Spring 2015

Using A Motivational General-Mastery Imagery Intervention to Improve the Self-Efficacy Of Youth Gymnasts

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USING A MOTIVATIONAL GENERAL-MASTERY IMAGERY INTERVENTION TO IMPROVE THE SELF-EFFICACY OF YOUTH GYMNASTS

by

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(Under the Direction of Brandonn Harris)

ABSTRACT

Self-efficacy plays a significant role in influencing sport performance (Moritz, et al., 2000) and has been shown to be a stronger predictor of sport performance compared to anxiety, perceived control, and one's personal goals (Feltz & Lirg, 2001). The use of motivational general-mastery (MG-M) imagery has been shown to increase self-efficacy among athletic populations (O, et al., 2014); however, there is a paucity of research regarding the influence of imagery, particularly individualized MG-M imagery, on the self-efficacy of youth athletes specifically. Thus, the purpose of the present study was to examine the effects of an individualized MG-M imagery intervention on the self-efficacy and MG-M imagery use of youth gymnasts (M_{age} = 10.40). A single-subject, ABA design spanning seven total weeks was employed with five youth gymnasts who competed at a level six or above, as sanctioned by USA Gymnastics, and who had at least one year of competitive experience. Participants received individualized MG-M imagery scripts and engaged in guided imagery sessions along with independent imagery practice. Measures assessed athletes' MG-M imagery use, imagery ability, and self-efficacy specific to training. Visual inspection of the graphed data indicated improvements in self-efficacy from baseline through the intervention for one of the five participants. Effect sizes were also used to evaluate the magnitude of changes in mean and variability among phases. Both self-efficacy and imagery use scores decreased in variability, evidencing more stability from baseline to the intervention phase for two out of the five participants for self-efficacy and four of the five participants for imagery use. Implications from this study provide direction for practitioners and researchers regarding the development and implementation of MG-M imagery interventions in order to increase youth athletes' self-efficacy and imagery use.

INDEX WORDS: Self-efficacy, Imagery, Single-subject, Youth athletes

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by

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Sport and Exercise Psychology, West Virginia University, 2012

A Thesis Defense Submitted to the Graduate Faculty of Georgia Southern University in Partial Fulfillment of the Requirements for the Degree

MASTER OF SCIENCE IN KINESIOLOGY; SPORT AND EXERCISE PSYCHOLOGY

STATESBORO, GEORGIA

2015

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Electronic Version Approved:
Spring 2015

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CHAPTER 1

INTRODUCTION

Every athlete has an individual level of confidence in their ability to be successful in their sport. Bandura (1997) noted that confidence refers to the strength of belief in one's abilities but does not specify exactly what the certainty is about; whereas self-efficacy denotes the strength of belief in one's ability to perform a specific desired behavior. More specifically, self-efficacy has been defined as the "beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (Bandura, 1997, p.3). Self-efficacy is significant to athletes because their thoughts about their abilities have the potential to affect their actual performance.

Bandura (1997) explained that an athlete's performance might be influenced through their perceptions of self-efficacy, as self-efficacy may affect an athlete's task choice, level of effort, and persistence through obstacles. For example, an athlete with high self-efficacy will choose challenging tasks, put forth a substantial amount of effort, and more likely to persevere through obstacles. Conversely, an athlete with low self-efficacy is likely to avoid challenging tasks, put forth lackluster effort, and less likely to persevere through obstacles. Moritz, Feltz, Fahrbach, and Mack (2000) support this notion, suggesting self-efficacy to be a strong predictor of sport performance, with other researchers demonstrating self-efficacy to be a stronger predictor of sport performance compared to anxiety, perceived control, and one's personal goals (Feltz & Lirgg, 2001).

The importance of self-efficacy also appears to be consistent across the lifespan, with its significance evident specifically within youth sport. For example, Weiss, Wiese, and Klint (1989) conducted a study with male gymnasts between the ages of 7-18 and found self-efficacy to be a stronger predictor of performance when compared to precompetitive anxiety, years of experience, and worry-related cognitions. Within youth sport, levels of self-efficacy not only affect performance but also an athlete's development. Children's self-perceptions develop as a result of their cognitive maturation (Harter, 1999; Horn, 2004) and their environment including academic and sport domains (Harter 1996; 1999; Horn 2004). Of particular interest to the current research is their sport environment, as it is likely to influence children's perceptions of themselves and their competence, including levels of self-efficacy. Given the established impact self-efficacy can have on performance and an athlete's development, sport stakeholders aware of this knowledge (e.g. athletes, coaches, sport psychology professionals) may enhance their service provision from learning how to increase self-efficacy in themselves or athletes.

According to Bandura's (1997) self-efficacy theory, previous accomplishments, verbal feedback, physiological states, emotional states, and vicarious experience can enhance one's self-efficacy. Although Bandura (1997) noted previous accomplishments to be the strongest predictor of self-efficacy, vicarious experiences, including imagery, may be of particular relevance to youth athletes given they may not have many previous performance accomplishments to draw from. In order for youth athletes to effectively

increase levels of self-efficacy through the use of imagery, it is imperative to understand the various types of imagery.

There are five types of imagery that require athletes to visualize different images and have the potential to serve different purposes. The five types of imagery include (a) motivational-specific (MS), (b) motivational-general mastery (MG-M), (c) motivational-general arousal (MG-A), (d) cognitive specific (CS), and (e) cognitive general (CG; Martin, Moritz, & Hall, 1999). According to Martin and colleagues (1999), the function of imagery an athlete uses should coincide with the goal(s) of their behavior. Thus, it is important for athletes to determine their goal behavior before identifying the type of imagery that is the most appropriate for them to use. The applied model of imagery states "the type of imagery used by the athlete (i.e., the function of purpose that imagery is serving) as a determinant of cognitive, affective, and behavioral outcomes" (Martin et al., 1999, p. 249). If the goal behavior is to increase self-efficacy, motivation general-mastery is the recommended form of imagery for an athlete to use.

Research investigating the individual contributions of each type of imagery on enhancing self-efficacy has generated interesting findings. Munroe-Chandler, Hall, and Fishburne (2008) examined the relationship between imagery use, self-confidence, and self-efficacy among youth soccer players. Their results suggested that compared to other forms of imagery, MG-M imagery was the strongest predictor of increases in self-confidence and self-efficacy in both competitive and recreational athletes, aged 11-14 years. Motivation general-mastery imagery is defined as "imagery that represents effective coping and mastery of challenging situations, such as being mentally tough,

confident, and focused during sport competition" (Martin et al., 1999, p.250). An athlete using MG-M imagery may imagine themselves successfully performing during competition, exuding confidence, and being mentally tough. Although mental toughness can be defined in several ways, it is typically considered the amount of mental resilience and focus an athlete has when handling pressure and setbacks (Weinberg & Gould, 2007). Furthermore, the applied model of imagery predicts that the use of MG-M imagery would increase or maintain levels of self-efficacy in training, competition, and rehabilitation (Martin et al., 1999). Martin and colleagues also suggest that motivational types of imagery, such as MG-M imagery, are best used with athletes who have already learned requisite skills. Further, the authors note MG-M imagery can be used to help athletes perform skills they have already acquired with more confidence and assertiveness. Other benefits of using MG-M imagery during training situations include learning how to cope with setbacks and maintain a positive, confident attitude during those particularly challenging situations (Martin et al., 1999; Orlick, 1990).

Researchers have also examined the relationship between a MG-M imagery intervention and self-confidence. For example, Callow, Hardy, and Hall (2001) implemented a MG-M imagery intervention individually with four high-level badminton players under the age of eighteen. Results suggested that three of the four athletes experienced increases in mean self-confidence levels from baseline to post intervention. Callow and Waters (2005) found similar results when they implemented a three week MG-M imagery intervention with three professional flat-race horse jockeys, as results demonstrated two of the three jockeys experienced increases in sport confidence.

More recently, O, Munroe-Chandler, Hall, and Hall (2014), implemented a MG-M imagery intervention program with youth squash players. Instead of measuring self-confidence as previously done, these authors selected self-efficacy as the outcome variable of interest. The intervention consisted of daily imagery practice along with a weekly guided imagery session. Notably, the imagery scripts were highly individualized. Cumming, Hall, and Shambrook (2004) described the importance of individualizing imagery scripts for athletes by taking into consideration the sport's requirements, needs, interests, and capabilities of each athlete. Three of the five squash players involved in the study demonstrated improved levels of self-efficacy.

Much of the aforementioned research in this area has targeted the influence of imagery on adults' perceptions of self-efficacy and self-confidence. As such, there appears to be a paucity of research regarding the influence of imagery, especially MG-M imagery use, on the self-efficacy of youth athletes. Moreover, O and colleagues (2014) state there is a lack of research examining the effects of individualized imagery interventions with youth athletes. Additionally, Munroe-Chandler and associates (2008) recommended future research examine the relationship between imagery use and self-efficacy in sports other than soccer in order to generalize these findings, as well as using participants between the ages of seven to ten years. Given how influential self-efficacy is regarding sport performance and an athlete's development, as well as how the use of motivational general-mastery imagery has been demonstrated to increase self-efficacy, there is a need for further research that examines these concepts concurrently. Martin and colleagues (1999) encourage researchers to use the applied model of imagery to develop "specific, testable hypotheses" (p.258). Thus the purpose of the present study was to

examine the effects of an individualized MG-M imagery intervention on the self-efficacy and MG-M imagery use of youth gymnasts. It was hypothesized that athletes would show increases in both self-efficacy and imagery use from their baseline to intervention phases.

CHAPTER 2

METHODS

Participants

The initial pool of participants included six female youth gymnasts (8-12 years old, *M*=10.67). One participant quit gymnastics during the second week of the study and consequently dropped out of the study. The participants were selected based upon their age, level, and years of competitive experience. All participants were recruited from a gymnastics club in Southeastern Georgia and had at least one year of competitive experience. Furthermore, all of the participants were competing at a level six or above, as sanctioned by USA Gymnastics (USAG). Gymnasts competing under USAG regulations may compete in levels one through ten. Levels one through five are considered compulsory levels and requires gymnasts to learn and demonstrate the basic fundamentals of gymnastics. Gymnasts competing at level six and above have a higher degree of difficulty within their routines. Unlike the compulsory levels, gymnasts at level six or above have individual routines and choreography that follow regulations set by USAG.

Considering previous research has demonstrated male athletes to generally have higher self-efficacy than females, females could potentially benefit from this study more than males (Moritz, Feltz, Fahrbach, & Mack, 2000). This study involved youth gymnasts given previous research by O and colleagues (2014) indicate the lack of research examining the effects of individualized imagery interventions with youth athletes.

Additionally, Munroe-Chandler and associates (2008) recommended future research examine the relationship between imagery use and self-efficacy in sports other than soccer in order to generalize their findings, as well as using participants between the ages of seven to ten years. Further, through statistics presented by the national governing body of gymnastics in the United States, USA Gymnastics (USAG), it is evident that the amount of female gymnasts participating in USAG is steadily increasing. From 2000 to 2012, the membership of female gymnasts in USAG has increased from 76,046 to 96,175 (USA Gymnastics, 2013). This trend indicates the importance of choosing female gymnasts for this study.

Instrumentation

Demographics. Information regarding participants' age, current level, and years of competitive gymnastics experience were collected using a demographics form (see Appendix E). Parents completed this on behalf of the child simultaneously with the consent form.

Imagery ability. The Movement Imagery-Questionnaire-Revised was administered to participants to measure visual and kinesthetic imagery ability (MIQ-R; Hall & Martin, 1997; see appendix F). It is important, especially with youth participants, that they have the ability to visualize images sufficiently. The applied model of imagery describes imagery ability as a moderator variable (Martin et al., 1999). Baron and Kenny (1986) define a moderator variable as one that "affects the direction and/or strength of the relation between an independent or predictor variable and a dependent or criterion variable" (p. 1174). Within the present study, imagery ability may affect the relationship

between MG-M imagery and self-efficacy, which is why each participant must have an adequate score on both the visual and kinesthetic imagery ability scales (Callow, Hardy, & Hall, 2001). The MIQ-R is different from the MIQ in that it is shorter in length, items were reworded to be clearer, and the rating scale is reversed from the MIQ.

The MIQ-R includes eight items and asks participants to image four different motor actions. Each motor action is imaged twice with four of the items assessing visual imagery ability and four items assessing kinesthetic imagery ability for each of the motor actions. To implement this assessment, first, the starting position is described and the participant is asked to arrive in that position. Next, the movement is described and the participant is asked to perform it. The participant is then asked to reassume the starting position and imagine performing the movement (no movement is physically performed). Finally, the participant is asked to rate how easy or difficult it was for them to visually see or kinesthetically feel each movement. A 7-point Likert-type scale ranging from 1 (very hard to see/feel) to 7 (very easy to see/feel) is used to rate each item. The scores and means for the visual and kinesthetic items are added separately. According to Callow, Hardy, and Hall (2001), a score below 16 in either visual imagery ability or kinesthetic imagery ability is considered inadequate. A significant correlation was found between the already validated MIQ and MIQ-R for both the visual (r = -.77) and kinesthetic (r = -.77) scales (Hall & Martin, 1997). Because the MIQ is scored in the reverse direction compared to the original the MIQ-R, there are negative correlations which indicates the MIQ-R was an acceptable revision of the MIQ and adequately assesses visual and kinesthetic imagery ability.

Self-efficacy. The Self-efficacy Questionnaire was used to assess the perceived general self-efficacy of each participant in training (SEQ; Mills, Munroe, and Hall, 2001; see Appendix G). The SEQ is comprised of five items which ask the participant to write the strength of their belief in their mental abilities based on a 100-point scale, ranging in 10-unit intervals from 0 (no confidence) to 100 (complete confidence). Examples of the mental abilities include focus, being in control, and mental toughness. Specifically, the five items are: "I am confident I can work through difficult situations"; "I am confident I can remain focused during a challenging situation"; "I am confident I can be mentally tough throughout a competition"; "I am confident I can remain in control in challenging situations"; and, "I am confident I can appear confident in front of others." The SEQ has been found to have adequate internal consistencies with an alpha level of .86 (Munroe-Chandler, Hall, & Fishburne, 2008).

Imagery frequency. The Sport Imagery Questionnaire for Children was used to assess the frequency of motivational general-mastery (MG-M) imagery use by each participant (SIQ-C; Hall, Munroe-Chandler, Fishburne, & Hall, 2009; see Appendix H). The SIQ-C is a 21-item self-report questionnaire that measures all five functions of imagery. For the purpose of the present study, only the five items relating to MG-M imagery were included. Participants were asked to rate their use of imagery on a 5-point Likert-type scale ranging from 1 (not at all) to 5 (very often) indicating how often they use MG-M imagery. The five items are as follows: "I imagine myself being confident in competition"; "I see myself being mentally strong;" "I see myself being focused in a tough situation;" "I see myself being in control in tricky situations;" and "I see myself

getting through tough situations with good results." Factor analysis supported the separate constructs of the SIQ-C. The MG-M subscale also demonstrated acceptable internal consistencies with alpha coefficients ranging from .70-.82. Furthermore, a strong correlation was found between MG-M imagery use and self-efficacy through convergent validity of $r = .61$ (Hall, et al., 2009).

Weekly imagery use. Each participant was provided with an imagery journal to record daily imagery practice and any additional homework. Each journal contained an imagery use log for each day of the intervention, homework activities, and a copy of the SEQ and SIQ-C that was completed at the end of each week by the participant. The imagery use log was adapted from the original imagery use log by O and colleagues (2014). The daily log is an easy-read format which asks the participant the date, whether the participant performed her imagery practice that day, how many trials were performed (check boxes ranging from zero-three), how difficult it was to imagine the situation in the imagery script (five check boxes ranging from really hard to really easy), and a text box for any questions or comments (see Appendix I).

Procedures

After receiving approval from the IRB, owners of a gymnastics club in Southeastern Georgia were initially contacted by phone and email. Once permission to recruit for the study was granted through them, parents were approached to request their and their child's participation in the study. The researcher explained simultaneously to the parents and children the general purpose of the study. Then, of those who were interested, the parents were given the informed consent (see Appendix C) and

demographics form (see Appendix E) while the children were given the assent form (see Appendix D). Finally, the researcher arranged data collection days and times with each participant.

Baseline data collection occurred two to three times a week for one to two weeks. The researcher ensured each participant established a stable baseline before the intervention began. Once a stable baseline was established, each participant began the imagery intervention and met individually with the researcher twice a week for three weeks while completing three homework assignments per week. After the imagery intervention was complete, each participant completed two weeks of return to baseline data collection.

Baseline Data Collection

During the time agreed upon by each participant and researcher, gymnasts completed the SEQ and SIQ-C two to three times a week for one to two weeks, until a stable baseline was established. The participants were given the assessments individually prior to their gymnastics practice. After baseline data collection had concluded, the intervention phase began.

Intervention Phase

Following a similar protocol used by Callow and colleagues (2001), the intervention included each participant meeting with the researcher individually twice a week for three weeks. Outside of meeting with the researcher twice a week, the participants were asked to perform either imagery or homework activities at least three

days during week (adapted from O et al., 2004; see Appendix J). Each homework activity took approximately 10 to 15 minutes to complete. The first and second imagery session lasted approximately 25-45 minutes while the remaining four sessions were approximately 20-25 minutes. During sessions three through six, the first five minutes of the session were spent addressing any questions or concerns the individual may have about imagery practice or the intervention, as well as checking the individual's homework logs. The next ten minutes of the imagery session, the researcher read the participant their individualized MG-M imagery script. Afterwards, 10 minutes were spent for processing and an opportunity for the participant to present any questions or concerns to the researcher. Below is a detailed guideline for the intervention phase.

Session one. The first session included educating the athletes about imagery. The session focused on both visual and kinesthetic imagery**.** The researcher began by defining imagery, describing the senses involved, and explaining the internal and external perspectives of imagery. Then, the researcher administered the MIQ-R. Similar to the protocols employed by previous research (i.e. Callow et al.,2001; O et al., 2014), the participants who scored below a 16 on either the visual imagery ability or kinesthetic imagery ability subscales on the MIQ-R engaged in further imagery education during the second session. One participant demonstrated a kinesthetic imagery ability subscale score below 16. Therefore, she received additional imagery training until her kinesthetic imagery ability subscale score was above 16, indicating sufficient kinesthetic imagery ability. After completing the MIQ-R, the participants were asked whether they use an internal or external perspective during imagery. The session lasted approximately 45

minutes to an hour. Finally, the researcher completed a checklist in order to ensure consistency among all the sessions (see Appendix K).

In between the first and second session, the participants completed their first homework assignment. The participants completed a worksheet asking them to identify three examples of each of the five senses that they experience during a typical practice. Their answers were included in their imagery script in order to make it vivid and more individualized for participants.

Session two. During the second session**,** individual meetings were held with the gymnasts to discuss the content of their individualized imagery script. The researcher asked the athlete to identify several specific gymnastics situations where she had low confidence in her ability to be successful. Then, the researcher and athlete decided which gymnastics event was going to be used to create the imagery scripts. The researcher and athlete also discussed if the athlete preferred an audio recording or written version of their imagery script for the homework assignments. Following agreement upon this scenario, the researcher created an individualized imagery script which guided the participant to use aspects of MG-M imagery by imagining successfully overcoming a challenging gymnastics situation with an emphasis on feeling confident and being in control of one's own performance throughout a specific gymnastics scenario. Following this, the researcher and participant reviewed the first homework assignment. The content of this assignment was applied to each individual's script. The participants who previously scored below a 16 on either the visual imagery ability or kinesthetic imagery ability subscales on the MIQ-R received additional education on whichever subscale they

scored inadequately. Then, the participant took the MIQ-R again at the end of this session. Participants who scored adequately on the MIQ-R during the first session were administered an imagery script adapted from *The Mental Athlete.* To conclude the session, the researcher explained the second and third homework assignments. This session lasted approximately 45 minutes for each participant. Following the second session, the researcher created an individualized imagery script which guided the participant to use aspects of MG-M imagery by imagining successfully overcoming a challenging gymnastics situation with an emphasis on feeling confident, being in control of one's own performance, and being mentally tough throughout a specific gymnastics scenario. For the participant's imagery practice at home, the researcher created an audio recording of each participant's imagery script.

For the second homework assignment, the participant listened to their individualized imagery script and completed the imagery log. The participant completed the SEQ and SIQ-C for the third homework assignment.

Session three. During the beginning of the third session, time was set aside to collect and review the previous week's homework and address questions or concerns the individual had about imagery practice or the intervention. The researcher then read the imagery script that focused on feelings of confidence, control, and mental toughness associated with the successful performance experienced in the image. The final part of this session included time for the participant to ask any questions they had regarding their imagery practice or script. The researcher ended the session by reminding the participant about upcoming homework activities. This session took approximately 20-25 minutes.

For the fourth homework assignment, the participant visualized their imagery script and completed the imagery log.

Session four. The beginning of the fourth session of the second week, the researcher collected and reviewed the participant's imagery log and addressed questions or concerns the individual had about their imagery practice or the intervention. The researcher then read the imagery script that focused on feelings of confidence, control, and mental toughness associated with the successful performance experienced in the image. The final part of this session included time for the participant to ask any questions they had regarding their imagery practice or script. The researcher ended the session by reminding the participant about upcoming homework activities. This session lasted about 20-25 minutes.

The fifth homework assignment asked the participant to visualize their imagery script and complete the imagery log. For the sixth homework assignment, the participant completed the SEQ and SIQ-C.

Session five. Session five during the last week of the intervention began by the researcher collecting and reviewing the previous week's homework and addressing address questions or concerns the individual had about imagery practice or the intervention. Then, the researcher read the imagery script, which included feelings of confidence, control, and mental toughness associated with the successful performance experienced in the image. The final part of this session included time for the participant to ask any questions they had regarding their imagery practice or script. The researcher ended the session by reminding the participant about upcoming homework activities. This

session lasted approximately 20-25 minutes. For the seventh homework assignment, the participant visualized their imagery script and completed the imagery log.

Session six. The beginning of the sixth session was used to collect and review the participant's imagery log and address questions or concerns the individual had about imagery practice or the intervention. Then, the researcher read the imagery script which will included images of feeling confidence, control, and mental toughness associated with the successful performance experienced in the image. The final part of this session included time for the participant to ask any questions they had regarding their imagery practice or script. The researcher ended the session by reminding the participant about upcoming homework activities. This session took approximately 20-25 minutes.

The participant visualized their imagery script and completed the imagery log in order to complete the eighth homework assignment. For the ninth homework assignment, the participant completed the SEQ and SIQ-C.

Post-intervention Data Collection

The post-intervention questionnaire packet consisted of the SEQ and SIQ-C. Post-intervention data were collected from each participant for the same amount of time as baseline data collection. Administration of the questionnaire packet will occur during the previous time allotted for imagery practice and in the same location. The packet took approximately 10-15 minutes to complete**.**

Data Analyses

Data were graphically represented for each gymnast and was reviewed by visual inspection for any changes in self-efficacy and imagery frequency. Visual inspection was used to determine any changes between baseline and intervention conditions in regards to self-efficacy and MG-M imagery use. Researchers observed and analyzed the means, level, trend, latency, and variability across similar phases within the graphic representation of data. The magnitude of change in self-efficacy and imagery use was evaluated using visual inspection to examine changes in means and levels. Changes in means across phases are shifts in the average rate of self-efficacy and imagery use while changes in levels refer to the shift or discontinuity of scores from the end of one phase to the beginning of the next phase (Kazdin, 1982). Additionally, mean shift was analyzed using the d_1 statistic. The *d* index provides a description of the magnitude of change between phase means, with respect to changes in self-efficacy and MG-M imagery use from baseline through the intervention phase. Next, the rate of change in self-efficacy and imagery use was evaluated using visual inspection to analyze trend and latency. Kazdin (1982) defines trend as the tendency for scores to show systematic increases or decreases over time while latency of change refers to the period between the onset or termination of one condition (baseline, intervention, and return to baseline) and changes in self-efficacy and MG-M imagery use. Lastly, changes in variability were assessed using the f^2 statistic. The f^2 statistic indicates the strength of change in variability of self-efficacy and MG-M imagery use from baseline through the intervention phase. Each of these was measured individually and collectively to observe the effects of the MG-M intervention on the self-efficacy and imagery use of each participant.

CHAPTER 3

RESULTS

Magnitude of Change in Self-Efficacy

The magnitude of change in self-efficacy was evaluated using visual inspection to examine changes in means and levels. Changes in means across phases are shifts in the average rate of self-efficacy while changes in levels refer to the shift or discontinuity of performance from the end of one phase to the beginning of the next phase (Kazdin, 1982). Additionally, mean shift was analyzed using the d_1 statistic, an adaptation of Cohen's *d*, which provides a description of the magnitude of change between phase means, with respect to changes in self-efficacy from baseline through the intervention phase (Kromrey & Foster-Johnson, 1996).

Means. Upon visual inspection of the data, Participant 3 demonstrated an increase in self-efficacy levels during the intervention phase (Table 1). Further, through analyzing the corresponding d_1 statistic, moderate changes in levels of self-efficacy were evident (Figure 1; d_1= .51). Participant 4's mean self-efficacy scores between baseline and intervention phases remained fairly stable (Table 1). As evidenced by their mean self-efficacy scores from baseline through the intervention, Participants 1, 2, and 5 did not demonstrate increases in self-efficacy (Table 1). Through evaluating the corresponding d_1 statistic, Participant's 1 (d_1= -1.03), 2 (d_1= -4.07), and 5 (d_1= -6.79) did not experience increases in self-efficacy following the intervention. All participants established stable baseline self-efficacy scores and during the return to baseline phase, all participants demonstrated decreases in mean self-efficacy levels from the intervention phase.

Levels. Immediately after the intervention was implemented, no shifts in levels of self-efficacy occurred for Participants 1, 4, and 5. Levels of self-efficacy shifted slightly down for Participant 2 indicated by her final baseline self-efficacy score of 80 and first intervention self-efficacy score of 76. Participant 3's level of self-efficacy shifted up as evidenced by her last baseline score of 76 and her first intervention self-efficacy score of 82. As observed through their final self-efficacy score during the intervention phase (*I*) and first self-efficacy score during the return-to-baseline phase (*RB*), Participants 1 (I_9=78, RB_1=76), 3 (I_9=76, RB_1=72), 5's (I_8=82, RB_1=76) levels of self-efficacy shifted down immediately after the intervention was withdrawn. Participant 4's level self-efficacy shifted slightly up immediately after the intervention was withdrawn (I_9=93, RB_1=95). No change in level of self-efficacy occurred for Participant 2 between the intervention and return to baseline phases.

Rate of Change in Self-Efficacy

The rate of change in self-efficacy was evaluated using visual inspection to analyze trend and latency. Kazdin (1982) describes trend as the tendency for self-efficacy scores to show systematic increases or decreases over time while latency of change refers to the period between the onset or termination of one condition (baseline, intervention, and return to baseline) and changes in self-efficacy.

Trend. Little to no trend is evident for Participant 1 between the baseline, intervention, and return to baseline phases. Participant 2 demonstrated a steady trend during baseline, a decreasing trend during the intervention phase, and a relatively stable trend again when the intervention was withdrawn. An accelerated trend is seen

immediately after the intervention phase begins for Participant 3, however the trend stabilizes throughout the rest of this phase. During the return to baseline phase, Participant 3 demonstrates no trend until the final self-efficacy score increases slightly. Participant 4's baseline self-efficacy scores show no trend while an increasing trend is observed briefly during the end of the intervention phase. Further, Participant 4's trend is reversed a bit after the intervention is withdrawn but stabilizes throughout the rest of the return to baseline phase. During the baseline phase, Participant 5's self-efficacy shows no trend yet during the intervention and return to baseline phase, her self-efficacy demonstrates a decreasing trend.

Latency. Participant 1 did not experience a significant latency of change during any of the phases. Her self-efficacy remained stable until the second week of the intervention when it decreased slightly and did not increase until the last session of the intervention. Further, Participant 1's self-efficacy decreased slightly during the beginning of the return to baseline phase and then remained stable throughout. Participants 2 and 5's self-efficacy declined during the first week of the intervention, demonstrating a short period of latency. Participant 5 also demonstrated a short latency period during the return to baseline phase as her self-efficacy decreased immediately after the intervention was taken away. Participant 3 experienced an immediate increase in self-efficacy upon the intervention being implemented, indicating a short latency period. However, this increase was not sustained throughout the intervention phase as evidenced by a slight decrease in self-efficacy during the second week of the intervention. Further, Participant 3's demonstrated a short latency period during the return to baseline phase as her self-

efficacy decreased immediately after the intervention was withdrawn. Participant 4's self-efficacy scores increased slightly during the last week of the intervention, representing a delayed latency of change. This increase was maintained for two sessions until it decreased slightly. During the return to baseline phase, Participant 4's self-efficacy instantly increased a bit, indicating a short latency period, but then consistently fluctuated throughout the remainder of the return to baseline phase.

Variability. Changes in variability were evaluated using the f^2 statistic. A large decrease in self-efficacy variability was observed for Participants 1 and 3 (f^2= .4 and f^2=.75, respectively), evidencing more stability from baseline to the intervention phase. Additionally, Participants 2, 4, and 5 self-efficacy scores from baseline to intervention revealed a large increase in variability (f^2=1.04, .62, and 11.45, respectively).

Magnitude of Change in Imagery Frequency

The magnitude of change in imagery frequency was evaluated using visual inspection to examine changes in means and levels. Shifts in the average rate of MG-M imagery use across across phases refer to changes in means while changes in levels represent the shift or discontinuity of imagery use from the end of one phase to the beginning of the next phase (Kazdin, 1982). Additionally, the mean shift was analyzed using the d_1 statistic, an adaptation of Cohen's *d*, which provides a description of the magnitude of change between phase means, with respect to changes in imagery use from baseline through the intervention phase (Kromrey & Foster-Johnson, 1996).

Means. Data from the SIQ-C indicated that all participants used MG-M imagery during the intervention, as evidenced by MG-M mean frequencies being greater than

zero. However, gymnasts did not experience increases in MG-M imagery frequency from baseline through the intervention phase. Specifically, through evaluating the mean MG-M imagery use score and corresponding d_1 statistic, Participant 3 demonstrated a moderate decrease in MG-M imagery use from baseline through the intervention phase (M_{Base} = 3.36, M_{Int} = 3.22; d_1= -.68). Contrary to the hypothesis, Table 2 and the d_1 statistic reveal large decreases in MG-M imagery from baseline through the intervention were reported from Participants 1 (d_1= -1.19), 2 (d_1= -1.21), 4 (d_1= -1.5), and 5 (d_1= -1.67). Participant 5 stated that she forgot to complete the SIQ-C during the third and final week of the intervention. During the return to baseline phase, Participants 2 (M_{Int} = 3.6, M_{RtoB} = 4.8) and 5's (M_{Int} =3.675, M_{RtoB} = 3.24) mean MG-M imagery use scores decreased from the intervention phase. Additionally, Participant 3's mean MG-G imagery use increased during the return to baseline phase (M_{Int} = 3.22, M_{RtoB} = 3.64) while Participants 1 and 4 reported fairly stable mean MG-M imagery use scores during the intervention and return to baseline phases (Table 2).

Levels. Immediately after the intervention was introduced, no shifts in levels of imagery frequency were evident for Participants 1, 2, 3, and 4. The level of imagery frequency shifted slightly down for Participant 5 indicated by her final baseline imagery use score of 4.4 and first intervention imagery use score of 4. Moreover, immediately after the intervention was withdrawn, Participants 5's level of imagery use shifted down significantly as evidenced by her final imagery use score during the intervention phase of 4.4 and first imagery use score during the return to baseline phase, 3.4. Participants 1, 2, and 3's level self-efficacy shifted a bit up immediately after the intervention was

withdrawn (I_9=3.4, RB_1=3.6; I_9=3.4, RB_1=3.6; I_9=3.2, RB_1=3.6, respectively) . There was no change in level of imagery frequency for Participant 4 between the intervention and return to baseline phases.

Rate of Change in Imagery Frequency

The rate of change in imagery frequency was evaluated using visual inspection to analyze trend and latency. Trend is the tendency for imagery frequency scores to show systematic increases or decreases over time while latency of change refers to the period between the onset or termination of one condition (baseline, intervention, and return to baseline) and changes in MG-M imagery use (Kazdin, 1982).

Trend. Participant 1's imagery use revealed no trend during baseline, a fluctuating trend during the intervention phase represented by consistent shifts of imagery use, and no trend during the return to baseline phase until the second week when a slight decrease occurred. Participants 2, 3, and 4's imagery use constantly changed throughout all phases, representing a decreasing and increasing change throughout. Although during the intervention phase, Participants 2 and 3's imagery use revealed more of a decreasing trend. No trend was evident for Participant 4's imagery use during the intervention or return to baseline phases.

Latency. Participant 1 did not experience a latency of change between the baseline and intervention phases. The participant's imagery use slightly increased immediately increased after the intervention was removed, demonstrating a short latency period. Similarly, Participant 2 and 3 demonstrated short latency periods, as evidenced by their imagery use increasing slightly immediately after the intervention was withdrawn.

Participant 2's MG-M imagery use increased at the end of the first week of the intervention, indicating a short latency period between the baseline and intervention phases. This increase was maintained for one session. Participant 3 and 5 did not experience a latency of change as demonstrated by inconsistent imagery use from baseline through the intervention phase. However, both participants' imagery use during the return to baseline phase indicated a short latency period. Participant 3's imagery use increased immediately after the intervention was withdrawn while Participant 5's imagery use decreased at the onset of the return to baseline phase. Lastly, Participant 4 did not establish a latency of change as her imagery use remained stable after the intervention was introduced and withdrawn.

Variability. Similar to evaluating variability within self-efficacy scores, changes in imagery use variability were evaluated using the f^2 statistic. Imagery use scores largely decreased in variability, evidencing more stability from baseline to the intervention phase for Participants 1, 2, 3, and 5 (f^2= .71, 1.25, .56, and .4, respectively). Participant 4 maintained stable baseline and intervention imagery use scores and therefore, did not experience any variability in imagery use from baseline to intervention (f^2=0).

Weekly Imagery Use

All five participants regularly performed their imagery practice during the intervention phase of the study. Independent of their individual sessions with the researcher, participants were asked to visualize their imagery script 5 times total over the 3 week intervention phase and complete their imagery log. Moreover, participants were asked to visualize their imagery script once during the first week of the intervention and twice a week during the second and third week of the intervention. Participants 1, 2, 3,

and 4 reported imaging 100% of their imagery scripts (5 times). Participant 5 reported imaging 80% of her imagery scripts (4 times).

CHAPTER 4

DISCUSSION

The purpose of the present study was to examine the effects of an individualized MG-M imagery intervention on the self-efficacy and MG-M imagery use of youth gymnasts. It was hypothesized athletes would show increases in self-efficacy from their baseline to intervention phases. Results suggested a facilitative effect of the imagery intervention on self-efficacy for one of the five participants while another participant's self-efficacy remained fairly stable between baseline and the intervention phases. For the remaining three participants, self-efficacy means were found to have decreased from their baseline through intervention phases. While contrary to what was expected, these changes may have been observed for a several reasons. First, it should be noted that most participants reported relatively high levels of self-efficacy during baseline phases. Therefore, self-efficacy did not have the potential to increase substantially after the intervention was implemented. Rather than demonstrating increases in self-efficacy, the intervention may have been more effective in maintaining self-efficacy levels rather than increasing it further. This is evident by the decrease in variability that occurred for 2 of 5 participants between the baseline and intervention phases. Even though self-efficacy scores may have decreased, their perceptions of self-efficacy were more consistent through the intervention phase. For these participants, the use of MG-M imagery may have helped maintain their perceptions of high self-efficacy during the intervention phase. These findings are supported by the applied model of imagery (Martin et al., 1999; Orlick, 1990), which predicts that the use of MG-M imagery would increase or maintain levels of self-efficacy in training. No hypothesis was presented for changes in self-

efficacy from gymnasts' intervention to return to baseline phases. However, all participants' mean self-efficacy scores decreased after the intervention was withdrawn.

During the second week of the intervention, Participant 5 reported that she experienced a significant setback on an event separate from the one included in her imagery script. The setback occurred on the floor exercise and she was not able to perform her tumbling passes as usual. This may have affected her perceptions of self-efficacy throughout the study. Although it cannot be stated with certainty, it is plausible that the intervention may have mediated the effects of experiencing a mental block during the intervention phase for this participant. This is likely to have occurred as the athlete's self-efficacy immediately decreased further after the intervention was withdrawn. In addition to increasing self-efficacy, MG-M imagery has been found to support athletes in maintaining a positive attitude and handling setbacks (Martin et al., 1999; Orlick, 1990). Perhaps the intervention allowed this specific gymnast to more effectively cope with her mental block and perceive higher levels of self-efficacy than would have been experienced without the use of imagery (Shambrook & Bull, 1996).

It was also expected that athletes would show increases in the frequency of imagery use from their baseline to intervention phases. This hypothesis was not supported as participants' imagery use did not increase across all participants. While unexpected, there are plausible explanations as to why participants' imagery use did not increase following the introduction of the intervention phase. First, during the baseline phase, gymnasts may have been using more informal methods of imagery during their practice and using those experiences to complete the SIQ-C. Once the intervention began,

the participants were introduced to more structured forms of imagery. When completing the SIQ-C during the intervention phase, participants may have been evaluating the amount of structured imagery performed during the week while not taking into consideration the informal methods of imagery they may have used during practice as well. It is conceivable the gymnasts only responded to the SIQ-C relative to their use of imagery associated with the intervention and not any additional use they may have engaged in on their own.

Reactance theory (Brehm & Brehm, 2013) may also help explain participants' decrease in imagery use, as it suggests that individuals will sometimes be motivated to resist or act counter to a behavior if they feel a particular freedom is threatened or lost. Hence, reactance occurs in order to restore that freedom. Brehm and Brehm (2013) also suggested that the reactance will be greater if the importance placed on the freedom is greater. During the intervention phase, participants learned about MG-M imagery and were asked to perform MG-M imagery in a structured format. It is possible that some participants may have perceived a threat to their autonomy regarding when and how to perform imagery and consequently, reactance occurred. Participants did have the autonomy to choose an event for their imagery script, details included in their script, and when to practice imagery at home; however, the participants may have perceived a threat to their self-determination when they were asked to practice imagery a particular amount of time each week, given a specific type (MG-M) of imagery to use, and given their parents arranged when participants would meet with the lead investigator. This could

explain the observation of the decrease in imagery use from baseline to intervention phases for all participants.

Although self-efficacy and imagery use did not evidence substantial increases from baseline to intervention phases, a decrease in variability of imagery use occurred for Participants 1, 2, 3, and 5 between the baseline and intervention phases, representing more consistent imagery use during the intervention phase for these gymnasts; Participant 4's imagery use remained stable throughout baseline and intervention phase. An intervention can be considered effective if observed performance changes can be attributed to the intervention (Bryan, 1987). Throughout the current study, four of the five participants' imagery use was most stable during the intervention phase, indicating the intervention's effectiveness in stabilizing imagery use. There was no hypothesis regarding athletes' imagery use from the intervention to return to baseline phases. Three of the five participants imagery use decreased after the intervention was withdrawn. The findings of this study suggest MG-M imagery to facilitate the maintenance of imagery use. Participants were able to sustain more steady imagery use from practice to practice during the intervention phase, compared to the baseline and return to baseline phases.

All participants regularly performed their imagery practice during the intervention phase of the study, as evidenced by MG-M mean frequencies being greater than zero and the completion of their imagery logs. Perhaps participants were more motivated to adhere to the imagery program since each imagery script was individualized to their goals. O and colleagues (2014) state, "The benefits of using individualized imagery scripts are possibly linked to increases in more self-determined forms of motivation to engage in the

imagery practice." (p. 78). Further, participants' adherence to the imagery program demonstrates the feasibility of employing an individualized MG-M imagery intervention with youth athletes, consistent with the previous research by O and associates (2014). As suggested by Munroe-Chandler (2008), this study examined the relationship between imagery use and self-efficacy with participants between the ages of 8-10. The results of the study suggest to athletes, coaches, and sport psychology professionals, that athletes of this age are able to learn and apply MG-M imagery to their specific sport in order to increase or maintain levels of self-efficacy and imagery use.

Limitations

It is important to note limitations of the present study. First, performance data were not collected. Therefore, personal accomplishments achieved during practice could be a contributing factor in participants' perceived self-efficacy. Also, coaches evaluated each of the participants during the second week of the intervention to determine which level they would compete for the upcoming meet season. This, along with their personal accomplishments during practice, may have influenced perceptions of self-efficacy. As such, these limitations taken together may underscore the importance of future research examining the effects MG-M imagery interventions have on youth athletes' self-efficacy and performance accomplishments concurrently.

Conclusions and Future Directions

Results of the current study indicated that an individualized MG-M imagery intervention can be an effective method by which sport and exercise psychology

professionals can implement to increase the consistency of perceived self-efficacy and imagery use of among youth gymnasts. These findings are exceptionally important for youth athletes. More specifically, this developmental period for youth athletes is associated with a time where self-efficacy is extremely vulnerable to change. For example, Horn (2004) suggested there are critical periods in a child's development to facilitate self-perceptions that include the middle childhood (ages 4-8) and middle adolescent years (ages 12-15). Participants may fall into either of these age groupings and are experiencing a critical time in their lives in developing positive perceptions of competence, especially specific to their sport. Youth athletes can use MG-M imagery to help maintain or increase self-efficacy, especially at an age when self-efficacy is considered malleable (Horn, 2004), and sustain levels of self-efficacy through their development. Additionally, sport psychology professionals and coaches aware of this knowledge may enhance their service provision from learning how to increase or maintain self-efficacy in youth athletes through the use of MG-M imagery.

While developing an individualized imagery intervention for each participant, the present study aimed to take previous research into consideration (Callow et al., 2001; Munroe-Chandler et al., 2008; O et al., 2014) while being mindful of participants' age and the time commitment required for the study in addition to school, gymnastics, and other activities. As Weinberg (2008) noted, the exact combination of frequency and duration of imagery use in order to elicit an intended outcome remains unknown. As such, future research could supplement the findings of the current study by also

examining the dose-response relationship between imagery use and self-efficacy with youth athletes.

Collectively, the present study incorporated recommendations from previous research (Munroe-Chandler et al., 2008; O et al., 2014) in the design and implementation of an imagery intervention with youth gymnasts. As a result, this study added to the paucity of research examining the relationship between imagery use and self-efficacy with youth athletes, as well as the effects of individualized imagery interventions within this population. Implications from this study provide direction for practitioners and researchers regarding the development and implementation of MG-M imagery interventions in order to increase and maintain youth athletes' self-efficacy and imagery use.

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APPENDIX A

RESEARCH QUESTION, HYPOTHESES, LIMITATIONS, DELIMITATIONS, ASSUMPTIONS, AND DEFINITIONS

RESEARCH QUESTION

Will self-efficacy levels and imagery use increase after an individualized motivational-general mastery imagery intervention in youth gymnasts?

HYPOTHESIS

1. Participants' self-efficacy will increase between baseline data collection and post-intervention baseline data collection.
2. Motivational-general mastery imagery use will increase over the course of the intervention.

LIMITATIONS

1. Participants may not have understood or participated fully in the intervention sessions.
2. Participants may not have fully understood or participated in the homework assigned.
3. Performance data was not be collected. Therefore, personal accomplishments may have contributed to changes of self-efficacy levels.
4. Convenience sampling was used.

DELIMITATIONS

1. This study only focused on youth athletes from the southeast.
2. Participants were between the ages of eight to twelve.

3. All of the participants were competing at level six or above, as sanctioned by USAG.

4. This study only focused on the sport of gymnastics.

ASSUMPTIONS

1. Each participant completed the MIQ-R, SEQ, and SIQ-C honestly and to the best of their ability.

2. Each participant was fully engaged in interventions and homework.

3. Participants were not be affected by external influences unrelated to the MG-M interventions during the length of the study.

DEFINITIONS

1. Self-efficacy- One's belief in their ability to be successful in a specific situation

2. Motivational-general mastery imagery- Imagery that represents effective coping and mastery of challenging situations, such as being mentally tough, confident, and focused during sport competition

APPPENDIX B

LITERATURE REVIEW

The present chapter attempts to examine self-efficacy in the youth sport domain. Included will be the definitions and main theoretical frameworks used to explain self-efficacy. Furthermore, the main theoretical frameworks regarding the significance of self-efficacy on youth development will also be examined. Imagery and related terms that function as an intervention for self-efficacy will be presented including the definitions, types of imagery, main theoretical frameworks used to explain imagery, suggested amount of imagery use, and previous imagery interventions. Additionally, the assessment of self-efficacy, imagery use, and imagery ability will be discussed. Finally, a summary and direction for future research will be addressed.

Defining Self-Efficacy and Related Terms

Before specifically addressing self-efficacy, it would be advantageous to understand the definitions related to self-perceptions. Horn (2004) defines self-perceptions as individual's beliefs, perceptions, and feelings about themselves in general or about their abilities and competencies. There have been more specific terms to define various aspects of individuals' overall perceptions of the self and it is beneficial to know the differences between each of them (Horn, 2004). Of particular interest to the proposed research, self-esteem, self-confidence, sport confidence, and self-efficacy will be defined and discussed.

Self-esteem. Self-esteem is considered a rather stable evaluation of the overall self. Self-esteem is an individual's evaluation of their self-worth which requires an

individual to assess the value they place on their abilities, traits, characteristics, and overall person. Another term used interchangeably throughout the research with self-esteem is general self-concept (Marsh, 1987) However, Horn (2004) states the difference between self-esteem and self-concept is that self-esteem is an individuals' perception of the overall self while self-concept is an individuals' evaluation of their personal characteristics, attributes, and abilities. Individual's perceptions of themselves and their skills, abilities, and competencies are related to their performance, behavior, and health (Horn, 2004). For instance, high self-esteem has been correlated to low anxiety, generalized optimism, adaptability, emotion stability, happiness, life satisfaction, and the ability to cope with daily life stresses

Self-confidence. More specific terms are beneficial in fully understanding how individuals evaluate different aspects of themselves. Self-confidence is defined as the degree of certainty individuals possess about their ability to be successful (Vealey, 1986). Bandura (1997) presented a definition of self-confidence that supports Vealey's (1986) explanation. Bandura (1997) describes confidence as the strength of belief in one's abilities. Bandura (1997) argues confidence is a general term because it does not specify exactly what the certainty is about.

Sport confidence. Vealey (1986) created the model of sport confidence in order to provide a definition of self-confidence specific to sport situations. Sport confidence is defined as the degree of certainty individuals possess about their ability to be successful in sport. In order to differentiate between overall sport confidence and situation specific

sport confidence, the construct of sport confidence is divided into in trait (SC-trait) and state (SC-state) components.

Self-efficacy. Bandura (1997) states that confidence refers to the strength of belief in one's abilities but does not specify exactly what the certainty is about; whereas self-efficacy denotes the strength of belief in one's ability to perform a specific desired behavior. Self-efficacy can be defined as "beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (Bandura, 1997, p.3). In other words, self-efficacy is a situationally specific form of self-confidence. Self-efficacy is distinguished from other self-perception constructs because self-efficacy beliefs represent individuals' beliefs about what they can accomplish in achievement situations (Feltz & Chase, 1998). Individuals' self-efficacy levels determine the strength of their belief in their ability to be successful in specific tasks or skills. Self-efficacy is significant to athletes because their thoughts about their abilities have the potential to affect their actual performance. Moritz, Feltz, Fahrbach, and Mack (2000) support this notion, suggesting self-efficacy to be a strong predictor of sport performance, with other researchers demonstrating self-efficacy to be a stronger predictor of sport performance compared to anxiety, perceived control, and personal goals (Feltz & Lirgg 2001). Bandura (1997) explained that an athlete's performance may be influenced through their perceptions of self-efficacy, as self-efficacy may affect an athlete's task choice, level of effort, and persistence through obstacles. For example, an athlete with high self-efficacy will choose challenging tasks, put forth a substantial amount of effort, and more likely to persevere through obstacles. On the other hand, an athlete with low self-efficacy is likely

to avoid challenging tasks, put forth lackluster effort, and less likely to persevere through obstacles.

The importance of self-efficacy also appears to be consistent across the lifespan, with its significance having been evident within youth sport as well. For example, Weiss, Wiese, and Klint (1989) conducted a study with male gymnasts between the ages of seven and eighteen and found self-efficacy to be a significant predictor of performance when compared to precompetitive anxiety, years of experience, and worry-related cognitions. In addition to influencing performance, research has also shown how significant self-efficacy is to youth development.

Youth Development- Major Theoretical Frameworks of Self-Esteem Structure

Multidimensional model of global self-esteem. Individuals' self-perceptions are best explained in a multidimensional and hierarchical framework. The multidimensional model of global self-esteem suggests that individual self-evaluations combine in different ways to form the global self-esteem construct (Horn, 2004). This model shows that individuals view themselves in a variety of different life situations or contexts, such as academic/cognitive, social, and physical, and that these individual life situations contribute to an overall level of global self-esteem. Also, each individual self-evaluation most likely does not contribute equally to the overall level of self-esteem. Horn (2004) states the apex of the model, global self-esteem, is the most stable and most resistant to external forces. Each successive level is less stable more susceptible to change through external factors..

Hierarchical model of global self-esteem. The hierarchical model of global self-esteem is similar to the multidimensional model as it includes a global self-esteem construct that is affected by individuals' perceptions of themselves across a set of subdomains (Horn, 2004). Furthermore, global self-esteem is considered the apex and most stable level of each model. However, the hierarchical model suggests that each subdomain can be divided into more specific levels. The subdomains include domain specific self-assessments of individuals' academic self-concept and nonacademic self-concept such as social, emotional, and physical domains (Shavelson, Hubner, & Stanton, 1976). The third level comprises of individuals' self-perceptions within each specific subdomain while the fourth level is individuals' self-assessments in even more specific subject-matter areas. The final level includes individuals' self-assessment of their abilities pertaining to extremely specific behavioral situations. This level would include individuals' perceptions of their abilities, confidence, or efficacy (Horn, 2004). Therefore, each level after global self-esteem pertains to more specific domains.

Horn (2004) states that previous research view individuals' global self-esteem independent of their self-assessments in each subdomain. This is due to individuals placing importance on certain subdomains more than others. For instance, if an individual viewed their ability in one subdomain very low but it was not important to him of her than his or her global self-esteem is unlikely to be very affected.

When evaluating individuals' self-perceptions, Fox (1998) stresses the theoretical importance for researchers to clarify and understand which multidimensional and hierarchical level the research is investigating. Researchers need to identify whether

participants' self-perceptions are being evaluated at the global, subdomain, or at one of the lower hierarchical levels. Horn (2004) supports Fox's (1998) suggestion by indicating the level at which researchers are examining avoids confusion that has previously occurred in research on individuals' self-perceptions. When implementing interventions, researchers can identify which hierarchical level they are examining and anticipate a single achievement could have more of an effect on participants' perceptions of efficacy while repeated successes in various situations are more likely to have an effect on participants' self-esteem at the higher levels of the hierarchical model (Horn, 2004). For instance, self-efficacy is more susceptible to change since it is at the lowest level of the hierarchy. Harter (1990) states the importance for researchers to assess to significance participants attach to each level or subdomain in order to better evaluate individuals' global self-esteem.

Fox and Corbin self-perception model. Fox and Corbin (Fox, 1990; Fox & Corbin, 1989) developed a self-perception model specific to the physical domain while incorporating the multidimensional and hierarchical perspectives. This framework is similar to the multidimensional and hierarchical models as the apex of the model is global self-esteem. The second level becomes specific to the physical domain because it represents physical self-worth. The third level is comprised of four subdomains that signify individuals' perceptions of their sport competence, bodily attractiveness, physical strength and muscular development, and physical conditioning and exercise. Within this model, Fox (1990, 1998; Fox & Corbin, 1989) integrates a perceived importance profile that assesses the amount of importance individuals place on each subdomain. In order to

understand individuals' global self-esteem, it is thought to more beneficial to observe the degree of importance individuals place on domains rather the number of domains they perceive to have high or low competence. A study with youth athletes conducted by Ebbeck and Stuart (1996) supports this concept. Their results indicated the combination of the athletes' perceptions of individual competence and perceptions of their importance of being successful were significant predictors of their global self-esteem. However, despite Ebbeck and Stuart's findings, Fox (1998) states that more support is needed to determine that the degree of importance individuals place on certain domains is a prediction of individuals' global self-esteem.

Developmental considerations in children. Individuals experience developmental changes throughout their lifespan that affect their perceptions of their world. For the purpose of the proposed research, it is key to understand children's' perceptions of their self and competence. Children's self-perceptions develop due to a combination of cognitive maturation (Harter, 1999; Horn, 2004) and their sociocultural environment such as academic and physical domains (Harter,1996,1999; Horn, 2004). As children grow older, they develop more cognitive skills to be able to process information more maturely as well as experience various academic and sport environments that are likely to influence their perceptions of themselves and their competence. According to Horn (2004), children experience developmental changes in three areas; the structure and content of the self-perception system, the influences of individual subdomains on the global self-esteem structure, and the cognitive processes used to evaluate competence in subdomains.

In order to evaluate how individuals perceive themselves throughout different stages of life, Harter and colleagues developed the Self-Perception Profile (Horn, 2004). The Self-Perception Profile is divided into six age periods: early childhood, middle to late childhood, adolescence, college years, early through middle adulthood, and late adulthood. The profile demonstrates that as individuals increase in age, the self-perception system becomes more diverse. The differences between each age period are evident through the number of subscales and the factor analytic procedures that reveals an increase in independence with age (Horn, 2004). Of particular interest to the proposed research, children in the middle to late childhood years (ages 8-11) perceive themselves in terms of scholastic competence, athletic competence, physical appearance, peer acceptance, behavioral conduct, and global self-worth (Harter, 1985). Children in this age period differ from children in early childhood (ages 4-7) because they are able to not only identify the five subdomains that create their sense of self; cognitive competence, physical competence, physical appearance, peer acceptance, and behavior conduct (Harter & Pike, 1984) but they also appear to have the ability to differentiate them. Hence, children in early childhood are only able to describe themselves in terms of the five subdomains but unable to differentiate them from each other.

In addition to quantitative changes, seen through the number of subdomains increasing with age, there are also qualitative changes that occur as individuals grow older. These qualitative changes are marked through the content of the subdomains as well as the content of the children's self-descriptions. Children's self-perceptions mature in several ways between early childhood and middle to late childhood. For instance,

individuals in early childhood tend to evaluate themselves on very concreate behaviors, skills, abilities and characteristics within the five subdomains relating to physical and cognitive competence (Harter & Pike, 1984; Horn, 2004). As children enter middle to late childhood, they can differentiate their abilities between each of the subdomains and also demonstrate the ability to evaluate their abilities within each subdomain. Children within this age period develop the ability to perceive their competence more realistically and evaluate their abilities more specifically. Thus, children between the ages of 8-11 can recognize differences in their abilities across subdomains and also within subdomains. Also, children in middle to late childhood place importance on relationships with others. Both of these changes lead to more levels within the self-esteem framework (Horn, 2004).

Another developmentally based change that occurs within the self-perception system relates to the global self-esteem construct. Horn (2004) notes that global self-esteem is the apex of the self-perception system and is defined as the individual's evaluation of the value of the self. Children develop the cognitive ability to assess their global self-esteem around age 8 (Harter, 1990). This ability is established when children can differentiate between the ideal self and real self, differentiate between subdomains, and begin to separate subdomains in terms of importance (Horn, 2004). As individuals age, they experience developmental changes that each subdomain influences their level global self-esteem. These changes occur due to the importance individuals place on each subdomain and the amount of support they receive from their environment (Harter 1990).

Developmental changes also occur through the cognitive processes individuals use to evaluate their abilities. Horn (2004) explains the two areas of developmental progressions are the sources of information individuals use to evaluate competence and the ways in which individuals conceptualize the concept of ability. Children in middle to late childhood use four to six sources to perceive competence within their sport environment including peer comparison, evaluative feedback from individuals in the sport environment, internal information, evaluative feedback from parents, game outcome, and attraction to the sport (Horn & Hasbrook, 1986; Horn& Weiss, 1991; Weiss, Ebbeck, & Horn, 1997).

Within the sport domain, perceptions of abilities are considered a key psychological construct when trying to understand individuals' motivation, performance, behavior, and affective reactions in achievement contexts (Horn, 2004). From early to middle and late childhood, individuals vary in the way they view the construct of personal ability (Nicholls, 1989, 1990). Specifically, Nicholls (1989, 1990) notes that as children age, they are able to differentiate between luck, effort, and normative task difficulty as well as distinguish factors that affect performance in achievement domains. Additionally, children use their understanding of ability and integrate sources of information to develop a construct of personal competence.

Practical applications to increase children's self-esteem. As Horn (2004) states, there is a strong correlation between children's perception of competence in various subdomains and their global self-esteem. Therefore, in order to facilitate high self-esteem, children should have high perceptions of competence in various subdomains.

Researchers (Harter, 1981, 1999, Hattie, 1992; Weiss & Ebbeck, 1996) have suggested the most effective way for children to develop positive perceptions of competence is for them to experience mastery experiences. Horn (2004, p.133) defines mastery experiences as "opportunities children have in achievement contexts to acquire, through personal effort and hard work, a skill or ability they previously did not have." Within the sport domain, mastery experiences would include any task that challenges individuals and requires them to learn the task through repeated practice attempts (Horn, 2004). Mastery experiences facilitate children's abilities to evaluate themselves and require them to assess their competence and define it in terms of skills mastery and improvement.

As noted earlier, the apex of the self-esteem model, global self-esteem, may be very resistant to change while the lower hierarchical levels are more vulnerable to change. However, Horn (2004) states there are certain periods in childhood where global self-esteem is most apt to change. The first period is during early to middle childhood (ages 4-8). During this time, children are still in the process of verbally defining global self-esteem, differentiating between the real self and ideal self, dependent of the feedback of significant adults, and using simple mastery of skills to evaluate their competence. The developmental characteristics of children in this age bracket prove it to be a critical period for them to develop high perceptions of competence in specific domains as well as high global self-esteem. The second period that individuals' global self-esteem is most vulnerable to change is during middle adolescent years (ages 12-15). During this time period, there are several fluctuations in how individuals perceive themselves due to physical changes, cognitive-maturational changes in the ways individuals perceive

themselves across a variety of domains, cognitive-maturational changes in the ways individuals view feedback from outside sources, and changes in the social environment (Horn, 2004). The two critical periods for facilitating positive self-perceptions is significant considering the research suggests positive self-perceptions, both global and domain specific, are correlated with psychological constructs such as anxiety, locus of control, and depression as well as positive achievement behaviors including persistence and motivation (Horn, 2004). For the purpose of the proposed research, the participants may fit into either of these age brackets. Therefore, the participants are experiencing a critical time in their lives in developing global self-esteem.

Given the established impact self-efficacy can have on performance and an athlete's development, sport stakeholders aware of this knowledge (e.g. athletes, coaches, sport psychology professionals) may enhance their service provision from learning how to increase self-efficacy in themselves or athletes.

Defining Imagery and Related Terms as an Intervention for Self-Efficacy

According to Bandura's (1997) self-efficacy theory, previous accomplishments, verbal feedback, physiological states, emotional states, and vicarious experience can enhance one's self-efficacy. Although Bandura (1997) noted previous accomplishments as the strongest predictor of self-efficacy, vicarious experiences, including imagery, are significant to youth athletes as they may not have a large amount of previous performance accomplishments to draw upon. White and Hardy (1998) define imagery as using one or more senses to create, or recreate, a particular skill or situation in one's mind. It is a form of stimulation that incorporates all the senses and involves shaping

pieces of information from experience, experienced internally or through previous experiences, into meaningful images.

Research has shown imagery to improve sport performance, enhance motivation, regulate arousal, manage stress, and increase self-confidence (Martin et al., 1999). There are several approaches to explain the effects imagery has within the sport domain. According to Paivio's (1985) analytical framework, imagery can be used to influence motor behavior through cognitive and motivational functions at either a general or specific level. Martin and colleagues (1999) identify a few limitations within Paivio's framework. First, they suggest that Paivio's framework does not include every type of imagery athletes may use. Next, the framework does not contain situational factors such as the sport context or the athlete's imagery ability. These factors have the potential to affect the type of imagery used by an athlete and the effects it has on them. Lastly, it does not clearly identify the types of images that lead to specific cognitive and motivational changes in athletes. After Martin and colleagues (1999) identified limitations within Paivio's framework, they decided to develop a new model combining aspects of Paivio's framework, Ahsen's (1984) triple code model, and Lang's (1977, 1979) bioinformational theory.

Ahsen's (1984) triple code model emphasizes the importance of the meaning to the individual. The model describes three effects that are essential parts of imagery: the image, the somatic response, and the meaning of the image. The model highlights how individuals perceive images differently. Hence, images will have different cognitive, affective, and behavioral effects on different individuals. While Ahsen's model focuses

more on individuals' cognitive reactions to imagery, Lang's (1977, 1979) bioinformational theory centers around imagery's effects on physiological and emotional reactions. Lang (1977,1979) states imagery includes activation of information about the stimulus characteristics of the imaged situations and response propositions to the imaged situation. In other words, individuals should include visualizing physiological and emotional reactions into their imagery practice. After combining various aspects of Paivio's framework, triple code model, and bioinformational theory, the applied model of imagery aimed to represent how athletes use imagery (Martin et al., 1999).

According to Martin and colleagues (1999), the function of imagery an athlete uses should coincide with the goal(s) of their behavior. "The applied model of imagery centers on the type of imagery used by the athlete (i.e., the function of purpose that imagery is serving) as a determinant of cognitive, affective, and behavioral outcomes" (Martin et al., 1999, p. 249). Thus, it is important for athletes to determine their goal behavior before identifying the type of imagery that is the most appropriate for them to use. The four components of the model include sport situation, type of imagery, imagery ability (kinesthetic and visual), and the outcome. Outcomes include acquisition of skills and improved sport performance, cognitive changes, and arousal regulation. When identifying the best type of imagery to use, the sport situation needs to be known. The three sport situations within the applied model of imagery include training, competition, and rehabilitation.

It is key to identify the sport situation because certain types of imagery may be used more across particular situations more than others. For instance, during training, the type

of imagery depends on the athlete's skill level and focus of training of the training program (Martin et al., 1999). Skill level affects athlete's use of imagery as novice athletes tend to use more cognitive types of imagery in order to enhance acquisition of skills. Once athletes have learned necessary skills, they may use motivational types of imagery. If competition is identified as the sport situation, research has shown athletes use imagery to regulate arousal, concentrate on the competition, and maintain levels of confidence and optimism (Martin et al., 1999). Martin et al. (1999), also note that previous research has indicated motivational types of imagery to be more widely used and beneficial to athletes than cognitive types of imagery prior to competition. Lastly, Martin et al. (1999) explain athletes who identify rehabilitation as the sport situation may use imagery as arousal regulation to relax, visualize aspects of healing, maintain or improve motivation, and to image their sport performance to replace physical practice.

After the sport situation is known, the type of imagery is selected. According to the applied model of imagery, the type of imagery, along with imagery ability, influence the outcome. The applied model of imagery identifies five types of imagery that require athletes to visualize different images and have the potential to serve different purposes. These five types of imagery include 1) motivational-specific (MS), 2) motivational-general mastery (MG-M), 3) motivational-general arousal (MG-A), 4) cognitive specific (CS), and 5) cognitive general (CG) (Martin et al., 1999). Motivational-specific imagery represents specific goals and goal-oriented behaviors. Martin and colleagues (1999) also outline studies that demonstrate motivational-specific imagery to have a stronger effect on motivation and effort than cognitive specific imagery. Motivational-general mastery

imagery involves effective coping and mastery of challenging situations. If the goal behavior is to increase self-efficacy, motivation general-mastery is the recommended form of imagery for an athlete to use (Martin et al. 1999; Moritz et al., 1996). Motivational general-arousal imagery includes feelings of relaxation and arousal within a sport competition. Studies have shown if an individual's goal is to improve arousal regulation, motivational general- arousal imagery has been found to be more effective than cognitive specific imagery. Cognitive specific imagery involves visualizing specific sport skills and strategies while cognitive general imagery includes imagery of strategies associated with a competitive situation. Research has shown if an individual's desired goal involves skill acquisition, cognitive specific imagery is the best type of imagery to use (Martin et al., 1999). Seeing as the goal of the proposed research is to enhance self-efficacy, motivational general-mastery imagery, or MG-M imagery, will be examined more thoroughly.

Motivation general-mastery imagery is defined as "imagery that represents effective coping and mastery of challenging situations, such as being mentally tough, confident, and focused during sport competition" (Martin et al., 1999, p.250). An athlete using MG-M imagery may be imagining themselves successfully performing during competition or practice, exuding confidence, feeling in control, and successfully overcoming obstacles (Martin et al., 1999; Orlick, 1990). Research has shown if an individual's desired behavior is to increase self-confidence of self-efficacy, MG-M imagery should be used. The applied model of imagery predicts that the use of MG-M imagery would increase or maintain levels of self-efficacy in training, competition, and rehabilitation (Martin et al.,

1999). Bandura (1997) supports this by noting that imagery may increase self-efficacy because it requires individuals to visualize positive images which prevent visualizing negative images. MG-M imagery requires the athletes to visualize themselves in positive contexts. Furthermore, if an athlete does image a perceived negative event, such as an obstacle, he/she images successfully overcoming the obstacle while maintaining focus, confidence, and control of the situation. Similarly, Moritz et al. (1996) suggest that imagery will improve self-efficacy if the images are associated with success and proficiency, two key features of MG-M imagery.

It should be noted that there are a few limitations within this model. First, the model does not explain how individual difference can influence the relationship among the four constructs. Individuals may react differently to the types of imagery and the effects of imagery ability may vary across individuals. Next, time is not accounted for. The amount of time spent on imagery practice may affect the outcomes of imagery use. Also, no predictions are made about using more than one type of imagery at a time. The advantages of using the applied model of imagery to understand imagery and implement an imagery intervention appear to outweigh the limitations. An advantage to using the model when designing an imagery experiment is it includes clear, theoretically based guidelines, including which variables to select and measure. Next, the model includes a conceptual framework to help develop imagery interventions to achieve specific outcomes. Finally, the model contributes to understanding imagery as a whole in terms of variables that are relevant to athletes' use of imagery, how imagery is used, and when to use imagery.

MG-M Imagery Interventions with Youth Athletes

Knowing the influence of MG-M imagery on self-efficacy, researchers have implemented MG-M imagery interventions with youth athletes and their results have generated interesting findings. For instance, Munroe-Chandler and Hall (2005) conducted a study implementing a MG-M imagery intervention to increase a youth soccer team's collective efficacy. Two of the three groups, forwards and midfielders, experienced increases in collective efficacy for both training and competition. However, all groups reported using imagery on a regular basis and found it to be a positive experience. The results from this study demonstrate the use of MG-M imagery may help increase collective efficacy and an imagery intervention may increase the use of imagery. Other researchers have implemented MG-M imagery interventions to each participant individually.

For instance Callow, Hardy, and Hall (2001) implemented a MG-M imagery intervention individually with four high-level badminton players under the age of eighteen. The researchers examined the effects of the intervention on the participants sport confidence. Results from the State Sport Confidence Inventory suggested that three of the four athletes experienced increases in mean self-confidence levels from baseline to post intervention.

More recently, O, Munroe-Chandler, Hall, and Hall (2014), implemented a MG-M imagery intervention program with youth squash players. Instead of measuring self-confidence as previously done, these authors selected self-efficacy as the outcome variable of interest. The intervention consisted of daily imagery practice along with

weekly guided imagery session. Notably, the imagery scripts were highly individualized. Cumming, Hall, and Shambrook (2004) described the importance of individualizing imagery scripts for athletes by taking into consideration the sport's requirements, needs, interests, and capabilities of each athlete. Three of the five squash players involved in the study demonstrated improved levels of self-efficacy. In order to provide an appropriate intervention for youth athletes, it is essential for researchers to understand how constructs such as self-efficacy, imagery use, and imagery ability can be assessed.

Self-efficacy Assessment

The State Sport Confidence Inventory. Vealey (1986) developed the SSCI to measure an athlete's state sport confidence. The SSCI consists of 13 items with each item asking the participant to rate the amount of confidence they currently have pertaining to various situations typically experienced during sport competition. Each item is rated using a Likert-type scale ranging from 1 (low) to 9 (high). A sample question on the SSCI is "Compare the confidence you feel right now in your ability to make critical decision during competition to the most confident athlete you know." The SSCI has demonstrated an internal consistency of .95 (Vealey, 1986) and content validity was found to be acceptable (Feltz & Chase, 1998). Researchers state the format of the SSCI may cause unsystematic variance since it asks participants to rate their confidence compared to the most confident athlete they know (Feltz & Chase, 1998). Hence, over time changes may be difficult to observe if a participant's sport confidence is increasing however, the most confident athlete they are comparing themselves to is improving as well.

The self-efficacy questionnaire. Feltz and Chase (1998) explain how most researchers have constructed self-efficacy measures specifically tailored to their study. One example of this is the SEQ. The SEQ has been used in several studies and has been modified for specific sport use such as squash and soccer (Mills et al, 2001; Munroe-Chandler et al., 2008; O et al., 2014). Mills, Munroe, and Hall (2001) created the SIQ to assess the perceived general self-efficacy in training and competition. The SEQ is comprised of ten items which ask the participant to write the strength of their belief in their mental abilities based on a 100-point scale, ranging in 10-unit intervals from 0 (no confidence) to 100 (complete confidence). Examples of the mental abilities include focus, being in control, and mental toughness. Specifically, the five items pertaining to training are: "I am confident I can work through difficult situations"; "I am confident I can remain focused during a challenging situation"; "I am confident I can be mentally tough throughout a competition"; "I am confident I can remain in control in challenging situations"; and, "I am confident I can appear confident in front of others." The SEQ has been found to have adequate internal consistencies with an alpha level of .86 (Munroe-Chandler, Hall, & Fishburne, 2008).

Imagery Use Assessment.

Previous imagery interventions have required participants to practice imagery independently, outside of their sessions with the researchers. In order to assess imagery use, researchers have created logs or questionnaires to monitor the participant's imagery practice.

Imagery assessment questionnaire. Munroe-Chandler and Hall (2005) conducted a study implementing a MG-M imagery intervention to increase a youth soccer team's collective efficacy. Following Wollman's (1986) guidelines, Munroe-Chandler and Hall (2005) provided participants with an imagery assessment questionnaire in order to observe and determine if the participants were using the imagery as instructed. The questionnaire consists of four items: 1) Are you using the imagery outlined in the script? 2) In the last week how many times did you practice the imagery script? 3) On a scale from 1-10 how effective was your imagery session? and 4) Did you change the imagery script to suit your individual need and if so, what did you image?

Imagery logs. Similarly, O, Munroe-Chandler, Hall, and Hall (2014) provided daily imagery logs for their participants who were youth athletes between the ages seven to fourteen. The daily imagery log is an easy-ready format which asks the participant the date, whether the participant performed her imagery practice that day, how many trials were performed (check boxes ranging from zero-three), how difficult it was for her to imagine the situation in the imagery script (five check boxes ranging from really hard to really easy), and a text box for any questions or comments.

Sport imagery questionnaire for children. With regard to measuring the frequency of cognitive and motivational imagery use, the SIQ-C is most suitable (Hall, Munroe-Chandler, Fishburne, & Hall, 2009). The SIQ-C is adapted from the Sport Imagery Questionnaire (SIQ) which was developed to assess adult's sport imagery use. Researchers chose to adapt the SIQ-C from the SIQ in order for children, ages of 7-14, to clearly comprehend the assessment (Hall, Munroe-Chandler, Fishburne, and Hall, 2009).

The SIQ-C is 21-item self-report questionnaire which measures all five functions of imagery. For the purpose of this study, only the five items relating to MG-M imagery will be included. Participants are asked to rate their use of imagery on a 5-point Likert-type scale ranging from 1 (not at all) and 5 (very often). Participants will circle the number that best applies to each particular statement. Examples of the five items pertaining to MG-M imagery are as follows: "I imagine myself being confident in competition"; "I see myself being mentally strong;" "I see myself being focused in a tough situation;" "I see myself being in control in tricky situations;" "I see myself getting through tough situations with good results." Factor analysis supports the separate constructs of the SIQ-C. The MG-M subscale demonstrates acceptable internal consistencies with alpha coefficients ranging from .70-.82. Also, results of a confirmatory factor analysis showed that the five-factor model approached a reasonable fit (Q=3.33, CFI=.89, GFI=.91, RMSEA= .06). Furthermore, a strong correlation was found between MG-M imagery use and self-efficacy through convergent validity of r = .61. Discriminant validity was supported between cognitive specific imagery (r=.39) and cognitive general imagery and self-efficacy (r=.38) (Hall, Munroe-Chandler, Fishburne, and Hall, 2009).

The SIQ-C differs from the SIQ in a few ways. First, the SIQ contains 30-item compared to 21 items on the SIQ-C. Additionally, items on the SIQ are measured using a 7-point Likert-type scale ranging from 1 (rarely) to 7 (often). Furthermore, the rating scale on the SIQ displays numbers where the SIQ-C contains numbers and descriptives for each number. The items on the SIQ were revised for the SIQ in order for children to clearly understand the items. For instance, the SIQ address MG-M imagery use by stating

"I imagine myself being in control in difficult situation," was reworded to "I see myself being in control in sticky situations," on the SIQ-C.

Imagery Ability Assessments

Vividness of movement imagery questionnaire. Hall, Buckolz, and Fishburne (1992) note individual differences in imagery ability to be one of the most important factors influencing imagery use. One assessment of imagery ability is the VMIQ which includes 24 items and assesses how vivid participants are able to visualize different images. Participants are asked to rate the vividness of different movements on a 5-point scale with 1 representing perfectly clear/vivid as normal vision and 5 representing no image at all. The VMIQ is considered reliable with a correlation of .76 over a 3-week interval (Hall & Martin, 1997). One concern of the VMIQ is the vagueness of the items. The participants are asked to imagine general movements which could be perceived in a number of ways which could lead to increased variability in imagery ratings. Another limitation of the VMIQ is it exclusively measures visual imagery ability and not kinesthetic imagery ability.

Movement imagery questionnaire. Hall, Pongrac, and Buckolz (1985) created the MIQ to measure both visual and kinesthetic imagery ability. The MIQ consists of 18 items, 9 pertaining to visual imagery ability and 9 relating to kinesthetic imagery ability. The MIQ includes four steps. First, the starting position for a movement is explained to the participants and they are asked to physically assume the starting position. Next, the movement is described and participants are asked to physically perform it. Third, the participants are asked to assume the starting position and visualize performing the

movement. Lastly, participants are asked to rate the ease or difficulty of imaging the movement on a 7-point scale ranging from 1, very easy to picture/feel to 7, very difficult to picture/feel. The MIQ was shown to have internal consistency coefficients of .87 for the visual subscale and .91 for the kinesthetic subscale as well as a test-retest reliability of .83 for a 1-week interval (Hall, Pongrac, & Buckolz, 1985). Hall & Martin (1985) explain how some participants refuse to physically perform all the items on the questionnaire which is considered a major drawback to implementing the MIQ. The length and the amount of time the MIQ takes to complete are considered another weakness. Taking the shortcomings of the MIQ into consideration, researchers revised the questionnaire and created the Movement Imagery Questionnaire-Revised. The MIQ-R varies from the MIQ since it is shorter in length, some items are worded differently in order to enhance comprehension, and the rating scale is reversed from the MIQ.

Movement imagery questionnaire-revised. Similar to the MIQ, the MIQ-R is used to assess visual and kinesthetic imagery ability (Hall and Martin, 1997). The MIQ-R is includes eight items and asks participants to image four different motor actions. Each motor action is imaged twice with four of the items assessing visual imagery ability and four items assessing kinesthetic imagery ability for each of the motor actions. First, the starting position is described and the participant is asked to arrive in that position. Next, the movement is described and the participant is asked to perform it. Then, the participant is asked to reassume the starting position and imagine performing the movement (no movement is physically performed). Finally, the participant is asked to rate how easy or difficult it was for them to visually see or kinesthetically feel each movement. A 7-point

Likert-type scale ranging from 1 (very hard to see/feel) and 7 (very easy to see/feel) is used to rate each item. The scores and means for the visual and kinesthetic items are added separately. According to Callow, Hardy, and Hall (2001), a score below 16 in either visual imagery ability or kinesthetic imagery ability is considered inadequate. A significant correlation was found between the already validated MIQ and MIQ-R for both the visual ($r = -.77$) and kinesthetic ($r = -.77$) scales (Hall & Martin, 1997). Since the MIQ is scored in the reverse direction compared to the original the MIQ-R, there are negative correlations which indicated the MIQ-R is an acceptable revision of the MIQ and adequately assesses visual and kinesthetic imagery ability.

APPENDIX C

PARENTAL INFORMED CONSENT

COLLEGE OF HEALTH AND HUMAN SCIENCES

SCHOOL OF HEALTH AND KINESIOLOGY

Article I.

INFORMED CONSENT

1. My name is Emily Parkerson and I am a second year Master's student in the Sport and Exercise Psychology program at Georgia Southern University, and a teaching assistant in the School of Health and Kinesiology. I am conducting research in order to fulfill the requirements of the Georgia Southern University for the completion of my Master's degree.

2. Purpose of the Study: The purpose of this study is to examine the use of a motivational imagery intervention on youth gymnasts' belief in their ability to complete specific gymnastics routines and increase their imagery use.

3. Procedures to be followed: Each of the parents/guardians will be asked to complete a short demographics survey, which will prompt parents/guardians of participants to provide information regarding their child's age, race, ethnicity, current USAG level, and extent of USAG experience. Children's participation in this research will include completion of the Self-Efficacy Questionnaire, the Sport Imagery Questionnaire for Children, the Movement Imagery Questionnaire-Revised, and imagery use logs. I would also be meeting with gymnasts two days a week for three weeks at their practice facility. Each time we meet it will take about 30 minutes. Gymnasts would also do activities 3 times a week on their own practicing imagery and answering questions about how they feel about gymnastics. These assignments would take about 10-15 minutes and could be completed without parents/guardians.

4. There is a minimal risk for mental or social discomfort. Risks associated with participation in this survey are no greater than risks experienced in everyday settings and similar to possible stress experienced during normal sports participation. If the parent/guardian or participant experiences any emotional or

psychological discomfort as a result of participating in the study, a list of mental health professionals is available upon request.

5. The researcher expects to identify the effectiveness of using an imagery intervention with a youth population. Learning a psychological skill such as imagery and experiencing increases in competence relating to gymnastics could lead to improved sport performance and contribute to youth development. Further, the results from this study could benefit sport psychologists and researchers interested in youth athletes and the effectiveness of MG-M imagery interventions.

6. The duration/time required from the participant is approximately 30 minutes depending on the session.

7. Only the researcher and the researcher's committee will have access to the surveys. Data will be maintained in a secure location for a minimum of 5 years following completion of the study.

8. Participants and their parents/guardians have the right to ask questions and have those questions answered. If you or your child have questions about this study, please contact the researcher named above or the researcher's faculty advisor, whose contact information is located at the end of the informed consent. For questions concerning your rights as a research participant, contact Georgia Southern University Office of Research Services and Sponsored Programs at 912-478-0843.

9. Individuals are not obligated to take part in this research. You may end participation at any time by informing the researcher of your request to leave the study. Also, you are not required to answer any questions that you do not want to answer.

10. There is no penalty for deciding not to participate in the study; you may decide at any time you do not want to participate further and may withdraw without penalty or retribution.

You will be given a copy of this consent form to keep for your records. This project has been reviewed and approved by the GSU Institutional Review Board under tracking number _____

Title of Project: Using a motivational general-mastery imagery intervention to improve the self-efficacy of youth gymnasts
Principal Investigator: Emily Parkerson
244A Sawgrass Trail, Statesboro, GA 30458 (410) 585-4265
Ep01828@georgiasouthern.edu
Other Investigator(s):
Faculty Advisor: Dr. Brandonn Harris

Hollis Building 1103C P.O. Box 8076 Statesboro, GA 30460 (912) 478-7900
bharris@georgiasouthern.edu

_____ _____
Participant Signature Date

I, the undersigned, verify that the above informed consent procedure has been followed.

_____ _____
Investigator Signature Date

APPENDIX D

MINOR ASSENT FORM

COLLEGE OF HEALTH AND HUMAN SCIENCES

SCHOOL OF HEALTH AND KINESIOLOGY

MINOR ASSENT FORM

Hello,

My name is Emily. I am a student at Georgia Southern. I am doing a project on how to use imagery for gymnasts. I was hoping you would want to help with this project. We will meet about 12 times. We have asked your parents if you can help. If you want to help, you would work with me or my classmates on making an imagery script. The script is a story about a part of gymnastics that you would like to make better. You do not have to do this project. If you join, you can stop if you want. You can say no even if your parents say you can do the project. If you say no, nothing bad will happen. If you do the study, your parents or coaches will not see answers to your questions during the project.

If you or your parent has questions about this study, please call me at (410) 585-4265 or my advisor, Dr. Brandonn Harris at (912) 478-7900. Thank you!

If you want to do the project, please sign your name on the line below:

Yes, I will do this project: _____

Child's Name: _____
Investigator's Signature: _____
Date: _____

APPENDIX E

DEMOGRAPHIC QUESTIONNAIRE

Directions: Please complete the following demographic information.

Name of person filling out this form (please write):_____

Relationship to Gymnast: _____

Gymnast Age: _____

Gymnast's Current Competitive Level: _____

Race of Gymnast (please circle):

Caucasian (White)

African-American (Black)

Asian

Native American (Alaska American)

Native Hawaiian (Pacific Islander)

Other (Please Specify) _____

Ethnicity of Gymnast (please circle):

Hispanic/Latino

Non-Hispanic/Non-Latino

Amount of *prior* experience competing in USA Gymnastics (in years):

APPENDIX F

MIQ-R

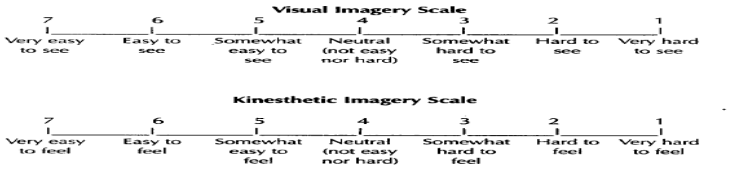
Instructions

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

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

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

RATING SCALES



1. Starting Position: Stand with your feet and legs together and your arms at your sides.

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

Mental Task: Assume the starting position Attempt to feel yourself making the movement just performed without actually doing it. Now rate the ease/difficulty with which you were able to do this mental task.

Rating:_____

2. Starting Position: Stand with your feet slightly apart and your hands at your sides.

Action: Bend down low and then jump straight up in the air as high as possible with both arms extended above your head. Land with your feet apart and lower your arms to your sides.

Mental Task: Assume the starting position. Attempt to see yourself making the movement just as performed with as clear and vivid a visual image as possible. Now rate the ease/difficulty with which you were able to do this mental task.

Rating:_____

3. Starting Position: Extend the arm of your nondominant hand straight out to your side so that it is parallel to the ground, palm down.

Action: Move your arm forward until it is directly in front of your body (still parallel to the ground). Keep your arm extended during the movement and make the movement slowly.

Mental Task: Assume the starting position. Attempt to feel yourself making the movement just performed without actually doing it. Now rate the ease/difficulty with which you were able to do this mental task.

Rating:_____

4. Starting Position: Stand with your feet slightly apart of your arms fully extended above your head.

Action: Slowly bend forward at the waist and try and touch your toes with your fingertips (or of possible, touch the floor with your fingertips or hands). Now return to the starting position, standing erect with your arms extended above your head.

Mental Task: Assume the starting position. Attempt to see yourself making the movement just performed with as clear and vivid a visual image as possible. Now rate the ease/difficulty with which you were able to do this mental task.

Rating:_____

5. Starting Position: Stand with your feet slightly apart and your hands at your sides.

Action: Bend down low and then jump straight up in the air as high as possible with both arms extended above your head. Land with your feet apart and lower your arms to your sides.

Mental Task: Assume the starting position. Attempt to feel yourself making the movement just performed without actually doing it. Now rate the ease/difficulty with which you are able to do this mental task.

Rating:_____

6. Starting Position: Stand with your feet and legs together and your arms at your sides.

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

Mental Task: Assume the starting position. Attempt to see yourself making the movement just performed with as clear and vivid a visual image as possible. Now rate the ease/difficulty with which you were able to do this mental task.

Rating:_____

7. Starting Position: Stand with your feet slightly apart and your arms fully extended above your head.

Action: Slowly bend forward at the waist and try and touch your toes with your fingertips (or if possible, touch the floor with your fingertips or hands). Now return to the starting position, standing erect with your arms extended above your head.

Mental Task: Assume the starting position. Attempt to feel yourself making the movement just performed without actually doing it. Now rate the ease/difficulty with which you are able to do this mental task.

Rating:_____

8. Starting Position: Extend the arm of your nondominant hand straight out to your side so that it is parallel to the ground, palm down.

Action: Move your arm forward until it is directly in front of your body (still parallel to the ground). Keep your arm extended during the movement and make the movement slowly.

Mental Task: Assume the starting position. Attempt to see yourself making the movement just performed with as clear and vivid a visual image as possible. Now rate the ease/difficulty with which you were able to do this mental task.

Rating:_____

APPENDIX G

SEQ

This questionnaire concerns your confidence in practice. For each item, please indicate how confident you are using the 0 – 100% scale given below.

0% 10 20 30 40 50 60 70 80 90 100%

No confidence **Complete confidence**

1. I am confident that I can work hard at every practice. _____

2. I am confident that I can always be psyched up for practice. _____

3. I am confident that I can stay positive at every practice. _____

4. I am confident that with practice I can achieve my performance goals. _____

5. I am confident that I can successfully work through difficult situations. _____

APPENDIX H

SIQ-C

Directions: Imagery is a mental skill that is used to create and re-create pictures in your mind. Athletes use imagery in practices and in competition. Imagery can be used to see different skills in your head and can also be used to help with your confidence and nervousness. This questionnaire measures how you are using imagery. Any statement that explains an imagery situation that you often use should be given a high number. The statements will be scored from 1-5. Please read each statement and then circle the number that most applies to you for that statement. Feel free to use a number more than once and remember – there are no right or wrong answers.

1= not at all 2= a bit 3= sometimes 4= often 5= very often

1. I imagine myself being confident in competition.	1 2 3 4 5
2. I see myself being mentally strong.	1 2 3 4 5
3. I see myself being focused in a tough situation.	1 2 3 4 5
4. I see myself being in control in tricky situations.	1 2 3 4 5
5. I see myself getting through tough situations with good results.	1 2 3 4 5

APPENDIX I

IMAGERY LOG

TODAY'S DATE:

_____

	No	Yes
Did you do your imagery today?	☐	☐

How easy was it for you to imagine the situation in your imagery script?

REALLY HARD	HARD	SO-SO	EASY	REALLY EASY
☐	☐	☐	☐	☐

Write down any comments you may have about imagining the situation or any questions you have about your imagery practice.

APPENDIX J

SESSION PROTOCOL

Baseline Session Protocol

Sessions per week: 3x

Session time: 10 – 15min

Length of Baseline: 1-2 weeks

Session:

(10-15 min.) Administer SEQ and SIQ-C questionnaires

Intervention Session Protocol

Sessions per week: 2x

Session time: 20 – 35 min

Length of Intervention: 3 weeks

Session 1:

(15-20 min.) 1st – Educational Imagery Session

(15-20 min.) 2nd – Administer MIQ-R

(5 min) 3rd- SEQ & SIQ-C

(*1-5 min.)* 4th- Address questions or concerns the individual may have about imagery practice or the intervention. Explain upcoming homework and remind participant to complete it

Homework 1= Identifying examples of each of the 5 senses participant uses in practice

Session 2:

(5 min.) 1st – Address questions or concerns the individual may have about imagery practice or the intervention

(5 min) *2nd*- Review Homework 1

(10-15 min.) 3rd- Create individualized imagery script

(10-15 min.) 4th - Administer MIQ-R again if participant's score were not adequate during the previous session or administer an imagery script adapted from *The Mental Athlete* if the participant's MIQ-R scores were adequate during the first session

(2 min) 5th- The participant will be asked whether they would like the researcher's or their voice on the audio recording of their imagery script

(5 min) 6th- SEQ & SIQ-C

Homework 2= Imagery script and complete imagery log

Homework 3= SEQ & SIQ-C

Session 3:

(5 min.) 1st - Check participant's log sheets to verify homework has been completed and kept up with. Address questions or concerns the individual may have about imagery practice or the intervention

(10-15 min.) 2nd – Administer imagery script

(2-5 min.) 3rd- Answer any questions about imagery script & remind participant to complete upcoming homework

(10 min) *4th*- If the participant would like their voice on the audio recording of their imagery script, have the participant record the script.

(5 min) 5th- SEQ & SIQ-C

Homework 4= Imagery script and complete imagery log

Session 4:

(5 min.) 1st – Check participant's log sheets to verify homework has been completed and kept up with. Address questions or concerns the individual may have about imagery practice or the intervention

(10-15 min.) 2nd – Administer imagery script

(2-5 min.) 3rd – Answer any questions about imagery script & remind participant to complete upcoming homework

(5 min) 4th - SEQ & SIQ-C

Homework 5= Imagery script and complete imagery log

Homework 6: Complete SEQ & SIQ-C

Session 5:

(5 min.) 1st – Check participants log sheets to verify homework has been completed and kept up with. Address questions or concerns the individual may have about imagery practice or the intervention

(10-15 min.) 2nd – Administer imagery script

(5 min) 3rd - SEQ & SIQ-C

(2-5 min.) 4th -Answer any questions about imagery script & remind participant to complete upcoming homework

Homework 7= Imagery script and complete imagery log

Session 6:

(5 min.) 1st – Check participants log sheets to verify homework has been completed and kept up with. Address questions or concerns the individual may have about imagery practice or the intervention

(10-15 min.) 2nd – Administer imagery script

(5 min) 3rd - SEQ & SIQ-C

(2-5 min.) 4th – Answer any questions about imagery script & remind participant to complete upcoming homework

Homework 8= Imagery script and complete imagery log

Homework 9= Complete SEQ & SIQ-C

APPENDIX K

IMAGERY EDUCATION PROTOCOL (Adapted from O et al., 2014)

- ☐ Define imagery as practicing their gymnastics skills in their mind. The participant will be informed that the sessions will be time for them to practice imagery and they will be practicing imagery at home as well.

- ☐ Describe how all senses are involved while practicing imagery. The participant will use examples of what they normally see, hear, smell, taste, and touch at the gym and apply that to their imagery script.

- ☐ Explain internal and external perspectives of imagery. Imagery perspectives will be explained to the participant by defining an internal perspective as experiencing an image as if they are actually doing it in practice. An internal perspective would be defined as experiencing an image as if you were watching a movie of yourself. The participant will be encouraged to use whichever perspective is most comfortable for them. The researcher will ensure the participant understands these ideas and answer any questions if necessary.

- ☐ Next, the participant will be guided through visual and kinesthetic imagery training. The participant will be guided through the creation and experience of an image of themselves performing a handstand on the floor. Emphasis will first be placed on accurately recreating the visual aspects of the image, which include the visual image of herself and of the equipment. The participant will be asked to image herself performing a handstand on the floor, for three successive practice trials. Each trial will last approximately 30 seconds and a break of approximately 30 seconds will be given between each trial. During the imagery practice trials, the researcher will remind each participant to focus on seeing her own movements on the floor exercise and seeing the various structural details of the floor (the color, the feeling of the carpet, the space).

- ☐ Following the visual imagery training session, kinesthetic imagery training will take place. The participant will be asked to focus on feeling her own movements while on the floor, including pointing toes, straightening legs, and placing hands on the floor. The participant will be asked to perform three imagery practice trials focusing on feeling her movements. Each trial

will last approximately 30 seconds and a break of approximately 30 seconds will be given between each trial. During the kinesthetic-focused images, the researcher will remind the participant to focus on feeling themselves lift their arms in preparation for the handstand, reaching out to place their hands on the floor, their legs moving into the air, and their feet landing on the floor.

- ☐ The researcher will administer the MIQ-R. The participants who score below a 16 on either the visual imagery ability or kinesthetic imagery ability subscales on the MIQ-R will engage in further imagery education during the second session.

TABLES

Table 1

Mean Self-Efficacy Scores

	Participant 1	**Participant 2**	**Participant 3**	**Participant 4**	**Participant 5**
Baseline	78.4	82.4	76.8	93.2	96
Intervention	76.66	71.77	78.66	93.33	86.25
Return to Baseline	75.6	69.6	74.8	91.8	72.8

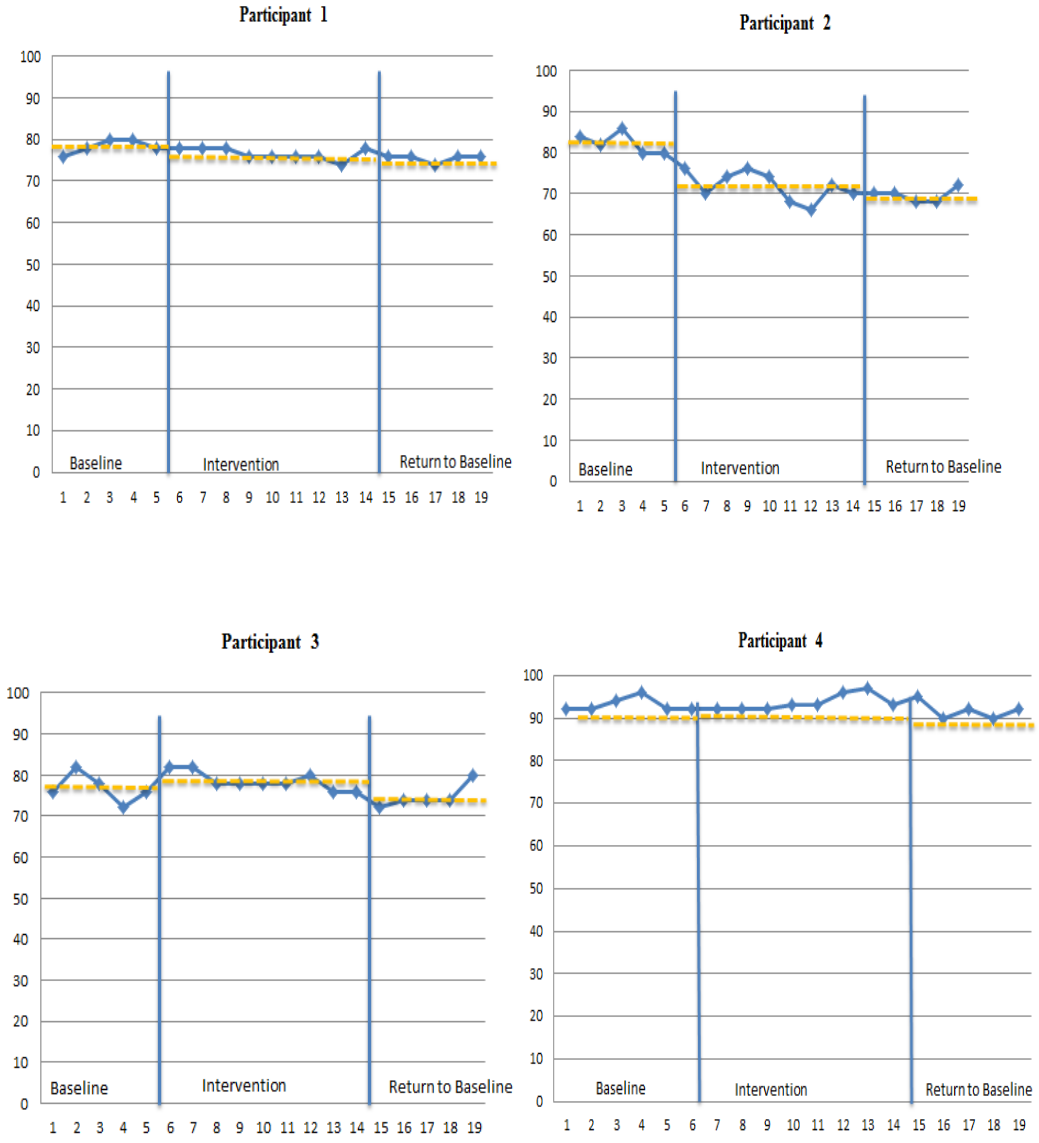
Table 2

Mean MG-M Imagery Use Scores

	Participant 1	**Participant 2**	**Participant 3**	**Participant 4**	**Participant 5**
Baseline	3.64	3.96	3.36	4.48	4.36
Intervention	3.53	3.6	3.22	4.2	3.67
Return to Baseline	3.52	3.48	3.64	4.2	3.24

FIGURES

Figure 1. Participants' Baseline, Intervention, and Return to Baseline Self-efficacy Data. Horizontal dotted line= mean self-efficacy score during that phase.



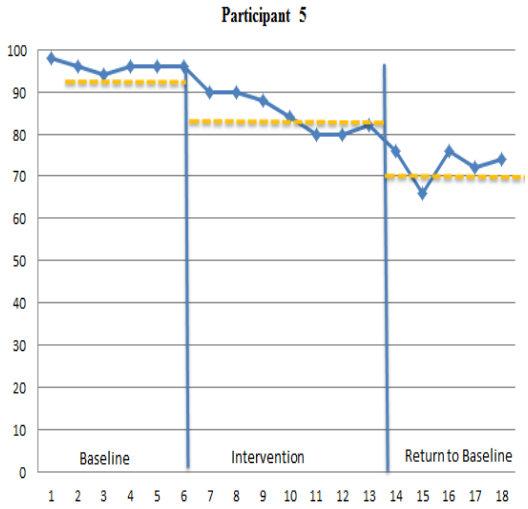
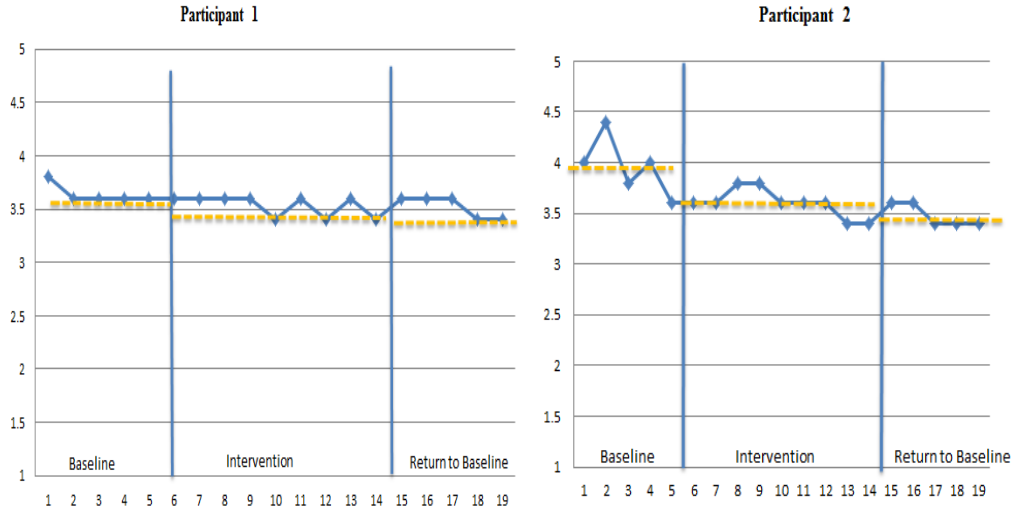
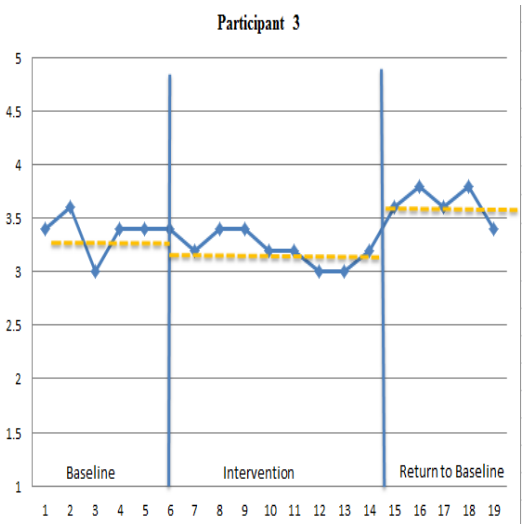
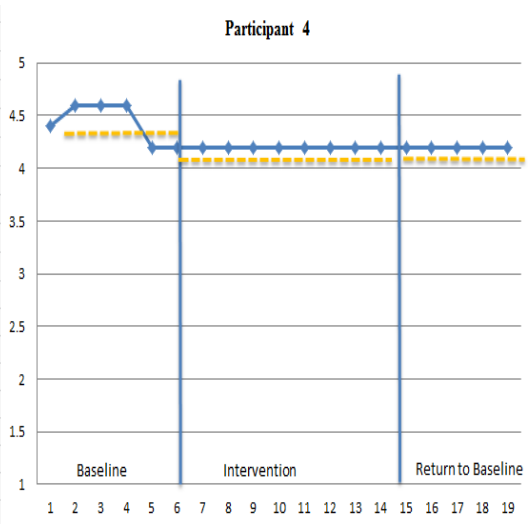
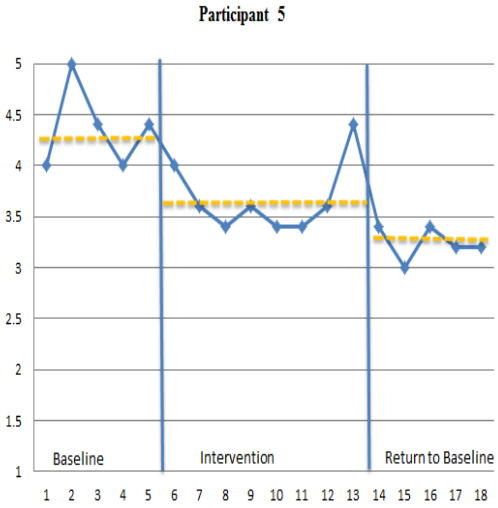


Figure 2. Participants' Baseline, Intervention, and Return to Baseline MG-M Imagery Frequency Data. Horizontal dotted line= mean imagery use score during that phase.




Participant 3
5
4.5
4
3.5
3
2.5
2
1.5
1
Baseline
Intervention
Return to Baseline
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19


Participant 4
5
4.5
4
3.5
3
2.5
2
1.5
1
Baseline
Intervention
Return to Baseline
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19


Participant 5
5
4.5
4
3.5
3
2.5
2
1.5
1
Baseline
Intervention
Return to Baseline
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18