular motor skills
b. **Cognitive General (CG):** The imaging of general routines and strategies

c. **Motivational Specific (MS):** Goal-oriented imagery

d. **Motivational General-Arousal (MG-A):** Emotion-related imagery

e. **Motivational General-Mastery (MG-M):** Imagery associated with control and confidence.

3. **Sport Confidence:** As defined by Vealey (1986), “the belief or degree of certainty individuals possess about their ability to be successful in sport” (p. 222).

4. **Vealey’s Trait Sport Confidence Inventory (TSCI):** An instrument designed by Vealey (1986) used to measure subjects’ sport confidence. The inventory consisted of 13 items answered using a nine-point Likert scale, with “1” representing low confidence and “9” representing high confidence. The test-retest reliability of the TSCI was found to be very high ($r = .86$), and the inventory was shown to be valid with significant correlations to other measurements of self-confidence among athletes.

**Conclusion**

As some research has suggested that confidence could be a determinant of athletic performance, this study was conducted to establish whether imagery use by athletes would have any effect on their levels of sport confidence. Specifically, the current study investigated imagery use and confidence among a small sample of NCAA Division III athletes. Prior to the commencement of the project, however, a review of literature was conducted to more deeply examine the findings of prior research on similar topics.
Chapter II: Review of Literature

In order to proceed with the imagery study, the researcher first conducted a review of literature in which to base the project. The purpose of the project, again, was to determine whether weekly use of motor imagery exercises by track athletes at a NCAA Division III liberal arts college would enhance those athletes’ levels of confidence in their sport, as measured by Vealey’s (1986) Trait Sport Confidence Inventory (TSCI). The research questions were:

1. How did the professional literature define motor imagery in the context of athletics?
2. What were the potential benefits to confidence of athletes performing imagery exercises, according to the research?
3. Why, based on the literature reviewed, was confidence in sport important to an athlete?
4. Did the implementation of regular motor imagery exercises enhance athletes’ confidence in their sport?

While the final research question was the basis for this project, the answers to the other questions and the justification for this study was found in the literature based on previous research.

Question One: How Did the Professional Literature Define Motor Imagery in the Context of Athletics?

The main type of imagery utilized by athletes, motor imagery, has been defined as the internal mental representation of movement without any corresponding physical bodily action (Guillot & Collet, 2008). While the uses for imagery in the context of sport have been abundant and therefore somewhat difficult to classify, Paivio’s (1985) seminal article on the functions of imagery in human performance helped to categorize motor imagery. Paivio contended that imagery provided both cognitive and motivational functions to athletes, as well as both general
and specific functions. Therefore, imagery could take on four distinct roles: cognitive-general, cognitive-specific, motivational-general, or motivational-specific. These initial classifications of the functions of imagery provided a basis upon which other research built to more formally define sport motor imagery.

Paivio’s (1985) work on imagery was furthered years later when he collaborated with other researchers to develop the Sport Imagery Questionnaire (SIQ; Hall, Mack, Paivio, & Hausenblas, 1998). While neither the SIQ nor its purposes are relevant to this particular study of motor imagery, what came out of its development was vital in defining the functions of imagery in sport. Hall, Mack, Paivio, and Hausenblas (1998) established that while Paivio’s original classifications were a solid foundation for the functions of imagery in sport, further subdivision was necessary which resulted in a total of five functions of sport motor imagery, rather than the original four. For the development of the SIQ, cognitive specific imagery (CS) involved imaging particular skills. Athletes made use of cognitive general imagery (CG) when imaging general routines and strategies. Motivational specific imagery (MS) was goal-oriented imagery. Motivational general imagery, however, was subdivided into motivational general-arousal (MG-A)—imagery dealing with emotion—and motivational general-mastery (MG-M)—imagery associated with control and confidence. These definitions are aligned with Paivio’s original research on the functions of imagery, and it has been these five classifications of sport imagery that have been analyzed in many athlete imagery studies since the Hall et al. research.

While motor imagery has been simply defined as the mental representation of movement without action (Guillot & Collet, 2008), Paivio (1985) along with Hall et al. (1998) helped to further define imagery as it has been used by athletes. These five specific types of imagery—CS, CG, MS, MG-A, and MG-M—were the types of imagery that ultimately emerged as the
dominant forms of imagery examined by the world of sport psychology, and they were also the types to have been explored further by this project.

**Question Two: What Were the Potential Benefits to Confidence of Athletes Performing Imagery Exercises, According to the Research?**

Hays, Maynard, Thomas, and Bawden (2007) noted that “the positive role of imagery on athletes’ feelings of confidence is well-documented” (pp. 450-451). In their study of world class athletes, the researchers identified nine “global dimensions” (p. 439) of self-confidence. Of the nine global dimensions, mental preparation was one source of confidence cited by a majority of the athletes. The results of the Hays et al. study were fairly congruous to existing studies and theories on comparable topics. Curry and Maniar (2004) suggested that some of these aspects that have consistently been found to influence self-confidence that athletes may or may not learn through years of experience could instead be taught in a collegiate course designed to improve athletic performance. In fact, the researchers indicated that the “primary issue student-athletes… have wanted to learn more about… is how to perform with confidence” (Curry & Maniar, 2004, p. 306). The confidence building part of the course included positive imagery, among other aspects. Curry and Maniar described in detail the successes achieved in various imagery exercises used in the class, such as replacement imagery, which replaced negative images and thoughts with positive ones, and imagery used to elicit specific physiological responses. Although this article was not based on a particular study and no quantitative results were gathered to indicate the outcomes of athletes that were enrolled in the course, feedback from the student-athletes was noted and was very positive regarding the confidence building component of the course.
Studies on pre-competition intervention have also made use of imagery. Thomas, Maynard, and Hanton (2007) followed five team-sport athletes through a competitive season planning intervention sessions with them at prescribed points leading up to nearly every game. The athletes were given booklets as a kind of pre-intervention homework before each intervention session with a coach. Their preparation homework was then discussed at the session. The booklets that they were given included instructions to analyze and write down certain aspects of past competitions utilizing many of the same mental techniques discussed in the Curry and Maniar (2004) article. A significant amount of imagery was involved in both the pre-intervention preparation and was then also examined further in the coach’s intervention as well. The homework and intervention pattern occurred three times each week: first within a day or two of the previous competition, again roughly two days before an upcoming competition, and lastly on the morning of competition. This coach-assisted mental preparation had significant effects on the athletes’ frequency and intensity of self-confidence (Thomas et al., 2007) throughout the course of the season. The Thomas et al. research followed very closely along the lines of Curry and Maniar’s theory that many aspects of mental preparation could be taught or coached in order to improve confidence and athletic performance. Thomas et al. also described in detail the extensive use of imagery in intervention sessions, which was in parallel with the Curry and Maniar article as well.

The mention of the positive effects of imagery on athletes’ self-confidence by Hays et al. (2007), Curry and Maniar (2004), and Thomas et al. (2007) concurred with other research on the benefits of imagery exercises. Many articles focused almost solely on the use of imagery as a way of improving self-confidence and self-efficacy among athletes in various sports. Short and Short (2005) studied the difference in imagery use among high- and low-confident football
players using the Sport Imagery Questionnaire (SIQ), the questionnaire developed by Hall et al. (1998) to measure the frequency of usage of the five main types of imagery: CS, CG, MS, MG-A, and MG-M. After testing for frequency of imagery usage, the authors measured self-confidence using the TSCI (Vealey, 1986). The athletes in the highest and lowest third of the TSCI scores were separated into high- and low-confidence groups and the SIQ scores of these two groups were analyzed. The findings were substantial. High-confidence athletes used every type of imagery more often than low-confidence athletes, significantly so with three of the five types of imagery (Short & Short, 2005). Although the authors did note the small sample size of the study after eliminating the one-third of the participants with average confidence scores, the findings of their research was not unique.

Cumming, Olphin, and Law (2007) also found significant boosts of self-confidence associated with various types of imagery in a study that attempted to determine the effects of various types of imagery on psychological and physiological states. The imagery techniques used, similar to the techniques used in the Short and Short (2005) study, were three types of MG-A imagery focusing on psyching up, anxiety, and relaxation; MG-M imagery; and coping imagery, which combined MG-M and MG-A imagery methods. The authors hypothesized that the most effective imagery methods of the five used would be MG-M and coping imagery, of which MG-M was a component, due to the fact that MG-M focused on imagery in which the athlete was most confident and positive about their performances. Cumming et al. were correct in their hypothesis, as MG-M and coping imagery resulted in nearly equal and the highest self-confidence scores among the five imagery strategies. They also encountered one surprise, though, as the MG-A psych up imagery produced self-confidence scores only slightly lower than the MG-M and coping imagery. The authors pointed out, however, that although the increased
self-confidence following MG-A psyching up imagery came as a surprise to them, it was explained by Bandura’s (1997) theory that athletes’ optimal levels of activation can have a facilitory effect on their confidence, which could surely have been an effect of the MG-A imagery (Cumming et al., 2007).

Through a review of the professional literature, abundant examples of the use of various imagery techniques and scripts and their positive effects on athletic self-confidence were identified. Guillot and Collet (2008) discovered the same in an article investigating the various uses and effects of imagery in sport. They found studies and research suggesting that imagery has aided in many aspects of sport, such as motor skills, sport strategy and other cognitive skills, injury rehabilitation, and of course self-confidence and other psychological aspects. Guillot and Collet suggested that unlike imagery use for motor learning purposes, which was described as somewhat complex and should be used in a prescribed method for optimal result, imagery can be used as an athlete confidence enhancement tool at almost any time and in any situation. According to Guillot and Collet, the most effective imagery techniques would be the MS, MG-M, and MG-A methods, as predicted by Cumming et al. (2007). Guillot and Collet noted that imagery has been found effective in increasing self-confidence when used before competition, during competition and after competition, as well as during the training cycle and even during the off-season, therefore, athletes could use imagery at nearly any time of their choosing and still gain the benefits that the research and studies have found. The only possible limits on imagery use and its effect on self-confidence as noted by Guillot and Collet would be the imagery methods used, which the authors believed would be limited to MS, MG-M, and MG-A, but as Cumming et al. discovered, even those suggested limitations were questionable, as many athletes have reported boosts of confidence when utilizing other methods of imagery.
The literature has shown that improved confidence was undoubtedly an apparent benefit of imagery use by athletes (Curry & Maniar, 2004; Short & Short, 2005; Cumming et al., 2007; Hays et al., 2007; Thomas et al., 2007; Guillot & Collet, 2008). Regardless of the sport or level of the athlete, the use of imagery by athletes was found to boost their sport confidence in nearly any setting or situation. In addition, at least two studies (Short & Short, 2005; Cumming et al., 2007) found that imagery use resulting in increased confidence was not limited to just motivational imagery, but that other types of imagery could have had a positive impact on confidence as well. Having taken this research into consideration, the researcher further reviewed the importance of sport confidence, in order to analyze the potential indirect benefits of imagery.

**Question Three: Why, Based on the Literature Reviewed, Was Confidence in Sport Important to an Athlete?**

As stated previously, many researchers have investigated effects of self-confidence on athletic performance. Mamassis and Doganis (2004) conducted a study of junior tennis players who had undergone a mental training program throughout the course of a tennis season compared with players who had not completed the same mental training program. The researchers used the indices of the Competitive State Anxiety Inventory-2 (CSAI-2) as their instruments of measure, which were somatic and cognitive anxiety as well as confidence. In addition, the researchers also measured the athletes’ performance in competition throughout the season. By the end of the season, researchers found that confidence intensity and overall performance were the two measurement factors that had increased the most. The study made two implications: (a) that a mental training program, including imagery, had positive effects both
on confidence and on performance, and (b) that confidence and performance seemed to be somewhat correlated.

Craft, Magyar, Becker, and Feltz (2003) found similar results in their quantitative analysis of 29 other studies which made use of the CSAI-2. The researchers attempted to determine correlations between each of the three indices of the CSAI-2 and overall athletic performance. As their research was an analysis of other studies that had been conducted all over the world, it was a very broad view of the topic, incorporating athletes of all levels, sports, and nationalities. While the breadth of the study appeared to hinder the finding of conclusive results across all groups, the researchers noted that because the CSAI-2 is more a measure of overall anxiety and self-confidence, studies involving the measurement of specific sport confidence may have resulted in more definitive correlations. Despite the lack of solid findings, however, Craft et al. did note that among all studies, the strongest predictor of athletic performance appeared to be self-confidence.

Bandura (1997), a prominent psychologist and expert on social learning theory and other topics surrounding self-confidence and self-efficacy, summarized these studies nicely as he determined that while self-efficacy was not a substitute for physical talent, it was surely one of the co-determinants of athletic success. In his book *Self-efficacy: The Exercise of Control*, Bandura even suggested that in contests of evenly-matched opponents, “perceived efficacy emerges as the sole determinant of overtime performance” (p. 383). It was appropriate, then, that Craft et al. (2003) and Mamassis and Doganis (2004) made similar findings regarding the apparent importance of self-confidence to athletes. It would appear, therefore, that while a coach’s primary job has always been to instruct his or her athletes on the finer points of the sport
itself, one of the most helpful things a coach has been able to do for the athletes’ overall performance has been to find ways to improve their self-confidence and self-efficacy.

**Conclusion**

Imagery in sport has been well defined by the literature. Beginning with Paivio’s (1985) influential research on the topic, which was furthered by the work of Hall et al. (1998), the definition of and uses for imagery in athletics have been clear. Since those articles, any investigation into imagery in sport has involved one or more of the five major classifications as determine by Paivio and Hall et al. Likewise, the positive effects that imagery has had on confidence have also been well established in research. Countless researchers have concluded that the use of nearly any of the five types of sport imagery—CS, CG, MS, MG-M, and MG-A—has resulted in a significant improvement in confidence (Curry & Maniar, 2004; Short & Short, 2005; Cumming et al., 2007; Hays et al., 2007; Thomas et al., 2007; Guillot & Collet, 2008). Moreover, as the literature has also determined that confidence has benefited athletic performance, (Bandura, 1997; Craft et al., 2003; Mamassis & Doganis, 2004), it appeared that a goal of any coach or athlete looking to improve performance would have been to increase confidence.
Chapter III: Methods

After reviewing the literature, it was evident that imagery could have positive effects on athletes’ confidence (Curry & Maniar, 2004; Short & Short, 2005; Cumming, Olphin, & Law, 2007; Hays, Maynard, Thomas, & Bawden, 2007; Thomas, Maynard, & Hanton, 2007; Guillot & Collet, 2008). However, before gathering data the researcher first established the methods and procedures for determining whether weekly use of motor imagery exercises by track athletes at a NCAA Division III liberal arts college would enhance those athletes’ levels of confidence in their sport, as measured by Vealey’s (1986) Trait Sport Confidence Inventory (TSCI). The research questions were:

1. How did the professional literature define motor imagery in the context of athletics?

2. What were the potential benefits to confidence of athletes performing imagery exercises, according to the research?

3. Why, based on the literature reviewed, was confidence in sport important to an athlete?

4. Did the implementation of regular motor imagery exercises enhance athletes’ confidence in their sport?

Athlete subjects volunteered to participate before beginning the intervention procedure, which involved specific relaxation and imagery techniques in which the athletes partook individually on their own and in more structured sessions with the researcher. Both a quantitative and a qualitative instrument were used to gather the appropriate data before both were analyzed and triangulated to assess the results of the study.
Participants

The participants that began this study were ten collegiate track and field athletes from a rural Division III liberal arts institution. They were selected on a volunteer basis and ranged in age from 18 to 21 years. The individuals represented both the male and female sex, and although the majority of the subjects were Caucasian, three of the athletes were African-American. The athletes that volunteered competed in the sprinting, jumping, hurdling, and throwing events in track and field, comprising a wide range of competitive events. Three athletes elected to quit the study or did not complete the imagery intervention as instructed and were thus excluded from the results. Results, then, were gathered for seven total participants consisting of four males, three females, six Caucasian athletes and one African-American. The age range of the participants and the variety of their competitive events did not change following the elimination of the two participants who did not complete the project. All athletes followed the intervention and procedures detailed below until they eliminated themselves from the study.

Intervention

Participants in the study were required to engage in regular weekly motivational imagery exercises, specifically MG-M imagery associated with control and confidence. The researcher explained that MG-M imagery involves imaging the entire process associated with mastering a difficult situation in a specific event, including specific details, such as the weather, the scenery, and feelings and emotions that may occur during the event. Athletes were told to engage in relaxation techniques before going through any imagery exercise. The relaxation techniques involved finding a quiet, comfortable location to sit or lie down. Athletes were told then to follow a relaxation script provided to them in audio and in written format (Price-Evans, 2010; see Appendix A). While the script was part of the public domain, readily available on multiple
websites, the researcher was able to contact the script’s author, who granted permission to use
the script in this study (see Appendix B). The relaxation script involved deep breathing exercises
meant to release tension and calm the athlete prior to their imagery session. After a five to ten
minute relaxation session, athletes would begin their MG-M imagery exercises, using as much
detail as possible. Regular imagery sessions were held for six weeks, as described below.

**Personal imagery sessions.** Prior to beginning the study, athletes received instruction to
engage in personal MG-M imagery sessions of five to ten minutes in length at least three times
each week on their own time. Before each session, athletes were to follow or listen to the
relaxation script as described above. After each session, in their imagery journal, athletes
summarized what they imagined during their imagery session and how they felt during the
exercise, in order to immediately reinforce their imagery experience. These personal imagery
sessions were augmented with structured imagery sessions to ensure that the motor imagery was
being conducted properly by the athletes themselves.

**Structured imagery sessions.** In addition to the personal imagery sessions, participants
scheduled 30 to 45 minutes each week to meet with the researcher in order to engage in
structured imagery sessions. During these sessions, the researcher and athlete discussed the MG-
M imagery process and techniques, such as what details should be included in their imagery
experiences and on which types of events and situations to focus during MG-M imagery. The
athlete’s imagery journal was also reviewed by discussing the images and feelings summarized
by the athlete in recent personal imagery session in order to further enhance and reinforce their
personal imagery sessions. The participant was then led through the deep breathing relaxation
techniques and a guided imagery exercise. While the guided imagery was led mainly by the
athlete’s images, the researcher aided the imagery exercise by asking questions in hopes of
activating more vivid imagery for the athlete. Questions were also guided by the athlete’s images, and involved topics surrounding the weather, emotions, the setting, sensory information, and other details to enhance the realism of the imagery session.

Instruments

**Trait Sport Confidence Inventory (TSCI).** The main instrument of measure used in this project was the TSCI (Vealey, 1986; see Appendix C), which assessed subjects’ sport confidence. The author of the TSCI could not be contacted, but as the instrument was readily available on multiple websites, as an appendix in Vealey’s (1986) own research, and also in other literature where it was used as a measurement tool, it was determined that the inventory was part of the public domain. The inventory consisted of 13 items answered using a nine-point Likert scale, with “1” representing “low” confidence, “5” representing “medium” confidence, and “9” representing “high” confidence. Before responding to the items, instructions directed athletes to base their responses on how confident they “generally feel” when competing in sport. Instructions also indicated that athletes were to compare themselves to the “most self-confident athlete” they knew. A sample item was: “Compare your confidence in your ability to execute the skills necessary to be successful to the most confident athlete you know.” The test-retest reliability of the TSCI was found to be very high (r = .86), and the inventory was shown to be valid with significant correlations to other measurements of self-confidence among athletes.

**Reflective response.** At the end of the study, during an individual session scheduled with the researcher, athletes were handed an 8½ x 11 piece of paper on which the following prompt was printed (see Appendix D):

Do you feel that the imagery exercises in which you have engaged throughout the course of this study had any effect on your levels of confidence in your specific event or sport as
a whole? Explain in detail the extent to which the imagery had an effect on your confidence. In addition, please indicate whether or not you intend to continue the use of imagery on your own following the conclusion of this study and your reasons for doing so or not.

Athletes responded to the prompt on the same piece of paper, continuing on to the back if necessary, in as much time as was necessary to give the response they desired.

**Procedures**

**Pre-intervention.** Before beginning any imagery exercises, written permission was obtained from both the head track and field coach and the athletic director of the institution at which the researcher conducted the study (see Appendix E). Once permission was obtained, the researcher met with the track and field team and explained that a study would be conducted to study the effects of imagery on athletic performance and that participants would be accepted on a volunteer basis, with the understanding that the volunteers would have to devote approximately 90 to 120 minutes each week to imagery exercises. After at least 10 participants had volunteered, to ensure that enough data could be collected even if some participants elected to suspend their participation prior to the end of the study, individual meetings were held with each volunteer in order to explain in greater detail the processes involved in the project. Once it was ascertained that the athletes were indeed interested in full participation in the study, informed consent was obtained from the athletes (see Appendix F) detailing their involvement in an imagery study, and the initial TSCI was administered. Participants then received instructions on which types of imagery they should focus and underwent a preliminary, researcher-led relaxation and imagery session, in order to experience the techniques and types of imagery to be used
throughout the six-week intervention. Finally, the researcher answered any questions the athletes had regarding the study. The intervention began from this point forward.

**Post-intervention.** Immediately following the last scheduled structured imagery session, athletes were instructed to submit their imagery journals so that the researcher could verify the frequency of the participants’ individual imagery sessions. The TSCI was then administered, once again, and the athletes were given as much time as they required to respond to the reflective prompt. Athletes who had not summarized in their journals at least three personal sessions each week throughout the six week intervention were excluded from the results, which were analyzed in detail following the post-intervention procedures.

**Data Analysis**

**Trait Sport Confidence Inventory.** Descriptive statistics were used to analyze and compare the athletes’ pre- and post-intervention TSCI scores. Mean, median, and standard deviations of both the pre- and post-intervention assessment were calculated using formulas within an Excel spreadsheet to initially determine central tendencies and variation. Following the initial calculation, it was discovered that one athlete had pre- and post-intervention TSCI scores that were significantly lower than the others (over 2 S.D. below the mean). Thus, the outlier was removed, and the mean and standard deviations of the two assessments were recalculated and used to determine whether a difference existed between the athletes’ confidence scores as a whole before the imagery program compared to afterwards. In addition, each athlete’s individual pre- and post-intervention scores were compared to determine whether the individual athlete’s confidence was affected by the imagery exercises. Afterwards, the reflective responses were examined.
**Reflective response.** Subjects’ responses to the reflective prompt were analyzed using the constant comparative method. After reading over each of the responses to become familiar with the content, the researcher first determined whether the two yes/no questions in the prompt—whether the athlete felt that imagery impacted his/her confidence and whether the athlete intended to continue imagery exercises following the end of the study—were answered in the affirmative or negative. If there was no specific language that indicated an affirmative or negative response, the answer was coded as *inconclusive*. Common themes and subthemes that were present in the athletes’ responses were established and an Excel spread sheet was used to group the common responses in order to analyze how often each theme occurred in the athlete responses.

**Triangulation.** Following the separate analysis of the quantitative TSCI and the qualitative reflective response, the two data sets were compared in order to determine whether the qualitative responses generated by the participants supported the quantitative data provided by the administrations of the TSCI and vice versa. In addition, the overall results were compared to similar findings in previous research to determine whether the study also concurred with the results found by others conducting comparable research in the past. The use of such methodological triangulation was deemed appropriate to sufficiently validate the findings of this particular study despite the small number of participants.

**Conclusion**

In order to determine whether mental imagery exercises would enhance track athletes’ levels of sport confidence, a small group volunteered to engage in regular weekly imagery sessions for six weeks. The athletes’ pre-intervention scores on the TSCI were compared with their post-intervention scores in an attempt to determine, quantitatively, whether the regular use
of mental imagery had any effect on their sport confidence. In addition, the participants also responded to a reflective prompt which asked them whether they felt the imagery was beneficial to their confidence, would they continue using imagery following the intervention, and the reasons for their given answers. This qualitative data was analyzed and compared by the researcher to establish any commonalities among the participants in their responses. Collectively then, the quantitative and qualitative results were reviewed to determine any effects the imagery sessions had on the athletes’ sport confidence.
Chapter IV: Results

Following a six week intervention, all qualitative and quantitative data were analyzed in order to determine whether weekly use of motor imagery exercises by track athletes at a NCAA Division III liberal arts college would enhance those athletes’ levels of confidence in their sport, as measured by Vealey’s (1986) Trait Sport Confidence Inventory (TSCI). The research questions were:

1. How did the professional literature define motor imagery in the context of athletics?
2. What were the potential benefits to confidence of athletes performing imagery exercises, according to the research?
3. Why, based on the literature reviewed, was confidence in sport important to an athlete?
4. Did the implementation of regular motor imagery exercises enhance athletes’ confidence in their sport?

Following separate analysis of the quantitative and qualitative results, triangulation was used to compare the two sets of results and determine whether the separate results supported each other.

Quantitative Results

Before beginning any motor imagery, all participants took Vealey’s (1986) TSCI to measure a baseline of sport confidence. At that point, the median TSCI score was 87 (N=7; M=83.3; SD=18.5). Following the six-week intervention, the athletes once again took the TSCI to determine whether the motor imagery program had any influence on their sport confidence. After six weeks of motor imagery, the median TSCI score rose to 99 (M=92.3; SD=15.5), a difference of 12 (See Figure 1 for a graphical representation of participants’ pre- and post-intervention TSCI scores). While the positive influence that the motor imagery intervention had
on the TSCI scores was noted, a larger difference was expected based on previous research (Curry & Maniar, 2004; Short & Short, 2005; Cumming et al., 2007; Hays et al., 2007; Thomas et al., 2007; Guillot & Collet, 2008). Therefore, scores were analyzed on an individual basis in comparison to the mean and standard deviation. Upon further investigation, it was discovered that one participant was a significant outlier—greater than two standard deviations away from the mean—in the negative direction on both the pre-intervention TSCI score and in the post-intervention score. This outlier was thus negatively skewing the mean and distorting the standard deviation. Therefore, the overall results were reanalyzed following the removal of the outlier from both sets of TSCI scores.

![Figure 1](image)

**Figure 1.** Participant pre- and post-intervention Trait Sport Confidence Inventory (TSCI) scores.

Following the removal of the outlier from both the pre-intervention and post-intervention TSCI scores, the pre-intervention TSCI score mean was 89.3 (N=6; SD=10.2), which was much closer to the overall median score of 87. The post-intervention score reanalysis resulted in a mean score of 98.3 (SD=6.0), also much closer to the overall median score of 99. These results showed an average increase of 9.0 on the post-intervention TSCI scores compared to the pre-
intervention baseline scores, which was an improvement of nearly an entire standard deviation (Z=0.88; see Table 1 for complete pre- and post-intervention TSCI score results).

Table 1

<table>
<thead>
<tr>
<th>Participant ID</th>
<th>Pre-Intervention</th>
<th>Post-Intervention</th>
<th>Difference</th>
<th>Z-score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1222</td>
<td>73</td>
<td>103</td>
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<td>2.95</td>
</tr>
<tr>
<td>1689</td>
<td>94</td>
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<td>-1</td>
<td>-0.10</td>
</tr>
<tr>
<td>2009</td>
<td>84</td>
<td>99</td>
<td>15</td>
<td>1.47</td>
</tr>
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<td>0.59</td>
</tr>
<tr>
<td>5068</td>
<td>87</td>
<td>89</td>
<td>2</td>
<td>0.20</td>
</tr>
<tr>
<td>6446*</td>
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<td>60</td>
<td>13</td>
<td>1.28</td>
</tr>
<tr>
<td>8181</td>
<td>101</td>
<td>103</td>
<td>2</td>
<td>0.20</td>
</tr>
</tbody>
</table>

Mean (N=6) 89.3 98.3 9 0.88

Note. Mean and standard deviations were calculated following the removal of one significant outlier.

*Participant 6446 scored over two full standard deviations below all other participants, qualifying as a significant outlier in both the pre- and the post-intervention TSCI.

*p=0.057

While the analysis of results prior to the removal of the significant outlier showed a greater average increase of 9.6, the improvement of slightly greater than one-half of a standard deviation (Z=0.52) was not as great and less indicative of the overall improvements that were made by the participants on their TSCI scores. Individual results showed that six of the seven participants scored higher on the post-intervention TSCI than their initial score, and the only
athlete that did not show improvement scored only one point less on her post-imagery TSCI. Additionally, more than half of the participants improved by a z-score of 0.55 or greater, with three athletes having improved by a z-score above 1.0. Despite the small number of participants, the improvements still resulted in a marginally significant 0.057 p-value. These quantitative results were somewhat mirrored by the responses of the athletes themselves to the qualitative reflective prompt.

**Qualitative Results**

The qualitative results stemmed from participant responses to the prompt:

Do you feel that the imagery exercises in which you have engaged throughout the course of this study had any effect on your levels of confidence in your specific event or sport as a whole? Explain in detail the extent to which the imagery had an effect on your confidence. In addition, please indicate whether or not you intend to continue the use of imagery on your own following the conclusion of this study and your reasons for doing so or not.

The two main parts of the prompt were whether athletes believed imagery had an effect on confidence and whether they intended to continue imagery in the future. These two pieces were analyzed separately using the constant comparative method.

All athletes responded that they felt imagery had a positive influence on their levels of confidence. After analyzing athlete responses as to why or how imagery affected confidence, the rationale listed by the participants were grouped into physically- and psychologically-based reasons for improved confidence. Physically based reasoning was subdivided into categories such as “helped improve weaknesses” and “helped improve mechanics.” Psychological reasons were also subdivided. Subcategories here included “helped with goal-setting” and “provided
situational experience” (See Table 2 for the complete analysis of why participants believed imagery enhanced their confidence).

Table 2

*Participant Responses to Why They Believe They Experienced an Increase in Confidence*

<table>
<thead>
<tr>
<th>Physical Basis</th>
<th>Psychological Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 total athletes</td>
<td>7 total athletes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Processes (Gen.)</th>
<th>Mech.</th>
<th>Impr. Weakness</th>
<th>Goal-Setting</th>
<th>Situation Exp.</th>
<th>Mental training</th>
<th>Pos. Self-Talk</th>
</tr>
</thead>
<tbody>
<tr>
<td>ID 1222</td>
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<td>4930</td>
<td>1222</td>
<td>1689</td>
<td>1689</td>
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<tr>
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<td></td>
<td>8181</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. Seven total athletes provided responses. Gen. = general; Mech. = mechanics; Impr. = improve; Exp. = experience; Pos. = positive; ID = participant identification number.

Overall, athletes found more positive influence on confidence based on psychological rationale, as all seven participants noted at least one psychological explanation for why they believed imagery positively influenced confidence compared to only four who believed their confidence was physically based. While individual answers largely varied, two specific reasons were listed by a majority of participants. Four athletes believed that their boost in confidence was due to the physically-based rationale that imagery allowed them to improve the mechanics of their event. There were also four athletes who thought that the psychological reasoning that imagery provided them with increased situational experiences led to enhanced confidence.
In addition to the unanimous agreement among participants that imagery had an influence on their confidence, all athletes also responded that they did plan to continue using imagery in the future. Again, reasons athletes gave for why they intended to continue their imagery use were grouped into the categories of physically- and psychologically-based as well as a generic category for responses that were unspecified or that did not fit into either of the main categories. The only sub-category that fell under the physical reasons for continued imagery use listed by participants was that imagery was “relaxing.” Sub-categories under the psychological rationale were highly diverse, but included responses such as “helps focus” and “boosts confidence” (See Table 3 for the complete analysis of why participants planned to continue imagery use). Generic responses were limited to the reasons that imagery “helps” and the athlete “already does it.”

Table 3

*Participant Responses to Why They Plan to Continue the Use of Imagery in the Future*

<table>
<thead>
<tr>
<th>Physical Basis</th>
<th>Psychological Basis</th>
<th>General</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 athletes</td>
<td>5 athletes</td>
<td>2 athletes</td>
</tr>
<tr>
<td>Relaxing</td>
<td>Helps Focus</td>
<td>Goal-Setting</td>
</tr>
<tr>
<td>ID 1222</td>
<td>1222</td>
<td>1222</td>
</tr>
<tr>
<td>5068</td>
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<td></td>
</tr>
<tr>
<td>6446</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note.* Seven total athletes provided responses. Exp. = experience; Conf. = confidence; ID = participant identification number.
Similar to the participants’ psychological rationale for why they believed imagery enhanced their confidence, athletes overwhelmingly stated that they intended to continue their use of imagery for psychological reasons over the relaxing physiological response. However, athlete responses that fell under the psychologically-based sub-categories were so varied that the dominant specific response for why athletes intended to use imagery in the future was that the imagery exercises were physiologically relaxing. The predominant psychological reasons were that imagery helped athletes focus and that it boosted their confidence.

**Triangulation of Results**

Following the separate analysis of the quantitative TSCI results and the qualitative responses to the reflective prompt, the two sets were compared. The qualitative responses that the athletes did experience positive influences on their self-confidence from the imagery seemed to support the fact that TSCI scores did increase by a significant margin over the course of the six-week imagery program. In addition, the unanimous response that all athletes intended to continue their use of imagery following the conclusion of the intervention period supported the idea that the exercises were working and enjoyable to the participants.

The concurrence of the quantitative and qualitative results in this study was no surprise, as previous research also made similar findings. In a qualitative study, Hays et al. (2007) found that a majority of athletes found mental preparation, including imagery exercises, to be a source of confidence. In an implementation of a mental training program, which included extensive use of imagery, during the competitive season, Thomas et al. (2007) found that this mental training had a significant effect both on the athletes’ frequency and their intensity of self-confidence. In studies focusing solely on imagery, similar to this one, Short and Short (2005) and Cumming et al. (2007) found that imagery was consistently correlated with high scores in self-confidence. In
the current study, then, despite the small number of participants, the results seemed to be supported by the findings of past research, both qualitative and quantitative, which further validated the findings of this study.

**Conclusion**

The analysis of the quantitative results, both with and without the presence of the single outlier, showed a marginally significant \( p=0.057 \) increase in sport confidence scores following a six-seek imagery intervention program. These results were in agreement with the qualitative responses of the athletes, who noted unanimously that they had experienced the positive benefits that the imagery exercises had on their sport confidence and also unanimously intended to continue imagery exercises on their own following the conclusion of the study. Additionally, further triangulation increasingly validated the results of the study by showing similarities between these findings and the findings of previous research on mental preparation and imagery (Short & Short, 2005; Cumming et al., 2007; Hays et al., 2007; Thomas et al., 2007).
Chapter V: Discussion

After careful analysis and triangulation of the results, the researcher ventured to determine whether weekly use of motor imagery exercises by track athletes at a NCAA Division III liberal arts college did possibly enhance those athletes’ levels of confidence in their sport, as measured by Vealey’s (1986) Trait Sport Confidence Inventory (TSCI). The research questions were:

1. How did the professional literature define motor imagery in the context of athletics?
2. What were the potential benefits to confidence of athletes performing imagery exercises, according to the research?
3. Why, based on the literature reviewed, was confidence in sport important to an athlete?
4. Did the implementation of regular motor imagery exercises enhance athletes’ confidence in their sport?

Results were compiled in an attempt to discover and clarify any underlying meaning before the entire study and its findings were summarized. Finally, the researcher made some suggestions and recommendations for future research and possible implications of this examination into imagery and its impact on athlete self-confidence.

Meaning of Findings

Out of seven total participants who completed the six-week mental imagery program, six achieved higher sport confidence scores on the TSCI following the intervention (M=98.3 compared to M=89.3). Additionally, five of the seven scored at least one-half of a standard deviation higher (SD=10.2) on the post-intervention TSCI than they had prior to the imagery program. The only athlete that did not experience an increase in sport confidence scores saw a
decrease of only one point. The results were only marginally significant (p=0.057), possibly due to the small number of participants involved in the study, but still suggested that the consistent use of MG-M imagery by athletes could increase their sport confidence overall.

The reflective responses provided by the athletes following the intervention also suggested that MG-M imagery was an effective and enjoyable method of increasing athlete sport confidence. Seven out of seven participants responded that they did experience a positive impact on their self-confidence due to the imagery exercises and that they enjoyed the intervention enough to plan to continue imagery sessions on their own in the future. The main sources of confidence noted by the participants were psychological, which corroborates their collective responses that the main reasons they intended to continue imagery use were also psychological in nature. This, of course, was expected, due to the psychological nature of confidence itself and that imagery is an exercise that takes place solely in the psyche.

The triangulation of the quantitative and qualitative results further validated the findings that the use of MG-M imagery could positively influence an athlete’s sport confidence. Both sets of results showed that the intervention program led to increased confidence, so much so that 100% of the participants intended to continue their use of imagery following the study. Previous research has made similar findings (Short & Short, 2005; Cumming et al., 2007; Hays et al., 2007; Thomas et al., 2007), further strengthening the implications that regular use of MG-M imagery could enhance sport confidence in athletes. Overall, then, this study did appear to accomplish its main goals, as summarized below.

**Summary**

The project was an attempt to determine whether a relationship existed between the regular use of motor imagery by athletes and their sport confidence. The seven participants in
the study were all track and field athletes from an NCAA Division III liberal arts institution located in the Midwest. Following a review of literature, it was found that justification existed to suggest that the use of imagery could possibly enhance the sport confidence of athletes. The researcher then set out to determine whether the use of MG-M imagery would in fact enhance athletes’ sport confidence.

After obtaining consent from the head track coach, the athletic director, and the seven volunteer participants, the athletes were then given basic definitions of MG-M imagery and relaxation techniques, as well as instruction on how they would be used in the project. Each athlete took a baseline TSCI in order to evaluate current levels of sport confidence. Individual meetings were arranged each week so that structured relaxation and imagery sessions could occur along with discussion between the athlete and researcher. Additionally, athletes were to conduct their own personal relaxation and imagery sessions three times per week and journal about their experiences in a notebook provided by the researcher. Following a six-week intervention period, athletes again took the TSCI to quantitatively measure any differences in sport confidence scores. In conclusion, participants also responded to a reflective response which asked them to evaluate their personal experiences with the imagery sessions and how they felt it impacted their confidence levels.

Results were measured quantitatively, using the TSCI, and qualitatively, with participant responses to the prompt, before data was triangulated to further validate the findings. The results of the TSCI showed that six of the seven athletes scored higher on their post-intervention measure of sport confidence. The responses to the reflective prompt indicated that all seven athletes believed that the MG-M imagery exercises did have a positive impact on their feelings of confidence and that they all intended to continue using imagery following the conclusion of
the intervention period. Through triangulation, the quantitative and qualitative results seemed to reaffirm each other, and further comparison of the collective results to previous research (Short & Short, 2005; Cumming et al., 2007; Hays et al., 2007; Thomas et al., 2007) also showed strong similarities between prior investigations into the effects of mental imagery on confidence and the current findings of this project. The results of the study lent themselves to some recommendations for future research.

**Recommendations**

This project suggested that the regular use of MG-M imagery by seven NCAA Division III track and field athletes at a small Midwestern liberal arts institution could have had a positive impact on their overall sport confidence. It is important to note, however, that this study was conducted at only one institution and with a limited number of participants, who took part on a volunteer basis over a six-week period of the preseason conditioning portion of the track and field season. In addition, the athletes knew and interacted with the researcher on a daily basis outside of the imagery study, which could have altered their responses to the TSCI and the reflective prompt. These factors could have impacted the results of the projects, and further investigation would be necessary in order to make broader generalizations regarding the impact of MG-M imagery on overall sport confidence.

One recommendation for future research would be to conduct a similar investigation at a larger NCAA Division I or II institution. Generally, these larger institutions put more of an emphasis on athletics than Division III institutions and are better funded in this area, including the allowance of athletic scholarships. Therefore, perhaps more controls could be put in place to further validate the findings, such as funding for an imagery expert to conduct the imagery sessions as opposed to an assistant coach who has limited imagery experience and who also has
additional contact with the study participants outside of the imagery sessions. Additionally, perhaps these athletes, some of whom would presumably be on scholarship or competing to earn a scholarship in the future, would take more seriously any element that could potentially improve their performance, such as imagery. It would be interesting to see whether a similar study conducted at one of these higher divisions would result in similar findings or whether the implications would be stronger or weaker due to the nature of athletics within the various divisions of the NCAA.

Another recommendation would be to investigate the effects of imagery use over a longer intervention period, especially one which would include the competitive season. The physical and mental changes that occur throughout the course of the season would presumably affect the imagery that would be used by the participants during this time, which could have effects on the overall results of the study. In addition, more prolonged regular use of imagery could show whether the positive impacts on confidence increases or eventually plateaus at some point. These results would be useful in determining the optimal length of an imagery training program and also possibly in determining when such a training program would be best implemented with the athletes.

Finally, perhaps the strongest recommendation and potentially the one with the most implications would be to conduct the study with a larger population sample, including athletes from different sports and multiple institutions. These results would be more valid across a larger cross section of the population and could be used to promote imagery training sessions for athletes in many sports. In addition, the inclusion of participants from multiple institutions could be used to validate the findings for athletes from colleges and universities of all sizes and divisions in different parts of the country. Research of this nature would be necessary in order to
further conclude that regular use of MG-M imagery could be generally effective at enhancing the sport confidence of all athletes.

Conclusion

The purpose of this project was to determine whether regular use of MG-M imagery by athletes over the course of a six-week intervention period would have any impact on their sport confidence as measured by Vealey’s (1986) TSCI. In the end, both the quantitative TSCI and the qualitative subject responses suggested that imagery use did enhance athlete sport confidence within the parameters of this study. Several recommendations were made which could further the literature in the area of imagery and sport confidence, including expanding the study to include a larger sample size of athletes from various sports who attend different institutions across the country. Such research would be beneficial in advancing the understanding of the link between imagery and confidence, which is essential for a high level of performance for any athlete. This understanding could be vital in enhancing the methods of coaches in any sport in order to provide their athletes with the highest opportunities for success.
References


Deep Breathing: II

By: Prentiss Price, Ph.D.
All About Self Help, LLC

After you get comfortable sitting where you are, we’ll begin this exercise by taking several nice, long, deep breaths. Gently pull the air in, let it fill your lungs fully... then smoothly let it all out. Do this a few times as you let yourself get more relaxed sitting where you are. Breath fully in, let the air expand your lungs... then let the air easily flow back out again. While you are taking a few more deep breaths, notice if you are holding any tension in the muscles in your body. You might mentally scan your body, starting with your head. Notice your forehead, your cheeks, your jaw. Are you holding any tension in these areas? If so, just gently let all that tension melt away. Next, take notice of your neck, your shoulders, and upper back. If you are holding any tension here, again, just let all that tension go. Continue to mentally scan your body moving down to your arms and hands, your abdomen, and then your legs and feet. Gently let any tension in these areas just melt away. You might find that some tension creeps back into these muscle groups, that’s okay. Just let it all go again with every out breath. Each time you breath out, let more and more tension leave your body. For a few more moments, bring your attention to your breathing... in and out. And, with every out-breath, let more and more tension melt away from your body.

As you are letting yourself become more relaxed sitting where you are, bring your attention to your breathing and begin to really notice how it feels. As you inhale, notice the cool air smoothly coming in through your nose or mouth, how it feels as it passes through your windpipe, gently filling your lungs. Notice the pause between the moment your lungs have fully filled with air, and the moment just before you exhale. Then notice how good it feels to let your full lungs collapse, and how the warm air easily passes back through your windpipe and out through your nose or mouth. Likewise, notice that brief pause between the moment you fully exhale, and just before you inhale again. Bring your attention to your breathing... in and out... in and out. Notice the cool air coming in... filling your lungs... and the warm, soothing air flowing back out. With every out-breath, let more and more tension melt away. Noticing your breathing... in and out... in and out. If your mind wanders, that’s okay, just gently bring your attention back to your breathing... in and out. Cool air coming in... filling your lungs... and the warm air gently flowing back out... in and out... in and out.

As you attend to your breathing, you might also begin to say a soothing word to yourself for the in-breath, and also for the out-breath. As you breath in, you might say to yourself, "peace." As you breath out, you might say, "release." On the in-breath "peace," and on the out-breath "release." Peace... release... peace... release. Bring your attention to your breathing... in and out. Peace... release... peace... release. If your mind wanders, that’s okay, just gently bring your attention back to your breathing... in and out... in and out... in and out. With every out-breath, let more and more tension leave your body. Notice the cool air coming in... filling your lungs... and the warm, soothing air going back out. Bring your attention to your breathing... in and out... in and out... in and out. Continue this attention to your breathing for as long as you feel comfortable. And, when you feel ready, you can gently bring your attention back to the room while still letting yourself feel nice and comfortable and relaxed sitting where you are... noticing your breathing... in and out... in and out... in and out.
Appendix B

From: webmaster@allaboutdepression.com
Subject: AllAboutDepression.com: Online Relaxation Exercise
Date: Fri, October 1, 2010 2:31 pm
To: sroberts@defiance.edu

> Below is the result of your feedback form. It was submitted by
> () on Thursday, September 30, 2010 at 11:39:52
> ---------------------------------------------------------------------------
> mailformtoemail: webmaster@allaboutdepression.com
> mailformsubject: Contact Us
> myName: Sterling M Roberts
> myEmail: sroberts@defiance.edu
> myComments: To Whom It May Concern:
> I am conducting a Master's project involving the use of imagery and
> self-confidence in athletics. My imagery program requires athletes to use
> a relaxation script. While several scripts are readily available on the
> internet, I found your Deep Breath II script and audio file (available on
> AllAboutDepression.com and on multiple other websites) to be the most
> soothing and best suited for my purposes. I am contacting you to ask your
> permission to use the audio file and a type-written script of the Deep
> Breathing II exercise to pass out to my athletes and use as part of my
> imagery program. Use of the exercise and its source will be cited and
> referenced in the final submission of the project. If you have any other
> questions, I can be reached at 614-657-5932 (cell) or
> sroberts@defiance.edu
>
> Thank you.
> Sterling M Roberts
> Graduate Assistant Track Coach
> Defiance College
> Defiance, OH
> ---------------------------------------------------------------------------

Hello Sterling,
Thank you for asking for permission to use one of my audio files in your
project. You are welcome to use the file and provide a script to your
athletes. I appreciate your citing the source as my website,
AllAboutDepression.com and my name, Prentiss Price-Evans, Ph.D.

Good luck with your project!
Dr. P :)

Prentiss Price-Evans, Ph.D.
AllAboutDepression.com
All About Self Help, LLC
P.O. Box 2530
Statesboro, GA 30459
Appendix C

Trait Sport-Confidence Inventory
(Adopted from Vealy, 1986)

Name: _______________________

Instructions:
Think about how self-confident you are when you compete in sport.

Answer the questions below based on how confident you generally feel when you compete in your sport. Compare your self-confidence to the most self-confident athlete you know.

Please answer as you really feel, not how you would like to feel. Your answers will be kept completely confidential.

When you compete, how confident do you generally feel? (circle number)

1) Compare your confidence in your ability to execute the skills necessary to be successful to the most confident athlete you know.

Low 1 2 3 4 5 6 7 8 9

2) Compare your confidence in your ability to make critical decisions during competitions to the most confident athlete you know.

Low 1 2 3 4 5 6 7 8 9

3) Compare your confidence in your ability to perform under pressure to the most confident athlete you know.

Low 1 2 3 4 5 6 7 8 9

4) Compare your confidence in your ability to execute successful strategy to the most confident athlete you know.

Low 1 2 3 4 5 6 7 8 9

5) Compare your confidence in your ability to concentrate well enough to be successful to the most confident athlete you know.

Low 1 2 3 4 5 6 7 8 9

6) Compare your confidence in your ability to adapt to different game situations and still be successful to the most confident athlete you know.

Low 1 2 3 4 5 6 7 8 9

(continued on next page)
Trait Sport-Confidence Inventory (cont.)
(Adopted from Vealy, 1986)

When you compete, how confident do you generally feel? (circle number)

1) Compare your confidence in your ability to achieve your competitive goals to the most confident athlete you know.
   Low  Medium  High
   1  2  3  4  5  6  7  8  9

2) Compare your confidence in your ability to be successful to the most confident athlete you know.
   Low  Medium  High
   1  2  3  4  5  6  7  8  9

3) Compare your confidence in your ability to consistently be successful to the most confident athlete you know.
   Low  Medium  High
   1  2  3  4  5  6  7  8  9

4) Compare your confidence in your ability to think and respond successfully during competition to the most confident athlete you know.
   Low  Medium  High
   1  2  3  4  5  6  7  8  9

5) Compare your confidence in your ability to meet the challenge of competition to the most confident athlete you know.
   Low  Medium  High
   1  2  3  4  5  6  7  8  9

6) Compare your confidence in your ability to be successful even when the odds are against you to the most confident athlete you know.
   Low  Medium  High
   1  2  3  4  5  6  7  8  9

7) Compare your confidence in your ability to bounce back from performing poorly and be successful to the most confident athlete you know.
   Low  Medium  High
   1  2  3  4  5  6  7  8  9
Appendix D

Reflective Response

Directions: Read and respond to the prompt below with as much detail as possible. Take as much time as necessary, and continue onto the back of this sheet if you run out of room.

Do you feel that the imagery exercises in which you have engaged throughout the course of this study had any effect on your levels of confidence in your specific event or sport as a whole? Explain in detail the extent to which the imagery had an effect on your confidence. In addition, please indicate whether or not you intend to continue the use of imagery on your own following the conclusion of this study and your reasons for doing so or not.
Appendix E

Permission to Proceed with Graduate Study Involving Student-Athletes

To Whom It Way Concern:

I, Sterling M. Roberts, am writing this letter in order to obtain your permission to proceed with a project here at Defiance College involving Defiance College student-athletes. This project is being conducted as a part of ED 590 as my final graduate project under the supervision of Matt Lydum, faculty member at Defiance College. The purpose is to investigate the potential benefits of a mental imagery program on athletes’ self-confidence. The study will last approximately six weeks, during the months of October and November of 2010. Participants will engage in weekly one-on-one imagery sessions with me, the researcher, lasting about one hour each week throughout the course of the study. In addition, participants will be asked to keep an imagery journal throughout the study, where they will journal on their own personal imagery sessions at least three other times each week. Prior to beginning the study, participants will answer some self-evaluation questions, and following the imagery program participants will answer self-evaluation questions in addition to responding to an open-ended prompt.

The major potential benefit from involvement in this study, as noted in similar previous studies, is enhanced athletic self-confidence. Risks involved in this study are minimal. What occurs during all researcher-participant interaction will be kept confidential, including any and all answers to self-evaluation questions and responses to the open-ended prompt. The researcher will use participant identification numbers to keep track of individual data in order to ensure anonymity. While all contact between researcher and participant will be kept as confidential as possible, and some of this communication will potentially be via e-mail, it should be noted that e-mail is not a secure means of communication. Participation in the study is completely voluntary, and participants are free to withdraw at any time without penalty. No one under the age of 18 will be permitted to take part in the study.

If you have questions about the study, or to obtain results of the study at its conclusion, you may contact the primary research, Sterling M. Roberts, at 614-657-5932 or via e-mail (sroberts@defiance.edu), or faculty advisory, Matt Lydum, at 419-783-2419 or via e-mail (mlydum@defiance.edu).

Your support and permission to move further with this project is greatly appreciated.

I, _____________________________, Athletic Director at Defiance College, grant the graduate researcher, Sterling M. Roberts, permission to move ahead with his project involving student-athletes at Defiance College.

________________________________________  __________________________
A.D. Signature  Date

I, _________________________________, Head Men’s and Women’s Track and Cross Country coach at Defiance College, grant the graduate researcher, Sterling M. Roberts, permission to move ahead with his project involving student-athletes at Defiance College.

________________________________________  __________________________
Head M&W Track Coach  Date
Appendix F

Consent to Participate in Research Project.

Title of study: The Effects of Mental Imagery on Sports Performance
Principle researcher: Sterling M. Roberts, Defiance College
Faculty member: Matt Lydum, Defiance College

This study is part of the capstone project of Sterling M. Roberts, under the guidance of Matt Lydum. The purpose is to investigate the potential benefits of a mental imagery program on athletes’ performance. The study will last approximately 6 weeks, and participants will engage in weekly one-on-one imagery sessions with the researcher lasting about one hour each week throughout the course of the study. In addition, participants will be asked to keep an imagery journal throughout the study, where they will journal on their own personal imagery sessions at least three other times each week. Prior to beginning the study, participants will answer some self-evaluation questions, and following the imagery program participants will answer self-evaluation questions in addition to responding to an open-ended prompt.

The major potential benefit from involvement in this study, as noted in similar previous studies, is enhanced athletic performance. Risks involved in this study are minimal. What occurs during all researcher-participant interaction will be kept confidential, including any and all answers to self-evaluation questions and responses to the open-ended prompt. The researcher will use participant identification numbers to keep track of individual data in order to ensure anonymity. While all contact between researcher and participant will be kept as confidential as possible, and some of this communication will potentially be via e-mail, it should be noted that e-mail is not a secure means of communication.

Your participation in the study is voluntary, and you are free to withdraw at any time without penalty. If you have questions about the study, or to obtain results of the study at its conclusion, you may contact the primary research, Sterling M. Roberts, at 614-657-5932 or via e-mail (sroberts@defiance.edu), or faculty advisor, Matt Lydum, at 419-783-2419 or via e-mail (mlydum@defiance.edu).

You must be at least 18 years of age to participate in this study.

You are to keep one copy of this consent form.

I, _________________________________________________, agree to participate in this study.

(participant’s printed name)

_______________________________   _________________________

(participant’s signature)   (Date)