5-1-2013

Development and Implementation of a Video-Based Activity Preference Assessment for Children with Autism and Their Parents

Lena Sankovich

University of Nevada, Las Vegas, sankovic@unlv.nevada.edu

Follow this and additional works at: http://digitalscholarship.unlv.edu/thesesdissertations

Part of the Exercise Science Commons, and the Special Education and Teaching Commons

Repository Citation

http://digitalscholarship.unlv.edu/thesesdissertations/1882

This Dissertation is brought to you for free and open access by Digital Scholarship@UNLV. It has been accepted for inclusion in UNLV Theses, Dissertations, Professional Papers, and Capstones by an authorized administrator of Digital Scholarship@UNLV. For more information, please contact digitalscholarship@unlv.edu.
DEVELOPMENT AND IMPLEMENTATION OF A VIDEO-BASED PHYSICAL ACTIVITY PREFERENCE ASSESSMENT FOR CHILDREN WITH AUTISM AND THEIR PARENTS

By

Lena Sankovich

Bachelor of Science in Special Education
University of Nevada, Las Vegas
2005

Master of Education
University of Nevada, Las Vegas
2006

A dissertation submitted in partial fulfillment of the requirements for the

Doctor of Philosophy in Special Education

Department of Educational & Clinical Studies
College of Education
The Graduate College

University of Nevada, Las Vegas
May 2013
THE GRADUATE COLLEGE

We recommend the dissertation prepared under our supervision by

Lena Sankovich

entitled

Development and Implementation of a Video-Based Physical Activity Preference Assessment for Children with Autism and Their Parents

be accepted in partial fulfillment of the requirements for the degree of

Doctor of Philosophy in Special Education
Department of Educational and Clinical Studies

Susan Miller, Ph.D., Committee Chair

Tom Pierce, Ph.D., Committee Member

Nancy Sileo, Ed.D., Committee Member

Richard Tandy, Ph.D., Graduate College Representative

Tom Piechota, Ph.D., Interim Vice President for Research & Dean of the Graduate College

May 2013
ABSTRACT

Development and Implementation of a Video-Based Physical Activity Preference Assessment for Children with Autism and Their Parents

by

Lena Sankovich
Susan P. Miller, Doctoral Committee Chair
Professor of Special Education
University of Nevada, Las Vegas

Individuals with autism often lack the necessary motivation to engage in physical activity. In addition, due to the characteristics defining autism, such as deficits in social skills, motor coordination, and behavior, individuals with autism are less likely to participate in physical activity with their peers than individuals without autism. Additionally, poor motor functioning, sedentary lifestyle, lack of information and lack of access to physical activity may be barriers to physical activity for individuals with developmental disabilities. These barriers, in addition to the characteristics particular to autism spectrum disorder (i.e., social skill deficits and challenging behavior) may preclude children with autism from participating in physical activity. The selection of preferred activities and items that serve as reinforcers is often determined through the use of preference assessments. These assessments have been widely reported in the literature as effective procedures for identifying preferences for individuals with autism.

The purpose of this investigation was to explore self-perceptions and parental perceptions related to physical activity preferences of children with autism. Specifically, the study involved the development and administration of a forced-choice assessment tool designed to measure physical activity preferences as they relate to social and environmental contexts.
The participants in this study were 30 children with autism (24 males and 6 females) between the ages of 5 and 14 years. In addition to the 30 child participants, a total of 30 parent participants (i.e., one parent of each child) were included in the study. The study took place at an autism treatment center located in a metropolitan city in the southwestern United States.

The study was conducted in three phases. Phase one involved the development of the video-based preference assessment (i.e., Physical Activity Choice Assessment (PACA). Phase two consisted of administration of the assessment to the child and parent participants. Phase three involved treatment of the data to answer research questions related to the study.

The results indicated that the children with autism who participated in this study selected trampoline, bowling, and bike riding as the most preferred activities. The results also indicated that the child participants preferred to engage in physical activity with friends and in the home setting. The results related to child-parent comparisons for each component indicated a high percentage of agreement related to physical activity preferences and low agreement for social and environmental preferences.
ACKNOWLEDGMENTS

I would like to take this opportunity to thank all the people who supported me through this endeavor. I would like to thank my committee chair, Dr. Susan Miller. I could not have completed my dissertation without your kind words of encouragement, guidance, knowledge and patience. I am grateful for the opportunity to have collaborated with you on my dissertation before your retirement. I would like to extend my sincere appreciation to Dr. Nancy Sileo; you made it possible for me to pursue my passion by helping me develop my idea into a dissertation study. I would like to thank my committee members for their support and expertise. Dr. Tom Pierce, thank you for your edits and encouragement to continue my research. Dr. Dick Tandy, thank you for your valuable input and assistance with the stats and the development of the activities selection. Thank you to the UNLV faculty in the special education office who were always so helpful.

Thank you to my research team, Anna O’Malley and Ashley Horton, your dedication and hard work is always appreciated. I would also like to thank all the employees at Southwest Autism & Behavioral Solutions who participated in the development of the video portion of the assessment. Vanessa Fessenden, my friend and business partner. I am always grateful for your friendship, support and always being there for me.

As always, I am grateful to my family, for their unconditional love, support, and encouragement. Thank you, Vinny for always being there to listen, mom for your continued support and insistence that I could do anything I wanted in life. Dad, who passed away before the completion of my dissertation; I know you are proud. And most
of all, I would like to thank my husband, Nick Sankovich for making all of my accomplishments and dreams possible, for keeping me focused and for giving me more love and support than anybody deserves. I would not have wanted to take this journey without you.
# TABLE OF CONTENTS

ABSTRACT ................................................................................................................................. iii

ACKNOWLEDGMENTS ................................................................................................................ v

LIST OF TABLES ........................................................................................................................... ix

LIST OF FIGURES .......................................................................................................................... x

## CHAPTER 1 INTRODUCTION ........................................................................................................ 1
   Statement of the Problem ........................................................................................................... 5
   Purpose of the Study ................................................................................................................ 7
   Research Questions .................................................................................................................. 7
   Significance of the Study .......................................................................................................... 8
   Delimitations of the Study ....................................................................................................... 9
   Definition of Terms .................................................................................................................. 9
   Summary ..................................................................................................................................... 13

## CHAPTER 2 REVIEW OF RELATED LITERATURE ....................................................................... 15
   Literature Review Procedures ................................................................................................. 16
   Selection Criteria .................................................................................................................... 16
   Review and Analysis of Literature Related to Quality of Life and Children With Autism .......... 17
   Review and Analysis of Literature Related to Childhood Obesity ............................................. 18
   Review and Analysis of Literature Related to Physical Activity for Children With Autism ........... 21
   Review and Analysis of Literature Related to School-Based Obesity and Physical Activity Programs for Children With and Without Disabilities ................................................ 26
   Summary of Reviewed Literature ............................................................................................ 40

## CHAPTER 3 METHODOLOGY ....................................................................................................... 44
   Research Questions .................................................................................................................. 46
   Participants ............................................................................................................................... 46
   Setting ...................................................................................................................................... 49
   Equipment and Materials .......................................................................................................... 50
   Design and Procedures ............................................................................................................. 51
   Summary ..................................................................................................................................... 63

## CHAPTER 4 RESULTS ................................................................................................................. 64
   Research Questions and Related Findings ................................................................................. 64
   Fidelity of Treatment ............................................................................................................... 72
   Interscorer Reliability .............................................................................................................. 73
   Social Validity Questionnaire ................................................................................................... 74
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summary of Findings</td>
<td>76</td>
</tr>
<tr>
<td>CHAPTER 5 SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS</td>
<td>80</td>
</tr>
<tr>
<td>Discussion of Results</td>
<td>82</td>
</tr>
<tr>
<td>Conclusions</td>
<td>91</td>
</tr>
<tr>
<td>Limitations of the Study</td>
<td>91</td>
</tr>
<tr>
<td>Practical Implications</td>
<td>92</td>
</tr>
<tr>
<td>Recommendations for Further Study</td>
<td>94</td>
</tr>
<tr>
<td>Summary</td>
<td>95</td>
</tr>
<tr>
<td>APPENDIX A PHYSICAL ACTIVITY CHOICE ASSESSMENT (PACA PROTOCOL AND GENERAL INSTRUCTIONS)</td>
<td>97</td>
</tr>
<tr>
<td>APPENDIX B PHYSICAL ACTIVITY CHOICE ASSESSMENT PROCEDURAL FIDELITY CHECKLIST</td>
<td>100</td>
</tr>
<tr>
<td>APPENDIX C REINFORCER ASSESSMENT FORM</td>
<td>101</td>
</tr>
<tr>
<td>APPENDIX D PHYSICAL ACTIVITY CHOICE ASSESSMENT VIDEO SLIDE</td>
<td>102</td>
</tr>
<tr>
<td>APPENDIX E PHYSICAL ACTIVITY CHOICE ASSESSMENT SOCIAL AND ENVIRONMENTAL PICTURE SLIDE</td>
<td>103</td>
</tr>
<tr>
<td>APPENDIX F RECRUITMENT PHONE SCRIPT</td>
<td>104</td>
</tr>
<tr>
<td>APPENDIX G RESEARCH STUDY INTAKE FORM</td>
<td>105</td>
</tr>
<tr>
<td>APPENDIX H INFORMED CONSENT FORM</td>
<td>106</td>
</tr>
<tr>
<td>APPENDIX I PARENT PERMISSION FORM</td>
<td>109</td>
</tr>
<tr>
<td>APPENDIX J SOCIAL VALIDITY SURVEY</td>
<td>112</td>
</tr>
<tr>
<td>REFERENCES</td>
<td>114</td>
</tr>
<tr>
<td>VITA</td>
<td>124</td>
</tr>
</tbody>
</table>
## LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table 1</td>
<td>Participant Demographic Information</td>
<td>47</td>
</tr>
<tr>
<td>Table 2</td>
<td>Research Administrator Demographic Information</td>
<td>48</td>
</tr>
<tr>
<td>Table 3</td>
<td>Child Participant Activity Scores</td>
<td>66</td>
</tr>
<tr>
<td>Table 4</td>
<td>Child Participant Social and Environmental Scores</td>
<td>68</td>
</tr>
<tr>
<td>Table 5</td>
<td>Parent Preference Scores</td>
<td>70</td>
</tr>
<tr>
<td>Table 6</td>
<td>Child-Parent Percentage of Agreements</td>
<td>72</td>
</tr>
<tr>
<td>Table 7</td>
<td>Treatment of Fidelity</td>
<td>73</td>
</tr>
<tr>
<td>Table 8</td>
<td>Inter scorer Reliability</td>
<td>74</td>
</tr>
<tr>
<td>Table 9</td>
<td>Social Validity Frequency Ratings and Mean Scores</td>
<td>76</td>
</tr>
</tbody>
</table>
LIST OF FIGURES

Figure 1  Child Participant Activity Preferences ..................................................65
Figure 2  Child Participant Social Preferences .....................................................67
Figure 3  Child Participant Environmental Preferences .........................................67
Figure 4  Child-Parent Activity Comparison .........................................................69
Figure 5  Child-Parent Social Comparison .............................................................71
Figure 6  Child-Parent Environmental Comparison ..............................................72
CHAPTER 1
INTRODUCTION

Quality of life is of significant interest in the field of special education. Further, quality of life is a theoretical construct associated with best practices as mandated in the Individuals with Disabilities Education and Improvement Act (IDEA, 2004) and identified as best outcomes for individuals with disabilities (Sacks & Kern, 2008). Factors that contribute to quality of life include psychological well-being, social interactions and physical ability (Pinhas-Hamiel, Singer, Pilpel Fradkin, Modan, & Reichman, 2006). Physical ability refers to the ability and the motivation to engage in physical activity for the purpose of maintaining health and participating in recreational activities.

Individuals with autism often lack the necessary motivation to engage in physical activity (Todd, Reid, & Butler-Kisber, 2010). In addition, due to the characteristics defining autism, such as deficits in social skills, motor coordination, and behavior, individuals with autism are less likely to participate in physical activity with their peers than individuals without autism (Pan & Frey, 2006). Limited physical activity puts individuals with autism at risk for a variety of health-related issues. For example, a lack of physical activity has been linked to obesity in children and adults (Center for Disease Control and Prevention, 2011).

According to the Center for Disease Control and Prevention (CDC) (2011), obesity has reached epidemic proportions in the United States (U.S.) and has become a serious health concern. The CDC states one-third of the adult population and 17% of children are currently overweight or obese in the U.S. The CDC further cites physical activity as a major component in the solution to the obesity problem and has
mandated many federally funded programs for the purpose of promoting physical activity for children and adults. In addition, the President’s Council on Physical Fitness, and Sports (Rimmer, 2011), advocates regular physical fitness as a critical element for achieving a healthy lifestyle and combating the problem of obesity.

Research supports that maintaining a healthy weight and staying physically active has many health benefits such as lower risks for high blood pressure, type 2 diabetes, heart attack, stroke, depression, and anxiety (CDC, 2011). In addition, benefits such as positive self-esteem, happiness, and positive social outcomes among youth have been associated with physical activity (Pan & Frey, 2006). Moreover, studies indicate physical activity resulted in a significant decrease of inappropriate behaviors and a reduction in stereotypy among children and adults with developmental disabilities (Rosser Sandt & Frey, 2005).

It has been suggested in the literature that poor motor functioning, sedentary lifestyle, lack of information and lack of access to physical activity may be barriers to physical activity for individuals with developmental disabilities (Holcomb, Pufpaff, & McIntosh, 2009; Johnson, 2009). These barriers, in addition to the characteristics particular to autism spectrum disorder (i.e., social skill deficits and challenging behavior) may preclude children with autism from participating in physical activity. Moreover, it has been reported that individuals with developmental disabilities often have fewer opportunities to make choices in their daily lives than their non-disabled peers (Burton Smith, Morgan, & Davidson, 2005). This may also affect children’s participation in physical activity.
The concept of self-determination may also play a role in the amount of physical activity that individuals with autism acquire. Self-determination refers to the ability and the opportunity to be the causal agent in one’s own life. This means individuals are responsible for the cause of change in their lives, not someone else (Wehmeyer & Schwartz, 1997). One of the primary elements of self-determination is choice-making. Individuals who experience self-determination make decisions based on their own choices, preferences and interests (Wehmeyer, Shogren, Zager, Smith, & Simpson, 2010). The notion of choice-making for individuals with disabilities is important because historically, they have been given little choice in the events that affect their lives (Romaniuk & Miltenberger, 2001). The opportunity to engage in the vital component of self-determination promotes independence and has a positive effect on quality of life for individuals with disabilities, particularly for adolescents with autism.

Self-determination and in particular, choice-making is critical for adolescents with autism. The ability to control some aspects of their lives is crucial to emotional well-being and may affect participation in physical activity. It has been reported in the literature that providing a choice of activities and tasks is reinforcing for students with autism (Watanabe & Sturmey, 2003) and concomitantly decreases problem behaviors and increases desirable behaviors. In addition, it has been suggested that providing choices to persons with autism is internally motivating (Kern, Mantegna, Vorndran, Bailin, & Hilt, 2001). Thus, children with autism may engage in increased amounts of moderate to vigorous physical activity (MVPA) when allowed to participate in preferred physical activities.
The selection of preferred activities and items that serve as reinforcers is often determined through the use of preference assessments. These assessments have been widely reported in the literature as effective procedures for identifying preferences for children and adolescents with autism (Schanding, Tingstrom, & Sterling-Turner, 2008). The purpose of conducting a preference assessment is to identify stimuli that will increase the likelihood of appropriate responding in the future (Cooper, Heron, & Heward, 2007).

Research reveals strong evidence in support of using preferred items and activities during intervention to decrease problem behavior (Morgan, 2006). In addition, reinforcers have been used successfully during intervention programs to teach new skills and desired behaviors (Cooper et al., 2007). A forced-choice assessment (Fisher, Piazza, Bownan, Hagopian, Owns, & Slevin, 1992) is a well-established procedure for identifying appropriate reinforcers. When a forced-choice assessment is employed, the stimulus is presented in pairs with each stimulus randomly paired with another until a ranking of high to low is established. The literature states edibles and tangibles as the stimuli most commonly used when administering preference assessments (Moher, Gould, Hegg, & Mahoney, 2008). Currently, there are no known studies that involved the use of this type of preference assessment to determine preferred physical activities for children and adolescents with autism.

Identifying preferences for physical activity is imperative for the promotion and maintenance of physical activity for children and adolescents with autism. Unfortunately, individuals with autism rarely have a choice when it comes to many
events and situations in their daily lives; they are often denied the autonomy enjoyed by most of their peers (Burton-Smith et al., 2005). These choices instead, fall to educators and parents.

Rating scales completed by parents are ubiquitous in special education to assess such concerns as behavior, quality of life and competency. Rating scales are typically given to provide a more comprehensive picture of a child (Friedman, Leone, & Friedman, 1999). However, there is consistent disagreement reported between parents and children concerning the outcomes of these assessments (Meer van der, Dixon, & Rose, 2008). It has been reported that parent and child perceptions related to health issues often differ and that these differences are specifically related to physical activity (Barr-Anderson, Robinson-O’Brien, Haines, Hannan, & Neumark-Sztainer, 2010). Moreover, because choice is often nonexistent in the lives of individuals with disabilities, this can have a significant impact on the amount of physical activity and the types of physical activities children with autism engage in throughout the day. Therefore, preference becomes an important issue.

Statement of the Problem

Limited engagement in physical activity and the prevalence of obesity in this country is of major concern. Obesity in children and adolescents with disabilities is 38% higher than in children without disabilities (National Health and Nutrition Survey, 2003-2008). Moreover, the health risks associated with inactivity for individuals with disabilities may include osteoporosis and a decrease in strength, endurance, and balance (Johnson, 2009).
Due to such factors as lack of motivation, deficits in social skills, and problem behaviors, children and adolescents with autism do not typically engage in the appropriate amount of physical activity (Holcomb et. al, 2009). According to the guidelines outlined by the CDC (2011), children and adolescents should engage in at least 60 minutes of moderate-to-vigorous physical activity (MVPA) daily.

Poor motor functioning has been associated with autism (Todd & Reid, 2006; Pan, Tsai, & Hsieh, 2011). In fact, studies have indicated that children with autism score lower on standardized tests that measure motor functioning performance than typical children. Moreover, it has been suggested that poor motor functioning may prevent individuals from participating in team sports and complex sports such as golfing (Todd & Reid, 2006). Thus, poor motor skills may limit physical activity for children with autism.

According to the literature, the opportunity to make a choice is an element of self-determination (Wehmeyer & Schwartz, 1997). However, the ability to make a choice is often a skill deficit for individuals with developmental disabilities. In addition, they are often given few choice making opportunities in their daily life (Romaniuk & Miltenberger, 2001). Thus, the inability to make a choice and the lack of opportunity to engage in the choice-making process may prevent individuals with autism from pursuing preferences and interests in their daily lives and may contribute to a more sedentary lifestyle.

Currently, there is minimal research on physical activity for individuals with autism in the literature. In the few studies that were found (Todd, Reid & Butler-Kisber; 2010, Todd & Reid, 2006), multi-component intervention packages that
included self-monitoring, goal setting, and reinforcement with edibles were examined. The remaining studies focused on patterns of activity, activity levels, and intensity of physical activity among individuals with developmental disabilities (Borremans, Rintala, & McCubbin, 2010; Pan & Frey, 2006). No studies were found that investigated the preferences or choices of individuals with autism relating to physical activity. Thus, this study helps address a substantial gap in the existing literature.

**Purpose of the Study**

The purpose of this investigation was to explore self-perceptions and parental perceptions related to physical activity preferences of children with autism. Specifically, the study involved the (a) development and administration of a preference assessment using videos to identify choices of physical activities as they relate to social and environmental contexts, (b) examination of parent perceptions of their children’s preferences of physical activities, and (c) the administration of an established preference assessment procedure that was not previously used for the purpose of identifying physical activity preferences.

**Research Questions**

1. What are the physical activity preferences of children with autism when given a forced-choice assessment using videos?

2. What are the social and environmental preferences for children with autism related to physical activity?
3. When given the same preference assessment as their children and instructed to choose their child’s preferences, is there a difference in reported preferences between parents and their children?

**Significance of the Study**

Children and adolescents with autism do not engage in the appropriate amount of physical activity due to factors such as poor motor functioning, sedentary lifestyles, and lack of motivation (Holcomb et. al, 2009). In addition, self-determination and the opportunity to make choices are often absent in the daily lives of individuals with disabilities (Romaniuk & Miltenberger, 2001). These factors negatively influence the daily physical activity of children with autism.

The benefits of physical activity for individuals with autism have been documented within the literature (Pan & Frey, 2006; Pitetti, Rendoff, Travis, & Beets, 2007; Rosenthal-Malek & Mitchell, 1997; Rosser Sandt & Frey, 2005; Todd et al., 2010; Todd & Reid, 2006). Some of the benefits of physical activity cited for children with autism include proper weight management, positive self-esteem, happiness, improved social outcomes, a decrease in problem behaviors, and a reduction in stereotypic behaviors (Pan & Frey, 2006; Rosser Sandt & Frey, 2005).

In addition, there is evidence that providing choices to individuals with autism is successful for increasing skills, promoting independence, and improving socially significant behaviors (Watanabe & Sturmey, 2003). Choice-making as an intervention has been used successfully to increase desirable behaviors and task performance for individuals with disabilities (Morgan, 2006). Moreover, Kern et al., (2001) suggest choice-making is inherently reinforcing independent of the chosen stimulus. Thus,
identifying preferences among children with autism regarding physical activity has the potential to promote effective research-based intervention practices, enhance self-determination, and improve quality of life.

This study provides useful information for educators and parents that will assist in the development of effective treatment programs that incorporate physical activity in the home and school environments. In addition, this investigation makes use of preference and choice-making to promote self-determination and independent leisure activities for adolescents with autism. This study addresses the current gap in the literature related to physical activity preferences among children with autism and extends the research on best practices for these individuals.

**Delimitations of the Study**

The participants in this study (i.e., children with autism and one of their parents) were obtained from a sample of convenience. Therefore, generalization to other types of participants may be limited. In addition, the sample of participants were obtained from a clinic that provides treatment for individuals with autism, thus generalizing the results to other individuals with autism may be limited. Furthermore, the study was limited geographically to Las Vegas, Nevada. Thus, caution must be used when generalizing the findings to other locations.

**Definition of Terms**

**Autism**

Autism is characterized by communication, social and behavioral deficits. According to the DSM IV 4th edition (2000), characteristics of autism include non-verbal or limited speech, repetitive motor movements, and stereotypical behaviors...
such as hand or finger flapping and body movements. Individuals with autism typically have limited interests in make-believe play and social interactions; autism is a lifelong disorder that begins before the age of three and lasts over a lifetime (Center for Disease Control, 2011).

**Choice-Making**

Choice-making refers to providing choices for tasks or activities. Choice-making has been an effective intervention for decreasing problem behaviors and increasing on-task behavior. It has been suggested that the opportunity to choose is internally reinforcing (Kern, Mantegna, Vorndran, Bailin, & Hilt, 2001).

**Developmental Disability**

Developmental disability refers to significant limitations in both adaptive and intellectual functioning that includes everyday and social practical skills originating before age 18 (American Association on Intellectual and Developmental Disabilities, 2012).

**Environmental Context**

Environmental context refers to physical activity as it relates to behaviors influenced by the environment such as primary locations, indoor activity contexts, and outdoor activity contexts (Brown, Pfeiffer, McIver, Dowda, Addy, & Pate, 2009).

**Forced-Choice Assessment**

Forced-Choice Assessment is a procedure that determines the stimuli that an individual prefers. In a forced-choice procedure, each stimulus is paired with another and presented to the individual to choose. In a paired stimulus assessment (i.e. forced-choice), each stimulus is randomly paired with all other stimuli. Preferences are then
ranked in order from high to low in terms of preference (Cooper, Heron, & Heward, 2007).

**Goal-Setting**

Goal-setting is an intervention that is used to teach individuals to set goals that are realistic and specific. Goal setting increases motivation and can increase efficacy (Todd, Reid, & Butler-Kisber, 2010).

**Moderate-to-Vigorous Physical Activity (MVPA)**

Moderate-to-vigorous physical activity (MVPA) is a term used to describe the intensity of physical activity. An individual engages in 3.0-5.9 times the intensity of rest when engaging in moderate physical activity. An individual engages in 6.0 times the intensity of rest when engaging in vigorous physical activity (Physical Activity Guidelines for Americans, 2008).

**Obesity**

Obesity refers to the range of weight that is greater than what is considered healthy for a given height. Obesity is associated with various health risks. It is measured for adults using the body mass index (BMI). A BMI of 30 or higher classifies an adult individual as obese. An adolescent’s BMI is calculated using age and gender to allow for growth (CDC, 2011).

**Physical Activity**

Physical activity is defined as any bodily movement that increases energy expenditure above the basal line while the body is at rest. This definition generally refers to any physical activity that is beneficial for an individual’s health (Physical Activity Guidelines for Americans, 2008).
Preference Assessment

Preference assessment is defined as a direct empirical method for presenting stimuli contingent on a response and measuring their effectiveness as a reinforcer (Cooper, Heron, & Heward, 2007).

Quality of Life (QOL)

Quality of Life (QOL) is a multi-dimensional construct. It encompasses a broad range of life domains and individual values that are both subjective and objective. The domains include the physical, emotional, material, and social well-being of an individual (Felce & Perry, 1995).

Reinforcer

A Reinforcer is a change in stimulus that increases the likelihood that a particular behavior will increase in the future (Cooper, Heron, & Heward, 2007).

Self-determination

Self-determination is defined as “acting as the primary causal agent in one’s life and making choices and decisions regarding one’s quality of life free from undue external influence or interference” (Wehmeyer & Schwartz, 1997, p. 246).

Self-monitoring

Self-monitoring refers to the systematic gathering of information about a target behavior with no external control such as reinforcement. When self-monitoring is applied as an intervention, the student records the occurrence of a target behavior and then evaluates reinforcement. This intervention promotes self-regulation of the student by shifting reinforcement from teacher to student control (Todd, Reid, & Butler-Kisber, 2010).
Social Contexts

Social contexts refers to physical activity as it relates to social behaviors such as group compositions, prompts from adults and peers, reinforcement, and initiators of activities (Brown, Pifieffer, McIver, Dowda, Addy, & Pate, 2009).

Stereotypy

Stereotypy refers to the self-stimulatory behaviors that typically occur in individuals with autism spectrum disorder. These behaviors consist of repetitive movements that appear to provide sensory input, and can include movements such as rocking, hand flapping and gazing (Powers, Thibadeau, & Rose, 1992).

Stimulus

Stimulus is defined as a thing that evokes a specific functional reaction in an organ or tissue (Pearsall, 1999).

Video

Video refers to the system of recording, reproducing or broadcasting moving visual images on or from videotape (Pearsall, 1999).

Summary

Lack of physical activity and the obesity problem in the U.S. is of significant concern (Center for Disease Control and Prevention, CDC, 2011). Children and adolescents with disabilities are typically more overweight and obese than their typical peers (Johnson, 2009). According to the CDC (2011) physical activity is part of the solution for the obesity problem. In fact, a healthy lifestyle that includes good nutrition and physical activity can reduce the risks of diabetes, heart disease, stroke and anxiety (CDC, 2011). The benefits of physical activity have been associated with
happiness, positive self-esteem and positive social outcomes for adolescents. For individuals with autism in particular, a reduction of stereotypic and challenging behaviors has been documented (Rosser Sandt & Frey, 2005).

There is evidence that children with autism do not engage in the appropriate amount of MVPA due to such barriers as poor motor functioning, sedentary lifestyle, and lack of access to physical activity (Holcomb et al., 2009; Johnson, 2009). In addition, individuals with developmental disabilities have been given little opportunity to make choices in their daily lives. This may contribute to less participation in physical activity (Burton-Smith et al., 2005).

Self-determination refers to the opportunity to be the causal agent in one’s own life. Choice-making is a primary element of self-determination and is critical for adolescents with autism (Wehmeyer & Schwartz, 1997). It has been reported that choice-making is internally motivating for students with autism (Kern et al., 2001). Thus, providing choices of physical activities may increase their engagement in daily physical activity.

This study was designed to investigate the preferences of children with autism concerning physical activity within environmental and social contexts. Identifying preferences among children with autism has the potential to contribute to the development of effective research-based interventions and/or curricula, promote self-determination, and potentially lead to a better quality of life. This study addressed the gap in the literature related to physical activity preferences and extends the research on best practices for individuals with autism.
CHAPTER 2

REVIEW OF RELATED LITERATURE

The initial purpose of this review of literature was to summarize, analyze, and synthesize experimental research related to physical activity and children with developmental disabilities, including autism. A secondary purpose of this review of literature was to examine and summarize experimental studies that relate to the benefits of incorporating physical activity in the educational and home environments of children with autism and the significance of promoting better quality of life (QOL) through self-determination and choice-making. Due to the limited number of studies related to these two purposes, the review was extended to include information on childhood obesity (a potential outcome for children with autism given their limited physical activity) and existing programs to address this problem.

This chapter begins with a brief discussion of the literature review procedures and the selection criteria, including the criteria for exclusion. Next, a review and analysis of literature related to quality of life and youth with autism is provided. Then, a review and analysis of literature related to childhood obesity is presented. The next section in the chapter includes a review and analysis of literature related to physical activity for children with autism. Next, a review and analysis of literature related to school-based obesity and physical activity programs for children with and without disabilities is provided. The final review and analysis of literature addresses choice-making and preference assessments for children with developmental disabilities. The chapter concludes with a summary of the reviewed literature.
Literature Review Procedures

A systematic search through several databases was conducted (i.e., PsychInfo, Sport Discuss, Premier Search, Educational Full-Text, PubMed, and Professional Development Collection). The descriptors used to locate journal articles for review were physical activity, physical fitness, children, adolescents, autism, developmental disabilities, overweight, obesity, self-determination, quality of life, intellectual disability, preference assessment, reinforcer assessment, forced-choice assessment, nutrition, parent, self-report assessments, exercise, choice-making, and fitness behaviors. Next, a manual search of the latest issues (1992-2012) of journals that emerged from the computerized search took place (i.e., PsychInfo, Sport Discuss, Premier Search, Educational Full-Text, Journal of Applied Behavior Analysis, and Professional Development Collection). Finally, the reference lists from the obtained articles were reviewed to identify other relevant research articles.

Selection Criteria

Studies were included in this review if (a) the participants were between the ages of birth and 21 years of age, and (b) the purpose of the study was to examine interventions used for weight loss or weight loss prevention (c) the purpose of the study was to examine the physical activity patterns of children with and without developmental disabilities (d) the purpose of the study was to examine interventions used to increase physical activity for children with and without developmental disabilities, or (e) the purpose of the study was to examine choice-making or preference as interventions for individuals with developmental disabilities. Studies
were excluded if (a) the purpose of the study was to examine weight loss or physical activity for adults.

**Review and Analysis of Literature Related to Quality of Life and Children with Autism**

Quality of life (QOL) is a theoretical construct that can be defined as the measure of an individual’s condition. This construct contains key elements that include psychological well-being, social interactions, and physical ability (Pinhas-Hamiel et al., 2006). Quality of life applies to all individuals; however, it is of particular interest to special educators in relation to individuals with disabilities and best outcomes (Sacks & Kern, 2008).

According to Brown and Brown (2005) the application of QOL should include applied research that makes use of assessments and evaluations that support the use of evidence-based interventions. In addition, the principles of QOL should be part of professional education and training because this would increase best outcomes, particularly for children with autism.

Research in QOL for children with autism and their families has been minimal (Lee, Harrington, Louie, & Newschaffer, 2008). In a study conducted by Lee et al., (2008) parent-reported data from the National Survey of Children’s Health (NSCH) was used to compare QOL for families that have children with autism, ADD/ADHD, and typical children. The children selected for the study were aged 3 through 17 and totaled 65,746 across all groups. The questionnaires included indicators such as caring burden, family outings, religious service attendance, days of missed school, and community service.
The results of this study indicated that families who have children with autism report a more diminished quality of life than families who have children with ADD/ADHD and typical children. Moreover, parents of children with autism reported greater concern for their child’s well-being. These results support the need to consider the impact that QOL has on families and children with autism and the necessity of supports and services that promote better QOL.

**Review and Analysis of Literature Related to Childhood Obesity**

Obesity among children is a major public health concern. The percentage of children who are overweight and obese in this country is 17%; the percentage of children with disabilities who are obese is even higher at 20% for children 10-17 years of age (CDC, 2011). Many factors contribute to obesity for children and adolescents with developmental disabilities including poor motor functioning, sedentary lifestyle, lack of motivation and lack of choice making opportunities in their daily lives (Holcomb et al., 2009; Johnson, 2009).

Physical activity has been cited as a critical component of the solution to the obesity problem (CDC, 2011). However, most children with autism do not engage in the appropriate amount of physical activity in their daily lives (Todd et al., 2010).

According to the literature, one of the indicators of QOL for every individual is physical ability (Pinhas-Hamiel et al., 2006). However, overweight and obese children often lack the ability to engage in the recommended amount of physical activity due to various health issues, including musculoskeletal problems (Krul, van der Wouden, Schellevis, & Suijlekom-Smit, & Koes, 2009). The inability due to
health issues to engage in the appropriate amount of physical activity may promote weight gain and contribute to the obesity problem for children and adolescents.

Krul et al., (2009) conducted a study in which data were collected from 2,459 participants between the ages of 2 and 17 and were evaluated to assess musculoskeletal problems. The purpose of the study was to determine if overweight and obese children reported more musculoskeletal problems than their typical normal weight peers. The results indicated a significant difference in the frequency of reported musculoskeletal problems for overweight and obese children and adolescents in their daily life. This study suggests that musculoskeletal problems due to significant body weight may prevent engagement in physical activity for children, thus affecting their physical ability and their quality of life.

The Stockholm Obesity Prevention Program (Early STOPP) was developed in Sweden and conducted a randomized controlled study to assess the efficacy of a program designed to involve parents in a weight loss intervention that is designed to target childhood obesity. The intervention consists of a multi-disciplinary approach that includes parental education and individual coaching. The purpose of the program is to increase parents’ knowledge and self-efficacy in the areas of eating, physical activity, and sleep. The researchers proposed that obesity prevention early in life may be an effective solution to childhood obesity (Sobko et al., 2011).

Boutelle et al. (2011) examined the notion of obesity prevention in children. Eating in the absence of hunger (EAH) has been linked to parent behaviors that include parent’s restriction of food and maternal disinhibition of eating. Thus, parents were included as participants in the study that was designed to examine two
interventions to address EAH. The participants in the study were 8 to 12 year old overweight and obese children and one parent for each participant. The children met criteria to participate in the study if their BMI percentile score was $\geq 85$ and the parent reported the child eating in the absence of hunger. The purpose of the study was to examine the effectiveness of cue exposure and appetite awareness training, two interventions that have validity for the treatment of weight loss. Cue exposure treatment is an intervention that is used to reduce sensitivity to external cues and thus reduce the physiological “cravings” when exposed to food cues. Appetite awareness training involved teaching sensitivity to hunger and coping skills to manage the urges that accompany eating when not hungry.

The results of the study demonstrated a reduction in binge eating, which can have an impact on daily caloric intake. In addition, posttreatment results indicated a 10% reduction of EAH, even after 12 months. These results suggest that a reduction in binge eating can have a long-term effect of weight loss. Moreover, the participants rated the interventions used in the study as tolerable and acceptable.

Obesity prevention programs that utilize behavior change techniques and involve family members in the intervention process are increasing. It is suggested that parents are vital to the intervention process because it is primarily the parents who shape their children’s food intake and physical activity behaviors (Golley, Hendrie, Slater, & Corsini, 2010). It is further suggested that family involvement is a critical component in the prevention of childhood obesity and increases intervention effectiveness (McLean, Griffin, Toney, & Hardeman, 2003). Research indicates an
association between overweight children and at least one overweight parent (Sobko et al., 2011).

In a review of the literature, McLean et al. (2003) identified 16 intervention studies that included a family-based component for weight loss. The behavior change techniques most commonly used in the studies were self-monitoring, reinforcement, social support, and increasing necessary skills. The results indicated positive results for children when both parents and children were targeted for intervention.

Kitzmann and Beech (2011) demonstrated further evidence of a positive association between family involvement and childhood weight loss and prevention. The purpose of their review was to examine the effectiveness of interventions that included parents and focused on changing child behaviors related to eating and exercise. They identified 31 studies demonstrating clear evidence that family-based treatments are effective for pediatric obesity.

**Review and Analysis of Literature Related to Physical Activity for Children with Autism**

Interventions that focus solely on diet and nutrition for childhood obesity have been reported in the literature (Olstad & McCargar, 2009). Specifically, researchers associated with the Nutrition Education Aimed at Toddlers (NEAT) program, Healthy Start Project, and the Special Turku Coronary Risk Factor Intervention Project (STRIP) investigated the role of nutrition education and obesity in children. The results of these studies revealed limited evidence that nutrition education alone is effective in controlling and reducing obesity in young children (Olstad & McCargar, 2009). Research on physical activity and weight reduction, however, has shown a
positive effect on weight loss (Yetter, 2009). Thus, interventions that include physical activity may be more effective for weight loss in children than interventions that focus only on eating habits.

Incorporating physical activity into the daily lives of children seems to be imperative for effective weight management. Physical activity has a significant impact on metabolism, body composition, and bone development. Children who engage in regular physical activity maintain muscle strength, endurance, and motor skills (Nowicka, 2006). Personnel at the Institute of Medicine identified childhood as a critical time to implement interventions to prevent obesity (Foley, Bryan, & McCubbin, 2008).

Increasing physical activity for children with developmental disabilities is often challenging. Several factors contribute to inactivity among youth with disabilities including less access to recreational activities in school and within the community (Rimmer & Rowland, 2008). Moreover, they often lack motivation to engage in physical activity and have poor motor functioning leading to more sedentary activities such as watching television or playing video games (Holcomb, Pufpaff, & McIntosh, 2009; Johnson, 2009).

Studies indicate that individuals with autism are less likely to participate in physical activity with their peers (Pan & Frey, 2006). Todd and Reid (2006) conducted a study that included several behavioral techniques such as verbal cuing, edible reinforcement, and self-monitoring to increase sustained physical activity among adolescents with ASD.
The participants were three individuals with ASD that ranged from 15 to 20 years old. The exercise program consisted of snowshoeing and walking/jogging. These activities were chosen due to availability and low skill level. The results indicated a sustained duration of physical activity for all participants that lasted 30 minutes twice per week for six months. This study suggests that exercise programs that offer activities that require less reliance on motor functioning may be beneficial for youth with autism. Moreover, activities that are cost effective, require little equipment and can be carried out in educational settings are important for long-term maintenance. In addition, reliance on external reinforcement (i.e., edibles) and verbal cuing were reduced as the study progressed suggesting a transition to intrinsic motivation for all participants.

Pan and Frey (2006) theorized that a lack of physical activity for individuals with autism might be due to social constraints that are associated with fewer opportunities to engage in activities with peers rather than their actual impairment. They investigated patterns of physical activity among 35 children aged 10-19. The participants were given a 21 item self-report questionnaire and were fitted with an accelerometer that collected data in 1-minute intervals.

The results demonstrated a lack of continuous physical activity for children with autism and fewer than half of the participants were moderately active on a regular basis. Participants engaged in continuous MVPA for 5 or 10 minutes during the day. This is significant because the level of engagement in physical activity falls short of the recommended 60 minutes of daily MVPA for all children (CDC 2011).
Furthermore, the limited opportunities and options for the participants to engage in physical activity were consistent with the social model hypothesized by the authors. For example, access to extracurricular activities in the community was limited or non-existent for the participants; this was in contrast to their peers without disabilities. In addition, most of the participants had a preference for activities that did not involve teams and social demands, further supporting the use of a social model framework.

Todd, Reid, and Butler-Kisber (2010) examined the effect of self-regulation on the physical activity of three adolescents with ASD aged 15-17. The authors chose cycling as the activity due to several factors including skill level, generalization to family activities, and advantage of engaging in the activity in many environments, thus promoting a more active lifestyle.

A single subject design was used to examine self-regulation skills by implementing self-monitoring, goal setting, and self-reinforcement procedures. At the start of the study, the participants were given a choice between three cycles to ride for the duration of the study. The intervention lasted 12 weeks for three days a week, and the sessions were 30 minutes in length. The participants were expected to set intensity goals, followed by distance goals. A self-monitoring and goal setting board was used to measure achievement.

The results demonstrated an increase in sustained physical activity and self-regulation skills for two of the participants. All of the participants were able to set goals and two of the participants increased their distance. The third participant completed the sessions, but did not increase distance and preferred to observe his
peers most of time rather than actively engaging in cycling. This study is important because it evaluates goal setting as a vital element of self-determination for adolescents with severe autism. This study demonstrated that adolescents with autism are able to learn goal setting, a critical skill for the development of self-determination.

Although the results of the study were positive for increasing sustained physical activity and teaching goal setting, the intervention used in this study consisted of multiple components, thus it is difficult to determine which component was most effective for the increase in skills that was demonstrated by the participants (i.e., increase in distance and goal setting). Furthermore, the authors note that an activity chosen by the individual may have been more motivating than the cycling activity that was selected, therefore supporting choice-making as a viable option for increasing and sustaining physical activity engagement in individuals with autism.

Physical fitness profiles and patterns of physical activity are important when developing interventions and curriculum that address the inactivity levels for children with autism. Borremans, Rintala, and McCubbin (2010) investigated the activity patterns of 30 adolescents with ASD between the ages of 15 and 21 years old with a comparison group of 30 gender-matched adolescents without disabilities. The participants were administered the European test of physical fitness (Eurofit) 1993 and a physical activity questionnaire to assess their fitness profiles.

The results demonstrated significant differences in physical fitness between the participants with autism and the control group. The participants with autism had lower levels of physical fitness in several areas including coordination, muscular strength and cardio-respiratory endurance. This study supports the need for physical
activity that is more conducive to children with autism. Based on the results of this study, the authors stated that children with autism might be more motivated to engage in physical activity if they were actively involved in the process of choosing age appropriate activities that were enjoyable and noncompetitive.

**Review and Analysis of Literature Related to School-Based Obesity and Physical Activity Programs for Children With and Without Disabilities**

School-based intervention programs are critical for the prevention of childhood obesity (CDC, 2008). According to the literature, school-based programs that focus on healthy eating and physical activity for the prevention of childhood obesity have been effective (Wang et al., 2008). In fact, the Child Nutrition and WIC Reauthorization Act of 2004, mandates that schools establish wellness programs when participating in federal nutrition programs; the mandate specifically includes goals for physical activity and nutrition education (Cook-Cottone, Casey, Feeley, & Baran, 2009). According to the research in this area, one of the advantages of school-based programs is that children spend most of their day at school and for children at risk, approximately 51% of their daily nutritional intake comes from school lunch and breakfast programs (Hollar et al., 2010). Furthermore, schools are able to provide intervention to a large population, making it cost-effective (Pyle et al., 2006). According to Pyle et al., several components contribute to an effective school-based program. Promoting a healthy weight, implementing behavioral strategies that focus on teaching replacement behaviors and new habits are some of the components that are suggested. In addition, nutrition education and physical activity were cited as critical to a successful school-based program.
Cook-Cottone et al. (2009) conducted a meta-analysis to determine previously examined moderating factors in school-based obesity studies such as sex, age, intervention features, family involvement, delivery features and physical activity. The authors spanned 10 years of obesity prevention studies ranging from 1997 to 2008. The findings indicated long-term interventions lasting approximately 32 weeks that involved adolescents and studies that included family involvement had the best outcomes for obesity prevention. In addition, studies that included increased physical activity as a sole component of intervention demonstrated overall positive effects.

A study by Tucker et al., 2011) expanded upon the Let’s Go 5-2-1-0 Program conducted in Maine. The original program was developed for a pediatric primary care facility for children at risk for obesity and used motivational interviewing techniques as the intervention. The purpose of the program was to increase healthy behaviors. Tucker et al. expanded the original study to a school setting and included a 1:1 coaching component not previously used in the original study and specifically measured outcomes related to physical activity (i.e., BMI percentile and number of steps). The participants were two groups of children (i.e., control and intervention) totaling 99 children in grades 4 or 5 at two elementary schools. The researchers measured BMI percentile, healthy habits using a survey to assess health behaviors, and physical activity using a StepWatch Activity Monitor (SAM) to assess walking activity.

The findings demonstrated a decrease in BMI and a significant increase in physical activity among children at both schools; however, the results were more significant at one of the elementary schools as compared with the other. Some of the
reasons cited for the difference were the frequency of sessions and the difference in starting points for the two schools. Although the overall results of the study were positive, it is important to note that the intervention method used for this study (i.e., motivational interviewing) is subject to varying styles by the coaches and thus, might have had an impact on the results. Overall, the Let’s Go 5-2-1-0 Program was successful in a school setting. Thus, the program supports the use of a school-based program that focuses on physical activity as a key component of a healthy lifestyle.

Hollar et al. (2010) examined academic performance and healthy weight in a school-based program entitled Healthier Options for Public Schoolchildren (HOPS). The study involved 1197 elementary students in the two-year study. The intervention consisted of a nutrition education component that included nutrition activities aimed at teaching about healthy lifestyles and the benefits of physical activity. In addition, a physical activity component was included in the intervention. The physical activity component consisted of arranging for increased opportunities to engage in physical activity during the school day and structured activities such as 10-15 minute desk-side activities that corresponded to academic lessons and recess activities. Furthermore, meals consisting of fruits, vegetables, and whole grains were provided to the students in order to strengthen and validate the information taught in the education component of the program.

The results indicated a reduction in weight for the children at the intervention schools and an increase in math and reading scores. This pilot study demonstrates a positive relationship between a healthy lifestyle (i.e., proper nutrition and physical activity) and academic performance and weight management for at-risk elementary
students. The strengths of this study were a large sample size and the diversity of the sample in addition to the duration (i.e., two years), however, no measures were taken to assess duration of physical activity, and thus making it difficult to replicate the study or determine what duration of physical activity is most effective. However, this study adds to the literature on the effectiveness of school-based obesity programs.

Although the majority of school-based obesity programs implement combination intervention packages that typically include nutritional education and physical activity, Shaya, Flores, Gbarayor, and Wang (2008), conducted a review of literature and concluded that studies employing physical activity as the exclusive intervention reported statistically positive results. Moreover, the authors reported a high efficacy rate of programs that use physical activity either alone or in combination with other interventions. In addition, long-term interventions were cited as being the most effective.

Carrel, Clark, Peterson, Nemeth, Sullivan, & Allen, (2005) conducted a long-term study that used physical activity as the primary intervention. Fifty children with a BMI above the 95th percentile (i.e., obesity range for age) participated in a school fitness program designed to improve cardiovascular fitness, body composition, and insulin sensitivity. The authors chose to measure insulin sensitivity due to the positive effect that physical activity has on insulin sensitivity independent of weight and body composition (Bajpeyi et al., 2009). Therefore, the authors proposed, by increasing physical activity, insulin sensitivity would improve and as a result, BMI would be reduced.
The participants were randomized into a treatment group and a control group for the entire school year (i.e., nine months). The intervention group was placed in a small gym class (i.e., 12-14 students) that focused on non-competitive, lifestyle activities such as walking and cycling. The control group was placed in a typical gym class with 35-40 other students with a standard curriculum. The intervention gym class differed from the typical class in several ways such as no change of clothes, small class size, and more adherence to the students skill levels. Due to the changes in class size and curriculum, the intervention group engaged in movement for 42 minutes of the standard 45-minute gym class. In contrast, the control group assigned to a standard gym class with no modifications engaged in movement for 25 minutes of the 45-minute gym class. There were no differences between groups in fitness levels or BMI at baseline and the frequency of gym classes was five times every two weeks.

The results showed significant improvements in all measures for the intervention group compared to the control group. The results of this study are important because they demonstrate making small changes such as increasing physical activity in a school setting can be an effective treatment for obesity prevention and weight loss for children.

As with all treatments that include multiple components (i.e., curriculum change and class size change), it is difficult to identify which component most effected the improvements identified in this study. For this reason, further research is necessary to determine which aspects of the treatment were more effective so that the best approach can be taken when developing obesity programs for children. Overall,
this study validates physical activity as a vital component in reducing body composition and improving cardiovascular fitness for children. In addition, this study supports the school environment as a setting in which to focus weight loss programs for children.

Wilson et al. (2005) examined the effects of choice and student involvement on physical activity in an after-school program. Twenty-eight students received a student-centered intervention that occurred after school for two hours a day, three days a week and 20 students participated in standard health education class during school hours for the equivalent amount of time.

The intervention consisted of three main components meant to increase physical activity levels and psychosocial factors particular to physical activity such as motivation. The intervention components consisted of homework-snack for 30 minutes, a choice of activities that ranged from moderate to vigorous that were selected on a majority vote by the students, and a videotaped motivational session that taught coping strategies.

The results indicated an increase in physical activity and psychosocial factors for the intervention group. This study supports the use of choice as an intervention for increasing physical activity among children. In addition, participants showed increases in motivation and self-concept for physical activity, which may promote participation in physical activity that is intrinsically motivated and therefore, may lead to long-term behavior and health changes for children and adolescents at risk for obesity.
Choice making is an intervention that has been successful for individuals with developmental disabilities, including ASD (Watanabe & Sturmey, 2003). Research demonstrates reduction in problem behaviors for students with ASD who are provided with opportunities to make choices throughout the school day. In addition, an increase in adaptive behaviors has been observed (Romaniuk & Miltenberger, 2001). Moreover, it has been theorized that having the opportunity to make a choice has reinforcing value independent of the preferred stimulus (Kern et al., 2001).

Kern et al. (2001) investigated the possibility of choice making having reinforcing value in and of itself, unrelated to the chosen stimulus. The participants were three individuals between the ages of 7 and 15 with various disabilities and problem behaviors that included tantrums, aggression, throwing objects, and noncompliance with task demands. A single-subject reversal design was used to assess engagement and problem behaviors; the independent variable for all participants was choice and sequence of task completion. The study consisted of a choice and a no choice condition in which the participants were allowed to choose the order in which they completed the tasks in the choice condition and were given the order by the therapist in the no choice condition. In addition, during the choice condition, participants were able to change the tasks.

The results indicated that task engagement increased and problem behaviors decreased during the choice condition. The results support choice making as an effective intervention for children with problem behaviors and children who display...
noncompliance with task demands. Furthermore, it demonstrates choice making as a viable intervention because it is practical and easy to implement in any setting. Although this study included a small sample, it is significant because it lends support to the hypothesis that not only is choice making an effective intervention, but also it may have reinforcing value independent of stimulus. Therefore, providing choices may promote self-determination for children with autism and increase their range of participation in daily activities.

Peck, Wacker, and Berg (1996) assessed choice-making as part of a treatment package for aberrant behaviors. The participants were five children between the ages of 16 months and four years old diagnosed with various developmental delays. All the children displayed either life threatening behaviors or severe behaviors such as head hitting, tantrums, noncompliance, aggression, food refusal, and pulling on tubes in the hospital.

The study used a multi-element single subject design that included manipulation of antecedent and consequence variables to determine if duration and quality of reinforcement had a positive effect on response allocation (i.e., manding vs. inappropriate behaviors). In addition, a choice-making strategy was included to assess choice-making as an effective intervention component to reduce inappropriate behaviors. Each child was prompted before each session to choose the reinforcement with the longer duration and higher quality as opposed to a lower duration and quality of reinforcement and then prior to each trial, the child was asked to make a choice between both stimuli.
The results of this study demonstrated that choice-making as a component in an intervention plan that includes functional communication training (FCT) can increase appropriate responses and reduce aberrant behaviors for children with severe and life threatening behaviors. In addition, the results of this study support the use of high quality reinforcement as a way to minimize extinction and punishment procedures when implementing FCT.

This study is important because it demonstrates choice-making as an effective motivator for increasing appropriate behaviors and may support the hypothesis of choice-making having inherent reinforcing properties (Kern et al., 2001). Thus, choice-making as an intervention may be used to increase other socially significant behaviors such as health related and daily living behaviors. A couple of limitations include a small sample size and no separation of duration from quality of reinforcement; that is, there is no way of determining if duration had more of an effect on response allocation than quality of reinforcement.

In a study by Fisher, Thompson, and Piazza (1997) choice and differential consequences were evaluated using a single subject design. The participants were three children with developmental disabilities. Two experiments involving choice-making were conducted using a concurrent-operant arrangement. Prior to the experiments, the participants were given a forced-choice stimulus assessment to ascertain a hierarchy of preferred items. Both experiments consisted of a choice condition and a no-choice condition. Three microswitches were used to indicate the choices available to the participants; key one represented choice, key two was labeled as no-choice, and key three produced no consequences (i.e., control). During
experiment one, the participants were able to make a choice between two highly
preferred items in the choice condition. In the no-choice condition, the participants
were given a highly preferred item by the therapist that was previously chosen by the
child in the choice condition. That is, the reinforcers in experiment one were highly
preferred items in both conditions. In experiment two, the participants were given a
choice between two lower preference items in the choice condition, and alternating
low and high preference items for the no-choice condition.

The results for experiment one indicated a clear preference for choice. The
participants chose to make a choice even though they were given a highly preferred
item in the no-choice condition. Results for experiment two indicated a preference for
choice when the reinforcers were of the same value. However, the participants chose
the no-choice key when the reinforcers offered were of higher value then in the
choice condition. Overall, the results of the study indicate a preference for making a
choice when given the opportunity to do so.

Although the participants chose the no-choice key when reinforcers were of
greater value, it is important to note that they still made a choice to gain access to a
higher preferred item. The ability to make choices or to relinquish choices is a skill
that is highly beneficial for individuals with developmental disabilities, however, is
often absent or not taught. Thus, incorporating choice in a variety of environments for
children with developmental disabilities may promote appropriate behaviors and
increase skills.

In addition to using choice as an intervention for disruptive behaviors, there
is research to support choice-making as a viable intervention to increase task
engagement in the educational setting. Moes (1998) examined choice-making as an antecedent intervention to increase homework for students with autism who were participating in the general education curriculum. The participants were four children with autism between the ages of five and eight years old. All participants were having difficulty with academic tasks for reasons related to challenging behaviors and cognitive difficulties.

The study consisted of a choice condition and a no-choice condition; both conditions were counterbalanced in a multi-element design. During the choice condition, the participants were able to choose the materials, such as types of pens, the order of activities and the order of items within the activity. During the no-choice condition, the therapist made the choices.

The results demonstrated an increase in on-task behavior and a reduction in problem behaviors for all participants. The results provide evidence for choice-making as an effective antecedent intervention to increase academic performance for children with autism.

Morgan (2006) examined the effects of choice-making and preference on behavior and task engagement in educational settings. Fifteen studies were included in the review. Selection criteria included children who were school age (i.e., kindergarten-grade 12). In addition, the participants had to have been observed engaging in academic activities, the dependent measure had to assess academic or behavioral performance, and the study had to examine choice-making or preference directly.
The results indicated that both choice-making and preference increased task engagement and decreased problem behaviors, making both interventions viable in educational settings. Furthermore, preference was indicated to have a positive effect on behavior regardless of whether the participants were able to make a choice. Thus, indicating the use of preference assessments in conjunction with choice-making may be a more viable option for improving behavior and task engagement for students with disabilities.

Preference assessments may serve several functions within a treatment program. However, the primary function of a preference assessment is to identify preferred stimuli that can then be used to teach new skills and behaviors (Logan & Gast, 2001).

Piazza, Fisher, Hagopian, Bownam and, Toole (1996) evaluated the effectiveness of items ranked as high, middle, and low when given a forced-choice preference assessment. The participants were four male children with developmental disabilities who were receiving treatment for severe destructive behavior. Prior to the choice assessment, an interview was conducted with the participants’ caregivers to determine potential reinforcers.

The procedures used for the forced-choice preference assessment were identical to the procedures used by Fisher et al. (1992). That is, each stimulus was paired with every other stimulus to produce a ranking of items as high, middle, and low. After the forced-choice assessment, the items ranked as high, middle, and low were evaluated for reinforcer effectiveness through a concurrent operants design.
The results demonstrated relative reinforcer effectiveness. All items ranked as highly preferred functioned as reinforcers for all participants. The items ranked in the middle, functioned as reinforcers when compared with low preference items, and low ranking stimuli did not function as reinforcers for any of the participants when compared to high or middle stimuli. The results support the efficacy of a forced-choice/paired stimulus preference assessment to determine effective reinforcers for individuals with developmental disabilities. The results are significant because there is evidence in the literature that conducting preference assessments to identify items with reinforcing value has increased skills and improved problem behaviors for individuals with developmental disabilities, including autism (Logan & Gast, 2001).

Lanner, Nichols, Field, Hanson, and Zane (2010) examined the utility of two preference assessments commonly used for children with developmental disabilities to select potential reinforcers. The authors chose the Multiple Stimulus Without Replacement (MSWO) (DeLeon & Iwata, 1996) and the forced choice/paired stimulus (Fisher et al., 1992) assessments. The design was a single subject across participants. The participants were four children ranging in ages from 14-20 years old with developmental disabilities, and the study was conducted in a school located in a residential facility where the participants lived.

The study was conducted in two phases. The purpose of the first phase was to evaluate two preference assessments to determine the ranking of reinforcers and the time it took to administer each assessment. The purpose of phase II was to determine if the resulting list of potential reinforcers actually functioned as reinforcers during a sorting task. The list of potential reinforcers was derived from an interview with the
staff at the facility. Five potential reinforcers were chosen; the list was comprised of items thought to be preferred by the participants.

The results indicated a shorter duration time for administration of the forced choice/paired stimulus assessment. In addition, the rankings of the items chosen by the children were the same for both assessments. The results for phase II indicated that all the high-ranking stimuli increased performance of sorting for all of the participants. The findings from this study are important because they demonstrate the strength of using preference assessments to increase skills for individuals that require external motivation, such as children with autism.

Limitations of the study, however, are worth noting. The researchers did not take into consideration meal and leisure times of the participants. These factors may have influenced the reinforcing value of the items (i.e., edibles are not as motivating after mealtimes and leisure items are not as motivating when given free access). In addition, a more difficult task than sorting may have had a reinforcing effect of the items in phase II. Overall, the study supports the use of preference assessments in the classroom environment to increase task engagement and reduce problem behaviors for children with autism and adds to the literature on preference assessments.

Cote, Thompson, Hanley, and McKerchar (2007) used a paired stimulus preference assessment to evaluate the agreement between an indirect and direct assessment. The participants were nine children between the ages of 18 and 29 months old in an early childhood classroom. The indirect assessment was administered to the teachers of the children. All teachers were asked to generate a list of potential reinforcers based on their knowledge and experience with the children.
Ten items were generated through the indirect assessment with the teachers. Next, a paired stimulus preference assessment was conducted with the children and all stimuli were ranked according to preference. Subsequent to the paired stimulus assessment, a reinforcer assessment was conducted to compare the highly preferred ranked items identified by the teachers (i.e., indirect assessment) to the high-ranking items identified by the paired stimulus assessment (i.e., direct assessment).

The results showed poor agreement between the indirect and direct assessments. The stimuli ranked as highly preferred in the paired stimulus assessment served as more potent reinforcers than the stimuli identified as highly preferred in the teacher interview (i.e., indirect assessment). The results are consistent with previous research that indicates positive findings for the use of a forced choice/paired stimulus preference assessment. Moreover, the findings suggest that a direct preference assessment is more effective than caregiver or teacher reports. However, this study also suggests that an interview with caregivers and teachers to generate a list of potential reinforcing items is beneficial prior to conducting a direct preference assessment.

**Summary of Reviewed Literature**

Quality of life (QOL) is of major importance to special educators. It is a construct that contains several key factors such as psychological well-being, social interactions, and physical ability (Pinhas-Hamiel et al., 2006). Applied research in the field of QOL should include evidence-based interventions that are structured to achieve best outcomes for individuals with disabilities, particularly for children with autism (Brown & Brown, 2005).
Research in the area of QOL as it pertains to children with autism is minimal (Lee et al., 2008). However, the existing literature indicates diminished QOL for families of children with autism when compared with families of typical children (Lee et al., 2008).

A component of QOL includes physical well-being and ability to engage in physical activity. According to the CDC (2011), obesity is higher for children with disabilities. Several factors contribute to the obesity problem for children with autism including poor motor functioning, sedentary lifestyle, lack of motivation, and lack of choice making opportunities. The literature indicates children with autism do not engage in the recommended 60 minutes of MVP even though physical activity has been cited as critical for weight management, weight loss, and overall good health (Todd et al., 2010).

Current research suggests that family involvement is crucial to the effectiveness of the intervention process for childhood obesity (McLean et al., 2003). Thus, several current studies have included at least one parent or family member in addition to the obese child as participants (Boutell et al., 2011; Kitzmann & Beech, 2011; McLean et al., 2003; Sobko et al., 2011). The evidence from these studies supports family education and behavior change techniques such as self-monitoring, reinforcement, and social support as effective components in a treatment plan for the prevention and management of childhood obesity.

Physical activity is a critical component in the reduction of weight for children who are overweight or obese. Research indicates that diet and nutrition alone is not effective for weight management, and that physical activity should be incorporated
into weight loss programs for children (Olstad & McCargar, 2009). However, due to some challenging factors such as lack of motivation and poor motor functioning, it is often difficult to engage children with developmental disabilities in physical activity (Holcomb et al., 2009). In addition, Pan and Frey (2006) found evidence to support lack of extracurricular activities in the community and a preference for activities that do not have social demand factors that contribute to less physical activity for children with autism.

Although children with autism engage in less physical activity, a couple studies provided evidence that verbal cuing, reinforcement, and self-monitoring are effective interventions for increasing physical activity for children with autism (Todd & Reid, 2006; Todd et al., 2010).

School-based intervention programs that focus on healthy eating and physical activity have been effective for the prevention of childhood obesity (CDC, 2008). The literature indicates school-wide programs that have used motivational interviewing techniques, 1:1 coaching, nutrition education and activities, and physical activity components have been successful in increasing weight loss for children (Hollar et al., 2010; Tucker et al., 2011). Moreover, research supports physical activity as a primary intervention and choice as an effective component in a weight loss treatment program (Carrel et al., 2005; Wilson et al., 2005).

Providing choices and the use of preference assessments have been successful in reducing problem behaviors and increasing task engagement for children with developmental disabilities (Fisher et al., 1997; Kern et al., 2001; Moes, 1998; Peck et al., 1996; Wantanabe & Sturmey, 2003). Studies have shown evidence that providing
the opportunity to make a choice has reinforcing properties in and of itself, unrelated to the chosen stimulus (Kern et al., 2001). Moreover, preference has been shown to have positive effects on behavior, independent of the opportunity to make a choice (Morgan, 2006).

Lanner et al. (2010) demonstrated the beneficial effects of using a forced-choice/paired stimulus preference assessment to increase the task performance of children with developmental disabilities. Moreover, paired stimulus assessments were determined to be more effective than an indirect assessment such as a teacher interview. Cote et al. (2007) and Piazza et al. (1996) provided evidence for relative reinforcer effectiveness for high, middle and low ranked stimuli identified through a paired stimulus assessment.

Research supports the provision of choices and using a forced choice/paired stimulus preference assessment as a way to increase new skills for children with developmental disabilities. There appears to be a paucity of research related to the use of forced-choice preference assessments to identify physical activity preferences among children with autism. Thus, this study used a forced-choice video preference assessment to investigate the physical activity preferences of children with autism. In addition, the preferences of physical activities among children with autism related to environmental and social contexts were explored. Finally, parental perceptions related to his or her child’s preferences were investigated.
CHAPTER 3

METHODOLOGY

Limited physical activity which is linked to obesity and overweight has become a major health concern in the United States (CDC, 2011). According to the CDC, 20% of children with disabilities are overweight or obese. The CDC further cites physical activity as a major component in the solution to the obesity problem.

The benefits of engaging in physical activity for individuals with autism are well documented in the literature (Pan & Frey, 2006; Pitetti, et al., 2007; Rosenthal-Malek, 1997; Rosser-Sandt & Frey, 2006; Todd et al., 2010; Todd & Reid, 2006). Some of the benefits of physical activity cited for youth with autism were proper weight management, positive self-esteem, happiness, improved social outcomes, a decrease in problem behaviors, and a reduction in stereotypic behaviors (Pan & Frey, 2006; Rosser-Sandt & Frey, 2005).

It has been reported in the literature that children with autism often do not participate in the recommended 60 minutes of MVP per day. Poor motor functioning, lack of motivation, and the absence of opportunities to make choices in their daily lives have been cited as barriers to physical activity (Holcomb et al., 2009).

There is evidence that providing choices to individuals with autism is successful for increasing skills, promoting independence, and improving socially significant behaviors (Watanabe & Sturmey, 2003). Choice-making and preference as interventions have been used successfully to increase desirable behaviors and task performance for individuals with developmental disabilities, including children with autism (Morgan, 2006). Moreover, research reveals strong evidence in support of
using reinforcers during intervention programs to teach new skills and desired behaviors (Cooper et al., 2007). A forced-choice preference assessment (Fisher et al., 1992) is a well-established procedure for identifying appropriate reinforcers. No studies were found that have used this type of preference assessment to determine preferred physical activities for adolescents with autism.

This study was designed to investigate self-perceptions and parental perceptions related to physical activity preferences among children with autism. The study involved the (a) development and administration of a forced-choice preference assessment using videos for the purpose of identifying physical activity preferences, as well as social and environmental preferences and (b) examination of parent perceptions of their children’s preferences of physical activities.

Presented in this chapter is the methodology that was used in the study. Included are the descriptions of the participants, setting, equipment and materials, design and procedures, interscorer reliability, and treatment of data. The study was conducted in three phases: (a) study preparation (b) data collection, and (c) data analysis. Phase One included (a) development of video-based preference assessment, (b) obtainment of research approval, (c) provision of Assessor and Research Assistant training, and (d) participant selection and consent. Phase Two involved (a) administration of child and parent preference assessments, (b) observation of assessment sessions to determine fidelity of assessment implementation, (c) observation of assessment sessions to determine interscorer reliability related to preference assessments, and (d) administration of social validity questionnaire. Phase Three consisted of data analysis related to each research question.
Research Questions

The following research questions were answered:

1. What are the physical activity preferences of children with autism when given a forced-choice preference assessment using videos?

2. What are the social and environmental preferences for children with autism related to physical activity?

3. When given the same preference assessment as their children and instructed to choose their child’s preferences, is there a difference in reported preferences between parents and their children?

Participants

Children with Autism and Their Parents

There were 30 children with a medical or educational diagnosis of autism who served as participants in this study and one parent of each child. A detailed summary of the child participants is provided (see Table 1). The ages of the participants ranged between 5 and 14 years. Each of the 30 participants was receiving individual treatment (i.e., either clinic-based or home-based) from a local community-based treatment center that provides services to children with autism. The participants were 24 males and 6 females. Twenty-one children were Caucasian, four children were Hispanic, two were African American, and one child was Asian. In addition to the 30 child participants, a total of 30 parent participants (i.e., one per child) were included in this study.
Table 1

*Participant Demographic Information*

<table>
<thead>
<tr>
<th>Demographics</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>26</td>
</tr>
<tr>
<td>Female</td>
<td>4</td>
</tr>
<tr>
<td><strong>Ethnicity</strong></td>
<td></td>
</tr>
<tr>
<td>Caucasian</td>
<td>21</td>
</tr>
<tr>
<td>Hispanic</td>
<td>6</td>
</tr>
<tr>
<td>African American</td>
<td>2</td>
</tr>
<tr>
<td>Asian</td>
<td>1</td>
</tr>
<tr>
<td><strong>Age Ranges</strong></td>
<td></td>
</tr>
<tr>
<td>5.0-7.11</td>
<td>14</td>
</tr>
<tr>
<td>8.4-9.10</td>
<td>10</td>
</tr>
<tr>
<td>11.7-14.7</td>
<td>6</td>
</tr>
<tr>
<td><strong>Grade Ranges</strong></td>
<td></td>
</tr>
<tr>
<td>PK-2</td>
<td>15</td>
</tr>
<tr>
<td>3-5</td>
<td>10</td>
</tr>
<tr>
<td>6-9</td>
<td>5</td>
</tr>
</tbody>
</table>

Assessors / Data Collectors

Two female behavioral consultants at the participating treatment center participated in the assessment of students with autism and their respective parents. One consultant had a bachelor’s degree in education; over 10 years experience teaching children with autism, and experience assisting with research. The other consultant was a doctoral candidate in a special education program and a licensed behavior analyst. She had 10 years experience teaching children with autism in her professional role and experience assisting with research. Both consultants had experience administering forced-choice preference assessments to children with autism.
Research Assistants

There were two research assistants associated with this study. The research assistants were responsible for determining reliability related to fidelity of assessment implementation. They were also responsible for determining reliability related to the scoring of the preference assessments used in the study. Both research assistants were female. One assistant had a master’s degree in education and six years experience teaching children with autism. In addition, she had experience assisting with research. The other assistant was a doctoral candidate in a special education program and a licensed behavior analyst. She had 10 years experience teaching children with autism and had experience conducting research. Both research assistants had experience administering forced-choice preference assessments to children with autism in their professional roles.

Table 2

Research Administrator Demographic Information

<table>
<thead>
<tr>
<th>Administrators</th>
<th>Age</th>
<th>Ethnicity</th>
<th>Experience</th>
<th>Education</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assessor</td>
<td>31</td>
<td>Caucasian</td>
<td>15 years</td>
<td>B.A.</td>
</tr>
<tr>
<td>Assessor</td>
<td>48</td>
<td>Caucasian</td>
<td>11 years</td>
<td>M.Ed, BCBA</td>
</tr>
<tr>
<td>Research Assistant</td>
<td>28</td>
<td>Caucasian</td>
<td>7 years</td>
<td>M.Ed</td>
</tr>
<tr>
<td>Research Assistant</td>
<td>33</td>
<td>Caucasian</td>
<td>15 years</td>
<td>ME.d, BCBA</td>
</tr>
</tbody>
</table>
Setting

The study took place at an autism treatment center located in a metropolitan city in the southwestern United States. The center personnel provided services to children with autism and other behavioral disorders. The treatment center employed approximately 40 interventionists who provided services to over 130 clients of varying ages; therapy with clients was conducted either in-clinic or through home-based services. The center was 3600 square feet and included four treatment rooms, two multi-purpose rooms used for group sessions such as social skills training and group therapy, and an assessment room. In addition, the center had a large multi-purpose area used for gross motor activities.

Administration of the preference assessments took place in two of the treatment rooms typically used for therapy. The therapy rooms were 14 X 18 feet and contained a table, two chairs, one storage cabinet, video taping equipment, and various items used for reinforcement such as toys and games. One treatment room was used to administer the preference assessment to the child participant. Both the child participant and an assessor sat at the table in the room. Concurrent to this assessment session, a second treatment room was used to administer the preference assessment to one of the parents of the child participant. Similarly, the parent participant and an assessor sat at the table in the treatment room for the purpose of administering and taking the preference assessment.
Equipment and Materials

Equipment

Two laptop computers were used to implement the preference assessment. One laptop was a Dell Inspiron with a 13-inch screen. The second computer was a MAC Air with an 11-inch screen. A JVC Everio video camera was used to develop the preference assessment.

Materials

*The Physical Activity Choice Assessment (PACA) Protocol.* The PACA protocol (see Appendix A) includes general instructions and rules related to administration of the Physical Activity Choice Assessment (PACA). The protocol also includes a script for the Assessor to follow as she implements the assessment. Finally, the protocol includes a data collection sheet that was used to record answers given by the participants during administration of the assessment.

*The Physical Activity Choice Assessment Procedural Fidelity Checklist.* The Physical Activity Choice Assessment Procedural Fidelity Checklist includes a list of 13 steps that the assessors are to follow when administering the PACA. The research assistants used this form as they viewed the assessment sessions. Checks were entered in the blank next to each step as the assessor implements the step (see Appendix B).

*Reinforcement Assessment.* The reinforcement assessment consists of exposing the child participant to a variety of tangible items. The items were displayed on a table. After the participant was seated at the table, the assessor presented the items to the participant. The assessor then recorded the items selected by the participant on a data sheet; the items were stored in a container next to the table for
use during reinforcement breaks. This assessment was conducted with each child participant prior to administration of the PACA to ascertain at least three reinforcing items to use during the assessment to prevent inappropriate behaviors (see Appendix C).

**Physical activity paired stimulus video.** The physical activity paired stimulus video consists of 66 sets of paired stimuli (i.e., 2 video clips presented on each slide) in which physical activities are being demonstrated (see Appendix D). These video clips were presented during the PACA assessment sessions with student participants and during the PACA assessment sessions with parent participants.

**Picture cards.** Picture cards that measured 3” X 5” were used to probe for identification of environmental and social choices prior to administration of the assessment. The picture cards were obtained through Photos.com Each picture card represented either a social or environmental choice. The social choices included four pictures: a boy, girl, friends, and family. The environmental choices consist of three pictures and included pictures of a school, home and a park. The picture cards were presented to the child participants prior to the assessment and were inserted into the assessment after each video pair presentation (see Appendix E).

**Design and Procedures**

The study was conducted in three phases: (a) study preparation (b) data collection, and (c) data analysis related to each research question. The procedures within each phase have been designed to ensure reliable and valid outcomes.
Phase One: Study Preparation

*Development of video-based preference assessment.* The investigator developed the Physical Activity Choice Assessment (PACA) based on the forced choice/paired stimulus assessment described by Fisher et al. (1992). When a forced-choice assessment is conducted, the stimulus is presented in pairs with each stimulus randomly paired with another until a ranking of high to low is established. The assessment was developed using videos to represent the paired stimuli of physical activities (see Appendix D).

The PACA consists of two components. The first component measures the choices for physical activities (see Appendix D). The second component measures choices for environmental and social preferences (see Appendix E). Videos were used for the first component and pictures for the second component. Each activity was recorded using a JVC Everio video camera. The videos are approximately eight seconds in length. Video filming took place in several locations depending on the context of the activity and with a variety of individuals. For example, several videos were filmed at local parks; other videos were filmed indoors at the research site.

Prior to inserting the videos into the Powerpoint-presentation software, the videos were edited to fit the eight-second time frame. Next, the videos were downloaded into a folder on a computer. Then the videos were randomly paired with each other. This was done by writing each activity on an index card and randomly applying a number to each index card. The activities were then paired so that each activity was paired with every other activity (e.g., 1 & 2, 2 & 3, 3 & 4, etc.). The videos were then inserted into presentation software (i.e., PowerPoint) in the
corresponding pairs. Each Powerpoint slide contains two stimuli side by side with the name of the corresponding activity on top of the video. There is no heading on the slides. The slides have a white background; the lettering is in black with a 36-point font. Each video is played separately by clicking on the video or play button; the video stops automatically when finished (i.e., 8 seconds).

The second component includes pictures to represent environmental and social preferences. Pictures were purchased from Photos.com prior to inserting the pictures into the presentation software, they were downloaded into a file on the computer. The pictures were then inserted into the Powerpoint software on a slide immediately following each paired stimuli. After each slide of paired stimuli, a slide was inserted with environmental and social pictures. The pictures contain headings to identify each picture (i.e., home, school, community setting, family, peer, peers). In addition, the pictures were printed and laminated to use during the choice assessment at the initial intake appointment.

**Obtainment of research approval.** Research approval was obtained prior to initiation of the study. The Research Protocol Proposal Form was submitted to the Institutional Review Board at the University of Nevada, Las Vegas. Upon approval of the proposed research, participants were contacted and informed consent and parent permission was obtained.

**Provision of assessor and research assistant training session.** Three consultants employed by the treatment center attended training sessions for administration of the assessment. Training was conducted in two parts. The first part consisted of training the research assistants to administer the forced-choice
assessment. The second part consisted of training the research assistants responsible for procedural fidelity and interscorer reliability to rate the implementation of the assessment using the procedural checklist (see Appendix B). The training sessions took place at the research site. Training sessions were scheduled for five days and lasted for one hour each day. The investigator conducted all training.

Part one of the training was scheduled for three days and consisted of teaching the assessor and the research assistants responsible for interrater reliability how to implement the assessment. The first day included teaching the assistants how to activate the videos. In addition, the assessment protocol was reviewed. The investigator reviewed the protocol and answered questions. Next, the assistants began the assessment on the computer and activated the videos on the slides. Day two consisted of training related to the administration of the forced-choice assessment. The assistants administered the assessment to the investigator following the assessment protocol. The investigator provided constructive feedback. This procedure was repeated until all the assistants implemented five consecutive slides correctly.

Day three consisted of practicing administration of the assessment using the same format that was used in day two. The investigator scored the assistants using the procedural checklist. The training session ended when the assistants demonstrated 100% accuracy on the procedural checklist.

Part two of the training was scheduled for two days and involved the research assistants responsible for interrater reliability and the assessor to act as a mock child participant. The procedural checklist was reviewed and discussed. The investigator answered questions from the research assistants to ensure clarity. One assistant
practiced scoring the assessment using the procedural checklist while the other assistant administered the assessment to the mock child. The investigator scored the checklist simultaneously with the research assistant to check for continuity of scoring. Errors in scoring were discussed and corrected. The two research assistants then switched roles to ensure that both had an opportunity to practice using the procedural checklist. Again, any scoring errors were discussed and corrected. Both assistants had to score 100% on the procedural checklist to complete training.

**Participant selection.** The participants were selected from a sample of convenience (i.e., students with autism receiving services at a local autism center). Specifically, the participants were selected from a pool of 130 clients. These clients were identified as having autism and ranged in age from 5 to 15. Specific selection criteria was applied to the client pool to identify eligible participants to take part in this study. Specifically, the following participant selection criteria was used to obtain child participants: (a) must have a medical or educational diagnosis of autism, (b) must be between the ages of 5 and 15 years old, and (c) must have the ability to make a choice between two items.

Once potential participants were identified, parents were contacted by phone and invited to participate in the study (see Appendix F for phone script). The purpose of the research was explained to them. If they verbally agreed to participate in the study, they were given an intake appointment at the treatment center with their child. During this initial appointment, the parents completed a research study intake form (see Appendix G). In addition, the parents signed an informed consent form related to their participation in the study (see Appendix H). Due to communicative and
cognitive deficits associated with autism, student assent forms were not provided. Instead, the parents signed a parent permission form for their children’s participation in the study (see Appendix I).

After the parent signed the intake, consent, and parent permission forms, the potential child participant was screened to ensure that he or she was capable of making a choice between two items. The child was seated at a table in a treatment room at the clinic with the assessor and the investigator; the parent was also in the room. The child was presented with two stimuli and instructed by the assessor to “pick one.” The investigator observed and collected data; three trials were conducted with the child. If the child was able to make a choice between two stimuli, he or she was eligible to participate in the study.

The parent was then given an appointment for the administration of the assessment with their child. Appointments were scheduled at the parent’s convenience. This intake appointment was conducted in a private room.

**Phase Two: Data Collection**

The assessor and research assistants have extensive experience teaching and conducting forced-choice preference assessments to children with autism in their professional roles. The trial-by-trial data sheet in the protocol was used to collect data during the assessment session (see Appendix A). Each session lasted approximately 30 minutes.
Administration of Child and Parent Preference Assessment

The administration of the preference assessments took place at the treatment center. The assessments were administered in a treatment room typically used for therapy. The preference assessment was administered to the child participants seated at a table with the assessor. At the same time, the assessment was administered to the parent of the child participant in another therapy room with the investigator. The therapy rooms were approximately 14 X 18 ft. and contained a table, two chairs, a storage cabinet, and various items used for reinforcement.

Two laptop computers were used to implement the preference assessments. In addition, a protocol developed for general instructions and data collection was used to record answers given by the participants during the administration of the assessment. Various tangible items were available for reinforcement for the child participants. Prior to administration, the assessors greeted the child and parent participants in the outer office of the treatment center. Next, they were taken separately to a therapy room set up for the administration of the assessment.

Child Preference Assessment Session

The participant was taken to a therapy room and seated at a table. The assessor explained to the child what was going to occur during the assessment session. The assessor followed the protocol script. However, clarification was given to the child if needed.

Prior to the start of the assessment, the assessor conducted a probe of the environmental and social pictures. The examiner presented the pictures one at a time to make sure the child was able to identify the pictures accurately. For the pictures
that were identified incorrectly, trials were conducted using a discrete trial teaching (DTT) format to teach the child the correct identification of the pictures. For example, the assessor presented a picture of a school and delivered a simultaneous prompt, “What is it, school.” The assessor conducted trials until the child identified the pictures. In the event the child could not identify one or more pictures, the assessor identified the pictures when presented during the assessment.

The assessment began when the first slide containing the first pair of stimuli (i.e., the videos with two different physical activities) was presented to the child. When the first pair of stimuli was presented, the assessor said, “Watch the videos.” When the second video ended, the assessor said, “Which activity would you like to do most, pick one.” After the child made a choice, the next slide was presented. This slide was the environmental and social choices and contained the environmental pictures (i.e., home, school, and park) and the social pictures (i.e., family, peer, peers). The environmental choices were on the top row, the social choices were on the bottom row. The assessor covered the social choices with a plain white piece of tagboard, and then pointed to the environmental pictures and said, “Look at these pictures.” When the child looked at the pictures the assessor said, “You picked (activity), where would you like to participate in the activity you just picked, you may pick more than one.” After the child chose the environmental picture(s), the assessor covered the environmental choices and said, “Look at these pictures.” When the child looked at the pictures, the assessor said, “You picked (activity), “Who would you like to participate with for the activity you just picked, you may pick more than one.” This procedure was repeated until all the slides with the pairs of stimuli and the
environmental and social pictures were presented. In the event of a “no response” from the child, the assessor repeated the question. If the child did not respond a second time, the assessor modified the questions according to the protocol. The assessor did not proceed to the next slide until the participant responded to all the questions. Reinforcement breaks were given, as needed, to the participant every 15 minutes during the assessment; the breaks lasted for no more than one minute. The assessment ended when the last slide was presented. The assessor said, “We are all done” and delivered verbal praise such as “You did great!” The child was then taken to the outer waiting area; there was an adult to watch them if his or her parent was not finished with the parent assessment.

**Parent Preference Assessment Session**

The parent was taken into a therapy room and seated at a table next to the assessor. The assessor explained the assessment procedures to the parent following the protocol. The assessment procedures were identical to the child participant procedures. However, some of the dialogue differed and the parents were not given reinforcement breaks. The assessment began when the first slide containing the videos of physical activities was presented. The assessor said, “Watch the videos and pick which activity you think your child would like to participate in the most.” After the parent chose the activity, the next slide was presented with the environmental and social choices. The assessor said, “Look at the pictures on the top row, where would your child like to participate in the activity you just chose? You may pick more than one.” After the parent chose, the examiner said, “Look at the pictures on the bottom row, who do you think your child would like to participate with for the activity you
just chose? You may pick more than one. This procedure was repeated until all the slides were presented. The assessment ended when all the slides were presented. After the assessment was completed, the examiner thanked the parent for participating and asked him or her to complete a social validity survey (see Appendix J). The examiner left the room while the parent completed the survey. The survey was optional and the parent was not required to put his or her name on the survey. The parent was instructed to put the surveys face down in a box containing all the completed surveys. The parent went to the waiting area after completing the survey.

**Observation of Assessment Sessions to Determine Fidelity of Assessment Implementation**

A procedural checklist of steps for the administration of the assessment was developed to determine fidelity of assessment administration (see Appendix B). The two research assistants were responsible for determining procedural fidelity of the assessment implementation. One assistant was a doctoral candidate in special education and the other assistant had a master’s degree in education. Both individuals had over 10 years experience teaching children with autism. One research assistant observed an assessment session and completed the procedural checklist; 25% of sessions were observed. The percentage of steps completed correctly was used to determine fidelity of implementation of the assessment (Cooper et al., 2007). The formula \( \frac{\text{number of correct steps}}{\text{total number steps completed}} \times 100 \) was used. If procedural fidelity fell below 90%, the research assistant would have received additional training.
**Determination of Interscorer Reliability Related to Preference Assessments**

One of the research assistants observed an additional 25% of randomly selected assessment sessions for the purpose of determining interscorer reliability related to the forced-choice assessment. The research assistant’s scores were compared to the assessor’s and/or investigator’s scores and the formula “agreements ÷ (agreements + disagreements) X 100” was used to determine the percentage of agreement between the research assistant and the assessor.

**Administration of Social Validity Questionnaire**

As previously mentioned, a social validity questionnaire (see Appendix J) was developed and administered to the parents at the completion of the assessment session. The questionnaire included a Likert scale that ranged from strongly disagree to strongly agree and consisted of 10 questions and an optional comment section. The parent was asked to complete the survey at the end of the assessment. The assessor left the room while the parent completed the questionnaire. The parent was asked to leave the questionnaire in a box that was provided in the therapy room. The parents were not required to put their names on the questionnaire.

**Phase Three: Data Analysis Related to Each Research Question**

Data from the Physical Activity Choice Assessment were analyzed to answer the research questions. Analysis procedures are provided for each question.

Research Question One: What are the physical activity preferences of children with autism when given a forced-choice assessment using videos?

Analysis: The scores from the video portion of the preference assessment were tallied to obtain a ranking for the chosen items (i.e., activities). The items were
ranked from highest to lowest and displayed using a bar graph. The three highest items on the bar graph were considered the most preferred activities chosen by the participants. The three lowest items depicted on the bar graph were considered the least preferred activities chosen by the participants.

Research Question Two: What are the social and environmental preferences for children with autism related to physical activity?

Analysis: The scores from the second component of the preference assessment were tallied to obtain a ranking for the chosen items (i.e., social and environmental choices). The items were ranked from highest to lowest and then displayed using a bar graph for social choices and a separate bar graph for environmental choices. The highest items were considered the most preferred by the participants and the lowest items were considered the least preferred by the participants for the environmental and social choices.

Research Question Three: When given the same preference assessment as their children and instructed to choose their child’s preferences, is there a difference in reported preferences between parents and their children?

Analysis: The treatment of the parent data was identical to the treatment of the child data (see research questions one and two). The scores were tallied to identify the highest to lowest preferred items for components one and two of the preference assessment. The scores from the parents and their respective child were matched and compared. The percentage of agreement was calculated for each component to determine the similarities/differences of reported preferences between parents and their children.
Summary

This study involved the use of a preference assessment to examine the choices of physical activities for children with autism. The forced-choice/paired stimulus preference assessment is a well-established procedure that has been widely used to assess tangible reinforcers for individuals with autism in order to teach new skills and maintain appropriate behaviors.

Currently, there are no known studies that involved the use of a forced-choice/paired stimulus preference assessment to determine preferred physical activities for children with autism. Participants in the study were 30 children with autism and one parent of each child. Data were collected and analyzed to determine a ranking of preferred activities and a ranking of preferences related to social and environmental contexts. In addition, data were collected and analyzed to determine similarities/differences in reported preferences between parents and their children.
CHAPTER 4

RESULTS

The purpose of this research was to investigate self-perceptions and parental perceptions related to physical activity preferences among children with autism. In addition, environmental and social preferences were investigated. A video-based forced-choice assessment (Fisher et al., 1992) was developed to measure preferences for physical activities. The assessment consisted of two components that included activity choices and environmental and social choices. The assessment was administered to 30 children with autism and one parent of each child. The participants were all children with a medical or educational diagnosis of autism. The administration of the assessment took place at a treatment facility for children with autism and behavioral disorders in the southwestern region of the United States. Data were collected to answer three research questions. This chapter includes a presentation of the results for each research question. In addition, interscorer reliability and procedural fidelity data are provided for all components of the assessment. Also, social validity scores are provided for each statement of the social validity questionnaire completed by the parent participants. The chapter concludes with a summary of the results obtained from the administration of the assessment.

Research Questions and Related Findings

Research Question One: What are the physical activity preferences of children with autism when given a forced-choice assessment using videos?

The choices from the video portion of the preference assessment were tallied to obtain a ranking for the chosen items (i.e., activities). The items were ranked from
highest to lowest and are displayed using a bar graph. The three highest items on the bar graph are considered the most preferred activities chosen by the participants. The three lowest items depicted on the bar graph are considered the least preferred activities chosen by the participants.

Thus, the data revealed the three highest rankings for the activity portion of the preference assessment chosen by the child participants were trampoline, bowling, and bike riding, respectively. Trampoline was selected 243 times, bowling was selected 211 times, and bike riding was selected 173 times by the child participants. The three activities ranked the least preferred by the child participants were lifting weights, basketball, and jump rope, respectively. Lifting weights was chosen 116 times, basketball was chosen 147 times and jump rope was chosen 149 times (see Figure 1). The activities presented in the assessment and the frequency for each activity are depicted in Table 3.

Figure 1

*Child Participant Activity Preferences*
Research Question Two: What are the social and environmental preferences for children with autism related to physical activity?

The choices from the second component of the preference assessment were tallied to obtain a ranking for the chosen items (i.e., social and environmental choices). The items were ranked from highest to lowest and are displayed using a bar graph for social choices and a separate bar graph for environmental choices. The highest item is considered the most preferred by the participants and the lowest item is considered the least preferred by the participants for the environmental and social choices.

The data revealed the child participants in the study preferred to engage in physical activities with friends the most and with a girl the least (see Figure 2). In addition, the data demonstrated the home as the most preferred environment to
engage in physical activities and school as the least preferred environment. The children selected friends 735 times and a girl 233 times. They chose the home 865 times and school, 340 times (see Figure 3). The frequency scores for the child social and environmental choices are displayed in Table 4.

Figure 2

*Child Participant Social Preferences*

![Child Social Preferences](image)

Figure 3

*Child Participant Environmental Preferences*

![Child Environmental Preferences](image)
Table 4

Child Participant Social and Environmental Scores

<table>
<thead>
<tr>
<th>Components</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Social</strong></td>
<td></td>
</tr>
<tr>
<td>Friends</td>
<td>735</td>
</tr>
<tr>
<td>Family</td>
<td>716</td>
</tr>
<tr>
<td>Boy</td>
<td>478</td>
</tr>
<tr>
<td>Girl</td>
<td>233</td>
</tr>
<tr>
<td><strong>Environmental</strong></td>
<td></td>
</tr>
<tr>
<td>Home</td>
<td>865</td>
</tr>
<tr>
<td>Park/Community</td>
<td>847</td>
</tr>
<tr>
<td>School</td>
<td>340</td>
</tr>
</tbody>
</table>

Research Question Three: When given the same preference assessment as their children and instructed to choose their child’s preferences, is there a difference in reported preferences between parents and their children?

The treatment of the parent data was identical to the treatment of the child data (see research questions one and two). The choices were tallied to identify the highest to lowest preferred items for components one and two of the preference assessment (i.e., activities, social and environmental). The choices are displayed using bar graphs for the activity, environmental and social preferences. The three highest are considered the most preferred and the three lowest are considered the least preferred for the activities component. The highest ranked item for the second component (i.e., social and environmental) is considered the most preferred and the lowest ranked item is considered the least preferred. In addition, the scores from the parents and their respective child were matched and compared. The percentage of
agreement were calculated for each component to determine the similarities/differences of reported preferences between parents and their children. The formula agreements÷ (agreements + disagreements)×100 was used to calculate percentage of agreements.

The data revealed the three highest rankings for the activity component of the preference assessment chosen by the parent participants were identical to the three highest preferences chosen by the child participants. Thus, the most preferred activities were trampoline, bowling, and bike riding, respectively. The least preferred ranked activities chosen by the parents were lifting weights, football, and jump rope, respectively. The parents chose trampoline 280 times, bowling 231 times, and bike riding 228 times; lifting weights was selected 67 times, football 102 times, and jump rope, 103 times. A child-parent comparison of activities is displayed in Figure 4 and Table 5 displays frequency data for the parent activity preferences.

Figure 4

Child-Parent Activity Comparison

![Child-Parent Activity Comparison Chart]

Table 5 displays frequency data for the parent activity preferences.
Table 5

*Parent Preference Scores*

<table>
<thead>
<tr>
<th>Components</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Activities</strong></td>
<td></td>
</tr>
<tr>
<td>Trampoline</td>
<td>280</td>
</tr>
<tr>
<td>Bowling</td>
<td>231</td>
</tr>
<tr>
<td>Bike Riding</td>
<td>228</td>
</tr>
<tr>
<td>Catch/Ball</td>
<td>190</td>
</tr>
<tr>
<td>Soccer</td>
<td>176</td>
</tr>
<tr>
<td>Running</td>
<td>168</td>
</tr>
<tr>
<td>Basketball</td>
<td>163</td>
</tr>
<tr>
<td>Golf</td>
<td>131</td>
</tr>
<tr>
<td>Tennis</td>
<td>109</td>
</tr>
<tr>
<td>Jump Rope</td>
<td>103</td>
</tr>
<tr>
<td>Football</td>
<td>102</td>
</tr>
<tr>
<td>Lift Weights</td>
<td>67</td>
</tr>
<tr>
<td><strong>Social</strong></td>
<td></td>
</tr>
<tr>
<td>Family</td>
<td>1465</td>
</tr>
<tr>
<td>Friends</td>
<td>1063</td>
</tr>
<tr>
<td>Boy</td>
<td>518</td>
</tr>
<tr>
<td>Girl</td>
<td>349</td>
</tr>
<tr>
<td><strong>Environmental</strong></td>
<td></td>
</tr>
<tr>
<td>Park/Community</td>
<td>1395</td>
</tr>
<tr>
<td>Home</td>
<td>1212</td>
</tr>
<tr>
<td>School</td>
<td>656</td>
</tr>
</tbody>
</table>

The results for parent responses related to the social and environmental portions of the assessment revealed the family as the most preferred and a girl as the least preferred for the social component of the assessment (see Figure 5). The results also indicated the park/community as the place their children would most likely engage in physical activities and school as the least preferred environment. The
parents chose family as the most preferred for their children 1465 times and a girl, 349 times (see Figure 5). The park/community was chosen by parents, 1395 times, and school, 656 times (see Figure 6). The percentage of agreement was calculated for both components of the assessment (i.e., activity, social and environmental) to determine similarities/differences between parents and their children regarding preference. Table 6 provides the results for the comparison of the two components (i.e., activity, environmental and social). The percentage of agreement score between children and their respective parent was 54% for the activities portion of the assessment. The percentage of agreement score between children and their parent was 13% for the social portion of the assessment and 21% for the environmental portion of the assessment.

Figure 5

*Child-Parent Social Comparison*
Figure 6

Child-Parent Environmental Comparison

![Bar chart showing child-parent environmental comparison](image)

Table 6

Child-Parent Percentage of Agreements

<table>
<thead>
<tr>
<th>Components</th>
<th>Total Agreements</th>
<th>Total Agreements + Disagreements</th>
<th>Percentage of Agreement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activities</td>
<td>1079</td>
<td>1980</td>
<td>54</td>
</tr>
<tr>
<td>Social</td>
<td>1057</td>
<td>7920</td>
<td>13</td>
</tr>
<tr>
<td>Environmental</td>
<td>1228</td>
<td>5940</td>
<td>21</td>
</tr>
</tbody>
</table>

Fidelity of Treatment

To determine fidelity of assessment implementation, one research assistant observed 25% of assessment sessions and completed a procedural checklist. The percentage of steps completed correctly by the assessor was used to determine fidelity.
of assessment implementation. The percent of correct steps was 100% (see Table 7). Additional training would have been provided if fidelity fell below 90%; no additional training was required.

Table 7

*Treatment of Fidelity*

<table>
<thead>
<tr>
<th>Measure</th>
<th>Correct Steps</th>
<th>Correct Steps + Total Steps</th>
<th>Percentage of Correct Steps</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fidelity of Treatment</td>
<td>637</td>
<td>637</td>
<td>100</td>
</tr>
</tbody>
</table>

*Interscorer Reliability*

Two research assistants were responsible for interscorer reliability. The research assistants observed a combined total of 25% of the assessments. There was agreement when the research assistant and the assessor obtained the same score for each response. Interscorer reliability was calculated for each component of the assessment. The formula agreements ÷ (agreements + disagreements) × 100 was used to determine reliability. There was 99.6% agreement for the activity portion of the assessment, 99.7% agreement for the social, and 99.9% agreement for the environmental component (see Table 8).
Table 8

*Interscorer Reliability*

<table>
<thead>
<tr>
<th>Components</th>
<th>Total Agreements</th>
<th>Total Agreements + Disagreements</th>
<th>Percentage of Agreements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activities</td>
<td>460</td>
<td>462</td>
<td>99.6</td>
</tr>
<tr>
<td>Social</td>
<td>1843</td>
<td>1848</td>
<td>99.7</td>
</tr>
<tr>
<td>Environmental</td>
<td>1385</td>
<td>1386</td>
<td>99.9</td>
</tr>
</tbody>
</table>

**Social Validity Questionnaire**

A social validity questionnaire (see Appendix J) was offered to each parent at the completion of the assessment session to determine satisfaction with the assessment. A total of 20 parents completed the questionnaire and 10 chose not to complete the questionnaire. The questionnaire consisted of 9 statements and was developed using a four-point Likert scale. The parents were instructed to circle the number that corresponded with their choice: (a) number 1 indicated the parent strongly disagreed with the statement, (b) number 2 indicated the parent disagreed with the statement, (c) number 3 indicated the parent agreed with the statement, and (d) number 4 indicated the parent strongly agreed with the statement. The total number of responses for each statement is displayed along with the mean scores for each statement (see Table 9). According to the data, the mean scores ranged from 3.5 to 3.7. The parents either agreed (3) or strongly agreed (4) with all nine statements.
and were satisfied with the assessment; overall, parents had a good experience (see Table 5). The questionnaire included one open-ended question in which the parents were asked what other activities their children preferred. The activity reported most frequently as preferred was swimming (n = 11); other activities that at least one parent reported as preferred by their children were climbing, WII, scooter, gymnastics, hockey, and skate boarding.
Table 9

*Social Validity Frequency Ratings and Mean Scores (n = 20)*

<table>
<thead>
<tr>
<th>Statement</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>Mean Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>The assessment will be beneficial to my child.</td>
<td>0</td>
<td>0</td>
<td>10</td>
<td>10</td>
<td>3.5</td>
</tr>
<tr>
<td>I would be comfortable recommending the assessment to my child’s teacher or therapist</td>
<td>0</td>
<td>0</td>
<td>8</td>
<td>12</td>
<td>3.6</td>
</tr>
<tr>
<td>I would be comfortable recommending the assessment to other parents.</td>
<td>0</td>
<td>0</td>
<td>7</td>
<td>13</td>
<td>3.6</td>
</tr>
<tr>
<td>The assessment was easy to complete.</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>18</td>
<td>3.9</td>
</tr>
<tr>
<td>The quality of the videos was good.</td>
<td>0</td>
<td>0</td>
<td>8</td>
<td>12</td>
<td>3.6</td>
</tr>
<tr>
<td>The physical activities in the videos were easy to understand.</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>15</td>
<td>3.7</td>
</tr>
<tr>
<td>The physical activities were realistic for my child.</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>15</td>
<td>3.7</td>
</tr>
<tr>
<td>The amount of time for the assessment was appropriate.</td>
<td>0</td>
<td>0</td>
<td>6</td>
<td>14</td>
<td>3.7</td>
</tr>
<tr>
<td>Overall, I had a good experience.</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>15</td>
<td>3.7</td>
</tr>
</tbody>
</table>

*Note: 1 = Strongly Disagree; 2 = Disagree; 3= Agree; 4 = Strongly Agree*

**Summary of Findings**

*The Physical Activity Choice Assessment (PACA)* was administered to 30 child participants with autism to determine most and least preferred physical activities. Based on the child participant activity selections and the subsequent rank ordering, trampoline, bowling, and bike riding were the most preferred activities and
lifting weights, basketball, and jump rope were the least preferred activities. With regard to social preference, the child participant selections and subsequent rank ordering indicated that physical activity with friends was most preferred and physical activity with a girl was least preferred. With regard to environmental preference, the child participant selections and subsequent rank ordering indicated the home environment was most preferred and the school environment was the least preferred to engage in their selected physical activities.

*The Physical Activity Choice Assessment (PACA)* also was administered to one parent of each child participant in this study. The parents were instructed to select the preferences that they believed their respective children would select. The parent participants chose the identical activities as their children for the most preferred (i.e., trampoline, bowling, and bike riding). The least preferred activities chosen by the parents were lifting weights, football, and jump rope. Thus, the parent choices matched the child choices on two out of three least preferred activities (i.e., lifting weights and jumping rope). The parents chose the park as the environment their children would most prefer and school as the environment least preferred; whereas, the child participants selected the home as the most preferred environment and school as the least preferred. There was agreement between the parent and child choices related to school being the least preferred environment. The family was chosen by the parents as the most preferred in the social portion of the assessment and a girl as the least preferred; whereas, the child participants chose friends as the most preferred and a girl as the least preferred. There was agreement between the parent and child choices related to a girl being the least preferred.
When child participants were matched to their respective parents, the percentage of child-parent agreement related to physical activity choices was determined for each component of the assessment. The results indicated 54% agreement for the activities component, 21% agreement for the environment portion and 13% agreement for the social portion of the assessment, indicating a low percentage of agreement for environmental and social preferences related to physical activity.

Data were collected for procedural fidelity of implementation. A procedural checklist that consisted of 13 questions was used. Two research assistants observed a combined total of 25% of the sessions to determine correct implementation of the assessment. The percentage of correct steps was used to determine procedural fidelity of the assessment. Adherence to correct implementation was required to remain at 90% or above for all observed sessions. The data indicated that the assessor completed 100% of the steps correctly during all of the observed sessions.

The data for interscorer reliability were collected for 25% of the assessment sessions by two research assistants. The results revealed the percentage of agreements were 99.6 for the activities component, 99.9 for the environmental component, and 99.7 for the social component of the assessment. Thus, there was a very high level of agreement between the two research assistants.

A social validity questionnaire consisting of nine statements was administered to the parents upon completion of the assessment. Twenty parents completed the questionnaire. The mean scores for each statement were calculated, and ranged from
3.5 to 3.7; this indicated a high satisfaction level among the parent participants with regard to *The Physical Activity Choice Assessment (PACA).*
CHAPTER 5
SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Increasing physical activity for children with developmental disabilities is often challenging (Rimmer & Rowland, 2008). The benefits of engaging in physical activity for individuals with autism are well documented in the literature (Pan & Frey, 2006; Pitetti, et al., 2007; Rosenthal-Malek, 1997; Rosser-Sandt & Frey, 2006; Todd et al., 2010; Todd & Reid, 2006). However, individuals with autism often lack the necessary motivation to engage in physical activity (Todd, Reid, & Butler-Kisber, 2010). In addition, due to the characteristics defining autism, such as deficits in social skills, motor coordination, and behavioral difficulties, individuals with autism are less likely to participate in physical activity with their peers than individuals without autism (Pan & Frey, 2006).

It has been reported in the literature that children with autism often do not participate in the recommended 60 minutes of physical activity per day (Holcomb et al., 2009). In fact, Pan and Frey (2006) investigated patterns of physical activity among 35 children with autism aged 10-19. The results demonstrated that participants engaged in continuous MVPA for 5 or 10 minutes during the day; much less than the recommended 60 minutes. Thus, it is important for researchers to identify methodologies for determining the physical activities that children with autism enjoy.

Self-determination refers to the opportunity to be the causal agent in one’s own life. Choice-making is a primary element of self-determination and is critical for adolescents with autism (Wehmeyer & Schwartz, 1997). It has been reported that individuals with developmental disabilities often have fewer opportunities to make
choices in their daily lives than their non-disabled peers (Burton-Smith, Morgan, & Davidson, 2005). Choice making, as an intervention, has been successful for individuals with developmental disabilities, including ASD (Watanabe & Sturmey, 2003). There is evidence that providing choices to individuals with autism is successful for increasing skills, promoting independence, and improving socially significant behaviors (Watanabe & Sturmey, 2003). Furthermore, it has been theorized that having the opportunity to make a choice has reinforcing value independent of the preferred stimulus (Kern et al., 2001).

Kern et al. (2001) investigated the possibility of choice making having reinforcing value in and of itself, unrelated to the chosen stimulus. The results support choice making as an effective intervention and demonstrate that choice making is practical and easy to implement in any setting.

Research reveals strong evidence in support of using preferred items and activities during intervention (Morgan, 2006). Reinforcers have been used successfully to teach new skills and desired behaviors (Cooper et al., 2007). A forced-choice assessment (Fisher et al., 1992) is a well-established procedure for identifying appropriate reinforcers.

Piazza, Fisher, Hagopian, Bownam and Toole (1996) evaluated the effectiveness of items ranked as high, middle, and low when given a forced-choice preference assessment. The participants were four male children with developmental disabilities who were receiving treatment for severe destructive behavior. The procedures used for the forced-choice preference assessment were identical to the procedures used by Fisher et al. (1992).
The results demonstrated that all items ranked as highly preferred functioned as reinforcers for all participants. In addition, low ranking stimuli did not function as reinforcers for any of the participants when compared to high-ranking stimuli.

Currently, there is minimal research on physical activity for individuals with autism in the literature. Furthermore, no studies were found that investigated the preferences or choices of individuals with autism relating to physical activity. The current research involves administration of a researcher-developed video-based forced choice assessment to ascertain preferences for physical activity among children with autism. In addition, a comparison of child preferences and parent preferences were investigated.

Chapter five includes a discussion of the results related to three research questions, conclusions drawn from the findings of the study, practical implications, and suggestions for future research.

**Discussion of Results**

The purpose of this research was to investigate self-perceptions and parental perceptions related to physical activity preferences among children with autism. Environmental and social preferences were also investigated. The *Physical Activity Choice Assessment (PACA)* was developed to identify the most and least preferred activities, social and environmental preferences. The *Physical Activity Choice Assessment (PACA)* is a video-based forced-choice assessment (Fisher et al., 1992) that consisted of two components. Component one measured physical activity choices and component two assessed social and environmental choices. In addition, the *Physical Activity Choice Assessment (PACA)* was administered to one parent of each
child. Child-parent agreement was calculated for each component. A social validity questionnaire was provided at the completion of the assessment to measure overall satisfaction with the Physical Activity Choice Assessment (PACA). A discussion of each question is provided.

**Research Question 1**

Research Question One: What are the physical activity preferences of children with autism when given a forced-choice assessment using videos?

**Child preference sessions: Activity component.** Question one involved the exploration of child preferences related to physical activity. The data were collected using the first component of the Physical Activity Choice Assessment (PACA). The data were tallied and the preferences were then ranked to obtain the three highest-ranking activities and the three lowest-ranking activities. The three highest-ranking activities selected by the child participants were trampoline, bowling, and bike riding and the three lowest ranked activities were lifting weights, basketball and jump rope. These results were consistent with current research on physical activity for children with autism. For example, the choices provided in the assessment had differing levels of complexity ranging from easy to difficult. The most preferred activities (i.e., trampoline, bike riding, and bowling) selected by the children were less complicated than the least preferred activities chosen (i.e., jump rope, basketball, and lifting weights). This concurs with recent research that reveals children with autism are more likely to engage in activities that are not complicated and do not require complex motor coordination (Pan et al., 2011; Todd & Reid, 2006). Thus, jumping on a trampoline appears to be easier than jumping rope and bowling appears to be easier.
than playing basketball which requires complicated motor coordination and strict adherence to rules. The Physical Activity Choice Assessment (PACA) contained a variety of activities that are typically played solo, as a dyad, or with multiple players. For example, trampoline is typically played alone, tennis is typically played with two players, and basketball and football are usually team sports played with multiple players. It is not surprising that the child participants most preferred activities are typically played alone and do not require interaction with peers such as trampoline and bike riding. These findings concur with researchers that cite deficits in social skills as a barrier to participation in physical activities that are typically played with multiple players such as football or basketball (i.e., less preferred activities selected by child participants) (Holcomb et al., 2006). Thus, offering activities that are played alone or in dyads may promote physical activity among children with autism. In addition, providing options that enable children with autism to engage in activities that place less emphasis on social demands and interaction with peers may increase physical activity in their daily lives.

All the activities chosen as most preferred by the child participants were activities that do not require sustained participation and are noncompetitive. For example, trampoline can be played for one minute or 10 minutes; whereas basketball, football, and soccer typically require sustained participation for longer amounts of time especially when played with other players. These findings concur with Pan and Frey (2006) who found that children with autism engaged in physical activity for approximately 5 or 10 minutes of the day. Moreover, the most preferred activities selected by the children are typically noncompetitive because they are generally
played solo (i.e., trampoline, bike riding), unlike team sports such as football or soccer. These findings are also consistent with Borremans et al. (2010) who found that children with autism are more apt to participate in activities that are enjoyable and noncompetitive.

Lack of motivation has been cited as a barrier to physical activity for children with autism (Todd et al., 2010), and providing choices has been reported as inherently reinforcing for individuals with autism (Kern et al., 2001). In addition, Todd et al. (2010) found that choosing an activity was more motivating than the actual activity in their study on sustained physical activity for individuals with autism. Therefore, it is possible that providing choices of activities will promote increased participation and perhaps exposure to a variety of activities will also encourage children with autism to engage in physical activity. For example, during the parent administration of the assessment, several parents reported that their child did not know how to ride a bike, yet that was one of the most preferred activities chosen by the child participants. Moreover, some of the other activities such as golf and soccer were cited by parents as too complicated for their children, yet they were both selected over 100 times by the children when they were shown the activity in a video. Thus, exposure to a variety of activities and instruction in novel activities needs to be explored further because they may result in increased physical activity.

Finally, it is also important to note that although it is beneficial for children with autism to choose their own activities, implementing strategies that will remediate their deficits in social skills, motor coordination, and behavior is critical so that they can engage in team sports or more complex sports if they choose. In addition,
expanding their knowledge of activities may promote participation in a variety of activities.

**Research Question 2**

What are the social and environmental preferences for children with autism related to physical activity?

**Child preference sessions: Social and environmental components.**

Question two was developed to investigate child preferences related to social and environmental choices. The data were collected from the second component of the *Physical Activity Choice Assessment (PACA)*. The scores from the second component of the preference assessment were tallied to obtain a ranking for the chosen items (i.e., social and environmental choices). The items were ranked from highest to lowest. The highest item was considered the most preferred by the participants and the lowest item was considered the least preferred by the participants for the social and environmental choices.

With regard to social preference, the child participant selections and subsequent rank ordering indicated that physical activity with friends was most preferred and engagement in physical activity with a girl was least preferred. The child participants regarded the home as the most preferred environment and school as the least preferred environment to engage in physical activity. However, it should be noted that scores for the park/community (i.e., 847) were very close to the scores for home (i.e., 865), indicating the park/community as a strong preference as well.

No research was found for social and environmental preferences for children with autism related to physical activity. However, it is interesting to note that the
child participants in this study selected friends as most preferred to engage in physical activity. This finding is noteworthy because of the difficulty children with autism have interacting with multiple peers due to their deficits in social skills (Holcomb et al., 2006). In fact, when the parents were asked during the parent administration of the assessment if their children had friends, the majority of the parents reported their children either did not have friends at all or had one or two neighborhood children they associated with occasionally, yet friends was chosen over family, a boy, and a girl. Thus, it should be considered that children with autism desire to have friends and may engage in physical activity with their peers if they were able to do so with confidence. Further, this finding indicates social skills instruction as a critical component of treatment for children with autism. Finally, it was expected that a girl would be the least preferred because the majority of the child participants were male.

Rimmer and Rowland (2008) cited less access to recreational activities in the school and community environments as possible factors to less participation in physical activity. The child participants in the current study chose the home as the most preferred environment to engage in physical activity and school as the least. Thus, based on the findings from Rimmer and Rowland, a possible explanation for choosing home may be because there is less access to the community, and the home is where they currently engage in physical activity. Thus, more access to community recreational activities may increase participation in physical activity in the community environment and may promote more opportunities to participate in physical activity more frequently and with their peers. The school environment was chosen as the least preferred place for physical activity. Perhaps this is due to the
limited type of activities available in the school environment. Moreover, activities in school are typically structured to include multiple players, such as team sports. In addition, parents reported that their children had few or no friends at all in school; this might also account for the children choosing school as the least preferred environment to engage in physical activity.

With regard to school being chosen as the least preferred environment, another plausible explanation may be that the types of activities selected by the child participants as most preferred are not typically available in the school setting, such as trampoline and bowling. However, these activities can be incorporated easily into special education programs; the equipment is inexpensive and can be purchased with program funds available for students with disabilities (IDEA, 2004). Thus, including physical activity in special education programs may increase activity for students with autism. In addition, incorporating physical activity into programs for students with autism may increase their motor coordination abilities and social skills; improving these deficit areas may increase their interactions with their nondisabled peers and therefore, promote friendships.

**Research Question 3**

When given the same preference assessment as their children and instructed to choose their child’s preferences, is there a difference in reported preferences between parents and their children?

**Parent preference and child-parent comparison.** Question three was developed to investigate child-parent preference agreement for all components of the assessment (i.e., activity, social, and environmental). This was achieved by
administering the *Physical Activity Choice Assessment (PACA)* to the parents in the identical manner as the children. The treatment of the parent data was identical to the treatment of the child data. In addition, the scores from the parents and their respective child were matched and compared to determine the similarities/differences of reported preferences between parents and their children.

The data indicated trampoline, bowling, and bike riding as the three activities most preferred by their children. These choices were identical to the child participant selections demonstrating a high agreement for the activities component of the assessment. The data also revealed that the parent participants chose lifting weights, football, and jump rope as activities least preferred. There was little research located on parent rating scales related specifically to physical activity for children with autism. Barr-Anderson et al. (2010) cited that perceptions of health issues often differ between child and parent, particularly perceptions related to physical activity. The results for the activity component of this study did not support the findings of Barr-Anderson et al. The child-parent agreements for activity preferences were identical, and the least preferred agreements were also high (two out of three were identical). Football was the only activity that was not chosen by child and parent, however, football was ranked on the low end of the items selected by the child participants. This is important because individuals with autism rarely have the opportunity to make choices in their lives. Most often it is educators and parents that make choices for them (Burton-Smith et al., 2005). Perhaps this finding of similar choices between children and parents can be used to encourage parents to allow their children to make more of their own choices.
With regard to preference agreements for the social and environmental components of the assessment, parents chose the park/community as the most preferred and school as the least preferred environments. The family was selected as the most preferred and a girl was selected as the least preferred. These choices differed from child choices with the exception of school. A possible explanation for the differences in the social component may be because children with autism often engage in activities with their family due to the social constraints particular to individuals with autism. In addition, parents may have identified their child’s participation in physical activity with the family as preferred because their children do not frequently engage in activities with their peers. It is not surprising that the parents chose school as the least preferred as did their children. Parents reported that their children did not enjoy activities in school.

Child-parent matched comparisons were calculated for the activity, social, and environmental preferences. The child-parent percentage of agreements was calculated for each item in both components of the Physical Activity choice Assessment (PACA). The percentage of agreements for the activity portion was above 50%, indicating reasonably high agreement. However, the agreement for the social and environmental components was substantially lower (i.e., less than 50%). These findings concur with research reporting consistent disagreement between parents and children in regard to rating scales (Meer van der et al., 2008). These findings indicate the need to provide children with autism more autonomy in their daily choices. Moreover, because choice is often nonexistent in the lives of individuals with disabilities, it is possible that giving a choice will have a positive impact on the frequency of physical activity and
the types of physical activities children with autism engage in throughout the day in all environments. Thus, preference becomes an important issue and critical for the well-being of children with autism with regard to physical activity and self-determination.

**Conclusions**

Based on the results obtained in this research, the following conclusions may be drawn.

1. When responding to a video-based preference assessment, children with autism indicate a high preference for physical activities that do not require sustained participation, are noncompetitive, not complex, and played solo (i.e., trampoline, bowling, and bike riding).

2. When responding to a preference assessment designed to assess social preferences related to engagement in physical activities, children with autism indicate a preference to engage with friends.

3. When responding to a preference assessment designed to assess environmental preferences for physical activities, children with autism indicate high preference levels for both home and community parks.

4. Parents of students with autism are better able to identify the physical activity preferences of their children than the social and environmental preferences related to those activities.

**Limitations of the Study**

The sample size in this study was small (i.e., 30 participants); therefore, results may not generalize to other children with autism. Also, the results of the study
may be gender biased due to the disproportionate number of male participants as compared to female participants.

**Practical Implications**

Several practical implications emerged from this study and should be considered when developing and implementing a similar physical activity assessment for children with autism. First, the *Physical Activity Choice Assessment (PACA)* consisted of twelve activities, thus administration of the assessment took approximately 30 minutes. The short duration of time it took to administer the assessment had important implications associated with ease of administration. First, fewer breaks were required for the child participants during the session. Second, challenging behaviors were nonexistent during the sessions. Thus, it seems that the duration of the assessment should be approximately 30 minutes in order to ensure ease of administration.

Another practical implication that emerged from this research is that child participants as young as five years old were able to make choices using the *Physical Activity Choice Assessment (PACA)* as long as they were cognizant of the content presented in the videos (i.e., used for physical activity choices) and picture cards (i.e., used for social and environment choices). The use of videos and picture cards is a more abstract concept than what is typically used in a forced-choice procedure for students with autism (i.e., tangible items). Thus, cognitive ability to understand the content of the assessment videos and picture cards appears to be more important than age of the individual taking the assessment.
A third implication that emerged from this research is that reinforcers and short breaks every 15 minutes are beneficial in terms of ensuring ease of administration of the assessment. A reinforcer assessment was conducted prior to the start of each session and breaks were part of the general instructions outlined in the protocol (see Appendix C). There were no problem behaviors displayed by the child participants during the assessment sessions. Thus, frequent reinforcement and short breaks appeared to be sufficient in terms of preventing challenging behaviors from occurring.

Additional implications that emerged from this research is that parents may want to provide access to recreational activities in park or community settings and may want to provide social skills instruction to help their children engage in physical activities with peers in these settings. The child participants chose the park/community and friends as highly preferred. Thus, increased access to recreational activities in the community and social skills instruction appear to be important for children with autism.

Finally, including activities that are familiar to most children was an important factor when developing the physical activity assessment. For example, it was obvious during sessions that all the activities were known to the children, even if they were not selected as preferred. Thus, familiarity with the activities presented in the assessment ensured that participants made selections based on preference and not inaccurate assumptions.
**Recommendations for Further Study**

Reinforcer assessments and choice-making have been successfully used for children with autism. However, prior to this study, there was no research on using these procedures for physical activity. Thus, further study is highly recommended in this area. Specifically, researchers may want to consider the following suggestions for future research.

1. Conduct research to investigate the effectiveness of using preferred activities to increase engagement in physical activity among children with autism. In other words, determine whether activity choice translates to increased activity engagement.

2. Conduct research to investigate the maintenance of preferred physical activity. Providing choices is motivating for children with autism. The activity selections in this study, however, support previous researchers (Pan & Frey, 2006) who indicated that children with autism typically engage in physical activity for short durations. Further research should investigate the effectiveness of choice-making related to physical activity and maintenance of the preferred activity over time.

3. Conduct research to investigate the impact of social skills instruction related to preferences for physical activity. Activities that require social demands are difficult for children with autism. Thus, providing social skills instruction related specifically to participation in physical activity may promote increased participation with their peers.
4. Conduct research to investigate physical activity instruction directly related to team sports. Team sports such as basketball, soccer, and football were selected as least preferred by the child participants in this study. Thus, providing instruction and practice in team sports may promote participation in these types of activities and warrants further study.

5. Conduct research to investigate administration of the assessment to individuals with autism who have severe cognitive deficits. The children in this study were relatively high functioning and had no problem understanding the concepts presented in the *Physical Activity Choice Assessment (PACA)*. Further research should explore ways to modify the assessment to include individuals with moderate to low cognitive abilities.

**Summary**

The benefits of physical activity for individuals with autism have been well documented (Pan & Frey, 2006; Pitetti, Rendoff, Travis, & Beets, 2007; Rosenthal-Malek & Mitchell, 1997; Rosser-Sandt & Frey, 2006; Todd et al., 2010; Todd & Reid, 2006). In addition, choice-making as an intervention has been used successfully to increase desirable behaviors and task performance for individuals with disabilities (Morgan, 2006). Moreover, it has been suggested that choice-making is internally motivating (Kern et al., 2001) Thus, identifying preferences among children with autism related to physical activity has the potential to promote effective research-based intervention practices and increase participation in physical activity for children with autism.
This study made use of a video-based forced-choice assessment developed by the researcher to assess preferences for physical activity and associated components (i.e., social and environmental preferences). Several conclusions were obtained from the findings of this study that have the potential to increase physical activity for children with autism in the home, community, and school settings. In addition, the practical implications revealed in this study provide beneficial information to assist educators when developing a similar assessment. Furthermore, the findings from this study provide useful information for parents regarding physical activity. This study was conducted to ascertain preferences of children with autism related to physical activity. Research in the area of physical activity for individuals with autism is minimal. The results from this study begin to address the current gap in the literature related to physical activity and individuals with autism, but additional research is needed to advance this important area of study even further.
APPENDIX A

PHYSICAL ACTIVITY CHOICE ASSESSMENT (PACA)
PROTOCOL AND GENERAL INSTRUCTIONS

This protocol is designed to accompany the PACA. The protocol contains general instructions and the data collection procedures for the PACA.

The PACA is designed to assess physical activity preferences for children with ASD. The assessment uses a paired stimulus procedure widely used for individuals with developmental disabilities.

The PACA consists of two components. The first component is a paired stimulus preference assessment to assess physical activity preferences. The second component is designed to assess preferences related to environmental and social contexts. This assessment uses videos and pictures to depict the choices that are presented to the child.

Administration of Assessment

The examiner will follow the instructions and the script. Minimal modifications to the script are permitted only if the participant requires modifications to complete the assessment. For example, a participant may have limited cognitive or language abilities and as a result may need instructions that are shorter or different language. Modifications are at the discretion of the examiner. Modifications that are used must not change the procedures or the objective of the assessment. In addition, modifications must not provide prompts to the participant that may bias his/her responses. The general wait time between responses may vary depending on the participant.

General Instructions

Examiner: Explain to the participant that he/she is going to watch videos and look at pictures of activities. Tell the participant that he/she will choose one of the videos when instructed by the examiner and one or more of the pictures when instructed by the examiner.

The first slide of the assessment will present two videos containing one or more individuals performing a different activity in each video.
Examiner: “Watch the video.”
When the second video ends, the examiner says, “Which activity would you like to do most, pick one.” (Modification—“pick one”) The participant chooses an activity. The examiner records the choice on the protocol data sheet.

The next slide will contain the environmental and social pictures. The environmental pictures will be on the top row; the social pictures on the bottom row. The examiner covers the bottom row of pictures.

Examiner: “Look at the pictures” indicating the top row of pictures. Examiner: You picked (activity). “Which places would you like to participate in the activity you just picked, you can pick more than one. Modification—“You picked (activity). “Where would you like to (activity).” After the participant responds, the examiner will cover the top row of pictures. Examiner: “Look at the pictures” indicating the bottom row of pictures. Examiner: “You picked (activity). Who would you like to participate with for the activity you just picked, you can pick more than one.” Modification—“You picked (activity). “Who would you like to (activity) with?” The examiner repeats this procedure until all the slides are finished.

**Additional Rules**

- Reinforcers may be used if necessary to control inappropriate behaviors. A short reinforcer assessment will be conducted at the start of the session only.
- Modifications are to be used only if necessary.
- No prompting is permitted.
- Wait time between responses should not be excessive (no more than 1 minutes).
- If the participant does not respond, the examiner will repeat the instruction.
- Reinforcer breaks may be given at the examiner’s discretion. However, they must be short in length (i.e. approx. 2 minutes).
Protocol Data Sheet

Start time: ___________   Participant I.D. ___
End time: ___________    Child: ___  Parent: ___

Protocol Data Sheet

Place a checkmark in the correct response box for video stimuli. Circle correct response for environmental and social choices. Make copies as needed for additional stimuli.

<table>
<thead>
<tr>
<th>Stimulus</th>
<th>Stimulus</th>
<th>Environment</th>
<th>Social</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ex. Jump Rope</td>
<td>Bowling</td>
<td>H P S</td>
<td>FR B G FA</td>
</tr>
</tbody>
</table>

99
APPENDIX B

PHYSICAL ACTIVITY CHOICE ASSESSMENT PROCEDURAL FIDELITY CHECKLIST

Directions: Place a checkmark next to all questions that apply. Place an N/A next to all questions that do not apply.

Date: _________________
Examiner: ________________________________________
Rater: ____________________________________________

_____ A reinforcer assessment was conducted prior to the start of the assessment.
_____ The examiner explained the instructions to the participant prior to administration of the assessment.
_____ The examiner followed the script when giving instructions to the participant for component one.
_____ The examiner modified the instructions for the participant according to the guidelines described in the protocol.
_____ The examiner probed environmental and social pictures prior to the start of component two of the assessment.
_____ The examiner followed the script when giving instructions to the participant for component two.
_____ The examiner followed the guidelines in the protocol for no-responses by the participant.
_____ The wait time after instruction was not excessive.
_____ Breaks were given in 15-minute intervals, unless changed at the discretion of the examiner. Explain in note section.
_____ Reinforcer breaks were no more than two minutes in length.
_____ The examiner did not prompt the participant during the assessment.
_____ The examiner collected trial-by-trial data in the protocol.
_____ The examiner delivered social praise during the assessment when appropriate.

Notes:
________________________________________________________
________________________________________________________
________________________________________________________

100
APPENDIX C

REINFORCER ASSESSMENT FORM

Reinforcer Data Sheet

<table>
<thead>
<tr>
<th>Participant</th>
<th>Reinforcer</th>
<th>Reinforcer</th>
<th>Reinforcer</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

101
APPENDIX D

PHYSICAL ACTIVITY CHOICE ASSESSMENT VIDEO SLIDES

Soccer  Football
APPENDIX E

PHYSICAL ACTIVITY CHOICE ASSESSMENT SOCIAL AND ENVIRONMENTAL PICTURE CARDS

Home  Park/Community  School

Friends  Boy  Girl  Family
Hi, my name is (name).
I am calling to invite you to participate in a study that is being conducted at Southwest Autism & Behavioral Solutions. The purpose of the study is to assess choices related to physical activity for the purpose of increasing physical activity for children with autism. The study involves you and your child as participants and involves taking a preference assessment that was developed to assess choices related to physical activities such as running, basketball, bowling, etc.

The preference assessment will take approximately two hours and will be administered at the clinic. The assessment is administered on the computer and consists of choosing between two activities. For example, you and your child will be asked to pick between running and basketball as a preference. As a parent, you are asked to participate to determine parent perceptions of your child’s preferences. We do not anticipate any risk to you or your child when participating. Your child will be given breaks every 15 minutes and will be reinforced frequently. We want to make sure that it is a pleasant experience for you and your child.

If you agree to participate, you and your child would come to the clinic for an intake appointment. At that appointment you will sign the consent form and the parent permission form to allow your child to participate. Then a research assistant involved in the study will assess your child’s ability to make a choice between two objects. If he/she is able to make a choice, he/she will meet the criteria to participate in the study. The initial intake and screening appointment will take approximately one hour.

After the intake appointment, you will be asked to come back to the clinic with your child to take the preference assessment.

Participating in this study will enable Southwest Autism to develop an individualized physical activity program for your child. However, participation is voluntary and if you choose not to participate in the study, it will not affect your child’s services in any way and when the study is complete, the assessment will be available for all children obtaining services from Southwest Autism & Behavioral Solutions.

Do you have any questions?
Thank you for taking the time to talk to me. You can reach me at 702-270-3219. Please call me if you have any questions or concerns. If you would like to participate in the study, call me and we will schedule an appointment at your convenience for the initial intake and screening.
Research Study Intake Form

Date_________________________
Participant ID__________________

Parent Participant______________________________
Child Participant______________________________

Address____________________________________________
________________________________________________________________________

Phone:
Home_____________________________________
Cell_____________________________________

Child Demographic Data:
Child’s age/birthdate _______________________
Child’s gender _______________________
Child’s grade in school _______________________
Child’s ethnicity _______________________


APPENDIX H

INFORMED CONSENT FORM

TITLE OF STUDY: Development and implementation of a video-based physical activity preference assessment for children with autism and their parents.

INVESTIGATOR(S): Susan Miller, PhD and Lena Samovich, M.Ed

For questions or concerns about the study, you may contact 702-218-9403

For questions regarding the rights of research subjects, any complaints or comments regarding the manner in which the study is being conducted, contact the UNLV Office of Research Integrity – Human Subjects at 702-895-2794, toll free at 877-895-2794 or via email at IRB@unlv.edu.

Purpose of the Study
You are invited to participate in a research study. The purpose of this study is to explore self-perceptions related to physical activity preferences of children with autism. The study will involve the development and administration of a video-based preference assessment to identify self-perceptions among children with autism of preferred activity choices as they relate to social and environmental contexts. Parents of the child participants will also complete the video-based preference assessment indicating what they believe are their respective child’s preferences related to physical activities. The child’s self-perceptions will then be compared to their child’s beliefs about the preferred physical activities of higher child.

Participants
You are being asked to participate in this study because you fit these criteria: You are the parent of a child with autism who fits the criteria for inclusion in this study. Inclusion in the study for child participants consists of a medical or educational diagnosis of autism and the ability to make a choice between two items. Parent participants will not be screened to assess their ability to make a choice between two items.

Procedures
If you volunteer to participate in this study, you will be asked to do the following: You will be asked to participate in a video-based preference assessment with your child. The same assessment will be administered to you and your child separately in different rooms. Administration of the assessment will be conducted by a behavioral consultant employed by Southwest Autism & Behavioral Solutions. The assessment will take approximately 2 1/2 hours. The assessment contains videos displaying physical activities. You will be asked to make a choice between two activities that you believe your child would choose. In addition, pictures will be presented and you will be asked to make choices regarding environmental and social choices that you believe your child would choose. Finally, you will be asked to complete a social validity survey rating your experience.

Approved by the UNLV IRB. Protocol #1209-425234
Received: 11-05-12 Approved: 11-13-12 Expiration: 11-12-13
Benefits of Participation
There will be direct benefits to you as a participant in this study. However, we hope to learn valuable information for professionals who teach individuals with autism and for parents who have children with autism. This research will provide information that may promote self-determination and a healthy lifestyle for individuals with autism. The data from this study will be shared with Southwest Autism & Behavioral Solutions for the purpose of improving services for their clients.

Risks of Participation
There are risks involved in all research studies. This study may include only minimal risks. It is possible that participants will experience minimal stress as they attempt to select preferred physical activities for themselves or for their children.

Cost/Compensation
There will be no financial cost to you to participate in this study. The study will take approximately 2-3 hours and the time it takes to drive to the location of the assessment. You will not be compensated for your time.

Confidentiality
All information gathered in this study will be kept as confidential as possible. No reference will be made in written or oral materials that could link you to this study. All records will be stored in a locked facility at UNLV for 3 years after completion of the study. After the storage time the information gathered will be destroyed, including hard data and computer files. The data from this study will be collected by employees of Southwest Autism & Behavioral Solutions and will be shared with Southwest Autism & Behavioral Solutions.

Conflict of Interest Disclosure
The research team members involved in this study have an interest in the success of Southwest Autism & Behavioral Solutions and their clients. Lero Sankovich and Vanessa Jessen, two members of the research team, are Co-owners of Southwest Autism and Behavioral Solutions and also completing their doctoral dissertations at the University of Nevada Las Vegas. The information gathered from this study will be used as researchers and by Southwest Autism and Behavioral Solutions to improve services.

Voluntary Participation
Your participation in this study is voluntary. You may refuse to participate in this study or in any part of this study. You may withdraw at any time without prejudice to your relation with UNLV. You are encouraged to ask questions about this study at the beginning or any time during the research study. Your decision to participate or not to participate in this study will not affect individual services currently provided to you child from Southwest Autism & Behavioral Solutions.

Approved by the UNLV IRB. Protocol #1209-4252M
Received: 11-05-12 Approved: 11-13-12 Expiration: 11-12-13
TITLE OF STUDY: Development and Implementation of a Video-Based Physical Activity Preference Assessment for Children With Autism and their Parents

Participant Consent:
I have read the above information and agree to participate in this study. I have been able to ask questions about the research study. I am at least 18 years of age. A copy of this form has been given to me.

Signature of Participant

Date

Participant Name (Please Print)

Approved by the UNLV IRB. Protocol #1209-4252M
Received: 11-05-12 Approved: 11-13-12 Expiration: 11-12-13
APPENDIX I

PARENT PERMISSION FORM

UNLV
Department of Education and Clinical Studies

PARENT PERMISSION FORM

TITLE OF STUDY: Development and Implementation of a Video-Based Physical Activity Preference Assessment for Children with Autism and Their Parents

INVESTIGATOR(S): Susan Miller, PhD and Lea Sanislo, M.Ed

CONTACT PHONE NUMBER: 702-219-9403

Purpose of the Study
Your child is invited to participate in a research study. The purpose of this study is to explore self-perceptions related to physical activity preferences of children with autism. The study will involve the development and administration of a video-based preference assessment to identify self-perceptions among children with autism of preferred activity choices as they relate to social and environmental contexts. Parents of the child participants will also complete the video-based preference assessment indicating what they believe are their respective child’s preferences related to physical activities. The child’s self-perceptions will then be compared to his/her parent’s beliefs about the preferred physical activities of his/her child.

Participants
Your child is being asked to participate in the study because he is a child diagnosed with autism and he is able to make a choice between two items.

Procedures
If you allow your child to volunteer to participate in this study, your child will be asked to do the following: Your child will be asked to participate in a screening to determine the ability to make a choice between two items prior to participation in the study. Your child will be seated at a table with an assessor. Your child will be presented with two items and instructed to “pick one.” Three trials will be conducted. If your child is able to make a choice for each trial, they will be eligible to participate in the study. Your child will be asked to participate in a video-based preference assessment on physical activity. A preference assessment will be administered by a behavioral consultant employed by Southwest Autism and Behavioral Solutions. The assessment will take approximately 2 1/2 hours. The assessment contains videos that display various physical activities. Your child will be asked to make a choice between two activities that he/she would like to participate in. In addition, pictures of environmental places (i.e. home, school, and parks) will be presented. Your child will be asked to make a choice of places he/she would like to participate in the chosen activities. Next, pictures of social contexts will be presented (i.e. family, peer, and peers). Your child will be asked to make a choice of who he/she would like to participate with in the chosen activities. Your child may choose more than one place or individual. During administration of the assessment, your child will be given scheduled breaks and reinforcement will be provided. Scheduled breaks will occur every 15 minutes.

Participant Initials ______________________

Approved by the UNLV IRB Protocol #1209-4352M

Received: 11-05-12 Approved: 11-13-12 Expiration: 11-12-13
Benefits of Participation
There may not be direct benefits to your child as a participant in this study. However, we hope to learn valuable information for professionals who teach individuals with autism and for parents who have children with autism. This research has the potential to provide information that may promote self-determination and a healthy lifestyle for individuals with autism. The data from this study will be shared with Southwest Autism & Behavioral Solutions for the purpose of improving services for their clients.

Risks of Participation
There are risks involved in all research studies. This study may include only minimal risks. It is possible that participants will experience minimal stress as they attempt to select preferred physical activities for themselves.

Cost/Compensation
There will not be a financial cost to you to participate in this study. The study will take approximately 21/2 hours of your child’s time and the time it takes to drive to the location of the assessment. Your child will not be compensated for their time.

Contact Information
If you or your child have any questions or concerns about the study, you may contact Lora Sankovich at 702-219-9403 or Susan Miller 702-895-1108. For questions regarding the rights of research subjects, any complaints or comments regarding the manner in which the study is being conducted you may contact the UNLV Office of Research Integrity – Human Subjects at 702-895-2794, toll free at 877-895-2794, or via email at IRB@unlv.edu.

Voluntary Participation
Your child’s participation in this study is voluntary. Your child may refuse to participate in this study or in any part of this study. Your child may withdraw at any time without prejudice to your relations with the university or Southwest Autism & Behavioral Solutions. You or your child is encouraged to ask questions about this study at the beginning or any time during the research study. The choice to participate or not to participate in this study will not affect individual services currently provided to your child from Southwest Autism & Behavioral Solutions.

Confidentiality
All information gathered in this study will be kept completely confidential. No reference will be made in written or oral materials that could link your child to this study. All records will be stored in a locked facility at UNLV for 3 years after completion of the study. After the storage time the information gathered will be destroyed, including hard data and computer files. The data from this study will be collected by employees of Southwest Autism & Behavioral Solutions and will be shared with Southwest Autism & Behavioral Solutions.

Participant Initials ___

Approved by the UNLV IRB. Protocol #1209-4252M
Received: 11-05-12 Approved: 11-13-12 Expiration: 11-12-13
Conflict of Interest Disclosure
The research team members involved in this study have an interest in the success of Southwest Autism & Behavioral Solutions and their clients. Lena Stankovich and Vanessa Fessenden, two members of the research team, are co-owners of Southwest Autism and Behavioral Solutions and also completing their doctoral dissertations at the University of Nevada Las Vegas. The information gathered from this study will be used as researchers and by Southwest Autism and Behavioral Solutions.

Participant Consent:
I have read the above information and agree to allow my child to participate in this study. A copy of this form has been given to me.

Signature of Parent ___________________________ Child's Name (Please print) ___________________________

Parent Name (Please Print) ___________________________ Date ________________

Participant Initials ___________________________
APPENDIX J

SOCIAL VALIDITY QUESTIONNAIRE

Social Validity Questionnaire

Please circle the number that best describes your opinion about each statement. Use the Likert scale below.

1 - Strongly Disagree  2 - Disagree  3 - Agree  4 - Strongly Agree

The assessment will be beneficial to my child.

1  2  3  4

I would be comfortable recommending the assessment to my child’s teacher or therapist.

1  2  3  4

I would be comfortable recommending the assessment to other parents.

1  2  3  4

The assessment was easy to complete.

1  2  3  4

The quality of the videos was good.

1  2  3  4

The physical activities in the videos were easy to understand.

1  2  3  4

The physical activities were realistic for my child.

1  2  3  4
The amount of time for the assessment was appropriate.

1  2  3  4

Overall, I had a good experience.

1  2  3  4

Other physical activities that should be included in the assessment:

_________________  __________________
_________________  __________________

Comments (Optional):
REFERENCES


The Individuals with Disabilities Education Improvement Act (IDEA 2004).


VITA

Graduate College
University of Nevada, Las Vegas

Lena Sankovich

Degrees:

2005  B.S., Special Education
      University of Nevada, Las Vegas

2006  M.Ed, Special Education
      University of Nevada, Las Vegas

2010  BCBA
      University of Nevada, Las Vegas

Presentations:

2006  National Association for the Education of Young Children
      Home-based Intervention Programs for Parents with
      Intellectual Disabilities. University of Nevada, Las Vegas
      Poster presentation

2008  Association for Behavior Analysis International
      “Let us out!” College Students’ Preference for Escape-Related
      Consequences. University of Nevada, Las Vegas
      Poster presentation

2008  Council for Exceptional Children
      Division on Developmental Disabilities
      Effective Community-Based Instruction for Students with
      Developmental Disabilities. University of Nevada, Las Vegas
      Poster Presentation

Dissertation Title:
Development and Implementation of a Video-Based Physical Activity Preference
Assessment for Children With Autism and Their Parents

Dissertation Examination Committee:
Chairperson, Susan P. Miller, Ph.D
Committee Member, Nancy Sileo, Ed.D
Committee Member, Tom Pierce, Ph.D
Committee Member, Dick Tandy, Ph.D