

Spring 2015

Using a MG-M Imagery Intervention to Enhance the Sport Competence of Young Special Olympics Athletes

Kelley Catenacci

Follow this and additional works at: <https://digitalcommons.georgiasouthern.edu/etd>



Part of the [Other Psychology Commons](#), and the [Sports Studies Commons](#)

Recommended Citation

Catenacci, K. (2015). Using a MG-M imagery intervention to enhance the sport competence of young Special Olympics athletes (Unpublished master's thesis). Georgia Southern University, Statesboro, GA.

This thesis (open access) is brought to you for free and open access by the Graduate Studies, Jack N. Averitt College of at Digital Commons@Georgia Southern. It has been accepted for inclusion in Electronic Theses and Dissertations by an authorized administrator of Digital Commons@Georgia Southern. For more information, please contact digitalcommons@georgiasouthern.edu.

USING A MG-M IMAGERY INTERVENTION TO ENHANCE THE SPORT COMPETENCE OF YOUNG SPECIAL OLYMPICS ATHLETES

by

KELLEY CATENACCI

Under the Direction of Brandonn Harris

The opportunity for athletes with an intellectual disability (ID) to participate in sport is limited due to physical, social, and psychological barriers (Shields, Synnot, & Barr, 2012). Sport psychology interventions may have the capacity to address these barriers, namely the lack of sport competence that athletes with an ID tend to experience (Vealey, Hayashi, Garner-Holman, & Giacobbi, 1998). Therefore, this single subject A-B-A design sought to enhance sport competence among athletes with an ID using personalized motivational general-mastery (MG-M) imagery scripts. The study spanned six weeks and was implemented with five Special Olympics athletes ($M_{age} = 11.40$) who had ID's including autism, mild intellectual disability, and moderate intellectual disability. The Sport Imagery Questionnaire for Children (SIQ-C), the Movement Imagery Questionnaire-Revised (MIQ-R), and the Pictorial Scale of Perceived Competence and Social Acceptance for Young Children assessed athletes' imagery use, imagery ability, and sport competence level, respectively. Results demonstrated improvements in sport competence from baseline through intervention for three out of five participants, and these changes were maintained in the return to baseline phase for two of those three participants. Changes in mean and variability were also evaluated using effect sizes, and suggested that scores became more stable during the intervention phase for three out of five participants. Implications of the current study include emphasizing the importance and feasibility of conducting research with this special population of athletes. Additionally, this study identifies the relevant modifications for mental skills training with individuals who have an ID. In particular, results suggest that imagery use and ability, as well as sport competence, can be improved with individualized training among athletes with an ID.

INDEX WORDS: Sport competence, Intellectual disabilities, Special Olympics, Imagery

**“USING A MG-M IMAGERY INTERVENTION TO ENHANCE THE SPORT
COMPETENCE OF YOUNG SPECIAL OLYMPICS ATHLETES”**

by

KELLEY CATENACCI

Psychology, St. Norbert College, 2013

A Thesis Submitted to the Graduate Faculty of Georgia Southern University in Partial

Fulfillment of the Requirements for the Degree

MASTER OF KINESIOLOGY; SPORT AND EXERCISE PSYCHOLOGY

STATESBORO, GEORGIA

2015

© 2015

KELLEY CATENACCI

All Rights Reserved

USING A MG-M IMAGERY INTERVENTION TO ENHANCE THE SPORT
COMPETENCE OF YOUNG SPECIAL OLYMPICS ATHLETES

by

KELLEY CATENACCI

Major Professor: Dr. Brandonn Harris
Committee: Dr. Jody Langdon
Dr. Daniel Czech

Electronic Version Approved:
Spring 2015

TABLE OF CONTENTS

LIST OF FIGURES	7
LIST OF TABLES	8
CHAPTER	
1 INTRODUCTION	9
2 METHODS	15
Participants	15
Instrumentation	15
Procedures	18
Data Analysis.....	23
3 RESULTS	26
4 DISCUSSION	30
REFERENCES	36
APPENDICES	
A DEMOGRAPHIC QUESTIONNAIRE	42
B PICTORIAL SCALE OF PERCEIVED COMPETENCE AND SOCIAL ACCEPTANCE FOR YOUNG CHILDREN	44
C SPORT IMAGERY QUESTIONNAIRE FOR CHILDREN.....	60
D MOVEMENT IMAGERY QUESTIONNAIRE - REVISED	61
E INTERVENTION SESSION I SCRIPT	64
F SAMPLE INDIVIDUALIZED IMAGERY SCRIPT	66
G ADDITIONAL IMAGERY TRAINING I	67
H ADDITIONAL IMAGERY TRAINING II	68
I FIGURES AND TABLES	69

J LITERATURE REVIEW	75
REFERENCES	87

LIST OF FIGURES

Figure 1: Physical competence subscale sample item	69
Figure 2: Participants' Sport Competence Data	70
Figure 3: Participants' Imagery Use Data	71
Figure 4: Participants' Visual Imagery Ability Data.....	72
Figure 5: Participants' Kinesthetic Imagery Ability Data.....	73

LIST OF TABLES

Table 1: Summary of MG-M Imagery Intervention Results	74
Table 2: SIQ-C, MIQ-R, and Pictorial Scale Baseline, Intervention, and Return to Baseline Mean Scores	74
Table 3: Subscales of the SIQ-C	84

CHAPTER 1

INTRODUCTION

There are self-enhancing qualities to be gained from sport participation, qualities that are physical, social, and psychological in nature. These gains have been demonstrated among many different types of sport participants (Franz, Phillips, Matheri, & Kibet, 2011; Johnson, 2009), including children and those with an intellectual disability (Changing Lives through Sport, 2005). *Intellectual disability* (ID) is a term used when a person has certain limitations in cognitive functioning and in skills such as communicating, taking care of oneself, and social interactions. These limitations will cause a child to learn and develop more slowly than a typical child (National Dissemination Center for Children with Disabilities, 2014).

One way to address this delayed development such that physical and psychosocial functioning may be improved is through involvement in sport and exercise, which affords those with a disability the opportunity to develop and maintain a healthy lifestyle (Groff, Lundberg, & Zabriskie, 2009). Participation in physical activity is particularly important for children with an ID as it has the capacity to positively impact the children's quality of life, development, and future health and life outcomes. However, there are several barriers to initiating and/or maintaining sport participation for those with an ID (Shields, Synnot, & Barr, 2012). Children with an ID have reported a dislike for having to cope with attracting unwanted attention or the negative perceptions of those who have a disability when they participate in sport or physical activity. Some choose not to participate in activity for fear of their peers who are non-disabled viewing them as helpless (Shields et al., 2012).

Individuals with disabilities often experience limitations associated with physical activity, which can result in greater number of days experiencing pain, depressive and/or anxious symptoms, and fewer days of vitality than those without activity limitations (Groff, et al., 2009). These barriers reiterate the need for programming that encourages those with an ID to be active in sport. Programming that focuses on enhancing psychosocial characteristics of athletes who have an ID could aid in breaking down the barriers of sport participation and thus, allow them the opportunity to receive the numerous benefits of physical activity participation.

While evidence suggests that physical activity and sport participation are beneficial for those who have an ID, the opportunities for these individuals to participate in these types of programs are limited (Franz et al., 2011; Travis & Sachs, 1991). Developed in 1968, Special Olympics was designed as one of these unique opportunities to facilitate improvements in the physical as well as the social abilities among those with an ID (Riggen & Ulrich, 1993). Special Olympics currently has well over two million athletes worldwide, many of whom report enjoying the social experiences that accompany sport participation, as well as significant improvement in their sense of self, social skills, and social interactions (“History of Special Olympics,” 2014). Further, families of athletes note substantial improvements in psychosocial areas such as self-esteem, self-confidence, and friendship (“Changing Lives through Sport,” 2005).

Travis and Sachs (1991) noted that the aforementioned benefits of Special Olympics participation can be taken a step further by integrating sport psychology into the Special Olympics experience. It has been established that competitive athletic participation can pave the way for future success, but rarely are Special Olympians recognized as “real” athletes (Asken & Goodling, 1986; Travis & Sachs, 1991). The physical and psychosocial outcomes of Special Olympics participation can only be beneficial to an extent; it added element of competition and

with that, the feeling of being a “real” athlete, to truly enhance the lives of those with an ID. One factor that could contribute to these Special Olympians feeling like “real” athletes is the attention and benefits associated with participating in a sport psychology or mental skills intervention.

The evidence suggesting that physical activity is beneficial for youth with developmental disabilities (i.e., Johnson, 2009; Riggen & Ulrich, 1993; Travis & Sachs, 1991) is almost exclusively anecdotal. Families and coaches (“Changing Lives through Sport,” 2005; Gibbons & Bushakra, 1989) note the psychological and social benefits of Special Olympics to children with IDs, but empirical research on the topic is lacking. There are few reports of sport psychology service provision with athletes who have an ID, and still fewer that examine the impact of sport psychology and mental skills training on the psychosocial outcomes, rather than solely athletic performance outcomes, of athletes with an ID (Gregg, Hrycaiko, Mactavish, & Martin, 2004). The United States Olympic Committee on Sports for the Disabled, in conjunction with researchers such as Songster (1984) and Dykens, Rosner, and Butterbaugh (1998), emphasized the need for measuring specific psychological changes in individuals with an ID who participate in Special Olympics (Gibbons & Bushakra, 1989). This can potentially be accomplished via mental skills training.

Imagery is one such mental skill that has previously been used successfully with a disabled population (Poretta & Surburg 1995; Screws & Surburg, 1997; Sharp, Woodcock, Holland, Cumming, & Duda 2013; Surburg, 1989). Defined as a process of creating an experience in the mind for the purpose of preparing for a performance (Weinberg & Gould, 2011), imagery is known to be an effective means of enhancing the performance of motor tasks in children with an ID (Screws & Surburg, 1997). One theory of imagery outlined by Weinberg and Gould (2011) is the Psychological Skills Hypothesis, which suggests that imagery is

effective because it helps to build other psychological skills such as confidence, concentration and arousal regulation, all which are critical to performance enhancement. Imagery can also serve as a form of motivation, helping an athlete focus on positive outcomes such as improving performance of a skill.

Athletes can use different types of imagery to achieve various types of performance-related outcomes. Hall and colleagues identified five types of imagery within the sport domain: motivational-specific (M-S; imagery that represents specific goals and goal-oriented behaviors), motivational general-mastery (MG-M; imagery that represents effective coping and mastery of challenging situations), motivational general-arousal (MG-A; imagery that represents feelings of relaxation, stress, arousal, and anxiety in conjunction with competition), cognitive specific (CS; imagery of specific sport skills), and cognitive general (CG; imagery of the strategies related to a competitive event) (Hall, Munroe-Chandler, Fishburne, & Hall, 2009).

The function that imagery serves for an athlete is a determinant of the outcome of imagery use, be it learning and performance of skill or strategy, modification of cognitions (negative or otherwise), or regulation of arousal and anxiety related to competition. Most athletes can generate and use imagery, but not to the same degree. Previous research has indicated that those with higher imagery ability have experienced greater performance improvements and outcomes; thus, imagery ability moderates the effects of imagery use on outcomes (Hall & Martin, 1997; Martin, Moritz, & Hall, 1999). As such, there are three main points to be taken from this aforementioned information about imagery: (a) imagery can serve several different functions, (b) the function imagery serves for a given athlete should match their desired outcomes, and (c) one's imagery ability impacts not only their use of imagery, but also how imagery effects their outcomes.

Many athletes with an ID may lack confidence in their ability to be successful in sport due to either the nature of their disability or to the lack of recognition of them as a real athlete. This belief that one has the ability to be successful in athletic pursuits is called sport competence, and much like self-confidence, sport competence is a critical characteristic influencing sport performance (Vealey, Hayashi, Garner-Holman, & Giacobbi, 1998). Sources of sport competence include physical/mental preparation, social support, mastery, demonstration of ability, luck/superstition, vicarious experience, and environmental comfort (Vealey et al., 1998). Wright and Cowden (1986) demonstrated that athletes with an ID who competed in Special Olympics evidenced greater improvement in global self-esteem compared to non-disabled participants. With performance improvements, perceived competence in athletic and social areas is enhanced in children with an ID (Gibbons & Bushakra, 1989).

There also appears to be an established association between motivational imagery and confidence. Moritz, Hall, Martin, and Vadocz (1996) found that highly confident elite roller skating athletes were more likely to image mastery and emotions associated with competition (i.e., MG-M and MG-A imagery). Further, Salmon, Hall, and Haslam (1994) found soccer players to use imagery more for its motivational function than its cognitive function. Finally, Callow, Hardy, and Hall (2001) noted a facilitative effect of a MG-M imagery intervention on the sport competence of high-level badminton players. Thus, there are demonstrated relationships between MG-M imagery interventions and increased feelings of confidence or sport competence for those athletes at high or elite levels. However, the question remains whether or not this relationship exists among other groups of athletes, as well.

This study aimed to put forth a mental skill program designed to improve athletes' vicarious experiences, of which imagery is a type. As vicarious experience is a component of

sport competence, a psychosocial characteristic research has shown to be lacking in athletes with an ID (Dykens et al., 1998), there is the potential for imagery training to enhance this source of sport competence. The purpose of this study was to add empirical evidence to the field of sport psychology in terms of the psychosocial impact of mental skills training on athletes who have an intellectual disability. Specifically, MG-M imagery was taught to Special Olympics athletes in an attempt to enhance their perceptions of their ability to complete sport skills. It was hypothesized that athletes would (a) demonstrate an overall increase in imagery use and imagery ability from baseline through the course of the intervention, (b) maintain their levels of imagery ability through return to baseline, (c) show decreases in their imagery use levels at the withdrawal of the intervention, and (d) demonstrate increases from baseline through the course of the intervention in their sport competence scores (Ninot, Bilard, Delignieres, & Sokolowski, 2000), which would then be maintained through the return to baseline phase.

It was expected that evidence demonstrating the effective use of an MG-M imagery intervention with Special Olympics athletes would broaden the perspectives of researchers who had yet to consider individuals with an ID in their research on athletes. Further, a successful mental skills training program would have the potential of enhancing the sport experience and the overall feelings of competence in a population of athletes with an ID.

CHAPTER 2

METHODS

Participants

The initial sample of participants included six elementary and middle school students participating in a Special Olympics program located in the southeastern United States in the fall of 2014. However, one participant was removed from the study because they were unable to understand the assessment directions and meaningfully interact with the researcher, even though they met the participation requirements regarding having a mild to moderate intellectual disability. The remaining sample of five participants (one female, four males; 10-12 years old) had a mean age of 11.4 years and averaged 2.8 years of Special Olympics experience. Three of the participants had a diagnosis of autism, one participant was diagnosed with a mild intellectual disability, and one participant had a diagnosis of a moderate intellectual disability. Exclusion criteria of participants included children who were unable to write or sign their name indicating their assent to participate in the study. Further, those who were not officially registered as a Special Olympics athlete were excluded, as this served as a confirmation of a diagnosed intellectual disability (“Our Athletes,” 2014).

Instrumentation

Demographics. Information regarding the participant’s age, grade, sex, diagnosis, cognitive ability, and years of Special Olympics experience was provided by the school psychologist who was also the case worker for each of the participants (see Appendix A).

Sport competence. Sport competence was assessed using the Pictorial Scale of Perceived Competence and Social Acceptance for Young Children (Harter & Pike, 1984; see Appendix B), which is a developmentally appropriate downward extension of the Perceived Competence Scale

for Children (Harter, 1982). This scale was validated with participants in preschool (mean age = 4.45 years) through second grade (mean age = 7.41 years). The version of the scale administered in the present study (the preschool-kindergarten version or the first-second grade version) depended on the cognitive ability of each participant as reported by the school psychologist.

The Pictorial Scale consists of two general constructs: perceived competence and perceived social acceptance. Both of these constructs have two subscales with six items each. Perceived competence is divided into cognitive competence and physical competence. Social acceptance is divided into peer acceptance and maternal acceptance. As the focus of this study pertained specifically to the physical competence (sport competence) subscale, this was the only subscale that was administered to participants. Harter (1982) defined physical competence in this measure as a child's perception of how well they play sports. Thus, the physical competence subscale of the Pictorial Scale was considered to be an appropriate and congruent measure of sport competence.

A sample item is presented in Figure 1. The gender of the child in the picture matched the gender of the participant. For the sample item presented, the participant was read a statement about the child in the picture. The participant was told that the child on the right was good at climbing but the child on the left was not very good at climbing. The participant then had to indicate which child he/she was most like. Once they decided, the participant was then asked to think about the picture that they chose and decided if they were a lot like the child in the picture (indicated by marking the larger circle) or just a little bit like the child in the picture (indicated by marking the little circle). Each item was scored on a four-point scale, where a score of four indicated greater perceived competence or acceptance and a score of one indicated lesser perceived competence or acceptance. Item scores were averaged across the six items in the

subscale. The resulting mean indicated the participants' score for perceived physical competence.

Subscale reliability as assessed through indices of internal consistency (Cronbach's alpha) were combined according to their designated factors (perceived competence and perceived social acceptance). As reported by Harter and Pike (1984), these values were between .76 and .87 for the preschool-kindergarten version and .77 and .86 for the first-second grade version.

Imagery use. Imagery use was assessed using the Sport Imagery Questionnaire for Children (SIQ-C; Hall et al., 2009; see Appendix C), which examines five cognitive and motivational functions of imagery on either a specific or general level. This scale was validated with participants aged 7-14. The 21-item questionnaire consists of five subscales including cognitive general (CG), cognitive specific (CS), motivational general-arousal (MG-A), motivational general-mastery (MG-M), and motivational specific (MS). For the purposes of this study, only the five items pertaining to MG-M imagery (imagery associated with mental toughness, control, and self-confidence) were administered verbally to participants. Participants responded to items on a five-point Likert-type scale ranging from 1 (Not At All), to 5 (Very Often). A sample item from the MG-M subscale reads: "I see myself getting through tough situations with good results." The Cronbach's alpha coefficient for the MG-M subscale has been reported to be .82 (Hall et al., 2009).

Imagery ability. Visual and kinesthetic imagery ability were assessed by the Movement Imagery Questionnaire-Revised (MIQ-R; Hall & Martin, 1997; see Appendix D). The MIQ-R is a shortened version of the Movement Imagery Questionnaire (MIQ; Hall & Pongrac, 1983). The measure includes eight self-report items that require participants to perform one of four simple

movements. Each movement was rated on both a visual and kinesthetic subscale. Once a participant performed one of the four movements, they were then asked to “see” or “feel” themselves performing that movement without actually moving, and then indicated the difficulty of seeing/feeling the image on a 7-point Likert-type scale ranging from 1 (Hard to Image) to 7 (Easy to Image). Responses were summed for each scale resulting in two scores; one for kinesthetic and one for visual imagery ability. Subscale scores can range from values of 4 to 28. The factor structure and stability of the MIQ-R was assessed using participants ranging in age from 12 to 64. Internal consistency values were .88 for the kinesthetic subscale and .84 for the visual subscale. The one-week test-retest reliability coefficient was .81 for kinesthetic imagery ability and .80 for visual imagery ability (Monsma, Short, Hall, Gregg, & Sullivan, 2009).

The MIQ-R was administered to participants verbally, and the movements were both described to participants (Monsma et al., 2009) and demonstrated by the researcher administering the scale. This was done to ensure that participants fully comprehended the movement that they were asked to complete and aided in their visualization of the movement. It is suggested that working with an athlete who has a disability on his/her level, in communicating effectively, is a critical component of mental skills implementation in a special population (Travis & Sachs, 1991).

Procedures

In addition to the principal investigator, one additional graduate student in sport and exercise psychology assisted the lead researcher in administering the measures, and was trained ahead of time in a manner consistent with each scale’s procedural manual. The assisting graduate student had previous experience volunteering with children who had disabilities in a sport context.

Upon receiving clearance from the Institutional Review Board and from the local organizing committee for Special Olympics in the region, participants (and their parents/guardians) in a local Special Olympics program were contacted to participate in the study. Parents of participants who agreed to participate provided permission and written consent. Participants themselves provided individual assent. The school psychologist also completed and returned a demographic information form about each participant, including information regarding the participants' cognitive abilities.

There were three phases included in this reversal single subject design protocol: (a) a baseline phase comprised of three to five sessions (some participants required extra training and thus, extra baseline sessions in order for their scores to achieve stability); (b) an intervention phase comprised of six sessions, and (c) a return-to-baseline or withdrawal phase comprised of three sessions. These sessions took place three times a week for six weeks, the length and frequency of which was based on similar published protocols (Post, Muncie, & Simpson, 2012). Each session took place at the participants' school where their Special Olympics training and some competitions were held. Two participants attended an elementary school and three participants attended a middle school, both of which were a part of the same Special Olympics program. The lead researcher worked with the participants at the elementary school for the entire study, and worked with the participants at the middle school for the final week of return to baseline testing. The assisting graduate student worked with the participants at the middle school for the first five weeks of the investigation.

Two participants received extra imagery training during the baseline phase because they did not achieve the required score of a mean of at least 16 on both the kinesthetic and visual subscales of the MIQ-R (imagery ability; see below) in the first three baseline sessions (Callow

et al., 2001). One of these participants completed one extra baseline session after additional imagery training and the other participant completed two extra baseline sessions.

Baseline. The researcher explained the nature of the intervention to the participants individually, which was to teach the participants how to use imagery effectively in their sport participation. Next, the various scales were administered starting with the MIQ-R. It is suggested that a participant's ability to image mediates the effectiveness of an imagery intervention. Thus, the current study used the recommendations of Callow et al. (2001), which required participants to score a mean of at least 16 on both the kinesthetic and visual scales of the MIQ-R. A mean of 16 indicates that a participant scores an average of at least "not easy nor hard" for the task they imaged on the MIQ-R. For the current study, those who scored below a 16 were provided with training to improve their imagery ability and were not allowed to move on with the intervention until they achieved the criterion score on the MIQ-R.

Also administered during this phase was the physical competence subscale of the Pictorial Scale of Perceived Competence and Social Acceptance for Young Children to determine the participants' baseline level of sport competence. The version of the Pictorial Scale each participant was administered depended upon the participant's level of cognitive functioning as reported by the school psychologist on the demographic information form. In order to understand and reliably report on the concepts from the items in the preschool-kindergarten version of the Pictorial Scale, participants needed to know colors, the alphabet, and be able to count. In order to understand and reliably report on the concepts from the items in the first-second grade version of the Pictorial Scale, participants needed to be able to read, write, and do simple arithmetic problems. The version the participants were given for the baseline phase remained consistent across testing administrations.

Finally, participants were administered the MG-M subscale of the SIQ-C. Administration of all three scales took between 15-25 minutes each time. A minimum of three consecutive observations were collected in order to establish baseline scores for all three study measures: the Pictorial Scale of Perceived Competence and Social Acceptance for Young Children, the SIQ-C, and the MIQ-R (Post et al., 2012). These measures were administered individually to participants three times a week for one to two weeks (depending on the participant) until each participant's scores achieved stability.

Intervention: session 1. The intervention sessions took place three times a week for two weeks. In the first session, the researcher gave a brief presentation to participants individually that defined imagery and how to image, making sure this educational content was presented in a way that was relevant to the participants' sport/skill of interest and as well as their comprehension level. The researcher and assisting graduate student worked with the same participants for each session to maintain consistency as well as to build rapport with participants, with the exception of the final week of the return to baseline phase as was previously mentioned. The researcher and assisting graduate student also used a checklist for each session throughout the investigation to ensure consistency in terms of the content of each session across participants. Once the participants were comfortable with the notion of imagery, participants were asked in this first intervention session to identify a challenging situation with which they had been faced with pertaining to performance of their sport or a specific sport skill, as MG-M imagery guides imagers to visualize successfully overcoming a challenging sport-specific situation with an emphasis on feeling confident and in control (O, Munroe-Chandler, Hall, & Hall, 2014). All participants competed in both bowling and bocce with Special Olympics in the fall of 2014,

however all five participants chose bowling as the sport to focus on in their individual imagery scripts.

Either the researcher or the assisting graduate student working with the participant guided a discussion on the specific aspects of the sport skill the participant wanted to work on, including the kinesthetic and visual components. The skill was one that participants had little belief in their ability to perform successfully. Feedback obtained from participants during these meetings determined the specific content for the participants' personal imagery scripts (Post et al., 2012). To conclude the session, the three measures were administered. The session took between 15-25 minutes. Personalized imagery scripts were developed by the researcher between this meeting and the next session using script guidelines from *The Mental Athlete* (Porter, 2003).

Intervention: sessions 2-6: The lead researcher or assisting graduate student met with participants to administer their personalized imagery scripts. Additionally, all three measures were administered. The imagery script was continually customized to ensure that it met each participant's needs. Immediately following each administration of the imagery script, participants provided feedback to the researcher or the assisting graduate student and the script was subsequently updated for the next session (Post et al., 2012). These sessions lasted between 20-30 minutes.

Though each participant's imagery script was personalized to their needs and preferences, all scripts contained both stimulus and response propositions. Stimulus propositions describe the situation being imaged and response propositions describe the participant's desired response to the situation. Lang and colleagues suggest that participants who are presented with response-oriented imagery scripts that evoke physiological-emotional-movement reactions report more vivid and realistic imagery than those presented with stimulus-oriented imagery scripts that

simply describe the content of the scenario, thus the inclusion of both stimulus and response propositions (Lang, Kozak, Miller, Levin, & McLean, 1980). Each script also included multiple senses (Post et al., 2012; Short, Afremow, & Overby 2013), environmental information, and timing elements. Each of these factors have been suggested to be relevant regarding enhancing the vividness of one's imagery experience (Post et al., 2012).

Return to baseline. Each of the three measures was administered to each participant in three sessions over the period of one week. These sessions lasted between 15-25 minutes.

Data Analysis

This study is considered a single-subject A-B-A reversal design. Single subject designs look for the effect of a treatment or intervention without using randomization. It is not always feasible or even ethical to have a control group or a no-treatment group. Further, by not having groups, researchers can examine the specific impact of treatment on each individual participant as opposed to the average effect on a group of people. This type of result has practical significance rather than statistical significance. Many trials are needed to evaluate the influence of the treatment; participants in single subject designs are usually measured repeatedly on a task or topic of interest. Typically a baseline measurement of the task of interest is established, followed by administration of intervention and further testing on the task of interest (Thomas, Nelson, & Silverman, 2011).

The effectiveness of the MG-M imagery intervention on enhancing participants' perceptions of their ability in sport skills was assessed using visual inspection and graphs. Visual inspection depends on the magnitude and rate of changes across phases of data collection. Magnitude is comprised of two characteristics: changes in mean and changes in level. Rate is also comprised of two characteristics: changes in trend and latency of change. Changes in means

refers to shifts in the average rate of performance across intervention phases. In terms of changes in level, this refers to the shift in performance from the end of one phase to the beginning of the next. This characteristic indicates the effect immediately following either the introduction or withdrawal of an intervention. Changes in trend are illustrated through systematic increases or decreases in the data over time, which is relevant to the direction of behavior change. Finally, latency of change is associated with the period of time between the onset or termination of a condition (baseline, intervention, and return to baseline) and changes in performance (Kazdin 1982).

Barlow and Herson (1984) suggest that researchers can have greater confidence in positive performance change following the implementation of an intervention: (a) when baseline performance is stable or in a direction opposite of the anticipated effects of treatment, (b) when there are relatively few overlapping data points between baseline and intervention phases, (c) when changes in performance are observed soon after the introduction of the intervention, and (d) when changes in subsequent performance demonstrate consistency within and between participants. Additionally, Kromrey and Foster-Johnson (1997) note the viability of effect sizes in informing researchers about the strength of the relationship between variables. Though effect sizes are not synonymous with clinical significance, they are certainly related.

The d index is used for describing the magnitude of treatment effects, and is useful for single-subject data when the data do not show trends. Thus, the current study calculated the d index (d_1) as a change-in-level metric (O et al., 2014) between baseline and intervention phases. When interpreting the d index, values of 0.2, 0.5, and 0.8 indicate small, medium, and large treatment effects, respectively. Moreover, variability effect size was evaluated using the f statistic (f^2). The f statistic is sensitive to the change in the stability of behavior, and thus,

indicates the magnitude of a treatment effect when changes in level or trend are not apparent.

When interpreting the f statistic, values of 0.02, 0.15, and 0.35 indicate small, medium, and large changes in variability, respectively (Kromrey & Foster-Johnson, 1997). The current study calculated the f statistic for the variability between baseline and intervention phases.

CHAPTER 3

RESULTS

Imagery use

Participants A1, A2, and A3 demonstrated minimal to no changes in imagery use from baseline through the intervention phase ($d_1 = 0$; $f^2 = 0$ for all three participants). Participant A1 experienced a slight increase in imagery use during the return to baseline phase ($M_{\text{Int}} = 3.00$, $M_{\text{RtoB}} = 3.27$). Participant A2 and A3's imagery use remained the same in the return to baseline phase as it was in the baseline and intervention phases. Participant B1 demonstrated an unstable baseline, intervention, and return to baseline phase, with their d index ($d_1 = -0.67$) indicating a lower treatment effect on imagery use in the intervention phase than in the baseline phase. Additionally, B1 illustrated a large change in variability ($f^2 = .49$) from baseline to intervention, with imagery use scores becoming more stable in the intervention phase ($M_{\text{Base}} = 3.12$, $M_{\text{Int}} = 2.70$). Participant B2 demonstrated a stable baseline, followed by an unstable intervention, with a d index that indicated a large treatment effect ($d_1 = 5.28$) as well as an f statistic that demonstrated a large change in variability ($f^2 = 8.25$) from baseline to intervention ($M_{\text{Base}} = 2.95$, $M_{\text{Int}} = 4.10$). Participant B2 maintained the maximum imagery use score that they had established in the final session of the imagery session throughout the entire return to baseline phase.

Imagery ability

Imagery ability was assessed using the MIQ-R, which consists of two subscales; visual and kinesthetic. Imagery ability scores were recorded separately for each of these two subscales. For the MIQ-R visual subscale, Participant A1 experienced an unstable baseline phase followed by an unstable intervention phase ($d_1 = 1.13$; $f^2 = 0$). Imagery ability decreased for Participant

A1 in the return to baseline phase ($M_{\text{Int}} = 21.83$, $M_{\text{RtoB}} = 21.33$). Participants A2 and A3 scored the maximum possible for the assessment and maintained this score from baseline through return to baseline ($d_1 = 0$; $f^2 = 0$ for both participants). Participant B1 achieved a fairly stable baseline and intervention phase indicated by a large d index as well as f statistic ($d_1 = 0.52$; $f^2 = 1.88$), suggesting that there was a large treatment effect in addition to a large change in variability from baseline to intervention, indicating more stable scores in the intervention phase ($M_{\text{Base}} = 12.60$, $M_{\text{Int}} = 14.33$). The return to baseline phase for Participant B1 was characterized by a delayed latency period in which visual imagery ability decreased after the second session. Participant B2 experienced variable baseline and intervention phases ($f^2 = 0.67$; $M_{\text{Base}} = 14.50$, $M_{\text{Int}} = 18.83$) and illustrated a large treatment effect for visual imagery ability ($d_1 = 1.24$).

For the MIQ-R kinesthetic subscale, Participant A1 illustrated a fairly unstable baseline and intervention phase indicated by a large f statistic ($f^2 = .37$; $M_{\text{Base}} = 18.33$, $M_{\text{Int}} = 21.33$), and demonstrated a large treatment effect ($d_1 = 0.97$). Participants A2 and A3 scored the maximum possible for the assessment and maintained this score from baseline through the return to baseline phase ($d_1 = 0$; $f^2 = 0$ for both participants). Participants B1 and B2 experienced variable baseline and intervention phases ($f^2 = 1.68$ and 6.97 , respectively), with Participant B1 illustrating a small treatment effect for kinesthetic imagery ability ($d_1 = 0.32$) and Participant B2 illustrating a large effect ($d_1 = 0.83$).

Sport competence

Upon visual inspection of the data, Participants A1 and A2 demonstrated a relatively stable baseline and a short latency period upon initiation of the intervention session; sport competence scores decreased for both participants during session two, and then demonstrated a slight systematic increase for the rest of the phase. Participant A1's d index of 0.56 indicated a

medium treatment effect, whereas Participant A2 demonstrated a large treatment effect; $d_1 = 1.19$ and a large change in variability, indicating more stable scores in the intervention phase than in the baseline phase; $f^2 = 0.44$. Upon removal of the intervention, Participants A1 and A2 experienced minimal changes in sport competence scores (Participant 1 $M_{\text{Int}} = 3.70$, $M_{\text{RtoB}} = 3.61$; Participant 2 $M_{\text{Int}} = 2.75$, $M_{\text{RtoB}} = 2.94$). Participant A3 maintained the same score of sport competence throughout the entire investigation ($d_1 = 0$; $f^2 = 0$).

Participant B1 demonstrated unstable sport competence scores in the baseline phase, which continued into the intervention phase. Participant B1's sport competence scores decreased immediately upon the initiation of the intervention phase and did not increase until the last two sessions of this phase, indicating a delayed latency of change. The negative d index for Participant B1 ($d_1 = -0.13$) indicated a lower treatment effect on sport competence in the intervention phase than in the baseline phase ($M_{\text{Base}} = 3.70$, $M_{\text{Int}} = 3.64$). The increases in sport competence scores at the end of the intervention phase were maintained throughout the entire return to baseline phase. Participant B1 experienced a large change in variability from baseline to intervention, with sport competence scores becoming more stable in the intervention phase; $f^2 = .38$.

Participant B2 illustrated a stable baseline phase with a short latency period, as there was an immediate increase in sport competence scores upon the initiation of the intervention phase. Participant B2's results revealed a large treatment effect ($d_1 = 1.29$) and a large change in variability ($f^2 = .67$) from the baseline phase to the intervention phase, with sport competence scores becoming less stable in the intervention phase than they were in the baseline phase ($M_{\text{Base}} = 3.59$, $M_{\text{Int}} = 3.78$). The scores declined slightly between the first intervention session and the

fourth, then increased to the maximum sport competence score possible in the fifth and six sessions, which were maintained throughout the return to baseline phase.

CHAPTER 4

DISCUSSION

The purpose of the present study was to assess the effectiveness of an MG-M imagery intervention on enhancing the sport competence of young Special Olympics athletes. The hypotheses in this investigation were fourfold: (a) It was expected that athletes would demonstrate an increase in MG-M imagery use and imagery ability from baseline through the course of the intervention (Hall et al., 2009); (b) imagery ability was expected to be maintained through the return-to-baseline phase; (c) imagery use would decrease at the withdrawal of the intervention; and finally (d) it was expected that athletes' sport competence scores would increase from baseline through the course of the intervention and be maintained through the return-to-baseline phase.

Three out of five participants illustrated increases in imagery ability from baseline through intervention and maintained these scores in the return to baseline phase, providing support for hypotheses *a* and *b*. Two out of five participants demonstrated increases in their imagery use scores from baseline to intervention, however these scores demonstrated increases in the return to baseline phase, in the opposite direction of what was predicted. Thus, hypothesis *a* was supported while hypothesis *c* was not. Results demonstrated improvements in sport competence from baseline through intervention for three out of five participants, and these changes were maintained in the return-to-baseline phase for two of those three participants. Thus, support was provided for hypothesis *d*. Changes in mean and variability were also evaluated using effect sizes, and suggested that sport competence scores became more stable during the intervention phase for three out of five participants. A facilitative effect of a MG-M imagery intervention on the sport competence of athletes has previously been established

(Callow et al., 2001), and was both supported and extended by the results of the current study; individualized MG-M imagery scripts were found to be effective in increasing the sport competence of athletes with an ID.

Considering the noted barriers to initiating and/or maintaining sport participation for those with an ID, including unwanted attention, negative perceptions, and feelings of helplessness (Shields et al., 2012), the current study offered support for the supposition that programming focused on enhancing psychosocial characteristics of athletes with an ID could aid in breaking down the barriers of sport participation, thus allowing them the opportunity to receive the numerous benefits of physical activity participation.

As Travis and Sachs (1991) noted, the benefits of participation in adapted physical activity programming such as Special Olympics could be taken a step further by integrating sport psychology into the Special Olympics experience. Further, The United States Olympic Committee on Sports for the Disabled emphasized the need for measuring specific psychological changes in individuals with an ID who participate in Special Olympics (Gibbons & Bushakra, 1989). The current study was able to demonstrate (a) the effective implementation of a sport psychology intervention with a population of Special Olympics athletes and (b) a positive impact on the sport competence perceptions of over half of the study's participants.

A specific strength of the current investigation is its applicability to Special Olympics athletes who are not able to practice their sport on a consistent basis. According to the general rules of Special Olympics International (SOI), only those competing in Regional or World Games competitions are subject to a minimum amount of physical training time as contingent of their participation in the competitions ("Special Olympics General Rules," 2015). A consistent training model for all Special Olympics agencies and sports does not exist, thus, some train more

often than others and intensity of training varies with each agency, as well. The Special Olympics agency from which the participants of the current investigation hailed tended to offer no to minimal physical training opportunities outside of local or community competitions, which took place once or twice each school semester. Thus, the current study's intervention appears to be viable for those athletes with an ID who are unable to train frequently or consistently with their Special Olympics agency. In a rural area that has limited resources much like the one from the current study, Special Olympics athletes are able to supplement their infrequent physical training with mental training, including MG-M imagery, in an attempt to enhance their performance.

There are several factors that can potentially account for the participants who did not experience results in the hypothesized directions. Participants competed in a Special Olympics bowling event between the third and fourth intervention sessions. It is possible that some participants, such as Participant B2, who demonstrated large decreases in imagery ability and imagery use scores after the third intervention session, struggled to separate their perceived or actual performance in the bowling event from the scenario they were asked to visualize using the imagery script.

Similarly, it is important to note that the current investigation asked participants to use the personalized imagery scripts as a reference point for responding to the items on all three assessments. Thus, if participants struggled to separate their actual performance (based on past experiences) from the performance described in the scripts, then it is possible that their scores may not accurately reflect the effectiveness of the MG-M imagery script itself in producing increases in psychosocial functioning. Furthermore, based on the participants perception of their performance either in the bowling event in which they participated during the study or in other

past events, their sport competence levels may have been affected; if they experienced a negative perception of their performance in competition, then this would likely be reflected as low levels of sport competence on the Pictorial Scale.

Results also suggested that those participants who illustrated a lower level of imagery ability or use in the baseline phase of the investigation, namely Participants B1, B2, and A1, experienced the MG-M imagery intervention to be more effective than those participants who had a higher level of imagery ability or imagery use from the onset of the study. Understandably, participants with lower levels of imagery ability had more area to improve upon over the course of the study. Similarly, for those participants who had lower sport competence scores in the baseline phase, Participants A2, B1, and B2, the imagery intervention was more consistently effective.

Participant A3 did not illustrate any changes in level of sport competence throughout the study. Mazzoni and colleagues (2009) found that their participants' judgments of their athletic competence did not change over time or differ from their control group. As Bandura (1977) noted, mastery and success do not necessarily lead to more generalized expectations of efficacy or competence. When an individual's experience is not consistent with their established expectations of self-efficacy, little to no change may take place. Additionally, it is argued that in a domain that an individual considers unimportant, lack of competence is less likely to negatively impact evaluations of their self-worth (Mazzoni, Purves, & Southward, 2009).

Participants A1, A2, B1, and B2 demonstrated increases in sport competence scores after intervention sessions two (Participants A1 and A2) and four (Participants B1 and B2). Indeed, Shambrook and Bull (1996) also suggested that psychological interventions can show a temporal lag. Taking this into consideration, it is possible that the imagery intervention was indeed

effective for the aforementioned participants, but only after a period of time spent receiving the intervention.

All five of the participants illustrated a reduction in the variability of their sport competence scores after the cessation of the intervention. Bandura (1977) stated that efficacy expectations can vary in strength, and that weak expectations can be dismissed by disconfirming experiences. However, those who have strong expectations of mastery will overlook disconfirming experiences and persevere in their coping efforts. Therefore, although participants' sport competence decreased following the intervention, it could be regarded as being a more "resilient" construct, as sport competence scores illustrated less variation (Callow et al., 2001) than in the baseline or intervention phase of the investigation.

Limitations

Aside from the demonstrated effectiveness of the imagery intervention with athletes who had a diagnosed ID, there are limitations noteworthy of mentioning from the current study. First, both the lead researcher and the assisting graduate student were experienced with the notion of imagery. It is possible that during the one-on-one meetings between the researchers and participants, the researchers may have expected to see certain results on the various measures, which in turn may have influenced the participants to respond in a socially desirable manner (Callow et al., 2001; O et al., 2005). Second, researchers did not assess whether or not participants were previously familiar with or taught how to use imagery (Munroe-Chandler, Hall, Fishburne, O, & Hall, 2007); thus, learning imagery was not controlled for. As such, it is possible that if a participant had previous exposure to imagery or imagery training, that this could have impacted their imagery use or imagery ability scores, as well as their experience with their individualized imagery script. Finally, performance data were not collected before, during,

or after the intervention. Personal athletic accomplishments that may have occurred during athletes' participation in the study cannot be ruled out as a possible reason for those who exhibited increases in their sport competence scores.

Future directions

Future research should consider measuring performance for a specific sport or sport skill. Bandura (1977) noted that personal athletic accomplishments may impact feelings of sport competence, however, it has not been determined whether or not this effect holds true in populations of athletes who have an ID. Further, as the current study indicated success in utilizing an individualized imagery intervention with young athletes who have an ID, experts in the field of mental skills research and implementation should consider this customized technique, which O and colleagues (2005) recommend as an alternative to group or “cookie-cutter” MG-M imagery interventions. Moreover, research has suggested that self-confidence is critical to an athlete's development (Vealey, 2001). Children's perceptions of themselves are related to their performance and behavior, as well as their health. As such, both competitive and recreational level athletes, including those competing in adapted sport programming like Special Olympics, could observe the benefits of employing MG-M imagery as a means to increase their positive self-perceptions, including perceptions pertaining to their athletic ability, while participating in their chosen sport (Munroe-Chandler, Hall, & Fishburn, 2008).

REFERENCES

- Asken, M. J., & Goodling, M. D. (1986). Sport psychology: An undeveloped discipline from among the sport sciences for disabled athletes. *Adapted Physical Activity Quarterly*, 3, 312-319.
- Bandura, A. (1977). Self-efficacy: Towards a unifying theory of behavior change. *Psychological Review*, 84, 191-215.
- Barlow, D. H. & Herson, M. (1984). Single-case experimental designs: Strategies for studying behavior change. Oxford: Pergamon Press.
- Callow, N., Hardy, L., & Hall, C. (2001). The effects of a motivational general-mastery imagery intervention on the sport confidence of high-level badminton players. *Research Quarterly for Exercise and Sport*, 72(4), 389-400.
- Frantz, J., Phillips, J. S., Matheri, J., & Kibet, J. J. (2011). Physical activity and sport as a tool to include disabled children in Kenyan schools. *Sport in Society: Cultures, Commerce, Media, Politics*, 14(9), 1227-1236.
- Dyken, E. M., Rosner, B. A., & Butterbaugh, G. (1998). Exercise and sports in children and adolescents with developmental disabilities: Positive physical and psychosocial effects. *Sport Psychiatry*, 7(4), 757-771.
- Gibbons, S. L., & Bushakra, F. B. (1989). Effects of Special Olympics participation on the perceived competence and social acceptance of mentally retarded children. *Adapted Physical Activity Quarterly*, 6, 40-51.

- Gregg, M. J., Hrycaiko, D., Mactavish, J. B., & Martin, G. L. (2004). A mental skills package for Special Olympics athletes: A preliminary study. *Adapted Physical Activity Quarterly*, 21, 4-18.
- Groff, D. G., Lundberg, N. R., & Zabriskie, R. B. (2009). Influence of adapted sport on quality of life: Perceptions of athletes with cerebral palsy. *Disability and Rehabilitation*, 31(4), 318-326.
- Hall, C. R., Munroe-Chandler, K. J., Fishburne, G. J., & Hall, N. D. (2009). The sport imagery questionnaire for children (SIQ-C). *Measurement in Physical Education and Exercise Science*, 13, 93-107.
- Hall, C. R. & Martin, K. A. (1997). Measuring movement imagery abilities: A revision of the Movement Imagery Questionnaire. *Journal of Mental Imagery*, 21(1 & 2), 143-154.
- Hall, C., & Pongrac, J. (1983). *Movement Imagery Questionnaire*. London, ON: University of Western Ontario.
- Harter, S. (1982). The perceived competence scale for children. *Child Development*, 53, 87-97.
- Harter, S., & Pike, R. (1984). The pictorial scale of perceived competence and social acceptance for young children. *Child Development*, 55, 1969-1982.
- “History of Special Olympics.” Special Olympics, Inc. Retrieved on Feb. 24, 2014, from specialolympics.org.
- Johnson, C. C. (2009). The benefits of physical activity for youth with developmental disabilities: A systematic review. *American Journal of Health Promotion*, 23(3), 157-167.
- Kazdin, A. E. (1982). *Single-case research designs methods for clinical and applied settings*. New York: Oxford University Press.

- Kromrey, J. D., & Foster-Johnson, L. (1997). Determining the efficacy of intervention: The use of effect sizes for data analysis in single subject research. *Journal of Experimental Education, 65*(1), 73-93.
- Lang, P. J., Kozak, M. J., Miller, G. A. Levin, D. N., & McLean, A. (1980). Emotional imagery: Conceptual structure and pattern of somato-visceral response. *Psychophysiology, 17*(2), 179-192.
- Martin, K. A., Moritz, S. E., & Hall, C. R. (1999). Imagery use in sport: A literature review and applied model. *The Sport Psychologist, 13*, 245-268.
- Mazzoni, E. R., Purves, P. L., & Southward, J. (2009). Effect of indoor wall climbing on self-efficacy and self-perceptions of children with special needs. *Adapted Physical Activity Quarterly, 26*, 259-273.
- Monsma, E. V., Short, S. E., Hall, C. R., Gregg, M., & Sullivan, P. (2009). Psychometric properties of the Revised Movement Imagery Questionnaire (MIQ-R). *Journal of Imagery Research in Sport and Physical Activity, 4*(1).
- Moritz, S. E., Hall, C. R., Martin, K. A., & Vadocz, E. (1996). What are confident athletes imagining? An examination of image content. *The Sport Psychologist, 10*, 171-179.
- Munroe-Chandler, K., Hall, C. & Fishburne, G. (2008). Playing with confidence: The relationship between imagery use and self-confidence and self-efficacy in youth soccer players. *Journal of Sports Sciences, 26*(14), 1539-1546.
- Munroe-Chandler, K. J., Hall, C. R., Fishburne, G., O, J., & Hall, N. (2007). The content of imagery use in youth sport. *International Journal of Sport and Exercise Psychology, 2*, 158-174.

- National Dissemination Center for Children with Disabilities. *Intellectual Disability*. Retrieved on 24 March, 2014 from <http://nichcy.org/>
- Ninot, G., Bilard, J., Delignieres, D., & Sokolowski, M. (2000). Effects of integrated sport participation on perceived competence for adolescents with mental retardation. *Adapted Physical Activity Quarterly*, 17, 208-221.
- O, J., Munroe-Chandler, K. J., Hall, C. R., & Hall, N. D. (2014). Using motivational-general mastery imagery to Improve the self-efficacy of youth squash players. *Journal of Applied Sport Psychology*, 26, 66-81.
- Our Athletes* (n.d) retrieved September 21 2014, from Special Olympics Web Site:
<http://www.specialolympics.org/athletes.aspx>
- Poretta, D., & Surburg, P. (1995). Imagery and practice in the acquisition of gross motor timing by adolescents with mild mental retardation. *Perceptual and Motor Skills*. 80, 1171-1183.
- Porter, K. (2003). *The Mental Athlete*. Champaign, IL: Human Kinetics.
- Post, P., Muncie, S., & Simpson, D. (2012). The effects of imagery training on swimming performance: An applied investigation. *Journal of Applied Sport Psychology*, 24, 323-337.
- Riggen, K., & Ulrich, D. (1993). The effects of sport participation on individuals with mental retardation. *Adapted Physical Activity Quarterly*, 10, 42-51.
- Salmon, J., Hall, C. R., & Haslam, I. (1994). The use of imagery by soccer players. *Journal of Applied Sport Psychology*, 6, 116-133.
- Screws, D. P., & Surburg, P. R. (1997). Motor performance of children with mild mental disabilities after using mental imagery. *Adapted Physical Activity Quarterly*, 14, 119-130.

- Shambrook, C., & Bull, S. (1996). The use of single-case research design to investigate the efficacy of imagery training. *Journal of Applied Sport Psychology*, 8, 27-43.
- Sharp, L., Woodcock, C., Holland, M. J. G., Cumming, J., & Duda, J. (2013). A qualitative evaluation of the effectiveness of a mental skills training program for youth athletes. *The Sport Psychologist*, 27, 219-232.
- Shields, N., Synnot, A. J., & Barr, M. (2012). Perceived barriers and facilitators to physical activity for children with disability: a systematic review. *British Journal of Sports Medicine*, 46, 989-997.
- Short, S. E., Afremow, J., & Overby, L. (2013). Using mental imagery to enhance children's motor performance. *Journal of Physical Education, Recreation & Dance*, 72(2), 19-23.
- Songster, T. (1984). The Special Olympics sport program: An international sports program for mentally retarded athletes. In C. Sherrill (Ed.), *Sport and disabled athletes: The 1984 Olympic Scientific Congress proceedings*, 9, 73-79. Champaign, IL: Human Kinetics.
- "Special Olympics General Rules." Special Olympics, Inc. Retrieved on Mar. 3, 2015, from specialolympics.org.
- Special Olympics, Inc. (2005). Changing lives through sport – A report card on the impact of Special Olympics.
- Surburg, P. R. (1989). Application of imagery techniques to special populations. *Adapted Physical Activity Quarterly*, 6, 328-337.
- Thomas, J. R., Nelson, J. K., & Silverman, S. J. (2011). *Research Methods in Physical Activity*. Champaign, IL: Human Kinetics.
- Travis, C. A., & Sachs, M. L. (1991). Applied sport psychology and persons with mental retardation. *The Sport Psychologist*, 5, 382-391.

- Vealey, R. S. (2001). Understanding and enhancing self-confidence in athletes. In R. N. Singer, H. A. Hausenblas & C. M. Janelle (Eds.), *Handbook of sport psychology* (2nd ed.) (pp. 550–565). New York: Wiley.
- Vealey, R. S., Hayashi, S. W., Garner-Holman, M., & Giacobbi, P. (1998). Sources of sport-confidence: Conceptualization and instrument development. *Journal of Sport & Exercise Psychology*, 20, 54-80.
- Weinberg, R. S., & Gould, D. (2011). *Foundations of sport and exercise psychology*. Champaign, IL: Human Kinetics.

APPENDIX A
DEMOGRAPHIC QUESTIONNAIRE

Directions: Please complete the following demographic information.

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

Relationship to Participant: _____

Participant Gender (please circle): Male Female

Participant Age: _____

Participant Grade: _____

Participant's Primary Diagnosis: _____

Race of Participant (please circle): **Ethnicity of Participant (please circle):**

Caucasian (White)

Hispanic/Latino

African-American (Black)

Non-Hispanic/Non-Latino

Asian

Native American (Alaska American)

Native Hawaiian (Pacific Islander)

Other (Please Specify) _____

Amount of *prior* Special Olympics experience (in years): _____

Special Olympics sports *previously* participated in (please list): _____

Special Olympics sports participating in Fall 2014 (please list): _____

Comprehension Level. Please mark the box with an “x” if the participant is capable of

completing the task with little to no assistance:

- ☐ Able to recite the colors, recite the alphabet, count (from 1-10).
- ☐ Able to read some, write some, do simple arithmetic problems.
- ☐ None of the above.

Is the participant able to write and/or sign their own name (please circle)? Y/N

APPENDIX B

PICTORIAL SCALE OF PERCEIVED COMPETENCE AND SOCIAL ACCEPTANCE FOR
YOUNG CHILDREN

(Prompts are pictured in reverse from appearance in picture)

**The Pictorial Scale of
Perceived Competence and Acceptance
for Young Children**

Plates — Preschool and Kindergarten, Female
Susan Harter and Robin G. Pike

In collaboration with Carole Efron and Christine Chao
Illustrated by Deborah Kolbo Ellsworth

1980

University of Denver

© University of Denver (Colorado Seminary), 1980. Susan Harter, Ph.D., and Robin G. Pike.

Instructions

The child is given a sample item at the beginning of the booklet and instructed as follows:

I have something here that's kind of like a picture game and it's called WHICH GIRL IS THE MOST LIKE ME. I'm going to tell you about what each of the girls in the picture is doing.

Sample: In *this* one (examiner points to the picture on the left,) this girl is usually kind of *happy*, and this girl (examiner points to the picture on the right) is usually kind of *sad*. Now, I want you to tell me which of these girls is most like (Child's Name). After the child has pointed to the picture appropriate for him, the examiner points to the circles directly below that picture and emphasizes the key qualifying words to help the child refine his choice further. The examiner should always start with the extreme (larger) circle and proceed to the smaller circle. Thus, if the child points to the happy picture in response to the question concerning which is most like him, the examiner would say:

Are you *always* happy? (Pointing to the larger circle)

Or are you *usually* happy? (Pointing to smaller circle)

Occasionally a child will point to the middle of the two pictures and say that both are like her. The examiner should then say: Yes, sometimes we do feel both ways, but if you had to pick, which one of these girls is the way you are most of the time, which one would you choose?

The number value corresponding to the child's choice should be recorded on the Scoring Sheet for Individual Child Responses. Any comments should be recorded in the space provided at the bottom of the sheet.

The examiner continues for each plate, reading the descriptions, verbatim, as she/he points to the picture accompanying each description. In some pictures there is a target child central to the description, designated by an arrow pointing to that child. Be certain that on these items you point to that particular child.

SAMPLE QUESTION

This girl is usually kind of happy. Are you:

This girl is usually kind of sad. Are you:

Always happy

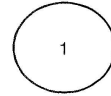
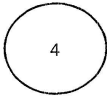
OR

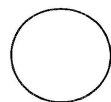
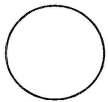
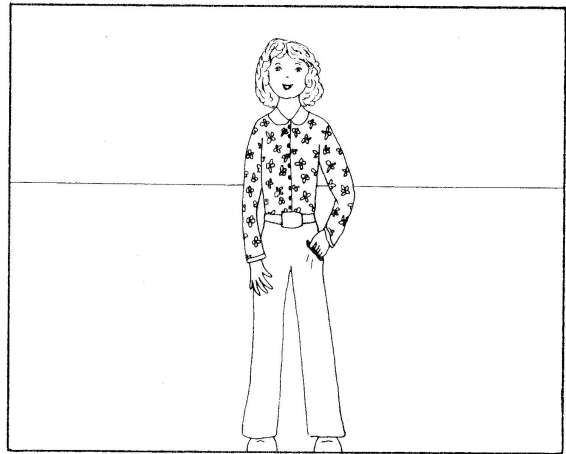
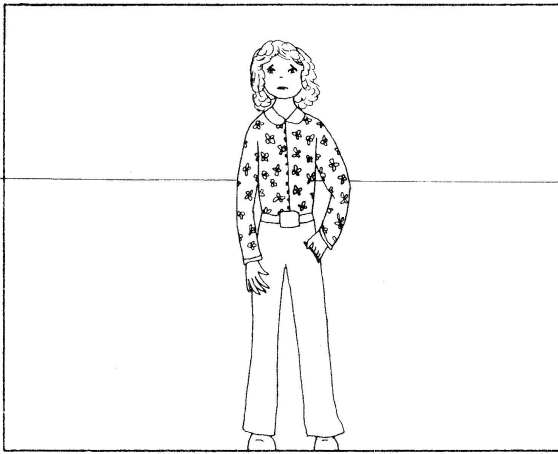
Usually happy

Usually sad

OR

Always sad





ITEM 3

This girl isn't very good at swinging by herself.
Are you:

Not too good

OR

Sort of good

☐☐

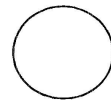
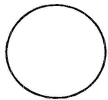
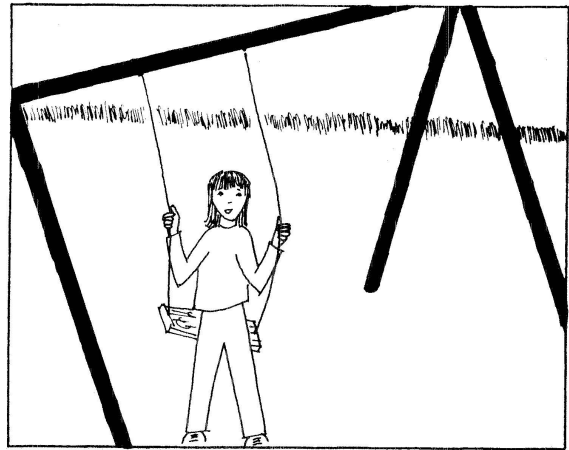
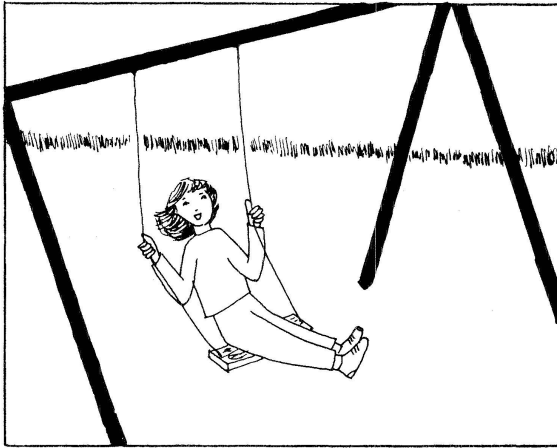
This girl is pretty good at swinging by herself.
Are you:

Pretty good

OR

Really good

☐☐



7

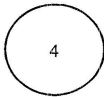
ITEM 7

This girl is pretty good at climbing. Are you:

Really good
at climbing

OR

Pretty good

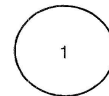


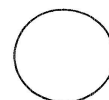
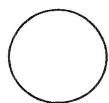
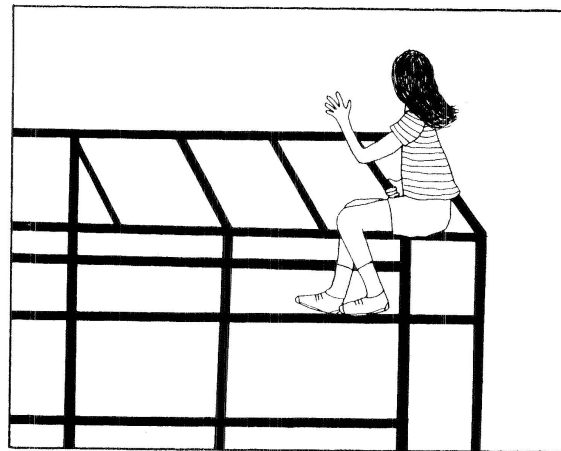
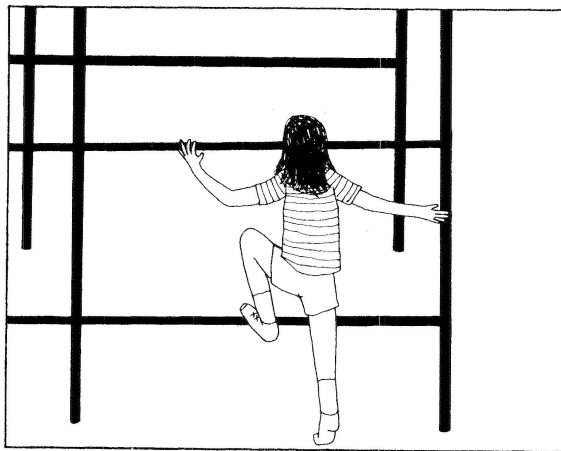
This girl isn't very good at climbing. Are you:

Sort of good

OR

Not very good
at climbing





9

ITEM 11

This girl isn't very good at tying her shoes.
Can you:

Not tie
them at all

☐

OR

Not too
good

☐

This girl is pretty good at tying her shoes.
Are you:

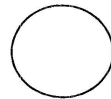
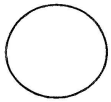
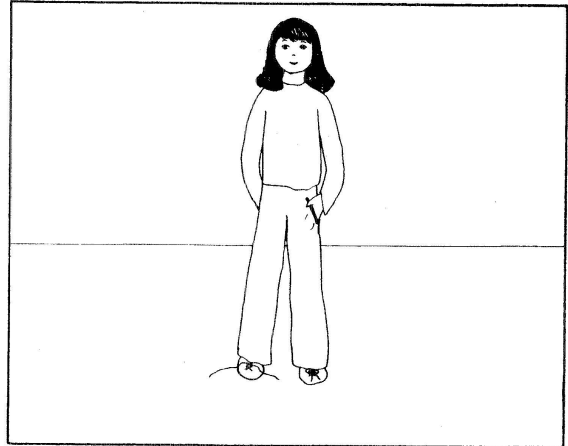
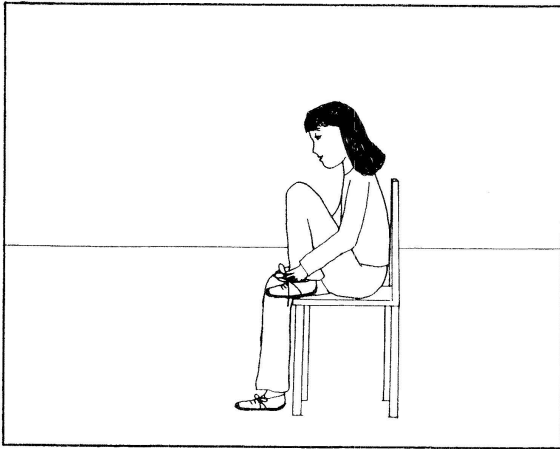
Pretty good

☐

OR

Really good
at tying shoes

☐



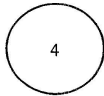
ITEM 15

This girl is pretty good at skipping. Are you:

Really good
at skipping

OR

Pretty good

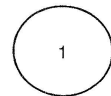


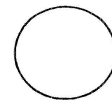
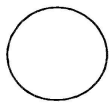
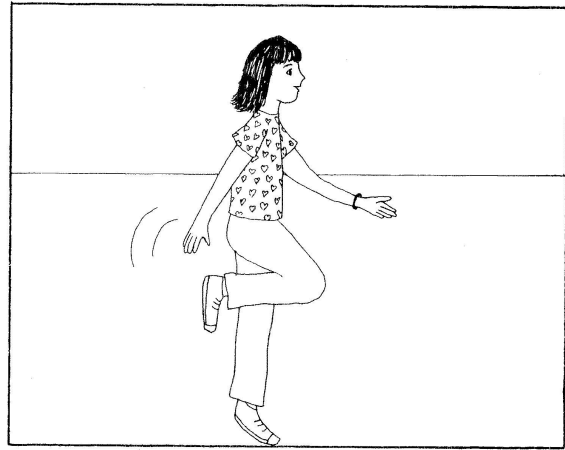
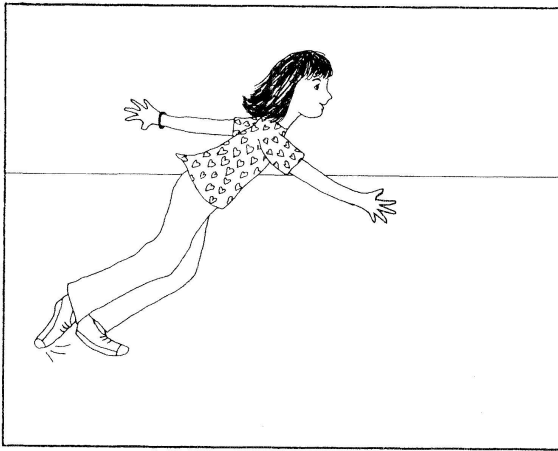
This girl isn't very good at skipping. Are you:

Sort of good

OR

Not too good
at skipping





ITEM 19

This girl can't run very fast. Are you:

Not very
fast

OR

Sort of
fast

☐☐

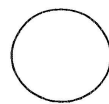
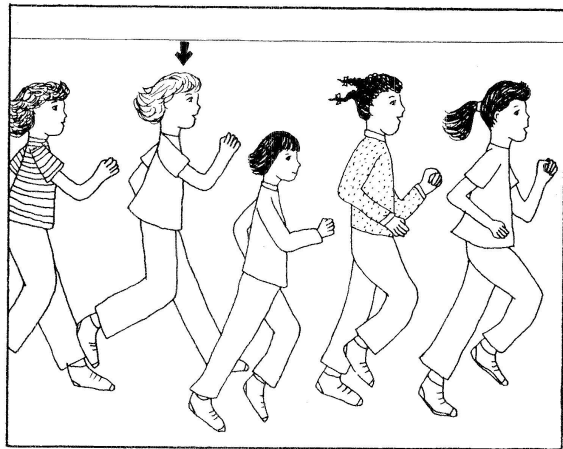
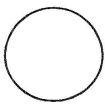
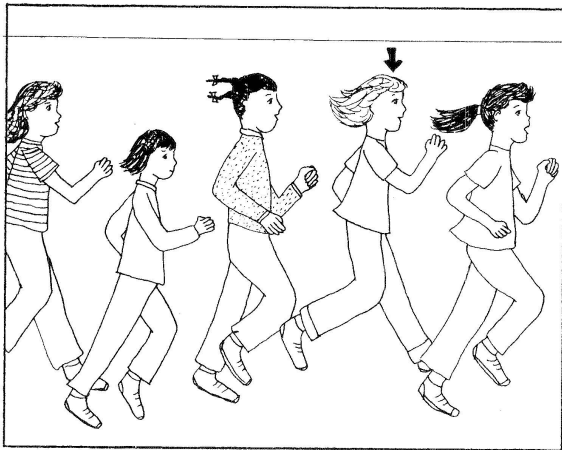
This girl can run pretty fast. Are you:

Pretty fast

OR

Really fast

☐☐



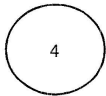
ITEM 23

This girl is pretty good at hopping on one foot.
Are you:

Really good
at hopping

OR

Pretty good

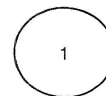


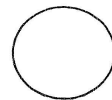
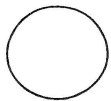
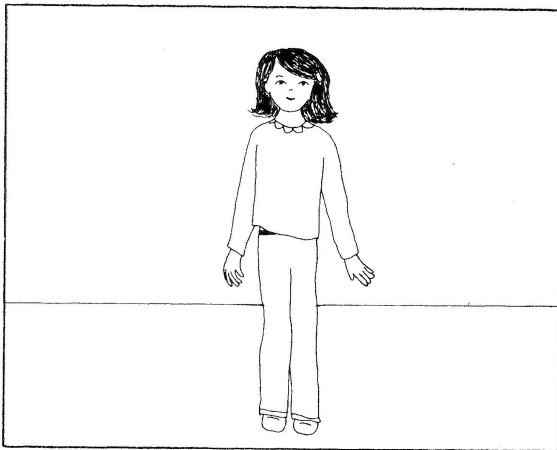
This girl has trouble hopping on one foot.
Can you:

Not too good

OR

Not hop
at all





APPENDIX C

SPORT IMAGERY QUESTIONNAIRE FOR CHILDREN

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 D

MOVEMENT IMAGERY QUESTIONNAIRE – REVISED

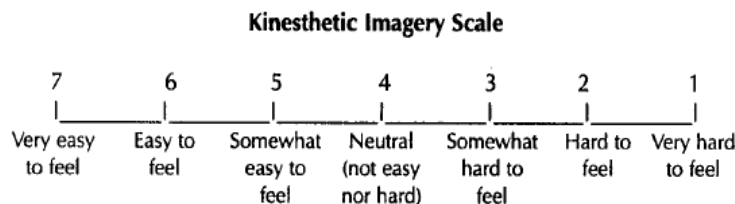
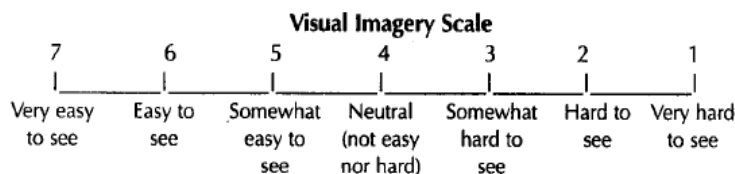
Instructions

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 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 E

INTERVENTION SESSION 1 SCRIPT

Script should emphasize feeling confident, being in control, and being mentally tough.

Write participant responses in the space below each prompt.

- ☐ Say, “Imagery is like a story about a skill in your sport and is used to help you get better”
- ☐ Ask which sport(s) they play, have them identify which one they compete in and/or which sport is their favorite.
- ☐ Say, “Imagine yourself competing in [bowling or bocce],” then take them through the following series of questions and write down their responses:
 - ☐ How does the ball feel in your hand?
 - ☐ What does the ball look like?
 - ☐ Is it light? Heavy? Smooth? Bumpy? What shape? Big? Small? Etc...
 - ☐ Where are you? In a room, a gym, etc..?
 - ☐ What sound does the ball make when it hits the floor?
 - ☐ What does it feel like to release the ball?
 - ☐ What does the ball look like as it travels towards the pins/other balls?
 - ☐ What happens after the ball is thrown?
- ☐ What are the different skills you have to use/do in your sport?
- ☐ Which skill in your sport do you need to work on or practice the most?
 - ☐ What does it take to complete this skill?
 - ☐ What are the different movements and actions that are a part of this skill?
 - ☐ What does your body feel like when you are doing this skill?
 - ☐ What sounds do you hear when doing this skill?

- ☐ What things do you see around you when you are doing this skill?
- ☐ Identify a challenging situation you have to deal with when you practice or perform your sport.

APPENDIX F

SAMPLE INDIVIDUALIZED IMAGERY SCRIPT

(Participant 2, Intervention Session 4)

Close your eyes and take a deep breath. Picture in your mind arriving at the school gym for your bowling competition. You walk into the door of the gym and right away you see lots of people and hear lots of sounds. There are other kids bowling and people watching and cheering. Your mom is sitting in the crowd ready to watch you compete. As you move towards the lane you will bowl at in the gym, you remember that you are a good bowler, and that you can get a high score and knock down all of the pins. Remember a time when you were “right on” and you bowled perfectly. See yourself at that time bowling at your best, in complete control of your game. As you arrive at the lane that you are going to bowl at, take in what is around you. The bowling area is big and there are lots of other lanes around you. There are many other kids getting ready to bowl and lots of parents, friends and teachers there to cheer the bowlers on. You hear the boom of the bowling ball as it hits the lane, and the “pow” of the pins as they are knocked over. You pick up your bowling ball and get ready to use it. You notice that the big round ball is heavy and smooth. The ball has three holes in it and has tiger stripes on it. You are getting ready to throw the first ball in your first game. You walk up to the lane, and feel the smooth gym floor underneath your feet. You hold your colorful ball with one hand. You put your three fingers in the ball’s holes. You bring your arm back, then forward, moving your arm fast so that the ball will go fast. You are focused on the pins that are standing at the end of the lane, ready to knock them all down. Your body feels excited as you let go of the ball, and as the ball hits the lane and rolls down toward the pins, it goes straight and fast. The ball hits the pins and knocks many down. You hear your mom and the other kids clap and cheer for you because you knocked down all of the pins. You tell yourself, “Yeah! Yes!” because you did a great job. You got a high score. You pick up the big, heavy, smooth ball for your next throw. The bowler who had his turn right before you knocked all of the pins down too. His score is higher than yours. You get ready to throw your tiger striped ball, and remember that you have knocked down all of the pins before. There are only a few pins left standing, and they are towards the side of the lane. You know you have to throw your ball with some curve to knock those pins down. You put your fingers in the holes of the heavy ball and swing your arm. The excitement comes back as the ball is let go. The ball booms when it hits the floor and curves perfectly at the pins left standing. You knock them all down. “Yaw!” you say, you are happy to get a better score than the other bowlers on your lane. You feel happy and proud because you knocked down all the pins. You got a good score. You were able to knock down the pins even though it was a hard shot. You know you are a great bowler. Your mom is proud of you. Take another deep breath in and out. See the picture of yourself bowling at the school gym float away and come back to this room. When you’re ready, open your eyes gently.

APPENDIX G

ADDITONAL IMAGERY TRAINING I

Picture a bocce/bowling (whichever sport they compete in) ball. What does it look like? What shape is it? What color is it? Is it big or small? How do you hold the ball? What does the ball feel like in your hand...rough or smooth? Soft or hard? How heavy is the ball? What do you look like when you hold the ball? How do you stand with the ball in your hand?



APPENDIX H

ADDITIONAL IMAGERY TRAINING II

Have participant complete the first movement listed on the MIQ-R. You can demonstrate the movement if needed. Have the participant do the same movement a second time without your demonstration, and this time hold up a mirror so that the participant can see themselves completing this movement. They can do movement while looking at themselves in the mirror as many times as they feel they need to. Once this has been completed, sit with the participant and talk about what they saw in the mirror:

- What did you see in the mirror?
 - Who did you see?
 - What were you doing?
 - What did you look like?
 - What were you wearing?
- What did the movement look like?
 - What were your arms doing?
 - What were your legs doing?
- Where were you when you did the movement?
 - What did this place look like? (I.e., was it a room, hallway, big space, small space, other people around? etc...)
- What did you hear as you did the movement?
 - Did your feet make a sound as they hit the ground?
 - Did your clothes rustle or make a sound as you moved?
 - Were there any other noises around you when you were doing the movement?
- How did it feel to complete the movement?
 - What did your arms feel like when you did the movement?
 - What did your legs feel like when you did the movement?
 - (i.e., tight, loose, hard to balance, felt foot strike the floor, felt air on arm as it moved from side to front, etc...)

Once participant has answered these questions, have them complete the MIQ-R followed by the SIQ-C and the Pictorial Scale. The session will then be complete.

APPENDIX I

FIGURES AND TABLES

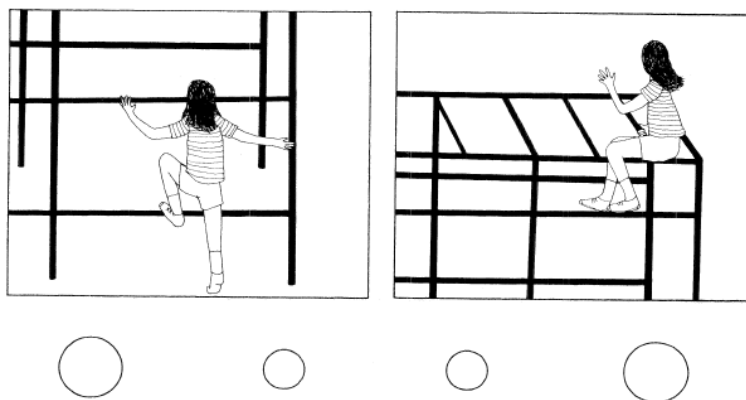


Fig. 1. – Physical competence subscale sample item

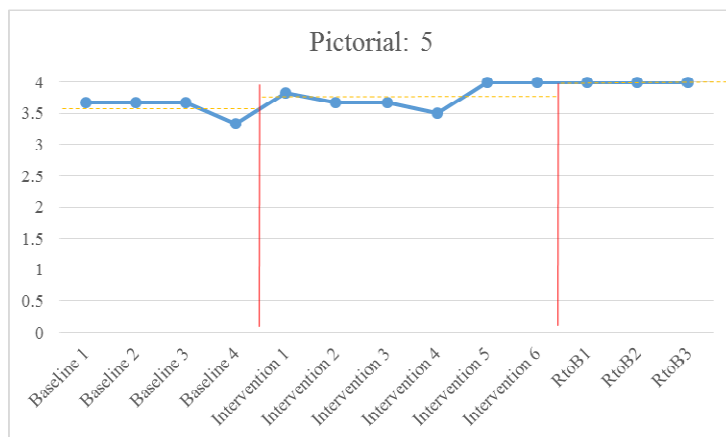
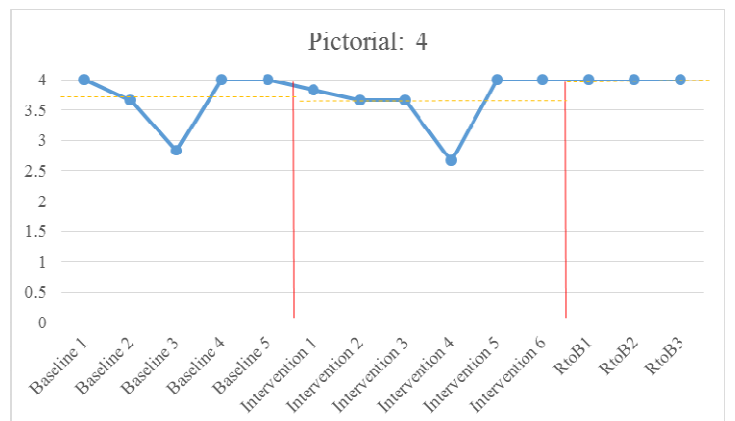
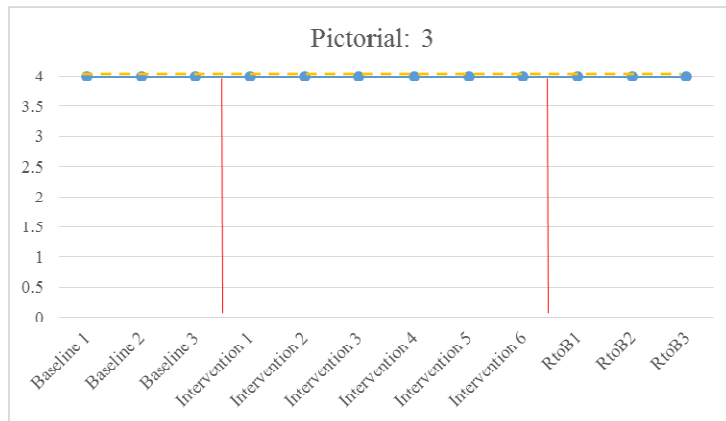
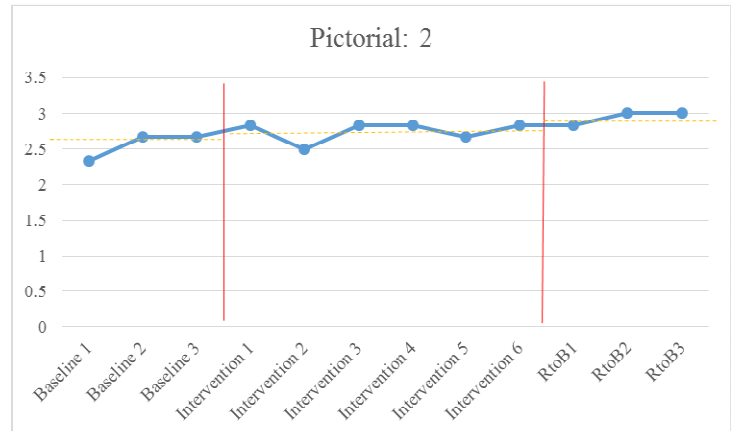
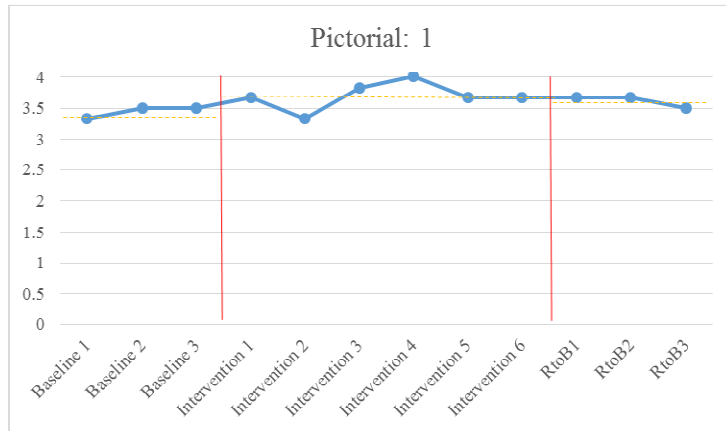


Figure 2. Participants' Sport Competence Data. *Note.* Horizontal-dashed line = mean sport competence score for phase.



Figure 3. Participants' Imagery Use Data. *Note.* Horizontal-dashed line = mean imagery use score for phase.

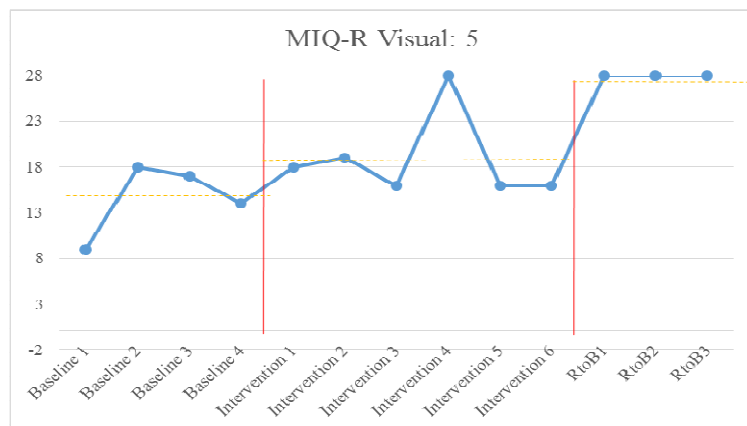
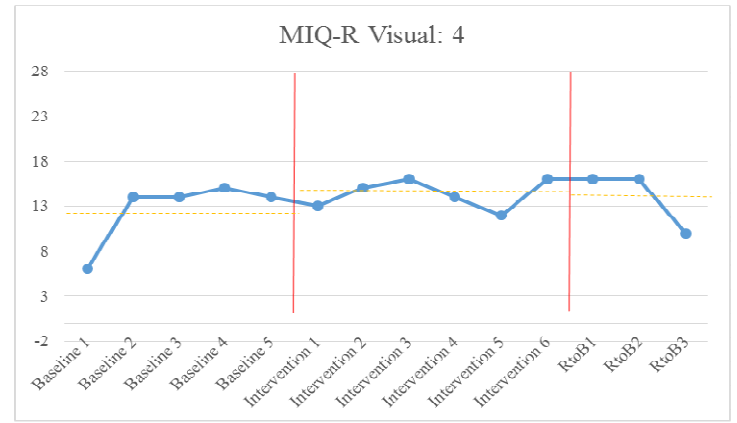
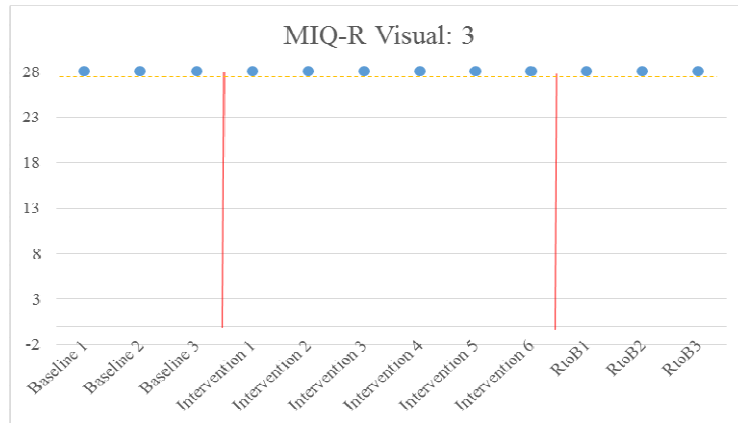
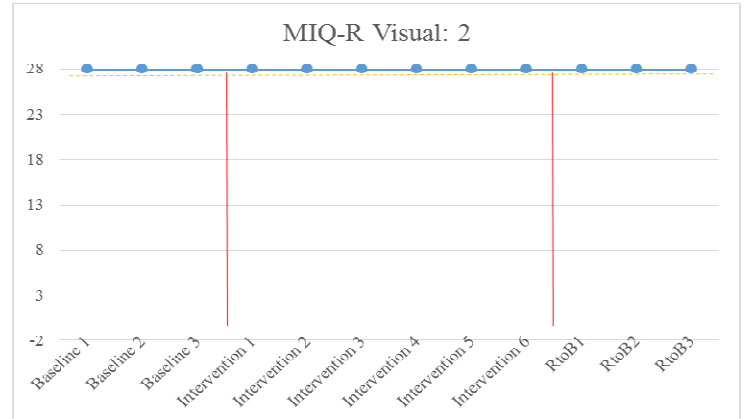
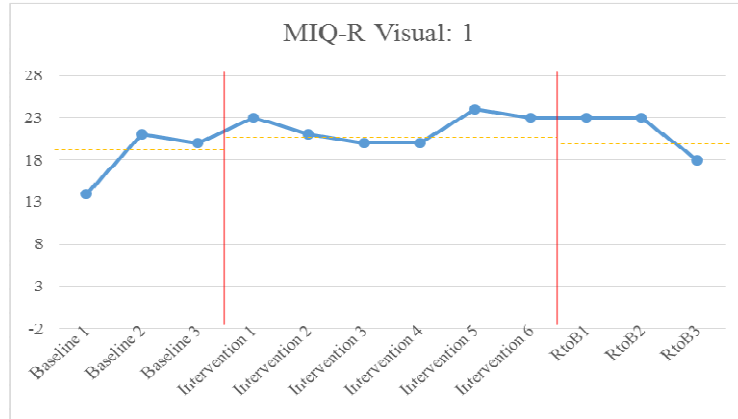


Figure 4. Participants' Visual Imagery Ability Data. *Note.* Horizontal-dashed line = mean visual imagery ability score for phase.

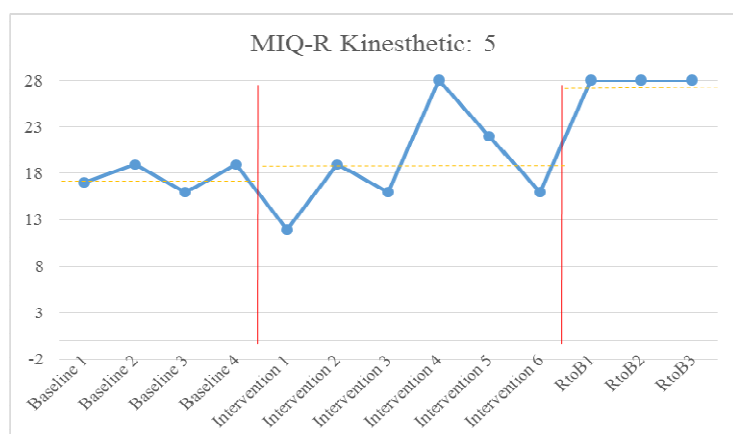
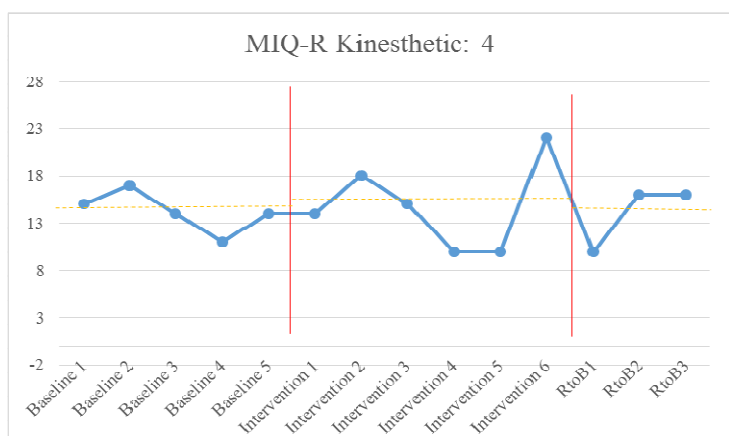
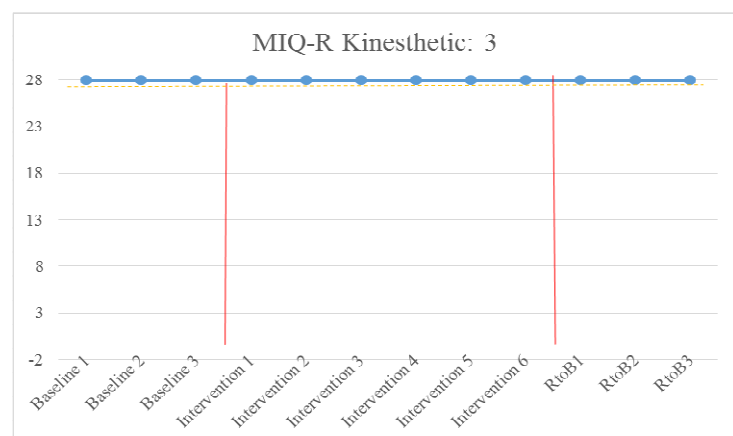
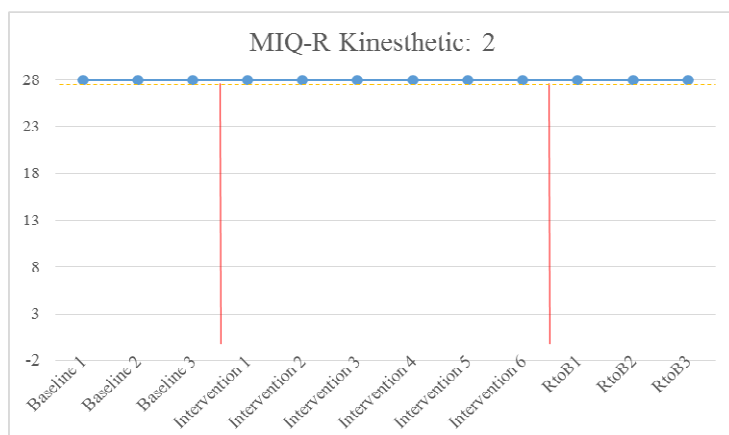
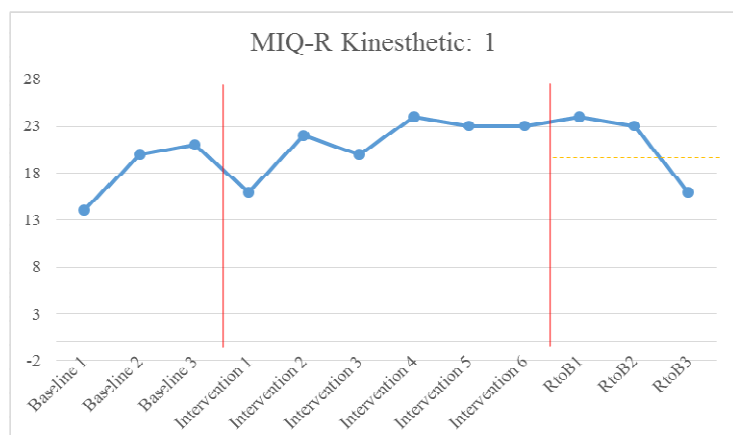


Figure 5. Participants' Kinesthetic Imagery Ability Data. *Note.* Horizontal-dashed line = mean kinesthetic imagery ability score for phase.

Table 1
Summary of MG-M Imagery Intervention Results

	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5
Sport Competence Level	0.56	1.19	0	-0.13	1.29
Sport Competence Variability		0.44	0	0.38	0.67
Imagery Use Level	0	0	0	-0.67	5.28
Imagery Use Variability	0	0		0.49	8.25
Visual Imagery Ability Level	1.13	0	0	0.52	1.24
Visual Imagery Ability Variability	1.07		0	1.88	0.67
Kinesthetic Imagery Ability Level	0.97	0	0	0.32	0.83
Kinesthetic Imagery Ability Variability	0.37	0	0	1.68	6.97

Table 2
SIQ-C, MIQ-R, and Pictorial Scale Baseline, Intervention, and Return to Baseline Mean Scores

Participant	SIQ-C Base	SIQ-C Int.	SIQ-C RtoB	MIQ-R V Base	MIQ-R V Int.	MIQ-R V RtoB	MIQ-R K Base	MIQ-R K Int.	MIQ-R K RtoB	Pictorial Base	Pictorial Int.	Pictorial RtoB
1	3	3	3.27	18.33	21.83	21.33	18.33	21.33	21	3.44	3.7	3.61
2	5	5	5	28	28	28	28	28	28	2.56	2.75	2.94
3	4	4.03	4	28	28	28	28	28	28	4	4	4
4	3.12	2.7	2.8	12.6	14.33	14	14.2	14.83	14	3.7	3.64	4
5	2.95	4.1	5	14.5	18.83	28	17.75	18.83	28	3.59	3.78	4

*V = Visual, K = Kinesthetic

APPENDIX J

LITERATURE REVIEW

Inequities in various areas of life are unfortunate realities for individuals whose lives are affected by disability (Groff, Lundberg & Zabriskie, 2009). These inequities have led to poor health, limited community participation, and a reduced quality of life. In addition, those with disabilities (both physical and intellectual) experience activity limitations which result in greater number of days experiencing pain, depressive and/or anxious symptoms, and fewer days of vitality than those without activity limitations (Groff et al., 2009). Specifically, adolescents with disabilities are at greater risk for psychosocial maladjustment than adolescents without disabilities (Edwards, Patrick & Topolski, 2003). One of the offered solutions for decreasing these maladaptive behaviors as well increasing the incidence of on-task behaviors in children with intellectual disabilities (ID's) is exercise and physical activity (Dyken, Rosner, & Butterbaugh, 1998).

Physical Activity and Disability

Groff et al. (2009) support the notion of physical activity for those with disabilities, stating that the improvement of physical and psychosocial functioning can be obtained through involvement in sport and exercise, which affords those with a disability the opportunity to develop and maintain a healthy lifestyle. Participation in physical activity is particularly important for *children* with an ID since it has the capability of positively impacting the children's quality of life, development, and future health and life outcomes. Further, regular physical activity improves well-being and contributes to the prevention or delay of chronic disease (Rimmer, Riley, Wang, Rauworth, & Jurkowski 2004).

People with disabilities who are physically active are better adjusted and more satisfied with life. It is suggested that the act of being physically active contributes to feeling accomplished and functionally efficient, which in turn contributes to feelings of empowerment manifested in increased self-efficacy, confidence, physical self-concept, and self-esteem. There is also a strong positive correlation between athletic identity and the influence of sports participation on quality of life (Groff et al., 2009). Self-ratings of health are significantly related to participation in sports and exercise, psychological well-being, self-esteem, and quality of life. Those who appraise their health positively mitigate the adverse impact of disability on life satisfaction (Edwards et al., 2003). Thus, improvement of physical and psychosocial functioning can be obtained through involvement in sport and exercise, which affords those with a disability the opportunity to develop, maintain, and perceive a healthy lifestyle (Groff, et al., 2009).

Barriers to Physical Activity Participation

Though research demonstrates that individuals with an intellectual disability's participation in physical activity has the capability of positively impacting the children's quality of life, development, mental health, and future health and life outcomes, children with disabilities often undertake lower levels of physical activity than their non-disabled peers (Shields, Synnot & Barr, 2012). In fact, a physically active lifestyle is not common in individuals with an ID (Balic, Mateos, Balsco, & Fernhall, 2000). Individuals with an ID tend to be less actively involved in free-time activities than those without an ID, and tend to have a more limited and sedentary repertoire of leisure skills (Zoerink & Wilson, 1995). All persons, regardless of their limitations, have a right to a lifestyle of health and physical fitness. Individuals with an ID benefit from physical activity programs as much as, if not more than, their nondisabled peers (Machek, Stopka, Tillman, Sneed, & Naugle, 2008).

The reasons for the low levels of physical activity within the disabled population include environmental, cultural, personal, and social factors that can act as barriers to a child with a disability participating in physical activity. Opportunities to partake in physical activity programs are limited for those with disabilities (Travis & Sachs, 1991) due to inadequate, inaccessible and/or inconvenient facilities or transport (Shields et al., 2012; Dykens et al., 1998). Access to fitness and recreation facilities remains a major environmental barrier to physical activity for individuals with disabilities, despite efforts made by the Americans with Disability Act (ADA; 1990) to make these facilities more accessible. A study conducted in the Kansas City area found that none of the fitness centers assessed were 100% compliant with the ADA. In western Oregon, only 8% of exercise equipment areas, 55% of drinking fountains, and 37% of customer service desks were found to be accessible for individuals with disabilities (Rimmer et al., 2004).

Shields et al. (2012) note cultural barriers to physical activity participation by those with disabilities, including those related to policy and programming. A lack of appropriate or adapted programming, in addition to deficient programming, limits the opportunity for those with disability to participate in physical activity. Further, low staff capacity and negative attitudes of staff toward working with children with disabilities also act as barriers.

Children with disabilities cite fear and a lack of knowledge about exercise, lack of skills, and attracting unwanted attention as personal barriers to physical activity (Shields et al., 2012). Social barriers include a lack of friends with whom to participate in physical activities, unsupportive peers, and negative societal attitudes or a 'stigma of disability.' Children with an ID dislike having to deal with attracting unwanted attention or the negative perceptions of those who have a disability when they participate in sport or physical activity. Some choose not to

participate in activity for fear of their peers who are non-disabled viewing them as helpless (Shields et al., 2012; Zoerink & Wilson, 1995).

The Role of Adapted Physical Activity Programming

The inequalities and barriers to sport and physical activity participation faced by people with disabilities can and have been addressed (Franz, Phillips, Matheri, & Kibet, 2011) through the advent and growing popularity of physical activity organizations such as Special Olympics. Not only does Special Olympics contribute to improved physical fitness and motor skills, promotion of greater self-confidence, and enhancement of self-esteem (Roswal & Damentkno, 2006; Machek et al., 2008), but it also makes physical activity more accessible to people of all abilities (Harada & Siperstein, 1989).

Developed in 1968, Special Olympics was designed to encourage improvements in the physical as well as the social abilities of those with an ID (Riggen & Ulrich, 1993). Special Olympics now has well over two million athletes worldwide, many of whom report enjoying the social experiences that accompany sport participation, as well as significant improvement in their sense of self, social skills, and social interactions. Further, families of athletes note substantial improvements in psychosocial areas such as self-esteem, self-confidence, and friendship (“Changing Lives through Sport,” 2005). Wright and Cowden (1986) demonstrated that athletes with an ID who competed in Special Olympics showed greater improvement in global self-esteem compared to non-disabled participants.

Though families and coaches note the psychological and social benefits of Special Olympics to children with ID’s (“Changing Lives through Sport,” 2005; Gibbons & Bushakra, 1989), empirical research on the topic is missing. The United States Olympic Committee on Sports for the Disabled, in conjunction with researchers such as Songster (1984) and Dykens et

al. (1998), emphasized the need for measuring specific psychological changes in individuals with an ID who participate in Special Olympics (Gibbons & Bushakra, 1989).

Mental Skills and Sport Psychology for Children with Disabilities

Travis and Sachs (1991) imply that the aforementioned benefits of Special Olympics participation can be taken a step further by integrating sport psychology into the Special Olympics experience. It is known that competitive athletic participation can pave the way for future success, but rarely are Special Olympians recognized as “real” athletes (Travis & Sachs, 1991; Asken & Goodling, 1986). The physical and psychosocial outcomes of Special Olympics participation can only be beneficial to an extent; it takes the added element of competition and with that, the feeling of being a “real” athlete, to truly enhance the lives of those with an ID.

Imagery is one such mental skill that has previously been used successfully with a disabled population (Surburg, 1989; Screws & Surburg, 1997). Richardson (1969) explained imagery as “those quasi-sensory and quasi-perceptual experiences of which we are self-consciously aware and which exist for us in the absence of the stimulus conditions that are known to produce their genuine sensory or perceptual counterparts.” Simply stated, imagery is a process of creating an experience in the mind for the purpose of preparing for a performance (Weinberg & Gould, 2011).

A theory of imagery outlined by Weinberg and Gould (2011) is the Psychological Skills Hypothesis, which suggests that imagery is effective because it helps to build other psychological skills such as confidence, concentration and arousal regulation, all which are critical to performance enhancement. Imagery can also serve as a form of motivation, helping an athlete focus on positive outcomes such as improving performance of a skill. According to Doussoulin & Rehbein (2011), imagery is a cognitive process that can be explained using

Symbolic Learning Theory (SLT). SLT suggests that the person imaging, or the learner, creates a “mental blueprint” of their movement patterns into symbolic codes that are encoded in the central nervous system. This mental representation or image can be used to cue a learner on temporal and spatial elements of a specific skill. This image is rehearsed by the learner and the information is used to improve the physical performance of the skill.

Athletes use different types of imagery to achieve different types of outcomes. Hall and colleagues have identified five types of imagery within the sport domain: motivational-specific (MS; imagery that represents specific goals and goal-oriented behaviors), motivational general-mastery (MG-M; imagery that represents effective coping and mastery of challenging situations), motivational general-arousal (MG-A; imagery that represents feelings of relaxation, stress, arousal, and anxiety in conjunction with competition), cognitive specific (CS; imagery of specific sport skills), and cognitive general (CG; imagery of the strategies related to a competitive event). The function that imagery serves for an athlete is a determinant of the outcome of imagery use, be it learning and performance of skill or strategy, modification of cognitions (negative or otherwise), or regulation of arousal and anxiety related to competition. Most athletes can generate and use imagery, but not to the same degree. Past research has indicated that those with higher imagery ability have experienced greater performance improvements and outcomes, thus, imagery ability moderates the effects of imagery use on outcomes (Martin, Moritz, & Hall, 1999; Hall & Martin, 1997).

There are three main points to be taken from this information about imagery: (a) imagery can serve several different functions, (b) the function imagery serves for a given athlete should match their desired outcomes, and (c) one’s imagery ability impacts not only their use of imagery, but also how imagery effects their outcomes.

Children frequently use imagery to learn skills, as imagery is a natural strategy for children. Young athletes involved in an imagery intervention indicated that the imagery sessions were highly effective in improving their performance (Munroe-Chandler, Hall, Fishburne, O, & Hall, 2007). Short, Afremow, and Overby (2013) suggest that individuals administering an imagery script to children should describe in detail what the children should “see” and “feel” when performing. Adding a positive outcome to the image, for example, “image the ball going into the net,” may also be beneficial. Imagery preceded by relaxation is more effective than using imagery alone. Imagery sessions should be regular and structured, complimenting (as opposed to replacing) physical practice. It is helpful to begin with simple, static images before attempting to image more complex, moving images. Having children use multiple senses will help to make their images as realistic as possible. Researchers who have conducted imagery sessions with young athletes have suggested that these sessions last approximately 10-20 minutes (Munroe-Chandler et al., 2007).

Significant changes in children’s cognitive processing happens between the ages of five and seven years old. It is suggested that kinesthetic imagery does not fully develop until around seven years old. Piaget (as cited in Munroe-Chandler et al., 2007) purports that between the ages of four and seven, children are able to mentally represent events clearly. However, the only types of images they can successfully handle are static, non-transformational images. This ability to mentally represent moving images does not develop until about eight to twelve years of age (Munroe-Chandler et al., 2007).

Young athletes can access the motivational function of imagery for their performance, and can image being successful and meeting goals. Self-confidence is an important determinant of successful performance, and is a common area that is in need of improvement in athletes at all

ages and ability levels. Imagery can be used to help gain, maintain, and enhance self-confidence. One confidence-boosting strategy is imaging previous successful performances (Short et al., 2013).

Sport Competence and its Role in the Lives of Athletes with a Disability

Self-confidence has been identified as the most critical psychological characteristic influencing sport performance. Confidence has a mediating effect on cognitions, affect, and behavior in sport contexts. A specific type of self-confidence is sport competence (also called sport confidence or physical competence), or the belief that one has the ability to be successful in athletic pursuits or on specific sport skills. Sources of sport competence include mastery, physical/mental preparation, and demonstration of ability. The model of sport competence suggests that these sources influence subsequent levels of sport competence, which then impact an athlete's affect, behavior, and cognitions. The resulting affect, behaviors, and cognitions then feed back to influence the sources and level of sport competence. (Vealey, Hayashi, Garner-Holman, & Giacobbi, 1998). The engagement in physical activities of those with an ID is involved with an individual's perceived competence, of which sport competence is a component (Ninot, Bilard, Delingnieres, & Sokolowski, 2000).

Children with poor motor skills tend to have lower perceptions of their sport competence than children with better motor skills. Physical competence self-perceptions such as these are significant predictors of self-worth among children with disabilities. In children with weak motor skills, perceived competence accounted for 64% of the variance in indicators of global self-worth. Athletic competence was found to be a significant predictor of self-worth among boys in a study of motor ability and self-perceptions among children with developmental coordination disorder (Mazzoni, Purves, Southward, Rhodes, & Temple, 2009).

The theory of effective motivation proposed that individuals are intrinsically motivated to cope within their social and physical environments by engaging in mastery attempts. If these mastery attempts produce successful performance outcomes, feelings of efficacy and inherent pleasure are experienced (White, 1959).

Measurement of Constructs

The Pictorial Scale of Perceived Competence and Social Acceptance for Young Children (Harter & Pike, 1984) is a developmentally appropriate downward extension of the Perceived Competence Scale for Children (Harter, 1982). This scale was validated to measure sport competence with participants in preschool (mean age = 4.45) through second grade (mean age = 7.41). The version of the scale administered (the preschool-kindergarten version or the first-second grade version) depends on the cognitive ability of each participant.

The Pictorial Scale consists of two general constructs, perceived competence and perceived social acceptance. Each of these constructs has two subscales. Perceived competence is divided into cognitive competence and physical competence. Social acceptance is divided into peer acceptance and maternal acceptance. Each subscale consists of six items. The gender of the child in the picture will match the gender of the participant. For each item, the participant is read a statement about the child in the picture. The participant will be told that the child on the left is good at puzzles but the child on the right is not very good at puzzles. The participant then must indicate which child he/she is most like. Once they decide, the participant is then asked to think about the picture that they chose and decide if they are a lot like the child in the picture or just a little bit like the child in the picture. Each item is scored on a four point scale, where a score of 4 indicates the most competent or accepted and a score of 1 indicates the least competent or

accepted. Item scores are averaged across the six items in the subscales. The resulting mean provides the participants' scores for perceived competence and social acceptance.

The Sport Imagery Questionnaire for Children (SIQ-C; Hall, Munroe-Chandler, Fishburne, & Hall, 2009) assesses imagery use by examining five cognitive and motivational functions of imagery on either a specific or general level. This scale was validated with participants aged 7-14. The 21-item questionnaire consists of five subscales including cognitive general (CG), cognitive specific (CS), motivational general-arousal (MG-A), motivational general-mastery (MG-M), and motivational specific (MS). More detailed descriptions of what each subscale measures can be found in Table 3. Participants respond to items on a five-point Likert scale with *1 = Not At All*, *2 = A Little Bit*, *3 = Sometimes*, *4 = Often*, and *5 = Very Often*. A sample item from the CS subscale reads: "I can usually control how a skill looks in my head."

Table 3

Subscales of the SIQ-C

<u>Subscale</u>	<u>Description</u>
CG	Imaging strategies, game plans, or routines
CS	Imaging specific sport skills
MG-A	Imagery associated with arousal and stress
MG-M	Imagery associated with mental toughness, control, and self-confidence
MS	Imaging individual goals

The Movement Imagery Questionnaire-Revised (MIQ-R; Hall & Martin, 1997) assesses visual and kinesthetic imagery ability. The MIQ-R is a shortened version of the Movement Imagery Questionnaire (MIQ; Hall & Pongrac, 1983), and thus, is more developmentally appropriate for young children. The inventory is an 8-item self-report scale which requires

participants to perform one of four simple movements. Each movement is rated on both a visual and kinesthetic subscale. Once a participant performs one of the four movements, they are then asked to “see” or “feel” themselves performing that movement without actually moving, then indicate the difficulty of seeing/feeling the image on a 7-point Likert scale (*1 = hard to image to 7 = easy to image*). Responses are summed for each scale resulting in two scores; one for kinesthetic and one for visual imagery ability. Subscale scores can range from values of 4 to 28 (Monsma, Short, Hall, Gregg, & Sullivan, 2009).

Data Analysis

It is not uncommon for research pertaining to physical fitness and disability to be single subject designs (Gorely, Jobling, Lewis, & Bruce, 2002; Gregg, Hrycaiko, Mactavish, & Martin, 2004). Single subject designs look for the effect of a treatment or intervention without using randomization. It is not always feasible or even ethical to have a control group or a no-treatment group. Further, by not having groups, researchers can examine the specific impact of treatment on each individual participant as opposed to the average effect on a group of people; participants act as their own control. This type of result has practical significance rather than statistical significance. Many trials are needed to evaluate the influence of the treatment; participants in single subject designs are usually measured repeatedly on a task or topic of interest. Typically a baseline measurement of the task of interest is established, followed by administration of intervention and further testing on the task of interest (Thomas, Nelson & Silverman, 2011).

Single subject designs are analyzed using visual inspection, which depends on the magnitude and rate of changes across phases of data collection. Magnitude is comprised of two characteristics: changes in mean and changes in level. Rate is comprised of two characteristics: changes in trend and latency of change. Changes in means refers to shifts in the average rate of

performance across intervention phases. In terms of changes in level, this refers to the shift in performance from the end of one phase to the beginning of the next. This characteristic indicates the effect immediately following either the introduction or withdrawal of an intervention. Changes in trend are illustrated through systematic increases or decreases in the data over time, which is relevant to the direction of behavior change. Finally, latency of change is associated with the period of time between the onset or termination of a condition (baseline, intervention, and return to baseline) and changes in performance (Kazdin, 1982).

REFERENCES

- Americans with Disabilities Act. Retrieved on 7 September, 2014 from www.ada.gov.
- Asken, M. J., & Goodling, M. D. (1986). Sport psychology: An undeveloped discipline from among the sport sciences for disabled athletes. *Adapted Physical Activity Quarterly*, 3, 312-319.
- Balic, M. G., Mateos, E. C., Blasco, C. G., & Fernhall, B. (2000). Physical fitness levels of physically active and sedentary adults with Down syndrome. *Adapted Physical Activity Quarterly*, 17, 310-321.
- Doussoulin, A., & Rehbin, L. (2011) Motor imagery as a tool for motor skill training in children. *Morticidade*, 7(3), 37-43.
- Dykens, E. M., Rosner, B. A., & Butterbaugh, G. (1998). Exercise and sports in children and adolescents with developmental disabilities: Positive physical and psychosocial effects. *Sport Psychiatry*, 7(4), 757-771.
- Edwards, T. C., Patrick, D. L., & Topolski, T. D. (2003). Quality of life of adolescents with perceived disabilities. *Journal of Pediatric Psychology*, 28(4), 233-241.
- Frantz, J., Phillips, J. S., Matheri, J., & Kibet, J. J. (2011). Physical activity and sport as a tool to include disabled children in Kenyan schools. *Sport in Society: Cultures, Commerce, Media, Politics*, 14(9), 1227-1236.
- Gorely, T., Jobling, A., Lewis, K., & Bruce, D. (2002). An evaluative case study of a psychological skills training program for athletes with intellectual disabilities. *Adapted Physical Activity Quarterly*, 19, 350-363.

- Gibbons, S. L., & Bushakra, F. B. (1989). Effects of Special Olympics participation on the perceived competence and social acceptance of mentally retarded children. *Adapted Physical Activity Quarterly*, 6, 40-51.
- Gregg, M. J., Hrycaiko, D., Mactavish, J. B., & Martin, G. L. (2004). A mental skills package for Special Olympics athletes: A preliminary study. *Adapted Physical Activity Quarterly*, 21, 4-18.
- Groff, D. G., Lundberg, N. R., & Zabriskie, R. B. (2009). Influence of adapted sport on quality of life: Perceptions of athletes with cerebral palsy. *Disability and Rehabilitation*, 31(4), 318-326.
- Hall, C. R., Munroe-Chandler, K. J., Fishburne, G. J., & Hall, N. D. (2009). The sport imagery questionnaire for children (SIQ-C). *Measurement in Physical Education and Exercise Science*, 13, 93-107.
- Hall, C. R. & Martin, K. A. (1997). Measuring movement imagery abilities: A revision of the Movement Imagery Questionnaire. *Journal of Mental Imagery*, 21(1 & 2), 143-154.
- Hall, C., & Pongrac, J. (1983). *Movement Imagery Questionnaire*. London, ON: University of Western Ontario.
- Harada, C. M., & Siperstein, G. N. (1989). The sport experience of athletes with intellectual disabilities: A national survey of Special Olympics athletes and their families. *Adapted Physical Activity Quarterly*, 26, 68-85.
- Harter, S. (1982). The perceived competence scale for children. *Child Development*, 53, 87-97.
- Harter, S., & Pike, R. (1984). The pictorial scale of perceived competence and social acceptance for young children. *Child Development*, 55, 1969-1982.

- Kazdin, A. E. (1982). *Single-case research designs methods for clinical and applied settings*. New York: Oxford University Press.
- Machek, M. A., Stopka, C. B., Tillman, M. D., Sneed, S. M., & Naugle, K. E. (2008). The effects of a supervised resistance-training program on Special Olympics athletes. *Journal of Sport Rehabilitation, 17*, 372-379.
- Martin, K. A., Moritz, S. E., & Hall, C. R. (1999). Imagery use in sport: A literature review and applied model. *The Sport Psychologist, 13*, 245-268.
- Mazzoni, P., Purves, L., Southward, J., Rhodes, R. E., & Temple, V. A. (2009). Effect of indoor wall climbing on self-efficacy and self-perceptions of children with special needs. *Adapted Physical Activity Quarterly, 26*, 259-273.
- Monsma, E. V., Short, S. E., Hall, C. R., Gregg, M., & Sullivan, P. (2009). Psychometric properties of the Revised Movement Imagery Questionnaire (MIQ-R). *Journal of Imagery Research in Sport and Physical Activity, 4*(1).
- Munroe-Chandler, K. J., Hall, C. R., Fishburne, G., O, J., & Hall, N. (2007). The content of imagery use in youth sport. *International Journal of Sport and Exercise Psychology, 5*(2), 158-174.
- Ninot, G., Bilard, J., Delignieres, D., & Sokolowski, M. (2000). Effects of integrated sport participation on perceived competence for adolescents with mental retardation. *Adapted Physical Activity Quarterly, 17*, 208-221.
- Richardson, A. (1969). *Mental imagery*. New York: Springer.
- Riggen, K., & Ulrich, D. (1993). The effects of sport participation on individuals with mental retardation. *Adapted Physical Activity Quarterly, 10*, 42-51.

- Rimmer, J. H., Riley, B., Wang, E., Rauworth, A., & Jurkowski, J. (2004). Physical activity participation among persons with disabilities: Barriers and facilitators. *American Journal of Preventative Medicine*, 26(5), 419-425.
- Roswal, G. M., & Dementko, M. (2006). A review of completed research in sports for individuals with intellectual disability. *Research Yearbook*, 12(2), 181-183.
- Screws, D. P., & Surburg, P. R. (1997). Motor performance of children with mild mental disabilities after using mental imagery. *Adapted Physical Activity Quarterly*, 14, 119-130.
- Shields, N., Synnot, A. J., & Barr, M. (2012). Perceived barriers and facilitators to physical activity for children with disability: a systematic review. *British Journal of Sports Medicine*, 46, 989-997.
- Short, S. E., Afremow, J., & Overby, L. Using mental imagery to enhance children's performance. *Journal of Physical Education, Recreation, & Dance*, 72(2), 19-23.
- Songster, T. (1984). The Special Olympics sport program: An international sports program for mentally retarded athletes. In C. Sherrill (Ed.), *Sport and disabled athletes: The 1984 Olympic Scientific Congress proceedings*, 9, 73-79. Champaign, IL: Human Kinetics.
- Special Olympics, Inc. (2005). Changing lives through sport – A report card on the impact of Special Olympics.
- Surburg, P. R. (1989). Application of imagery techniques to special populations. *Adapted Physical Activity Quarterly*, 6, 328-337.
- Thomas, J. R., Nelson, J. K., & Silverman, S. J. (2011). *Research Methods in Physical Activity*. Champaign, IL: Human Kinetics.
- Travis, C. A., & Sachs, M. L. (1991). Applied sport psychology and persons with mental retardation. *The Sport Psychologist*, 5, 382-391.

- Vealey, R. S., Hayashi, S. W., Garner-Holman, M., & Giacobbi, P. (1998). Sources of sport-confidence: Conceptualization and instrument development. *Journal of Sport & Exercise Psychology, 20*, 54-80.
- Weinberg, R. S., & Gould, D. (2011). Foundations of sport and exercise psychology. Champaign, IL: Human Kinetics.
- White, R. W. (1959). Motivation reconsidered: The concept of competence. *Psychological Review, 66*(5), 297-333.
- Williams, S. E., & Cumming, J. (2011). Measuring athlete imagery ability: The sport imagery ability questionnaire. *Journal of Sport & Exercise Psychology, 33*, 416-440.
- Wright, J., & Cowden, J. E. (1986). Changes in self-concept and cardiovascular endurance of mentally retarded youths in a Special Olympics swim training program. *Adapted Physical Activity Quarterly, 3*, 177-183.
- Zoerink, D. A., & Wilson, J. (1995). The competitive disposition: Views of athletes with mental retardation. *Adapted Physical Activity Quarterly, 12*, 34-42.