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PREPARATORY IMAGERY AND PRECOMPETITION ANXIETY
IN COLLEGIATE TRACK AND FIELD ATHLETES

MOIRA J. JOHNSON

PREPARATORY IMAGERY AND PRECOMPETITION ANXIETY IN COLLEGIATE
TRACK AND FIELD ATHLETES

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Presented to

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Of the Requirements for the Degree

Master of Science

Moira J. Johnson

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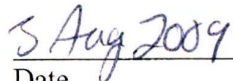
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Abstract

MOIRA JEAN JOHNSON. Preparatory Imagery and Precompetition Anxiety in Collegiate Track and Field Athletes (under the direction of DR. GREGG STEINBERG).

The success of using imagery in a sporting context has been well documented in sport psychology research, yet to date the vast majority of studies have only examined the effects of facilitative (positive) imagery and to a much lesser extent, debilitating (negative) imagery. The purpose of the present study was to describe and examine a new type of imagery which combines both positive and negative components. Facilitative preparatory imagery is a strategy employed wherein an event is imagined with obstacles and subsequent problem-solving strategies are employed. The ultimate outcome of the imagined event using preparatory imagery is positive. Eleven track, field, and cross country athletes from a mid-sized southern Division I-AA university were given an anxiety inventory to establish baseline anxiety levels. The baseline measurement was followed by the reading of one of three guided imagery scripts that contained either facilitative positive, facilitative preparatory, or neutral imagery cues. A post-test was then administered to detect any changes in anxiety levels. The researcher found statistically significant differences between the three imagery types at the .05 level. The findings indicated that facilitative positive imagery is effective in alleviating pre-competition anxiety, which support previous research. Facilitative preparatory imagery did not have an effect on anxiety. Further research is warranted by the limitations of the current study and the novelty of facilitative preparatory imagery.

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CHAPTER I

Introduction

The Giuliani Effect

Life is full of uncertainties, but not knowing what may happen in the future can lead to heightened levels of anxiety and stress. While there are numerous strategies to reduce these feelings, one main way is to develop an adversity plan, or a mental blueprint of how one can overcome obstacles. In the broadest sense, being prepared for the unexpected should bolster confidence and alleviate anxiety. No one illustrates this principle better than Rudy Giuliani, the former mayor of New York City.

While neither Giuliani nor anyone else could have foreseen the events of September 11th, 2001, the mayor was prepared for the terrorist attack because he had numerous other contingency plans in place. Having acknowledged New York City as a “place of catastrophes”, (Pooley, 2001) Giuliani had several procedures in place to deal with weather disasters, fires and biological warfare (Steinberg, 2009). His several emergency plans synergized and allowed him to deal with one adversity after another in the weeks following the attack. Hence, we define the Giuliani Effect as the ability to synthesize one action plan into another, allowing us to be prepared for the unknown.

This study presents the benefits of developing an adversity plan in conjunction with an imagery exercise to deal with unforeseen circumstances in sporting events. Track and field athletes were studied for the sport’s diversity of open and closed events. Poulton (1957) differentiated between closed sports, in which the environment is predictable and stable and every move can be planned in advance. Open sports, on the other hand, are played in a constantly changing environment that is determined by others’ movements. This distinction is still

employed in much sport psychology literature because it has a broad application. The present study focuses on the closed sport of track and field. In one sense, the likelihood of unforeseeable challenges in track and field is high. For example, during the regular outdoor season, the slightest change in weather is an uncontrollable variable in performance. Yet overall, since no physical contact is made between athletes and many field events are self-paced, the sport contains mainly closed elements. Studying a closed sport should limit any other effects that an imagery exercise might have on anxiety levels in an open sport. In fact, research has found that imagery is more effective for athletes participating in closed sports (Weinberg, Butt, Knight, Burke, & Jackson, 2003). The predictability of track and field provides a favorable population to study how athletes can best handle obstacles.

The present study examined how imagery may be used to mentally prepare athletes for performance by alleviating anxiety through the formulation of an adversity plan. Imagery has been studied extensively, yet no research to date has examined how formulating an adversity plan can be implemented to positively affect anxiety. The Giuliani Effect can be tested by examining how what will be called preparatory imagery works in the context of sport.

Background information

The resiliency of the people of New York City following the events of September 11th can be attributed to Mayor Giuliani's application of his adversity plan. The city was able to recover quickly because of Giuliani's preparation for a variety of disasters. He urged the city to get back on its feet as quickly as possible, and the infrastructure swiftly bounced back. Similarly, sport has many unforeseeable difficulties for which an adversity plan can help. One well-documented way that athletes prepare for performance is through the use of mental imagery.

While researchers have been examining imagery use in sport for some time, it has not yet been studied as a strategy to implement an adversity plan.

Mental imagery has received extensive research attention for decades. Imagery is the nexus of the mind-body connection in sport and lends insight as to how athletes can further develop their mental game, in both practice and competition. Researchers have found imagery to have a positive effect on performance (Malouff, McGee, Halford, & Rooke, 2008; Short, Tenute, & Feltz 2005). By 1999, over 200 studies had been published examining the relationship between mental imagery and sport performance (Martin, Mortiz, & Hall, 1999), and at least as many have been published since. There is no shortage of research documenting the usefulness of imagery; athletes who employ it have been found to have enhanced performance in their sport (Martin et al., 1999, Short & Short, 2005, Taylor, Gould & Rolo, 2008). Yet the impact of imagery is multifold: imagery can enhance player confidence while dissipating anxiety (Malouff et al., 2008; Short et al., 2005). This is key to sport psychology because anxiety has an enormous impact upon performance.

Anxiety was initially believed to have a detrimental effect on athletic performance. This assumption was based on early educational psychology research on test anxiety (Hatzigeorgiadis & Biddle, 2008). Physiological arousal produced symptoms of cognitive anxiety, which were considered to be inherently negative. Yet the growing field of sport psychology has warranted more extensive study on how the somatic symptoms of anxiety can actually enhance athletic performance (Hanton & Connaughton, 2002; Hatzigeorgiadis & Biddle, 2008; Tenenbaum, Edmonds & Eccles, 2008). Specifically, some heightened levels of anxiety can actually be facilitative to performance, depending on the athlete. While uncontrolled anxiety is usually detrimental to performance, a trained athlete can learn to use cognitive and somatic anxiety to his

or her advantage. The most important aspect of the process is in interpretation of anxiety symptoms (Hanton & Jones, 1999), in which the meaning is assigned to physiological reactions.

The focus of the present study, however, is the effect of different types of imagery in the form of adversity plans upon anxiety levels. One widely accepted explanation for the effects that mental imagery has on athletes is the bioinformational theory, proposed by Drobles and Lang (1995). This theory states that imagery interpretation consists of two types of images: stimulus propositions, which describe specific features of the scenario to be imagined, and response propositions, which describe the athlete's response to an imagery scenario. For example, when a hurdler imagines lining up at the block before the gun goes off and hearing the crowd cheering, this is a stimulus proposition, because it provides only factual information that could be described by another person. In contrast, feeling her heart race and her hands sweat in preparation for the gun to initiate the race is a response proposition. The response is unique to each person and is related to how they interpret their anxiety.

The key to successful imagery use is the imager's cognitive appraisal, or response, to the situation that is presented. Lang's theory emphasizes that the response proposition is a fundamental part of imagery; that is, imagery without interpretation is simply a factual description. It is only after cognitive appraisal takes place that imagery is fully processed in the mind.

As Lang emphasizes, the most important element in the anxiety process is cognitive appraisal. Physical symptoms of anxiety can either enhance or inhibit performance based on an individual's appraisal. For instance, one person may interpret increased heart rate as a pre-event adrenaline rush that energizes; yet another person may appraise the same symptoms as nervousness or jumpiness, which could lead to a false start. The present study will address the

function of cognitive appraisal by assessing how different imagery scripts are interpreted by participants. We proposed that reading an anxiety-producing imagery script which prepares the athlete for obstacles will decrease her anxiety relative to a baseline measurement.

In related work, Hanton and Jones (1999) and Hanton, Mellalieu and Hall (2004) identified imagery as a strategy that helps athletes reappraise negative symptoms of anxiety as controllable and facilitative to their performance. When imagery is appraised as preparatory for an athlete, then anxiety should lessen. The present study aims to demonstrate the importance of preparatory imagery in the anxiety process. That is, anxiety levels should be diminished when athletes use imagery to prepare themselves for obstacles in their environment.

Need for the study

Despite being widely accepted as a powerful mental tool, there has been some bias in the approach to imagery research that has left several questions unanswered. The majority of studies have exclusively examined *positive* (also referred to as *facilitative*) imagery. Malouff and associates (2008) defined facilitative imagery as when an individual images himself or herself carrying out the necessary athletic performance, though in practice facilitative imagery scripts often represent a flawless performance. The present study aims to expand the idea of facilitative imagery to include preparatory imagery, which is essentially the act of imagining oneself overcoming obstacles to achieve a successful performance. For the purpose of this study, this type of imagery will be defined as facilitative preparatory imagery.

A scientific tendency toward classification has inclined researchers to lump all other types of imagery into a single category, commonly referred to as *debilitative*. This category is comprised of any remaining type of imagery that is not strictly positive in nature. Imagery that is intentionally debilitative has been found to handicap performance and increase cognitive anxiety

(Ramsey, Cumming & Edwards, 2008). We propose that creating obstacles in an the proposed study is not debilitating imagery but rather facilitative due to the inclusion of an adversity plan.

The resulting gaps in research have necessitated a study that examines different types of facilitative imagery and their effects upon mental states.

Significance of study

There are ample opportunities for real-life application of facilitative preparatory imagery. The example of Rudy Giuliani's actions in the aftermath of September 11th demonstrates that although we can only conceive a small portion of the possible things that could go amiss in the future, preparation in as many areas as possible is ideal for maintaining cognitive focus and a calm demeanor in the midst of adversity.

The applications to sport are obvious. Athletes who develop the ability to use imagery as a preparatory tool rather than a simple fantasy or daydream about executing a flawless performance will be more equipped to deal with unforeseen circumstance. As in life, it is unfeasible to consider every possible detail of a performance that could go wrong; the purpose of facilitative imagery for preparatory purposes is to imagine feasible obstacles, which in turn will cognitively prime the athlete for the unknown. The cognitive state of the athlete should reflect one of lessened anxiety once feasible obstacles are acknowledged and a contingency plan of dealing with these difficulties is formulated.

Purpose

The purpose of this study was to examine the effects of facilitative positive imagery as compared to facilitative preparatory imagery upon anxiety levels in collegiate track and field athletes.

Research questions

The researcher hypothesized that female track and field athletes who engage in facilitative preparatory imagery will have lower levels of anxiety than those who engage in facilitative positive imagery. In addition, the researcher hypothesizes there will be a significant difference among the three types of mental imagery.

Delimitations

This section will discuss the boundaries placed upon the present study by the researcher.

1. Sporting event diversity.

There are several field events that might warrant individual imagery scripts in future studies. The present research will examine the anxiety levels caused by mental preparation for track, field, and cross country events collectively as internally paced team sports.

2. Measurement of imagery ability.

There will be no test in this study to measure participants' imagery ability. Due to other limitations (see below), setting any exclusionary limitations may severely decrease the sample size. While obtaining a quality sample is essential, it is assumed that the participants possess moderate ability to use imagery.

Limitations

This section will discuss the factors in makeup which restrict the scope of the present study that are out of the researchers' control.

1. Gender of participants.

At Austin Peay State University, there is no men's track and field team. While gender will not be examined in the course of this research, it is important that one take in to

account that the vast majority (about 85%), if not all, of the participants will be female.

The male participants will all be members of the cross country team.

2. Sample and population sizes.

The research design requires three groups, thereby limiting the largest possible size of each group to ten or eleven. Each member of the track team must be recruited in order to obtain a sufficient number of volunteers to participate so that the study may take place.

Ethical issues involving the use of human subjects prohibit convincing or coercing prospective participants to sign up for the study, yet practical considerations, methodology, and the need for reliability and validity require that most, if not all, of the population participates.

CHAPTER II

Review of Literature

Controlling anxiety in athletes

Anxiety has been classified into somatic and cognitive subcomponents. Somatic refers to the physical symptoms that are classically associated with nervousness, such as increased heart rate, respiration, and sweating. Colloquially, somatic anxiety is often referred to as having butterflies in the stomach or feeling jumpy. Numerous studies have found some level of somatic anxiety to be facilitative in competitive performance (see Craft, Magyar, Becker & Feltz, 2003; also Cumming, Olphin & Law, 2007; Hanton & Jones, 1999; Tenenbaum, Edmonds & Eccles, 2008). Cognitive anxiety, on the other hand, is more difficult to identify and describe, which renders it harder to study. Weinberg and Gould (2007) define state anxiety as “the degree to which one worries or has negative thoughts” (p. 79).

Imagery and anxiety

Imagery has been examined as a tool used to alleviate athletes' symptoms of both cognitive and somatic anxiety. Working to achieve the Giuliani Effect, this study aims to establish how athletes may use imagery to reappraise symptoms of cognitive anxiety to be more facilitative to their mental game. Cumming et al. (2007) point out that “considerable qualitative research has identified imagery as a strategy that helps athletes overcome negative symptoms [of anxiety] and reappraise them as controllable and facilitative to performance” (p. 630). The concept of cognitive appraisal will be reviewed in more detail in the pages to follow.

Facilitative positive imagery

Facilitative positive imagery is always a positive representation of a situation. To date, the vast majority of studies published on the topic have exclusively employed facilitative

positive imagery (see Malouff, McGee, Halford, & Rooke, 2008). Rather than exploring additional types of facilitative imagery (such as preparatory imagery, which will be examined in the present study), the aim in these studies has been to examine the effect of self-confidence when anxiety-producing thoughts are excluded (Malouff et al., 2008), using a quantitative method by measuring performance times. These studies have generally found that the removal of anxious thoughts improves performance.

The reason so much research has focused exclusively on these types of imagery is that while some researchers have found facilitative positive imagery to enhance performance and debilitating (or negative) imagery to impair performance, others have found only the latter (Ramsey et al., 2008). Ramsey, Cumming and Edwards (2008) point out that “an aim of imagery direction studies has been to instruct participants to intentionally use harmful images to impair subsequent performance” (p. 208). These researchers investigated the effects of imagery direction on golf putting performance with the goal of providing for their participants a more realistic debilitating condition. They found that neither debilitating nor facilitative positive imagery improved performance and concluded that their findings suggested that with a less catastrophic and more pragmatic presentation, debilitating imagery can still have a significant impact on performance.

In a groundbreaking study on imagery function in a golf putting task, Short and associates (2002) suggested that like anxiety, imagery direction should be conceptualized as either facilitative or debilitating. Later studies following this model found that debilitating imagery had a stronger or more immediate effect than facilitative imagery on self-efficacy (Nordin & Cumming, 2005) and that debilitating imagery need not be persuasive to influence motor skill performance (Ramsey, Cumming & Edwards, 2008).

Research examining the value of facilitative positive imagery immediately preceding a competition has produced mixed results (Malouff et al., 2008). To date, no published study has found intentionally debilitating imagery to be helpful to athletes. One reason cited by Ramsey and associates (2008) for these inconsistent findings is that in the past, the performance evaluations have been exclusively in terms of hit or miss. For example, a study examining the effects of facilitative positive mental imagery in a free-throw situation would most likely only count the baskets that were made or missed; there is typically no subscale for “getting close”. Olsson, Jonsson and Nyberg (2008) point out that “having only one type of sub-optimal outcome measure may be a reason why some studies of mental imagery failed to show any effects” (p. 134).

Ramsey, Cumming, and Edwards (2008) also point out that some purposeful forms of imagery, including facilitative positive imagery, can be detrimental to athletic performance simply because practitioners often encourage subjects to imagine a scene in as much detail as possible. This method “may prove to be counterproductive if individuals then become focused on details which are extraneous to performance” (p.208) because the athlete’s attention may be diverted away from the main task, such as completing a long jump.

Debilitative imagery

Studies that have used qualitative measures to examine anxiety levels have found debilitating imagery to worsen performance anxiety. For example, Cumming, Olphin, and Law (2007) found that the intensity of both subcomponents of anxiety was greater and participants found their anxiety to be more debilitating after simply reading an anxiety imagery script. Similarly, a study of elite swimmers by Hanton, Mellalieu, and Hall found associations between negative images and debilitating interpretations of cognitive anxiety symptoms, decreased self-

confidence, decreased focus, and poorer performance (Cumming, Nordin, Horton & Reynolds, 2006).

Lang's bioinformational theory

Lang's bioinformational theory of emotional imagery identifies three types of information, referred to as propositions. Firstly, the stimulus contains information about external stimuli, such as a cheering crowd, ill-fitting shoes, or a strong headwind. These are also referred to as environmental cues. In the next phase, response propositions refer to the individual's physiological response to these external stimuli, such as quickened breathing, butterflies in the stomach, or clammy hands. The third proposition describes the individual's cognitive appraisal of the situation, or how he assigns meaning to his physical responses of the stimuli. Since cognitive appraisal is a mental interpretation of corporeal responses, it appears to be largely unconscious and reflexive. Cognitive psychologists have identified the need for further study into cognitive appraisal to investigate whether mental reactions can be controlled (Cumming et al., 2007).

In their assessment of Lang's bioinformational theory, Cumming, Olphin, and Law (2007) say that "imagery allows individuals to develop a new response to stimuli that previously evoked the behavior designated to be changed" (p. 630). Cognitive appraisal is the essential component in determining anxiety direction. The present study investigates if cognitive appraisal of imagery can impact anxiety levels.

Anxiety direction

Until recently, anxiety direction has been studied in a broad sense; that is, interpretations of anxiety have been classified as either facilitative or debilitating to performance. This refers to an athlete's positive or negative interpretations of anxiety symptoms (Thomas, Hanton &

Maynard, 2007). Short and Short (2002) suggest that imagery direction should be conceptualized in this same manner. Facilitative positive imagery would then enhance performance and debilitating imagery would diminish it. The present study aims to reframe the idea of facilitative imagery and conceptualize it into a new form: facilitative preparatory imagery.

Cognitive appraisal with an adversity plan

With the aid of an adversity plan, we believe athletes can use facilitative preparatory imagery to prepare for a worst case scenario. The precompetitive mental training will allow the athletes to appraise their anxiety as helpful rather than debilitating. Following the Giuliani principle, while every possible error cannot possibly be considered, an overview of likely events (such as a faulty takeoff before a high jump or an overenthusiastic start of a distance event) will allow the athlete to consider these complications before they occur and be cognizant of their presence should they arise, allowing them to immediately fix the problem.

Facilitative preparatory imagery

Facilitative preparatory imagery is a process in which one takes a negative situation and develops a positive response to how a negative situation would be overcome. This process of cognitive reappraisal is believed to have a facilitative effect upon performance and cognitive state demonstrated by high levels of confidence coupled with lessened levels of anxiety.

While no studies to date have specifically defined facilitative preparatory imagery, there has been some applicable research in the field of educational psychology. Oettingen and Mayer (2002) point out that “research consistently finds that optimistic thinking about the future fosters motivation and successful performance, whereas pessimistic thinking dampens motivation and successful performance” (p. 1198).

Langens (2004) points out that “sometimes positive goal imagery can undermine motivation to strive for and actually achieve personal goals” (p. 28). Langens cites Oettingen and Mayer (2002), whose research found that those who fantasize more often about their goals invest less effort in putting effort into actually attaining them (Langens, 2004). Therefore, solely positive goal imagery has been shown to both undermine motivation and cause some individuals to disengage from implementing a goal-reaching (or contingency) plan.

While there is a lack of published research on using a contingency plan as part of preparatory imagery, the findings of several studies have necessitated further investigation on the role of positive imagery on goal-setting. In a recent study by Oettingen, Mayer, Thorpe, Janetzke & Lorenz (2005), subjects were instructed to imagine positive outcomes of a vocational training with negative reflections on the reality between the present and the future goal. Oettingen et al. found that having identified possible obstacles to their goal (termed negative reality), the subjects demonstrated a willingness to invest in the vocational training and refrain from dwelling on the negative reality. The researchers discussed the usefulness of mental contrasting, in which “fantasies about a positively-perceived, desired future with negatively-perceived aspects of a reality that stands in the way of realizing the desired future” (Oettingen et al., 2005, p. 239) will reveal a necessity—and more importantly, motivation—to overcome present obstacles.

While simply imagining a worst case scenario does little to psychologically prepare for an event, the present study aims to illustrate that the implementation of a strategic plan addressing possible obstacles should be helpful in alleviating precompetition anxiety.

Adversity plans

While the development of adversity plans has been studied in the context of social (see Oettingen & Mayer, 2002) and cognitive (Langens, 2004) psychology, they have not been thoroughly examined in a sport psychology context. An adversity plan is a mental outline of how an individual would overcome feasible obstacles to a goal. For the purposes of this study, preparatory imagery is the formulation of an adversity plan. This type of imagery should *not* be classified as debilitative although it contains negative thoughts. Instead, preparatory imagery should be conceptualized as another type of facilitative imagery. The key element in this type of imagery is negative images followed by a contingency plan to generate a mentally positive outcome.

Purpose

Based on a review of literature, the purpose of this study is to further develop the notion of facilitative positive imagery by imagining negative obstacles and formulating a contingency plan with positive responses so that participants can mentally rehearse what they would do if obstacles arise. The Giuliani Effect should be demonstrated through lessened levels of anxiety after facilitative preparatory imagery is employed. Therefore, we hypothesize that facilitative preparatory imagery as compared to facilitative positive imagery will lead to lessened anxiety in collegiate track and field athletes.

CHAPTER III

Methods

Design

The study was quantitative in nature, and the method used to collect data was a pre-test, post-test experimental design. The pre-test, treatment phase, and post-test were contained in a participation packet which was mailed to participants. The directions in the packet indicated that the experimental portion should be completed in a single twenty minute session.

Population and Participants

The population for this study was female collegiate track and field athletes in Tennessee. All active members of the track and field and cross country teams at Austin Peay State University in Clarksville, Tennessee were eligible to participate. The participants were given an introduction by the researcher at their final meeting of the academic year and provided the researcher with their contact information. The researcher then mailed out participation packets, which included an explanation of the experiment and procedural instructions, an informed consent form, a demographic information sheet, a Cognitive State Anxiety Inventory-2 (CSAI-2) pre-test, an imagery script, and a CSAI-2 post-test (see Appendix for participant packet contents). Once the sample frame was established, the researcher mailed out 21 informational packets; of these, 12 were returned. One of the returned packets lacked a signature on the informed consent form and its data were not analyzed.

Participants were members of the Austin Peay State University women's track and field cross country teams, all of whom were 19 to 22 years of age. Study participation was completely voluntary, and those that chose to participate were entered in a drawing to win one of three \$25 Nike gift cards.

Procedures

Prior to data collection, each participant was informed of the purpose of the study but was not told to which experimental group she was assigned. All participant rights were ensured by following the procedures put forth by the Institutional Review Board at Austin Peay State University. All participants read and signed an informed consent form before any data were collected. The participation packet also included a written explanation of the purpose of the study and a detailed explanation of participants' rights as human subjects.

Confidentiality will be maintained by keeping all files containing participant information in a locked drawer owned by the researcher. Data will be kept for three years, at which point it will be destroyed.

Each participant was mailed a packet including an informed consent statement and consent signature form, a participant information sheet, the CSAI-2 pre-test and post-test, and one of the three types of imagery scripts. The imagery script was the only component of the packet which was different among participants. Packet distribution was randomized in an ordinal fashion: each successive packet mailed contained (A) a facilitative positive imagery script; (B) a facilitative preparatory imagery script; or (C) a neutral imagery script (see Appendix for scripts).

Three imagery scripts were developed for the purposes of this study. Each script contained either facilitative positive, facilitative preparatory, or neutral imagery cues. All scripts were sport-specific; that is, each script described in detail different aspects of a track meet or cross country event. The competition situation described in each script was based on a first person (internal) perspective. The facilitative positive group read a script similar to that used in previous studies (Craft, Magyar, Becker & Feltz, 2003) which had established this type of imagery to be helpful in alleviating anxiety. A track meet performance was described in detail,

focusing on the athlete's flawless execution of their event. The facilitative preparatory imagery script described an unfavorable situation with several obstacles and a positive response to each obstacle. Finally, the participants given the neutral imagery script served as the control group. This script used impartial vocabulary to depict a factual representation of a track meet.

Following the treatment phase, all participants completed the post-test with the direction modification described above to access their anxiety levels. They returned their information in a self-addressed stamped envelope provided by the researcher.

Instruments

All groups took a pretest consisting of the CSAI-2. The inventory is a well-established instrument that is frequently used for assessing pre- competitive state anxiety (Martins et al., 1990). It was developed by Martins, Burton, Vealey, Bump and Smith in 1990 and is used to distinguish between cognitive and state anxiety. State anxiety is a short-term emotional condition characterized by tension. Its presence is always in response to a specific situation. State anxiety is further subcategorized as either somatic (being felt by the body) or cognitive (being interpreted by the mind). Examples of somatic anxiety include heavy breathing, perspiring, an accelerated heart rate, or the feeling of "butterflies" in the stomach. In contrast, cognitive anxiety is often identified by feelings of excessive apprehension or nervousness.

The CSAI-2 has been proven to be a valid and reliable assessment of precompetitive anxiety (Russell & Cox, 2002). Martens and associates note that it has been instrumental in gaining knowledge about an athlete's levels of anxiety and confidence before competition (1990). The inventory consists of ten questions, each of which is answered on a Likert-type scale of 1 through 4. The answer options measure anxiety intensity and as follows: not at all (1), somewhat (2), moderately so (3), and very much so (4). Four of the questions test for somatic

anxiety (e.g., “My body feels tense”), four test for cognitive anxiety (e.g., “I feel nervous”), and two questions test for confidence (e.g., “I should perform well in this upcoming competition”). The possible anxiety intensity scores range from a minimum of 4 to a maximum of 16 on each subscale. Cronbach’s alpha coefficients demonstrate a high degree of internal consistency for each of the CSAI-2 subscales; in addition, the inventory’s concurrent validity has been found to be highly compatible with the hypothesized relationships among scales of similar constructs and the CSAI-2 subscales (Martens et al., 1990).

The CSAI-2 was also used as a post-test, with the modified direction instructing the participant to apply their imagery script to assess their anxiety levels. During the post-test phase, the participants were instructed to imagine the scene described in the script and answer the questions about somatic and cognitive anxiety and confidence as if they were really at the track meet.

Analysis of Data

Data were analyzed by a multivariate analysis of variance (MANOVA) using the Statistics With Finesse (SWF) program. The MANOVA identifies whether changes in independent variables (to which imagery group participants belonged) have a significant effect on the dependant variables (cognitive anxiety, somatic anxiety, and confidence).

CHAPTER IV

Results

The purpose of this study was to examine the effects of facilitative preparatory imagery as compared to facilitative positive imagery upon anxiety levels in collegiate track and field athletes. Statistical significance required for analyses was a p value less than .05.

Demographics

The participants for this study were selected through their status as track, field, and cross country student-athletes in a mid-sized Division I-AA university. The eleven participants were female student-athletes from Austin Peay State University, aged 19 to 22 years old. They were participants in numerous track, field, and cross country events including 100, 400, and 800 meter sprints; 100 and 400 meter hurdles; 4 x 100 meter relay; 3k, 5k and 10k; 1200 meter distance medley relay; 3000 meter steeplechase; shot put; javelin, and pole vault.

Results

The raw scores for both cognitive and somatic anxiety were combined for each participant to determine their individual anxiety score for the pre-test and post-test phases. The scores were combined to establish a comprehensive anxiety score to make sense of scores reported from a small sample. This will be referred to as “anxiety score”. Possible anxiety scores could range from 8 to 32. The anxiety score was analyzed to determine if there was a significant difference between the three experimental groups.

A one-way multivariate analysis of variance (MANOVA) was conducted to determine the effect of the three types of imagery (facilitative positive, facilitative preparatory, and neutral) on pre-test and post-test anxiety scores. Significant differences were found between the three

imagery strategies. The test for equality of centriods (or Wilks' Lambda) found $F(2,8) = 6.73, p < .05$. Table 1 illustrates the anxiety score means reported by the MANOVA, the resulting probability (p-value), and the difference between pre-test and post-test anxiety score averages for each type of imagery.

Table 1.

Anxiety Score Means and Probability as Reported in Multivariable Analysis of Variance

	<i>Pre-test</i>	<i>Post-test</i>	<i>Difference</i>
Facilitative positive	21	16	5
Facilitative preparatory	26	26.75	.75
Neutral	24.5	24.75	.25
Probability	0.46	0.01	--

A two-sample t-test was conducted for the facilitative positive imagery group as a follow-up to the MANOVA. The researcher determined that one t-test was sufficient because only the facilitative positive imagery group exhibited a noticeable change between the pre-test and post-test scores. This change was calculated by subtracting the post-test mean anxiety score from the pre-test score. In column 3 of Table 1 labeled *Difference*, we can see that the facilitative imagery group average anxiety score dropped from 5 points, while the facilitative preparatory group average anxiety score increased .75 points and the neutral imagery group score increased .25. Therefore, the t-test was conducted to determine whether the mean of the anxiety scores was significantly different in the facilitative positive imagery group. With the statistical significance set at the .05 level, the two-sample t-test did not demonstrate significantly different results between pre-test and post-test anxiety scores for the facilitative imagery group $t(4) = 0.34, p = .056$.

The present research focused on the effects of facilitative preparatory imagery, and in order to examine facilitative preparatory imagery in more detail, a comparison between cognitive and somatic anxiety score is illustrated in Table 2. The means for each subscale of cognitive and somatic anxiety for the preparatory imagery group are demonstrated below. A high average score in each category corresponds to a high level of anxiety. The standard deviation (SD) is reported below each corresponding mean.

Table 2.

Comparison of Anxiety Score Means for Facilitative Preparatory Imagery

	<u>Cognitive anxiety</u>		<u>Somatic anxiety</u>	
	Pre-test	Post-test	Pre-test	Post-test
Mean score	11.75	13.0	15.5	12.75
SD	3.30	2.16	1.0	3.77

CHAPTER V

Conclusions

The researcher hypothesized that female track and field athletes engaging in facilitative preparatory imagery would experience diminished anxiety compared to those who engaged in facilitative positive imagery. The Wilks' Lambda test was found to be significant, $F(2,8) = 6.73$, $p < .05$. We can see in row 4 of Table 1 that the post-test $p = 0.01$, indicating a significant difference between one of the three imagery types in relation to pre- and post-test anxiety scores. These results indicate we can reject the null hypothesis: there *is* a significant difference between the three types of imagery upon the anxiety levels. Examination of anxiety score means reported in Table 1 reveals that facilitative positive imagery was found to reduce anxiety levels more so than facilitative preparatory or neutral imagery. These findings are consistent with previous research on facilitative imagery in that this type of imagery is effective (Malouff et al., 2008; Ramsey et al., 2008; Nordin & Cumming, 2005).

Discussion

An athlete can undergo all the physical preparation in the world, but if she is unable to harness her anxiety or feel confidence in her ability, her performance will ultimately suffer. Although no statistical significance was found to quantify the anxiety-reducing effects of a contingency plan through the use of preparatory imagery, its well-documented success in the social and political worlds warrants more study on this topic.

The importance of preparation in the athletic field can be partially described through the principle of specificity, from the field of strength and conditioning. Specificity is related to modality. In essence, an athlete must practice exactly how she wants to perform. Facilitative preparatory imagery is widely applicable in that if one can prepare for the worst in any situation,

heavy breathing can accommodate a better performance. Although this study focused on cognitive—and to a lesser extent physical—state rather than performance outcome, it is likely that future research in this area will find that a positive mindset corresponds to a better performance.

In the present study, the wide variety of events in track and field rendered a standardized evaluation of performance impossible, yet it is important to note that despite random group assignment, there was an even distribution of athletes who participated in track, field, and cross country events in each experimental group. There were no trends found between the anxiety levels of athletes competing in different events. This may suggest that the type of sport performance (i.e., a track event) does not have an effect on anxiety response when using imagery. Future research could examine these imagery methods across different types of sports.

Recommendations

A statistically significant difference was found between baseline anxiety levels measured before and after the imagery intervention; although not significant, further statistical analysis found this trend was only true for positive facilitative imagery rather than the facilitative preparatory imagery. While these findings were consistent with current research on the usefulness of facilitative imagery, additional studies should be conducted on the effects of facilitative preparatory imagery on anxiety. It is possible that if the participants were given the opportunity to formulate their own contingency plans rather than reading a self-contained preparatory script that they would have been able to modify their anxiety levels using facilitative preparatory imagery.

Further research must be conducted in this area to authenticate or reject the Giuliani effect in a sporting context. A larger sample size is absolutely essential in obtaining reliable information. Another delimitation of the present study that can be modified by use of a larger available participant pool is that of gender. Males might react differently than females to preparatory imagery; the same is true of varying ages of athletes. For instance, high school athletes may have different anxiety patterns than collegiate athletes. Another possibility could be to examine participants in competitive versus noncompetitive adult leagues.

If a researcher wishes to study confidence in particular, an instrument that measures confidence directly should be used rather than the CSAI-2, since it only has two questions pertaining to this area. Confidence associated with positive imagery has been shown to result in performance improvements (see Martin, Mortiz, & Hall, 1999). Future studies could examine if the same is true for using facilitative preparatory imagery. The measure of performance using facilitative preparatory imagery is another area which unquestionably warrants research attention. Unlike mental state, performance can be decisively measured and can provide more reliable information about the mind-body connection.

In terms of research design, future studies might include the administration of an imagery ability assessment before the pre-test phase to ensure the population studied is one that would be able to successfully use imagery independently. Research should focus on groups with high imagery ability first to detect differences in the effectiveness of preparatory imagery, and then any significant findings should be applied to a broader population in subsequent studies.

The present study was exploratory in nature in that the researcher sought to introduce the theory of facilitative preparatory imagery. Its extensive applicability makes preparatory imagery a topic of interest for sports psychologists, administrators, coaches, athletic trainers, and athletes

like. The conceptualization of preparatory imagery as a facilitative construct using negative images should be maintained. This type of imagery is meant to augment mental state and should be treated as another aspect of a well-rounded athletic training program.

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APPENDIX A

Imagery Scripts

Facilitative Imagery Script

DIRECTIONS: Read carefully through the following imagery script. Try to imagine the scene in as much detail as possible.

It is the day of your regional championship meet. The weather is cool and dry, and you anticipate no problems in competing in the sunshine. When you check in for your events, you here is no overlap in the times of the two events you are participating in. Each event begins promptly on time. You have had no injuries this season and you feel strong from your lifting sessions with Coach Troy. You have kept up with your schoolwork and have had no NCAA eligibility issues. As you step to the starting line, the spectators are supportive and their cheering pumps you up. You perform your event flawlessly.

Preparatory Imagery Script

DIRECTIONS: Read carefully through the following imagery script. Try to imagine the scene in as much detail as possible.

It is the day of your regional championship meet. The weather is windy and rainy. Imagine the feeling of performing your event in the rain, enjoying the cool mist on your face. When you check in, you find out that the two events you are participating in are happening simultaneously. At the designated starting time you find that both events have been delayed for several hours. Instead of panicking, you decide to use the extra time to mentally prepare, warm up, and support your teammates in their events. Though you suffered an injury earlier this season, your coach, trainer, and physician have all given you clearance for participation in

today's meet. You've fallen behind on your schoolwork and are worried about your NCAA eligibility, but you consider how you have improved time management skills by organizing study time around practice and travel. The spectators are loud and obnoxious. You turn their negative energy into positive energy to motivate yourself.

Imagery Neutral Script

DIRECTIONS: Read carefully through the following imagery script. Try to imagine the scene in as much detail as possible.

It is the day of your regional championship meet. You walk into the stadium and see several hundred athletes, trainers, coaches, and staff milling around and setting up. You recognize the colors from the warm-up suits of schools which you have been competing with all season. You have all your equipment with you and your event doesn't start for awhile, so you take a walk around with a couple of your teammates to familiarize yourself with the meet setup. Spectators begin to trickle in as you make your way back to your spot. Your event is called and you make your way over to its location and perform it when your name is called.

APPENDIX B

Cognitive State Anxiety Inventory-2

Questionnaire About Your Anxiety

For the following questions, please recall an experience in which you performed poorly:

1. I should perform well in this upcoming competition

Not at all	Somewhat	Moderately So	Very Much So
1	2	3	4

2. I am feeling nervous before this competition

Not at all	Somewhat	Moderately So	Very Much So
1	2	3	4

3. I have self-doubts about my ability

Not at all	Somewhat	Moderately So	Very Much So
1	2	3	4

4. I am feeling jittery before this competition

Not at all	Somewhat	Moderately So	Very Much So
1	2	3	4

5. I am having many unwanted thoughts about this competition

Not at all	Somewhat	Moderately So	Very Much So
1	2	3	4

6. I am feeling the butterflies before this competition

Not at all	Somewhat	Moderately So	Very Much So
1	2	3	4

7. I am concerned I may not do as well as I would like in this competition

Not at all	Somewhat	Moderately So	Very Much So
1	2	3	4

8. My body is feeling tense before this competition

Not at all	Somewhat	Moderately So	Very Much So
1	2	3	4

9. I feel confident that I will compete well

Not at all	Somewhat	Moderately So	Very Much So
1	2	3	4

10. I am having a hard time concentrating on what I need to do for this competition

Not at all	Somewhat	Moderately So	Very Much So
1	2	3	4

add 2, 4, 6, 8 for somatic anxiety

add 3, 5, 7, 10 for cognitive anxiety

add 1 and 9 for confidence

APPENDIX C

Participant Information and Directions

Dear Participant,

Thank you for taking part in my research study. I am examining how anxiety levels are affected in college-level track, field, and cross-country athletes by using a special type of mental imagery called preparatory imagery.

Below is a breakdown of what your participation packet contains:

- INFORMED CONSENT STATEMENT (3 pages)
- PARTICIPANT INFORMATION (1 page)
- QUESTIONNAIRE ABOUT YOUR ANXIETY: PRE-TEST (1 page)
- IMAGERY SCRIPT (1 page)
- QUESTIONNAIRE ABOUT YOUR ANXIETY: POST-TEST (1 page)

DIRECTIONS

STEP 1. Informed Consent

Please read and sign the Informed Consent form. You are required to sign this form if you want to participate and be eligible to win a gift card in the drawing.

STEP 2. Participant Information

Fill out the participant information form.

STEP 3. Pre-test

Follow directions on the "Questionnaire About Your Anxiety". This is a standardized anxiety assessment questionnaire. Recalling a recent practice or meet in which you performed very well, circle 1, 2, 3, or 4 on each question.

STEP 4. Imagery Script

Next is your imagery script. Not everyone will have the same script. You are instructed to read the script to yourself and try to visualize the scene described in as much detail as possible. If the script refers to "your event", please visualize your event.

STEP 5. Post-test

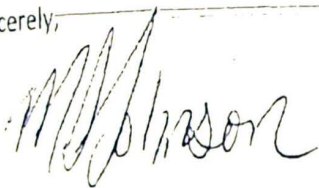
This is an exact replica of your pre-test, but there is a slight modification in the directions. This time, please recall the experience you imagined in your imagery script as you fill out this questionnaire.

STEP 6

Please return the stapled portion to me in the enclosed envelope AS SOON AS POSSIBLE. These directions can be discarded. You will be entered in the prize drawing as soon as I get your packet. The drawing will take place no later than June 15, 2009 or as soon as I receive all the packets from your teammates who participate. I will notify you via telephone or e-mail if you win a gift card.

That's all! Thank you so much for your participation in my research study. If you have any questions whatsoever, do not hesitate to contact me via e-mail, phone, or text.

Sincerely,

A handwritten signature in cursive script, appearing to read 'M. Johnson', written over a horizontal line.

Moira Johnson

(571) 217-1333

Mjohnson50@apsu.edu

APPENDIX D

Statement of Informed Consent

INFORMED CONSENT STATEMENT

The effects of preparatory imagery on anxiety in collegiate track and field athletes

INTRODUCTION

The Department of Health and Human Performance at Austin Peay State University supports the practice of protection for human subjects participating in research. The following information is provided to help you decide whether you wish to participate in the present study. You retain the right to refuse to sign this form and not participate in the study. You should be aware that even if you consent to participate in this study, you may withdraw from this study at any time without consequences. If you choose to withdraw from this study, it will not affect your relationship with this department, the services it may provide to you, or Austin Peay State University.

PURPOSE

The purpose of this study is to examine how the implementation of a contingency plan through preparatory imagery can help athletes alleviate their symptoms of performance anxiety.

PROCEDURES

You will be asked to take a pretest to assess your baseline anxiety level. You will then be given an imagery script to read which will describe a track meet. Finally, you will be given a post-test to assess your anxiety level again. The approximate time required for completion is thirty minutes.

RISKS

The possible risks associated with this research study are minimal and limited to slight psychological discomfort.

BENEFITS

You will familiarize yourself with the use of mental imagery in a sport context. Imagery can be applied to numerous areas of life.

COMPENSATION

Upon completion of your participation today, you will be entered in a drawing to win a \$25 Nike gift card.

PARTICIPANT CONFIDENTIALITY

Confidentiality will be maintained by keeping your participant packets in a locked cabinet to which only the principal researcher will have access.

REFUSAL TO SIGN CONSENT

You are not required to sign this Consent form and you may refuse to do so without affecting your right to participate in any programs or events of Austin Peay State University or any services you are receiving or may receive from Austin Peay State University. However, if you refuse to sign, you cannot participate in this study.

CANCELLING THIS CONSENT

You may withdrawal your consent to participate in this study at any time. If you choose to withdraw from the study before data collection is completed, any collected data will be destroyed and not used.

QUESTIONS ABOUT PARTICIPATION

If you have any questions about the procedures, you may direct them to the principal investigator, Moira Johnson.

CONSENT

I have read the above information and received a copy of this form. I have had the opportunity to ask questions regarding my participation in this study. I agree to take part in this study as a research participant.

By my signature I affirm that I am at least 18 years old and a student at Austin Peay State University.

Print Participant's Name

Date

Participant's Signature

Date

RESEARCHER CONTACT INFORMATION

Moira Johnson

Graduate Assistant office (931) 221-6311

Mjohnson50@apsu.edu

Dr. Gregg Steinberg

steinbergg@apsu.edu

931-221-6113

IRB CONTACT INFORMATION

Dr. Charles Grah, Chair

grahc@apsu.edu

(931) 221-7231

APPENDIX E

Participant Information Form

PARTICIPANT INFORMATION

Gender *(please circle)*:

Male

Female

Classification *(please circle)*:

Freshman

Sophomore

Junior

Senior

Please list the events you usually participate in:

State University
Psychology Department

May 18, 2009

Moira Johnson
205 Aster Drive
Clarksville, TN 37040

RE: Your application regarding study number 09-012: The effects of preparatory imagery on anxiety in collegiate track and field athletes.

Dear Ms. Johnson

~~Thank you for your application for the study above. The Austin Peay IRB has reviewed your application and has approved your study without modification. Congratulations!~~

You are granted permission to conduct your study as described in your application effective immediately. The study is subject to continuing review on or before May 18, 2010, unless closed before that date. Enclosed please find the forms to report when your study has been completed and the form to request an annual review of a continuing study. Please submit the appropriate form prior to May 18, 2010.

Please note that any changes to the study as approved must be promptly reported and approved. Some changes may be approved by expedited review; others require full board review. If you have any questions or require further information, contact me at (221-7231; fax 221-6267; email grahc@apsu.edu).

Again, thank you for your cooperation with the APSU IRB and the human research review process. Best wishes for a successful study!

Sincerely,



Charles R. Grah
Chair, Austin Peay Institutional Review Board

Cc: Dr. Gregg Steinberg, Health and Human Performance