Instructional Use of Research-Based Practices for Students with Autism Spectrum Disorder

Eric Jay Nach
Lynn University

Follow this and additional works at: https://spiral.lynn.edu/etds

Recommended Citation
https://spiral.lynn.edu/etds/291
Instructional Use of Research-Based Practices for
Students with Autism Spectrum Disorder

DISSERTATION
Presented in Partial Fulfillment of the Requirements for the Degree of
Doctor of Philosophy
Lynn University

By
Eric Jay Nach

Lynn University
2009
APPROVAL OF DISSERTATION

Instructional Use of Research-Based Practices for
Students with Autism Spectrum Disorder

By Eric Jay Nach

Mayra Ruiz-Camacho, Ph.D.
Dissertation Committee Chair

__________________________  ______________________
Mayra Ruiz-Camacho, Ph.D.  Date
Dissertation Committee Chair

__________________________  ______________________
Adam Kosnitzky, Ph.D.  Date
Dissertation Committee Member

__________________________  ______________________
Patrick Hartwick, Ph.D.  Date
Dissertation Committee Member
Parents and educators have limited resources to devote to the education and training of students with autism spectrum disorder (ASD). Research has identified numerous scientifically-based practices and promising practices teachers can use when working with students with ASD, while other types of practices that teachers are using have been identified as having limited support or are not recommended practices for educating children with ASD (Simpson, 2005).

The purpose of this quantitative, non-experimental and exploratory (correlational) study using a predictive research design is to determine if the types of training teachers have, years of teacher experience educating students with ASD, student age, and school type where they work has an influence on the types of practices teachers use with students with ASD. The Autism Treatment Survey was adapted and utilized by 62 participants as an online survey. The participants were special education teachers from a Southeast Florida School District who attended the 2009 CARD (Center for Autism and Related Disabilities) conference in West Palm Beach Florida.

Results identified that the amount of training a teacher has in practices used with students with ASD and the type of school where the teacher works are the most influential factors on the types of practices teachers use when educating students with ASD.
ACKNOWLEDGEMENTS

I would not have been able to complete this project without stating my appreciation for everyone that helped me with this dissertation process.

My first THANK YOU goes out to a Higher Power that has provided me with the gifts of inspiration and determination and provided me with the resources and support to persevere and complete this project.

A HUGE thank you goes out to my dissertation committee, Mayra Ruiz-Camacho my Dissertation Chair, and my Committee Members Adam Kosnitzky, and Patrick Hartwick. You all have been incredibly helpful throughout this process. Adam Kosnitzky helped my throughout the research process, Patrick Hartwick lending words of encouragement and was never shy to share his expertise with me. Mayra Camacho-Ruiz, who walked me through the dissertation process and spent countless hours supporting my efforts, I thank you all for believing in me.

My sincerest appreciation has to be towards my family and friends. My wife Paula, who continues to be encouraging of all the projects I undertake despite the massive sacrifices we choose to endure. To my parents Linda and Gilbert and my second set of parents Irv and Nancy. You all have helped me in more ways than you will ever know.

Next, I would like to thank Dr. Jack Scott with FAU C.A.R.D for allowing me to conduct my survey at their 2009 conference. Dr. Kyle Bennette for being supportive while providing me with much knowledge at his training sessions and my PEPSA partner Ali Cunningham who has offered much assistance and support.

I would also like to thank the many teachers who participated in my survey and thank you to the creators of my survey instrument Kristen Hess, Michael Morrier, and L. Juans Heflin for granting me permission to adapt their survey.
Thanks also go out to my many professors and friends in and out of Lynn University especially; Bob, Ann, Todd, Debbie, Ronda, Janie and Kenn, and with much appreciation I thank the Administrative Team and my ESE Department Members at Don Estridge High Tech Middle School.
TABLE OF CONTENTS

Instructional Use of Research-Based Practices for Students with Autism Spectrum Disorder

ABSTRACT iv
ACKNOWLEDGEMENTS v
TABLE OF CONTENTS vii
LIST OF TABLES xi
LIST OF FIGURES xiii

CHAPTER I: INTRODUCTION TO THE STUDY 1
Introduction and Background to the Problem 1
Statement of the Problem 5
Factors Influencing Teaching Students with Autism Spectrum Disorder 14
Integration of Autism Spectrum Disorder Theories into Teacher Pedagogy 19
Identifying and Integrating Educator use of Interventions 23
Definition of Terms 27
Purpose of the Study 28
Significance of the Study 29
Assumptions 30
Delimitations and Scope 30
Organization of the Study 31

CHAPTER II: LITERATURE REVIEW 33
Comorbidity Factors 34
Attention 34
Anxiety 36
Psychiatric Problems 37
Physiological Issues 38
Cognitive Theories of Autism 39
Executive Function Theory 40
Theory of Weak Central Coherence 42
Theory of Mind 45
Underconnectivity Theory 48
Problem Solving Theory 50
Socialization Theories of Autism 52
Social Competence Theory 52
Social Relations Theory 54
Communication Theories of Autism 56
Chaos Theory 57
Communication Theory 58
Language Development Theory 59

Gender Theories of Autism 61
Baron-Cohen’s Empathising-Systemising Theory 62
Baron-Cohen’s Extreme Male Brain Theory 63
Heritability/Genetic Theory 65

Physiological Theories of Autism 67
Limbic System (Amygdalae) Theory 68
Nutritional/Opioid Theory 69

INTERVENTIONS and PRACTICES 71

Scientifically-Based Practices 72
Applied Behavioral Analysis (ABA) 72
Discrete Trial Teaching 74
LEAP (Learning Experiences: An Alternative Program for Preschoolers and Parents) 74
Pivotal Response Training (PRT) 75

Promising Practices 76
Assistive Technology 77
Augmentative Alternative Communication 78
Cognitive Behavior Modification 79
Incidental Teaching 80
Joint Action Routines (JAR) 82
Picture Exchange Communication System (PECS) 83
Play-Oriented Strategies 84
Sensory Integration 84
Social Decision-Making Strategies 86
Social Stories 87
Structure Teaching (TEACCH) 91

Limited Supporting Information for Practice 92
Art Therapy 93
Auditory Integration Training 94
Cartooning 95
Fast ForWord 95
Floor Time 96
Gentle Teaching 97
Music Therapy 98
Option Method (Son-Rise Program) 99
Pet/animal Therapy 100
Power Cards 100
Relationship Development Intervention (RDI) 101
Scotopic Sensitivity Syndrome: Irlen Lenses 102
van Dijk Curricular Approach 103

Not Recommended Practices 104
Facilitated Communication 104
Holding Therapy 105

Not Rated Practices 106
Recommendations for Future Study

REFERENCES

BIBLIOGRAPHY

APPENDIXES
Appendix A: Autism Treatment Survey
Appendix B: Permissions to Use Instrument
Appendix C: Draft of Voluntary Consent Form
Appendix D: Draft of Flyer Distributed at Card 2009 Conference
Appendix E: Permission to Conduct Survey at 2009 Card Conference
Appendix F: IRB Approval

VITA
<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-1</td>
<td>Cognitive Theories of Autism Spectrum Disorder</td>
<td>40</td>
</tr>
<tr>
<td>2-2</td>
<td>Socialization Theories of Autism Spectrum Disorder</td>
<td>52</td>
</tr>
<tr>
<td>2-3</td>
<td>Communication Theories of Autism Spectrum Disorder</td>
<td>57</td>
</tr>
<tr>
<td>2-4</td>
<td>Gender Theories of Autism Spectrum Disorder</td>
<td>62</td>
</tr>
<tr>
<td>2-5</td>
<td>Physiological Theories of Autism Spectrum Disorder</td>
<td>68</td>
</tr>
<tr>
<td>2-6</td>
<td>Scientifically-Based and Practices</td>
<td>72</td>
</tr>
<tr>
<td>2-7</td>
<td>Promising Practices</td>
<td>77</td>
</tr>
<tr>
<td>2-8</td>
<td>Limited Supporting Information for Practice</td>
<td>93</td>
</tr>
<tr>
<td>2-9</td>
<td>Not Recommended Practices</td>
<td>104</td>
</tr>
<tr>
<td>2-10</td>
<td>Not Rated Practices</td>
<td>106</td>
</tr>
<tr>
<td>2-11</td>
<td>Interventions and Practices as Categorized by Simpson (2005) and on ATS</td>
<td>121</td>
</tr>
<tr>
<td>3-1</td>
<td>Target Population: K-12 Special Education Teachers in a School District in Southeast Florida</td>
<td>125</td>
</tr>
<tr>
<td>4-1</td>
<td>Gender of Participants</td>
<td>140</td>
</tr>
<tr>
<td>4-2</td>
<td>Education Level of Participants</td>
<td>140</td>
</tr>
<tr>
<td>4-3</td>
<td>Ethnicity of Participants</td>
<td>141</td>
</tr>
<tr>
<td>4-4</td>
<td>Scientifically-based Practices Used</td>
<td>142</td>
</tr>
<tr>
<td>4-5</td>
<td>Promising Practices Used</td>
<td>143</td>
</tr>
<tr>
<td>4-6</td>
<td>Limited Supporting Information for Practice Practices Used</td>
<td>144</td>
</tr>
<tr>
<td>4-7</td>
<td>Not Recommended Practices Used</td>
<td>144</td>
</tr>
<tr>
<td>4-8</td>
<td>Not Rated Practices Used</td>
<td>145</td>
</tr>
<tr>
<td>4-9</td>
<td>Participants’ Years Teaching Experience and Years of Teaching Children with Autism Spectrum Disorder</td>
<td>147</td>
</tr>
<tr>
<td>4-10</td>
<td>Types of Training Received for Scientifically-Based Practices</td>
<td>149</td>
</tr>
<tr>
<td>4-11</td>
<td>Types of Training Received for Promising Practices</td>
<td>151</td>
</tr>
<tr>
<td>4-12</td>
<td>Types of Training Received for Limited Supporting Information for Practice Practices</td>
<td>153</td>
</tr>
<tr>
<td>4-13</td>
<td>Types of Training Received for Not Recommended Practices</td>
<td>154</td>
</tr>
<tr>
<td>4-14</td>
<td>Types of Training Received for Not Rated Practices</td>
<td>156</td>
</tr>
<tr>
<td>4-15</td>
<td>Practices as Categorized on ATS as Dependent Variables</td>
<td>159</td>
</tr>
<tr>
<td>4-16</td>
<td>Scientifically-Based Practices Used by Participants</td>
<td>161</td>
</tr>
<tr>
<td>4-17</td>
<td>Promising Practices Used by Participants</td>
<td>162</td>
</tr>
<tr>
<td>4-18</td>
<td>Limited Supporting Information for Practice Practices Used by Participants</td>
<td>164</td>
</tr>
<tr>
<td>4-19</td>
<td>Not Recommended Practices Used by Participants</td>
<td>166</td>
</tr>
<tr>
<td>4-20</td>
<td>Not Rated Practices Used by Participants</td>
<td>167</td>
</tr>
<tr>
<td>4-21</td>
<td>Regression with Teacher Experience and Teacher Training Predicting Not Rated</td>
<td>170</td>
</tr>
<tr>
<td>4-22</td>
<td>Regression with Teacher Experience and Teacher Training Predicting use of Not Recommended Practices</td>
<td>171</td>
</tr>
<tr>
<td>4-23</td>
<td>Regression with Teacher Experience and Teacher Training Predicting use of Limited Supporting Information for Practice</td>
<td>173</td>
</tr>
<tr>
<td>4-24</td>
<td>Regression with Teacher Experience and Teacher Training Predicting</td>
<td>174</td>
</tr>
</tbody>
</table>
use of Promising Practices
4-25 Regression with Teacher Experience and Teacher Training Predicting use of Scientifically-Based Practices
4-26 Regression with Student Age Predicting use of Not Rated Practices
4-27 Regression with Student Age Predicting use of Not Recommended Practices
4-28 Regression with Student Age Predicting use of Limited Supporting Information for Practice Practices
4-29 Regression with Student Age Predicting use of Promising Practices
4-30 Regression with Student Age Predicting use of Scientifically-Based Practices
4-31 Type of School Where Participants Teach Students with ASD
4-32 Regression of School Type Predicting use of Not Rated Practices
4-33 Regression of School Type Predicting use of Not Recommended Practices
4-34 Regression of School Type Predicting use of Limited Supporting Information for Practice
4-35 Regression of School Type Predicting use of Promising Practice
4-36 Regression of School Type Predicting use of Scientifically-Based Practices
# LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Autism Spectrum Disorders Umbrella Diagram</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>School Type Where Participants Work</td>
<td>141</td>
</tr>
<tr>
<td>3</td>
<td>Question 3 from Section I on ATS</td>
<td>146</td>
</tr>
<tr>
<td>4</td>
<td>Sample Item from ATS Under Training Your Received Section</td>
<td>148</td>
</tr>
<tr>
<td>5</td>
<td>Training Received for Applied Behavior Analysis Practice</td>
<td>150</td>
</tr>
<tr>
<td>6</td>
<td>Training Received for Assistive Technology Practice</td>
<td>152</td>
</tr>
<tr>
<td>7</td>
<td>Training Received for Music Therapy Practice</td>
<td>154</td>
</tr>
<tr>
<td>8</td>
<td>Training Received for Facilitated Communication</td>
<td>155</td>
</tr>
<tr>
<td>9</td>
<td>Training Received for Visual Schedules Practice</td>
<td>157</td>
</tr>
<tr>
<td>10</td>
<td>Sample Item from ATS under Classroom Strategies Utilized</td>
<td>157</td>
</tr>
<tr>
<td></td>
<td>Section</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Sample Item from ATS of Chronological Ages of Students</td>
<td>177</td>
</tr>
<tr>
<td>12</td>
<td>Chronological Ages of Students Being Taught by Participants in 2008-2009</td>
<td>177</td>
</tr>
<tr>
<td>13</td>
<td>Sample Item from ATS under Interpersonal Relationship Interventions</td>
<td>178</td>
</tr>
<tr>
<td>14</td>
<td>Sample Item from ATS of School Types Participants Teach In</td>
<td>183</td>
</tr>
</tbody>
</table>
CHAPTER I
INTRODUCTION TO THE STUDY

Introduction and Background to the Problem

The prevalence of autism spectrum disorder (ASD) is increasing at an alarming rate. In 2007, 1 in 150 eight year old children in the United States were diagnosed with ASD (Autism Information Center, 2007). Today, every 20 minutes a child is diagnosed with ASD, suggesting that approximately 24,000 new cases of autism will be identified by the end of the year (Talk About Curing Autism, 2008).

Based on current research findings autism spectrum disorder is derived from neurodevelopmental origins and linked to genetic inheritance (Baron-Cohen & Bolton, 1993; Happe’, 1994; Harper et al., 2006; Howlin, 1998). Autism spectrum disorder is an “umbrella” under which five possible diagnoses are comprised: Autistic Disorder, Asperger Syndrome (AS), Childhood Disintegrative Disorder (CDD), Rett’s Disorder and Pervasive Developmental Disorder- Not Otherwise Specified (PDD-NOS) (Exkorn, 2006; Siegel, 1996).

FIG. 1 Autism Spectrum Disorder umbrella
The term spectrum as used in the phrase autism spectrum disorder suggests that there is a wide disparity of the academic, communication, language skills, socialization and overall functioning levels of students with mild, moderate or severe levels of impairments (Exkorn, 2006). Autism is described as a pervasive developmental disorder with greatest impairments in the areas of communication, socialization, repetitive and/or perseverative behaviors and cognitive functioning (National Education Association, 2006). According to the Diagnostic and Statistical Manual, Fourth Edition-Text Revision (2000), the diagnostic criteria for autism includes noticeable impairments in nonverbal behaviors, failure to develop relations with peers, lack of social reciprocity, impediment or lack of development of spoken language, stereotypic speech, and lack of make-believe play, ritualistic type behaviors and repetitive fine and/or gross motor movements.

Functioning ranges of students with ASD vary from severely impaired to gifted intelligence levels (Baron-Cohen & Bolton, 1993). Asperger syndrome (AS) was first described as a social disability by a Viennese psychiatrist, Hans Asperger, in 1944 (Attwood, 1998; Exkorn, 2006; Klin et al., 2000). Asperger syndrome is commonly referred to as the “upper element of the so-called autism spectrum” (Myles & Simpson, 1998, p.2). In his study Asperger described four individuals with autism like tendencies; however, they differed from individuals with autism in that they had normal intellectual and communication abilities, their greatest challenges were with socialization and perception (Howlin, 1998; Jordan & Powell, 1995; Schellenberg et al, 2006; Siegel, 1996). This realization lead Asperger to describe the individual with AS as having similar characteristics to individuals with autism (Myles & Simpson, 1998; Myles & Southwick, 2005).
To increase the complexity of proper diagnosis and treatment of individuals with AS, the level of social deficits experienced by each person will often vary significantly (Baron-Cohen & Bolton, 1993; Harper et al., 2006; Wing, 1981). Perceptual differences in individuals with AS also vary (Jordan & Powell, 1995). As issues that exist for some students with AS may not exist for others, some individual may be able to comprehend the meaning of facial expressions, eye contact, and body language or an appreciation for sports while others may not be able to understand the hidden meanings or their perception may be on different levels (Harper et al., 2006; Howlin, 1998; O’Neill, 1998).

Some children with AS have developmental delays in academic areas whereas, others may excel far past their peers (Attwood, 2007; Happé, 1994). The specific criterion in diagnosis that separates AS from other forms of ASD is ill-defined and makes proper diagnosis difficult at best. Happé (1994) suggests a diagnosis of AS only to those individuals on the spectrum that has developed Theory of Mind abilities, but, perhaps are not quite competent in applying them successfully in social interactions and activities. Baron-Cohen (1995) explained how the Theory of Mind might best be explained as how children with ASD lack the ability to appreciate how other people think and feel.

The U.S. Office of Special Education (2008) reported that during the 2004 school year, approximately 166,000 students between the ages of 6 and 21 were receiving special education services under the category of “autism spectrum disorder”. The challenging behaviors that may be exhibited by students on the spectrum can interfere with the education of the students themselves and other students that may be in inclusive settings along side them (Goodman & Williams, 2007). Students that experience profound impairments in the educational setting may need a greater amount of direct instruction than others. The types and frequency of the
accommodations and modifications to academic processes for students with ASD varies greatly depending on the needs of the students. Early intervention and highly structured academic programs are commonly viewed as the greatest hope for educating students with ASD (Harpur, Lawlor, & Fitzgerald, 2006).

The Individuals with Disabilities Education Act (IDEA) explains how the educational system in the United States guarantees a free and appropriate public education to all students, including those with ASD (Goodman & Williams, 2007). The complex issues of educating and socializing students with ASD form a complicated and challenging dilemma for parents, educators and other professionals (Attwood, 2007).

Students with ASD may experience problems in the school environment largely because many of them have pronounced difficulties being able to interact socially with peers and faculty, in their abilities to communicate with others, and because of unique behaviors and interests compared to peers (Attwood, 1998; Baron-Cohen & Bolton, 1993; Happe', 1994; Howlin, 1998; Jordan & Powell, 1995; Myles & Simpson, 1998; Selfe, 1977; Siegel, 1996; Treffert, 1989; Wing, 1995). Students with ASD may exhibit complicated methods of functioning in the school environment, may have challenges paying attention, and may react differently to stimulation than their non-disabled peers (Cumine, Leach & Stevenson, 1998).

Students with ASD have an inherent inability to cope with frustration and can become worried, anxious or fearful as a result, leading to further challenges with independent functioning and learning (Attwood, 2007; Happe', 1994; Howlin, 1998). Additional challenges involved in educating students with ASD entails co-existing conditions of other pre-teenage or teenage psychiatric issues such as “depression, anxiety disorders, attention deficit hyperactivity disorders, ADHD, adjustment disorders, and more” (Harper et al., 2006, p. 44).
Jordan and Powell (1995) found that since children with ASD have different levels of functionality and their levels of severity can vary greatly, how they learn and the types of interventions that are successful varies greatly. Regardless as to where they are on the spectrum, students with ASD are often perceived to be “socially awkward, socially stiff, emotionally blunted, self-centered, unable to understand nonverbal social cues, inflexible and lacking in empathy and understanding” (Myles & Simpson, 1998, p. 4). These perceived social deficits and others impact the effectiveness of interventions used by educators in the classroom setting and support the rationale that teachers working with students with ASD need to have a comprehensive theoretical knowledge of the issues students with ASD are faced with.

Statement of the Problem

According to IDEA data, the number of reported cases of ASD in the United States, for individuals between the ages of 6-22 during 1992 was 15,580, by 2006 the number increased to 224,594 an increase of 1442% (Fighting Autism, 2008). Under the category of Autism Spectrum Disorder, approximately 166,000 students currently received special education services in the United States (U.S. Office of Special Education, 2008). Occurrence reports in the State of Florida from 1992 to 1999 accounted for an increase in the number of students being served under the ASD diagnosis from 582 children to 3,114 children, a 435% increase (IDEA, 2008). In December 2006 data from the Florida Department of Education identified 10,712 students statewide who were diagnosed on the autism spectrum (Florida Department of Education Statistical Brief, 2007). These figures suggest an increase in the number of students with ASD being served in the state. The Florida Public Schools Autism Prevalence Report Series (2004) had the following to say about the prevalence of ASD and its effect:
The increase in autism prevalence is systemic across the entire United States and should be an urgent public health concern. The majority of the increase is attributed to young children. The increasing prevalence trend provides additional evidence that disease frequency is, and has been, increasing in the United States. The disease frequency of autism now surpasses that of all types of cancer combined. (Hollenbeck, 2004, p. 1).

The issue of educating students in the autism spectrum is multifaceted as these students have a host of characteristics that differentiate them from their typically developing peers. These differences lead to challenges in education that has lead to a prescribed set of solutions to assist in the education of students with autism. Federal legislation, such as the Individuals with Disabilities Education Improvement Act (IDEIA) of 2004 and No Child Left Behind Act (NCLB) of 2001, increases the stakes for educators to provide services to students with ASD in the Least Restrictive Environment (Etsceidt, 2006; Goodman & Williams, 2007; Simpson, 2005).

Both specialized training programs and in-service opportunities for teachers are limited in scope and content (Simpson, 2004). As more students with high functioning autism and Asperger syndrome are educated in general education classrooms, teacher preparation programs for general education teachers must be designed with the needs of students with ASD in mind. Students with ASD benefit from explicit instruction and direction in all areas of the school venue and teachers need to be able to provide them with what they need (Betts et al., 2007). Research also identifies a challenge with autism education is that specific degrees of programming is lacking (Stahmer, 2007). Teacher training and support is an area of variability that may affect the
quality of practices used and the effectiveness of the practices teachers tend to use (Stahmer, 2007).

A necessary skill that is often lacking for students with ASD is to be able to transition between classroom activities and class settings. Typically students with ASD have difficulties with changing from one activity to another and often do not have the ability to compartmentalize individual tasks and make necessary adjustments to transitional activities. This difficulty with transitioning type activities is a cause for challenges and frustration that affects academic and social performance. The inability to multitask in the inclusion classroom setting is another challenge faced by students with ASD. The ability to put closure to one idea and engage in another activity can be a source of physiological and psychological stress for students with ASD. These stresses can manifest themselves in disruptive behaviors that can affect the performance of the entire class (Attwood, 2007; Howlin, 1998).

Problems associated with academic performance for students with ASD are often derived from the following functional challenges (Attwood, 2007, p.234):

- Organization and planning
- Working memory
- Inhibitions and impulse control
- Self-reflection and self-monitoring
- Time management and prioritizing
- Understanding complex or abstract concepts
- Using new strategies
The students’ ability to solve problems in the classroom is another challenge for students with ASD in an inclusive environment. By increasing problem solving and socialization abilities, social adjustment skills will be enhanced, leading to greater academic success (Howlin, 1998; Jordan & Powell, 1995). Research has found that many students with ASD will continue to use their own method of problem solving even when the approach is not working. Therefore, teachers that understand the cognitive and behavioral aspects of students with ASD are more likely to make positive gains with these students. Educators that encourage flexibility in thinking and problem solving are most successful in educating students with ASD. Children with ASD can benefit from peers, parents and teachers verbalizing problem solving strategies so that they can mimic and utilize other problem solving methods (Attwood, 2007).

Children on the autism spectrum may experience problems with speech that greatly impact their ability to be educated in the general education or inclusive settings. It is estimated that 40 percent of all children with ASD can’t communicate verbally (Exhorn, 2006). The inabilities of some children with ASD to initiate or be successful in two way conversations with peers or teachers, causes further challenges to the education process (Exhorn, 2006; Howlin, 1996; Siegel, 1996).

Students with ASD often experience fears based on their experiences with socialization and communication that they do not comprehend (Attwood, 2007; Simpson, 2005). These fears may impact the learning experience and may cause physiological and psychological symptoms such as stress, lack of energy and loss of motivation due to the immense amount of anxiety they experience (Williams, 1994). Co-existing issues of anxiety, depression, hyperactivity, attention and obsessive compulsive disorders may also impact their ability to learn (Harpur et al., 2006).
In addition to the direct effects the students experience in the school environments, the costs associated with educating and taking care of these students is considerable.

The cost of autism to the economy is estimated at nearly $90 billion and projected to more than double in the next decade (TACA, 2008). The Autism Society of America (2008) projects that the lifetime cost of caring for a child with ASD could be as high as $5 million and cumulative costs of caring for children with ASD in the United States could be as high as $90 billion annually. Other factors contributing to the educational success of students with ASD involve legislation issues such as IDEA and NCLB. School based services, such as IEP’s (Individualized Education Plans), 504 Plans, inclusion education programming, support facilitation programming, Speech and Language Pathologist services, and behavioral plans are all potential issues that may lead to academic success.

According to the latest data from the Florida Department of Education website, the number of Public School students diagnosed with Autism and in exceptional student education programs statewide as of December 2006 was approximately 11,000 up from 582 in 1993. In the same year, the largest three counties in Florida, Broward, Dade and Palm Beach, the number of students labeled as Autistic were 2,160, 1,700 and 794 respectively (Florida Department of Education Statistical Brief, 2007).

According to rule 6A-6.03023, FAC. and the Florida Department of Education website, in order for a student in Florida to be eligible for Exceptional Student Education services under the diagnosis of Autism Spectrum Disorder, they must meet the following eligibility criteria:

- An uneven developmental profile across the domains of language, social interaction, adaptive behavior, and/or cognitive skills
• Impairment in social interaction evidenced by delayed, absent, or atypical ability to relate to people or the environment
• Impairment in verbal and/or nonverbal language or social communication skills
• Restricted repetitive and/or stereotyped patterns of behavior, interests, or activities
• Reference to evidence of onset during the first three years of life has been deleted (Florida Department of Education Website, 2007).

Students on the autism spectrum often have psychiatric irregularities and physiological abnormalities that co-exist with their autism characteristics and may impede learning and social skills development. Some of these Comorbidity issues may include; attentional abnormalities, anxiety issues, behavioral difficulties, depression, visual, auditory and tactile irregularities (Kutscher, 2005).

School districts and educators within these districts direct their teaching based on the requirements set out by the Department of Education for each State. To better understand how legislative factors influence the education of students with ASD, it is helpful to have a basic understanding of these factors.

Since the passing of Public Law 94-142 in 1975 (now IDEIA, 2004), it has been a civil right of all students with disabilities including those with ASD, to be educated in Public Schools. In 1990, these rights were further clarified and supported when Public Law 94-142 was reauthorized as the Individuals with Disabilities Education Act of 1997 (IDEA) (Goodman & Williams, 2007). In 2004 IDEA was reauthorized once again this time as the Individuals with Disabilities Education Improvement Act of 2004 (IDEIA). IDEIA guarantees students with disabilities a free and appropriate public education utilizing the Least Restrictive Environment (LRE) and Individual Education Plans (IEP’s) to enhance student success. IDEIA made
discrimination against people on the basis of the presence of a disability illegal (Goodman & Williams, 2007).

An Individualized Education Plan (IEP) serves as a legal document designed to track the advancement of goals and objectives of students with disabilities to improve the likelihood that they will make progress towards identified goals in their educational pursuits (Jordan & Powell, 1995). IDEIA also requires for the IEP to contain a statement that includes the students’ current level of performance in regards to educational objectives and their functional abilities, and the types of special education services the student must receive throughout the IEP year.

IEP’s must indicate how much time a student spends participating with students without disabilities in the general curriculum and the amount of specialized services they need as well as who will provide these services and when. It also includes a description of special accommodations students will need to have on state and district wide tests. Once a child turns 16, the IEP is required to have a statement regarding transitioning services beyond high school (Etscheidt, 2006).

Behavioral concerns are another component of the IEP process. The IEP team must identify problem behaviors and develop a Functional Behavioral Assessment (FBA) and Behavioral Intervention Plan (BIP) to reduce problem behaviors that impact the students learning process. In West Des Moines Community School District v. Heartland Area Education Agency (2002) a judge determined that the lack of specificity and program monitoring for a BIP for a young child with Asperger’s Syndrome rendered the IEP inappropriate (Etscheidt, 2006, p.58). The creation, implementation and utilization of a BIP can be an effective tool when working with students with ASD, however, proper training and implementation is essential.
Successfully educating children with ASD in public and private schools is a faced throughout the Country. Research has wide variations as to what methodological educational approach is best and which interventions and practices are most promising. Therefore, to follow the guidelines of IDEIA educators need to be open to the findings and recommendations of peer educators and professionals as successful ventures in the educational venue continue to develop and become documented (Attwood, 2007; Jordan & Powell, 1995).

Teacher monitoring of students with disabilities, including those students who have ASD, has been questioned (Baron-Cohen & Bolton, 1993). Shortfalls have been found in several areas, including lack of progress monitoring, poor delegation of monitoring assignments, a lack of monitoring behavior intervention plans for students with behavioral issues, the guidelines established by IDEIA not being met regarding frequency of monitoring of students with disabilities (Etsceidt, 2006). This lack of training and follow-through lead to a court case involving monitoring the progress of a student with autism in inclusion classes, "Sioux City Community School District v. Western Hills Area Education Agency 12 (2003), the administrative law judge concluded that the school district failed in its responsibility to monitor progress of a seven-year-old child with autism who was fully included in a general education classroom" (Etsceidt, 2006, p.57). In this case, the responsibility of monitoring the progress of the student was performed by a paraprofessional and not a certified special education teacher as was written in the IEP.

In another case involving a student with ASD the LinnMar Community School District v. Grant Wood Area Education Agency 10 (2004), a 19-year-old student on the autism spectrum was placed with an associate who was responsible for instruction, behavior management, and data collection however, the students' behaviors and progress did not get documented even
though the parents contacted the school and expressed their concern about a noticeable decrease in the student’s positive behavior at home and expressed a concern about the special education program. The student was awarded three additional years of educational services (Etsceidt, 2006).

The No Child Left Behind Act (NCLB) of 2001 increased the stakes for educators to implement research based strategies to improve the educational advancement of students with disabilities. “Although this is a daunting challenge for any group of students, the process of identifying and consistently and correctly using effective practice methods has been especially demanding for professionals who work with children and youth with autism spectrum disorder” (Simpson, 2005, p.140).

NCLB increased the need to identify effective methods of educating and training students with ASD. Based on the development of intervention strategies and the varying levels of need of students with ASD, there may not be a universally effective strategy and methodology that can be implemented with all students with ASD (Simpson, 2005). After reviewing multiple interventions and strategies identified as primary techniques to use with children with ASD, Simpson (2005) concluded that these children may benefit from having a variety of practices to help them depending on the specific needs of the child (Baron-Cohen & Bolton, 1993). Students with ASD may be exposed to treatment methods and intervention strategies that are not substantially researched supported at the current time. “The need to identify effective methods is so important that the field will not be able to move forward without significant progress in this area” (Simpson, 2005, p.147).
One clear message from the legislation is that educators need to be open to factors that assist and inhibit successful education of students with ASD (Attwood, 2007; Jordan & Powell, 1995). This last statement leads to a discussion of the first problem area:

**Factors Influencing Teaching Students with ASD**

Teacher Training: The first issue addresses the methods and strategies teachers can use to successfully educate individuals with ASD. One of the issues with inclusive education involves teacher selection and preparation. The levels and types of teacher certification, training, and personal attitudes can impact the effectiveness and implementation of educational approaches with students with ASD (Attwood, 2007). Bullard (2004) found that teachers who are patient, calm and willing to practice repetition are the most successful in teaching students with ASD. Autism spectrum disorder and the challenges associated with it in the educational environment lead to many educators and parents to promote methods of education and treatments that are not proven to be effective, even if they look promising (Simpson, 2005). The quantity of teachers that currently hold endorsements in autism is extremely low. The Florida Department of Education Website: Educator Certification Lookup (2008) reported that from the 281,761 teaching certifications that are currently held by teachers in the State of Florida only 122 of those teachers have an autism endorsement.

Having an Autism Endorsement is a new ruling developed by The Florida Department of Education (FLDOE) to increase the number of highly qualified teachers that educate students with ASD. The FLDOE anticipates that this increase in teacher training will lead to an increase in the academic and social performance of students with ASD. Rule 6A-4.01796 of the Florida Administrative Code (FAC) requires teachers grades K-12, who educate students with autism more than 50 percent of the time, must have a certification in exceptional student education area
and complete additional coursework to earn an endorsement in autism or severe or profound disabilities prior to July 1, 2011. The specialization requirements for an endorsement in autism, according to the Florida Department of Education’s: Educator Certification Administrative Rule 6A-4.01796 (2008) are as follows:

(1) A bachelor's or higher degree with certification in any exceptional student education area; and

(2) Twelve semester hours to include:

(a) Nature of autism (to include student characteristics, appropriate learning goals, teaching approaches, environmental arrangements, etc.);

(b) Use of assistive and instructional technology and natural, alternative and augmentative communication systems for students with autism;

(c) Behavior management and positive behavior supports for students with autism;

(d) Assessment and diagnosis of autism, and

(e) Field-based experience with students with autism

Teacher training and experience are additional factor affecting the education of students with ASD. There is a shortage of teachers who are qualified to teach students with ASD (Simpson et al., 2005). Teachers who educate students with ASD not only need to be knowledgeable about general and special education, but, need specialized skills in the area of autism (Simpson, 2004). Barriers that impact teacher integration of research-based practices into
the school environment include: limited opportunities for training, minimal resources to support
students with ASD, large student caseloads, and a less than adequate amount of specialized
programs for students with ASD (Stahmer, 2007). Topics such as social interactions, sensory
support, environmental management and positive behavioral management must be in the
repertoire of the teacher (Simpson, 2004). Additionally these teachers not only need the
theoretical knowledge of these core concepts, but will need to have practice incorporating these
skills into their teachings with students with ASD (Attwood, 2007).

Teacher Experience: The total number of years of experience educators have teaching
and the number of years they have had teaching students with ASD may be another factor
influencing the use of research-based practices. Hess, Morrier, Heflin, and Ivey (2008) surveyed
185 teachers in Georgia who work with students with ASD. Results indicated that overall years
of teaching experience was more than two times greater than the number of years teaching
students with ASD, averages were 12.25 years and 4.95 years respectively. Further results
indicated that the total number of years teaching was approximately twice as much as the total
number of years teaching students with ASD, 20.67 and 10.01 years respectively (Hess et al.,
2008).

Type of school where teachers work: Differences in school types are another factor that
may influence how teachers educate students with ASD. The type of school a student with ASD
attends should be based on the needs of the child and available services. School options are
reported as:

Public (border) school: most commonly known as a neighborhood public school and
attendance is based on the proximity students live to the school and school district boundaries.
Funding is through federal, state and local taxes, can not charge tuition. Teachers are required to have teacher certification in the area they teach. All students must be admitted, including those with special needs and the school is required to have programs so that all students are able to have a Free and Appropriate Public Education, including those students with ASD (Great Schools, 2009)

Choice school: a public school often specializing in a particular subject, theme or focus. Students from virtually all parts of a school district are eligible to attend, however, they have to submit an application and are typically chosen to attend based on a lottery type of selection. The same funding and teacher certification requirements are required as standard public schools (Great Schools, 2009)

Magnet school: a public school that attracts students from diverse social, economic, ethnic and racial backgrounds from all over a school district that are drawn to a specific subject or theme. The same funding and teacher certification requirements are required as standard public schools. Students typically have to audition, take an exam or demonstrate knowledge or ability in a specific area to be selected to attend (Ed. Gov, 2009).

Charter schools: are privately run public schools and are granted a charter by the school board. They may or may not be specifically focused and students typically live in the close proximity to the school. They usually have specialized programs are innovative and have smaller classes (Great Schools, 2009).

Private schools: are privately run and typically funded through tuition, fundraising, donations and private grants. Some are parochial but, not all. Admission is selective, unlike public schools. They do not have to provide services for students with special needs, although, they may choose to (Great Schools, 2009).
Data to support the effectiveness of one school type over another when educating students with ASD was not found in the literature at this time.

Students’ age: Research suggests that the age of the student with ASD is not a predictor of the types of interventions and practices teachers use with them (Iovannone, Dunlap, Huber, and Kincaid, 2003). In a study of teacher implementation of effective educational practices used with students with ASD ages 3-15 by Iovannone et al. (2003), no apparent correlation was found related to the type of practices used. Findings infer that choosing the right type of interventions and practices for students with ASD should be based on the specific needs of the student not age and that no one practices should be used to the exclusion of other. Findings also suggest that more research should be conducted with middle and high school age students with ASD (Iovannone et al., 2003).

Hess et al. (2008) utilized the Autism Treatment Survey in Georgia Public Schools and found that all types of student age categories (preschool, elementary school, middle school and high school) used sensory integration practice. Floor time, social stories, and music therapy were used with all age groups except for high school age students. Social decision making was utilized only in high school. Picture exchange communication systems (PECS) was used by all grades except preschool, while middle school teachers were the only ones to use relationship development intervention (RDI) and structured teaching. Only elementary grades used assistive technology, discrete trail, facilitated communication, Fast ForWord, LEAP and power cards. These results suggest that there are differences in the types of practices used by students of different age categories as they are grouped by grade level (Hess et al., 2008). As research has indicated school programming that does not have clearly identified guidelines for teachers on the
type of practices to utilize with their students at different age groups increases the likelihood that practices other than scientifically-based practices will be utilized (Hess et al., 2008).

**Integration of ASD Theories into Teacher Pedagogy**

The second issue addresses the lack of teachers’ theoretical knowledge in how students with ASD understand the world around them and how they function. Teachers may have preconceived attitudes and beliefs about what students with ASD can and cannot do as a result of limited interaction with students on the autism spectrum (Al-Shammari, 2006). Educating students with ASD is a complex challenge for teachers as students’ levels of functioning range from severely impaired to gifted intelligence (Baron-Cohen & Bolton, 1993). Students with ASD may have difficulties functioning in the school environment, have problems paying attention, and may react differently to stimulation than their non-disabled peers (Cumine, Leach & Stevenson, 1998). These students are challenging to educate as they have pronounced difficulties with being able to interact in a socially acceptable manner with peers and faculty, communicate differently than typical peers, and have unique behaviors and interests compared to peers (Baron-Cohen & Bolton, 1993; Happe’, 1994; Jordan & Powell, 1995; Selfe, 1977; Siegel, 1996; Treffert, 1989; Wing, 1995). Many students with ASD share many of the same difficulties in learning, communication, behavior and socialization as students with other types of disabilities. However, the severity of the socialization and communication issues is often greater and more complex.

Students with ASD often have learning challenges or disabilities based in cognitive, linguistic, and social areas and are in need of effective educational interventions to be successful in school (Attwood, 2007; U.S. Office of Special Education, 2008). In order for teachers to provide the services that are needed, they must be supplied with the necessary resources and training. By educating teachers on the different theoretical perspectives of ASD and how they
can be addressed by specific interventions, teachers can be more successful in identifying and using the most useful types of interventions with their students with ASD. The resources and types of training that might prove to be the most useful should focus on how to have student’s complete assigned tasks, work collaboratively and develop communication and socialization skills. Additional school base areas of concern include how to transitioning between activities, how to utilize technology and how to adjust to sensory stimulation within the school environment (Larkey, 2005).

The types of interventions, treatments and practices that can help teachers be most successful with students with ASD can be categorized according to the skills the practices are targeting: Interpersonal Relationship Interventions, Skill-based Interventions, Cognitive Interventions and Physiological/Biological/Neurological Interventions and Other (Simpson, 2005). These practices can also be categorized according to their level of efficacy when used with individuals with ASD: Scientifically-Based Practices, Promising Practices, Limited Supporting Information for Practice, and Not Rated Practices, where the Scientifically-Based Practices have the greatest amount of empirical support and Not Rated Practices have no support and may actually be harmful (Simpson et al., 2005). Teachers that are flexible in their presentation of academic materials, testing and expectations and enjoy working with these students seem to produce the greatest achievement (Attwood, 2007). Furthermore, teachers that understand the mind-set or how children with ASD think yield the best results (Attwood, 2007; Leicester City Council and Leicestershire County Council, 1998).

ASD theories are extensive and may be categorized as cognitive theories, socialization theories, communication theories, gender and physiological/neurological/biological and nutritional theories. These theories explore the impact of functioning of students with ASD. In
problem areas including learning, communication, socialization, cognition, problem solving skills deficits, language impairments, sensitivity to sight, sound and emotion, perceptual differences and a variety of emotional and behavioral issues. Symptoms are highly diverse and differ in frequency and severity and vary within the individuals and in specific situations (Siegel, 1996).

Cognitive based theories can be used by teachers to better enhance their own understanding of the cognitive abilities of students with ASD. By understanding their abilities, a teacher can adjust their method of presenting information and create assignments that meet the student’s level of comprehension, retention and application abilities within a given lesson. Cognitive factors that affect students’ planning, organizing, thinking processes, and memory, and are understood by educators, can be addressed by teachers to aid students in transitioning between settings and activities (Goldberg et al., 2005; Meltzer, 2007).

Socialization theories focus on the perceptual differences of students with ASD in and out of the classroom. Educators can benefit by understanding the perception and functioning of students with ASD in inclusion classes. Educators need to have a functional understanding of the way students with ASD struggle with internalizing external stimuli. Studies have shown that perceptual struggles are a significant factor in educating students with ASD in inclusion classes (Howlin et al., 1998; Jordan & Powell, 1995; Siegel, 1996).

An understanding of communication theories by educators can help provide some understanding of how students with ASD react to unpredictable and new experiences in the classroom and school settings (Baron-Cohen & Bolton, 1993; Siegel, 1996). Communication challenges that may be faced by students with ASD include issues of fluency, expressive
language, voice tone, and comprehension that may impact the learning process (Attwood, 1998; Howlin, 1996; Siegel, 1996)).

Educators that are knowledgeable of gender/heritability theories of autism may have a better understanding of their students than teachers without this knowledge. Due to the early onset of autism spectrum disorder, both Asperger and Kanner reasoned that autism is neuropathological in origin, however, studies by Bernard Rimland and Michael Rutter explained that the parents of children with autism are not different than other parents. These findings lead to compelling thoughts about the linkage of autism and genetics/heredity (Folstein & Ronen-Sheidley, 2001). Parents of children with ASD may be influential in identifying problems and solutions and provide valuable insight into the behaviors and needs of their children for educators to be aware of.

Increased understanding of physiological/biological/neurological and nutritional theories that focus on brain and nervous system function with students with ASD may lead educators to a better understanding of student emotions, perceptions, and reactive behaviors that effect levels of sociability and communication, and impact the learning process (Attwood, 2007; Harpur et al., 2006; Meltzer, 2007). As a teacher is better able to understand how and why students with ASD function the way they do, they may become more effective in their overall interactions with these students and therefore be better able to teach them. Nutritional theories based on foods and supplementation may be more in need of educator understanding for this population than any other. Although, studies have not shown significance in the effects of nutritional theory, some parents have noticed an increase in student academic and social performance when dietary needs are addressed and modified (Elder et al., 2006).
Theoretical knowledge may assist educators with being able to understand the internal make-up of their students with ASD, lessening the problem of how to educate these students. Individuals with ASD experience a wide range of symptoms, although, not all symptoms will be experienced by all people on the spectrum. Seemingly subtle variations in time of day, mood and physiological factors can all influence the way an individual on the spectrum perceives a situation and how they interact within it (Attwood, 1998; Siegel, 1996). Educators that are exposed to different theories and may be more willing and able to incorporate them into their teaching styles, may develop and/or integrate successful educational interventions to use with students with ASD or students with disabilities in inclusive classes. This last statement leads to the discussion of the third problem area:

Identifying and Integrating Educator use of Research Based Interventions

The third issue involves educator's ability to identify and use research based effective interventions for students with ASD. Since students with ASD are on a spectrum, the types and levels of severity of challenges relating to education are complex and diverse (Attwood, 2007; Baron-Cohen & Bolton, 1993; Cumine, Leach & Stevenson, 1998; Happe', 1994; Howlin, 1998; Jordan & Powell, 1995; Leicester City Council and Leicestershire County Council, 1998; Myles & Simpson, 1998; Selfe, 1977; Siegel, 1996; Treffert, 1989). An intervention that works with one student or a group of students may not be effective with other students, even though they may all be on the autism spectrum, as their needs and abilities vary.

A problem area with inclusion education for students with ASD is that their needs vary greatly. The types of potential interventions are numerous and studies rarely provide significant results that can be generalized to the entire population (Attwood, 2007; Baron-Cohen & Bolton, 1993; Goldberg et al., 2005; Harpur et al., 2006). Categories of interventions and strategies
reviewed include Interpersonal Relationship interventions, Skill-based interventions, Cognitive interventions, Physiological/Biological/Neurological interventions and Other type of interventions and treatments.

Simpson and colleagues (2005) based their description of the Interpersonal relationship interventions and treatments of students with ASD from the works of Kanner (1949). Research suggests that some children with ASD may experience impairments in how they react emotionally to situations based on a perceived lack of caring and concern from caretakers (Greenspan, Wieder and Simmons, 1998; Welch, 1988; Wolfberg, 1999). The early integration of these interventions and treatments has been found to minimize the effects of these often irrational and deep-rooted perceptions of children with ASD (Simpson, 2005).

Heflin and Simpson (1998) reviewed four Interpersonal relationship interventions: Holding therapy, Gentle Teaching, Options Method and Floortime interventions and found that they may help educators to enhance the performance of students on the autism spectrum to interact with peers, teachers and parents, although more research is needed. By increasing their abilities to interact with others in the general education class, the likelihood to be a part of the educational process is greatly enhanced (Jones et al., 1991; Jordan et al., 1989; McGee, 1985; Simpson et al., 2005). The problem is that an educator will need to be trained extensively, so that they can employ the right type of intervention for each student with ASD in order to lead to increased academic and social performance.

Skill-based interventions and treatments are the most commonly used type of approach utilized in the education venue. These interventions and treatments focus on individual abilities “to develop, maintain, or support functional demonstration of specific skills rather than to facilitate relatedness and bonding” (Simpson, 2005, p.47). Skill-based interventions can be used
by educators to change student behaviors that impede the learning process (Smith, 2001). Skill-based interventions have significant empirical support as they can help with the acquisition of academic skills, socialization abilities and language abilities (Farmer-Dougan, 1994; Simpson et al., 2005). Possibly the most favorable aspect of these interventions is that they can sometimes be generalized into other areas (Heflin & Simpson, 1998; Rimland, 1999; Simpson & Myles, 1998).

Cognitive interventions and treatments for some students with ASD helps them learn to take responsibility for their own actions and behaviors and to monitor and reinforce positive methods of self awareness. “Changing behavior or performance is believed to be best accomplished by changing individuals’ perceptions, self understanding, and beliefs” (Simpson et al., p.129). The greatest success with these interventions and treatments are found to be with individuals that have the ability to self monitor and have the ability and motivation to act upon internal motivations. Cognitive interventions are of importance to educators in helping students with ASD become integrated into inclusion classes. By helping students learn how to think through activities and socialize with peers and faculty, chances of academic success are increased (Attwood, 2007; Moyes, 2002; Simpson et al., 2005). In order for a teacher to be effective at employing these interventions and others, teachers need training of theoretical constructs and treatments/interventions, as well as the necessary resources and support.

Physiological/biological/neurological treatments and interventions focus on how the brain receives and processes information. “Physiological or biological based interventions and treatments are designed to address the neurobiological dysfunctions or problems that are thought to exist at the core of autism spectrum disorder (Simpson et al., 2005, p.169). Rimland (1990) found that nearly 40 percent of individuals with ASD had challenges with sensitivity to external sensory stimuli. Many students with ASD experience behaviors that may be effectively treated
by pharmacological interventions (Horvath et al., 1998; Lamson & Plaza, 2001; Owley et al., 2001; Simpson et al., 2005). Teachers serve a critical role in communicating what behaviors are being exhibited in the school setting that impacts the students’ academic and social performance. If a child with ASD is suffering from anxiety, depression or any other psychological problem, the teacher can act as a vital link to be able to report problems to parents who can then seek medical support from qualified providers (Tsai, 1996). These medically based interventions and treatments should be supported by medical professionals (Simpson et al., 2005).

Other interventions and treatments consist of methods that do not fit into the categories of Interpersonal-relationship, Skill-based, Cognitive or Physiological/biological/neurological treatments and interventions. These methods may include dietary and art and music based interventions and treatments, many have limited supporting information or are not rated in their effectiveness as interventions to use with children with ASD (Simpson, 2005).

Teachers who are able to identify the special interests of their students with ASD may find success in academic achievement (McGee, Daly & Jacobs, 1994; Simpson et al., 2005). However, for an educator to be successful using the special interests of their students, the educator must be able to identify the special interest and then integrate it effectively into their teaching pedagogy. Teacher training and awareness is critical to success with these interventions (Attwood, 1998; Harpur, Lawlor & Fitzgerald, 2006).

IDEIA (2004) guarantees students with disabilities the opportunity to have a free and appropriate public education and the NCLB Act of (2001) increased the stakes for educators to use research based interventions for all students with disabilities, including ASD (Simpson et al., 2005). As the discussion of the problem areas concludes, a look at key definitions to this study will begin.
Definition of Terms

As the inclusion of students with autism is a recent development, educators and researchers would benefit from understanding the commonly used terminology in autism research.

The definitions of concepts in this review are as follows:

**Academic Achievement.** Academic achievement is the way in which students' abilities are measured based on their "performance on academic achievement tests" (Cunningham, 2003, para.2).

**Appropriate play.** Appropriate play is “defined as interacting with the materials and/or peers at a given center in ways that same-age peers in a general education classroom would typically exhibit in the same situation” (Barry & Burlew, 2004, p.47).

**Inclusive Education.** Inclusive education is the integration of students with disabilities to be “included in general education classes for a majority of the school day” (Goodman & Williams, 2007, p.53).

**Level of functioning.** Level of functioning is defined as the students’ ability level and may range from “severe mental retardation to superior intelligence” (Mottron, 2004, p.20).

**Paraprofessional support.** Paraprofessional support is the role of the individual to extend past clerical and monitoring duties and to include an active role in instructional activities (Quilty, 2007).

**Social Appropriateness.** Social appropriateness is the ability of people to identify the social and behavioral associations of what people say and do, these interpretations can lead to behaviors not appropriate to the situation (Loveland, Pearson, Tanali-Kotoski, Ortegon & Gibbs, 2001).
Teacher attitudes. Teacher attitudes are discussed as teachers preconceived emotions, directed at a thing or situation (Al-Shammari, 2006).

Teacher training. Teacher training is the learned procedure of recognizing and constantly and appropriately using efficacious practice methods to enable the educator to become sufficient at teaching and proficient at classroom management (Simpson et al., 2005).

Therapeutic services. Therapeutic services are professional methods implemented to increase or decrease target behaviors that may impart a student’s functionality or learning (Lopata, Thomeer, Volker & Nida, 2006).

Purpose of the Study

The general purpose of this quantitative, non-experimental and exploratory (correlational) study using a predictive research design is to determine if the types of training teachers have years of teacher experience educating students with ASD, student age, and school type where they work has an influence on the types of practices teachers use with students with ASD. It is expected that by obtaining feedback from teachers of students with ASD and identifying the most commonly used educational interventions and treatments being utilized, support for current and future programming will be identified.

Factor included in this study were the amount of years experience teachers have educating students with ASD, the types of training teachers have on 42 research-based interventions, the students’ ages, and school type where teachers work with students with ASD. Types of educational interventions studied were categorized on the Autism Treatment Survey as: Interpersonal Relationship, Skill-based, Cognitive, Physiological/Biological/Neurological and Other types of interventions.

The specific purposes of this research are to examine the following:
1. The relationship between the numbers of years a teacher has educating students with ASD, the amount of training the teacher has and the type of practices they use.

2. The relationship between students' with ASD age and the types of practices the teacher uses with them.

3. The relationship between the school type where the teacher works and types of practices utilized when teaching students with ASD.

Significance of Study

This study is researchable because the variables are quantifiable and can be analyzed by statistical methods, using descriptive and inferential statistics. It is feasible because it can be implemented within a reasonable amount of time, has accessible and willing participants and has measurable concepts within the theoretical framework. The purpose of this study was to critically analyze the specific factors that may influence teachers of students with ASD to employ research-based practices.

The topic area of teacher’s use of educational interventions to educate students with ASD is significant because of the need to evaluate the interventions used in different class type settings and with various ages of students. The Florida Department of Education identified 10,715 students who were identified as being on the autism spectrum at the end of 2006 (Florida Department of Education Statistical Brief, 2007). In the meanwhile Federal legislation including NCLB Act of 2001 and IDEIA of 2004 increased the accountability of educators to provide a Free and Appropriate Public Education (FAPE) for students with ASD in the Least Restrictive Environment (LRE) (Etscheidt, 2006; Goodman & Wiliams, 2007; Simpson et al., 2005). By helping to identify the interventions and practices teachers have training in and use, it is expected
that this research can lead to an increase in academic performance and social abilities of students with ASD, by identifying what teachers are doing now and to suggest redirecting training and resources to the deliver the most productive results.

The topic area of school based interventions for students with ASD was selected based on reading the professional literature, personal interest, and personal experience as a Public School special education teacher. The increase in frequency of students identified with ASD has increased the need of the Public Schools to be able to provide services for these students. By identification, development and implementation of educational interventions that are both scientifically based and found to be the best practice, educators can become increasingly successful in educating students with ASD (Simpson et al., 2005).

Assumptions

This study was built upon certain assumptions:

1. Students are correctly diagnosed.
2. Teacher’s training in a particular intervention is consistent with their implementation of the intervention.
3. Teachers correctly identified the type of intervention they are using.
4. The respondents to the survey answered truthfully and to the best of their abilities.

Delimitations and Scope

The interpretations of results are restricted by the following limitations and scope of the study. The accessible population is limited to teachers self-identified as educating students on the autism spectrum and therefore may have been trained in the use of interventions and practices that they would use with these students in the academic venue. All participants are teachers in grades K-12 from a South-East Florida school district and voluntarily completed the survey.
The conclusions obtained are limited to the population sampled. This study involves a self-selection, convenience sampling plan without replacement. Limitations to the research design may include the inability of the results to be generalized to other areas of the State or Country. Additionally, teacher input was based on their teacher perceptions and not verified for accuracy.

**Organization of the Study**

**Chapter I**

The first chapter consists of the introduction to the research problem. The chapter is comprised of a discussion of autism spectrum disorder, and a statement of the problem areas. Further a discussion of Theory of Mind and Applied Behavioral Analysis, the definition of terms, the purpose of the study, the significance of the study, the assumptions, and delimitations and scope.

**Chapter II**

The second chapter encompasses the review of pertinent literature to the subject area. It aids in the development of a comprehensive understanding of the problem areas. The subsections are categorized as; comorbidity factors, cognitive theories of autism, socialization theories of autism, communication theories of autism, gender theories, physiological theories, interpersonal relationship interventions, skill-based interventions, cognitive interventions, physiological/biological/neurological interventions and other types of interventions a conclusion section.
Chapter III

This chapter provides a detailed description of all the components of the research design. The subsections are comprised of the research design, population and sampling plan, data collection procedures, and evaluation of research methods.

Chapter IV

The fourth chapter details the specifics found in compiling the data collected from the research study. Subsections include the results, research question I, research question II, research question III to include: main analyses, and a summary of findings. Tables and figures are used throughout the chapter to present the findings.

Chapter V

The fifth chapter discusses the results of the study. The subsections include the summary of findings, conclusions, limitations, implications for practice, and recommendations for future research.
CHAPTER II
THE LITERATURE REVIEW

This chapter provides a review of the literature on educating students with ASD in grades K-12 in Public Schools. It aids in the development of a comprehensive understanding of the problem areas. The central themes focus on the theory and practices used in the educational setting pertinent to educating students with ASD. Furthermore, exploration of co-existing conditions or comorbidity experienced by students with ASD and their impact on educational experiences.

Theoretical literature is divided into the following categories: cognitive theories, socialization theories, communication, gender and physiological theories. Educational interventions and practices are categorized as scientifically-based practices, promising practices, limited supporting information for practice, not recommended practices and not rated practices (Simpson et al., 2005). The chapter concludes with a synopsis of the literature from which the current study was developed, and discusses relevant information related to educating students with ASD in schools.

To enhance the understanding of issues relevant to educating students with ASD, an understanding of how these students experience day to day life and the challenges related to their ability to be educated is important. Common symptoms such as attention, anxiety, psychiatric and physiological issues that affect the way students with ASD learn, socialize, and function will begin the discussion of coexisting and emerging issues pertaining to individuals with ASD.
Comorbidity Factors

Attention

Research reported that young people with ASD respond to sensory experiences differently from peers without disabilities and that children with ASD have been found to be inattentive and distractible (Tomchek & Dunn, 2007). Study results indicate that children with ASD have difficulties with maintaining focus and attention to task, were under responsive to stimuli and sensitive to tactile input (Myles, Ferguson, & Hariwara, 2007; Schatz et al., 2002).

Ghaziuddin (2002) discovered from over twenty years of research that attentional issues such as impulsivity, hyperactivity and attention deficit hyperactivity disorder (ADHD) tend to be common in individuals with ASD. Attwood (2007) found that students with ASD tend to have difficulties with attention and focus during class activities. Proper diagnosis of attentional or other psychiatric disorders prior to treatment may lead to more effective interventions (Baron-Cohen & Bolton, 1993; Myles & Southwick, 2005). Misdiagnosis of attentional abnormalities of students with ASD may be due in part to behaviors that “suggest that persons with ASD are more likely to be active and odd, rather than aloof and passive” (Ghaziuddin, 2002, p.141). Therefore, careful observation and diagnosis can lead to an increased tendency to identify and treat attentional issues that may lead to enhanced academic and social behavior.

Schatz, Weimer and Trauner (2002) conducted an exploratory study involving a small sample of individuals with diagnosed Asperger’s (AS), one of the diagnosis under the autism umbrella. The intent of the study was to explore the rate of attentional issues of individuals with AS compared to individuals who do not have AS. The study incorporated eight individuals with AS and eight individuals without any diagnosed disabilities. The mean age of both groups was
about 16 years. Of the eight individuals with AS, only one was medicated with stimulants and was asked not to take his medication on testing day.

Schatz et al. (2002) used the Test of Variables of Attention (TOVA), a continuous performance test (CPT) to measure the reaction time of participants to stimuli on a computer screen (TOVA Company, 2008). Eight variables were measured. The four diagnostic variables measured as correct responses (able to pay attention) were variability, commissions, reaction time for correct responses and omission. The four variables measured to indicate incorrect responses (unable to pay attention) were inconsistency of response, impulsivity, processing and inattention respectively. A T-score measurement was used to identify attention deficit issues.

Results indicated that five of the eight individuals with AS attained scores indicative of attention deficit, while only two of the eight control individuals received scores indicative of attentional issues. Reportedly, the significant variability could have been influenced by factors related to cognition, anxiety, depression, obsessive thoughts or tiredness. Limitations of the study include small sample size and a wide variation of ages between the subjects (9.0 to 19.92) years. The researchers noted that this study opens the way to further studies that should be larger and contain a wider array of attention measures (Schatz et al., 2002).

Myles, Ferguson and Hagiwara (2007) found that one way to help minimize the apparent effects of the increased tendency of individuals with ASD living with attentional issues, is the usage of a personal digital assistant (PDA) in recording homework assignments in a classroom setting. The PDA provides structure and may decrease the chance of inattention influencing behavior and lessen the frustration with assignment completion, memory and transitioning activities. The ability of the student with ASD to be able to organize their assignments and have a system in place to monitor what assignments are done and which assignments need to be done
and improve overall school wide performance can increase students focus and reduce the frustration and level of student anxiety (Harper et al., 2006).

**Anxiety**

The prevalence of anxiety disorders in individuals with autism spectrum disorders have been reported to be as high as 35% (Green, Gilchrist, Burton, & Cox, 2000). Social interactions are often experienced as puzzling, expected, trying and fear-provoking by society. “People with Asperger syndrome are seen by others as socially naïve and regularly subjected to ridicule and harassment. Probably the most commonly experienced emotions by people with Asperger syndrome are fear and anxiety” (Harpur et al., 2006, p.145). The gifted child with AS has a higher level of intellectual ability and experiences higher levels of anxiety due to less effective coping mechanisms than their peers (Attwood, 2007).

People with ASD often have fears derived from social communication that they can not comprehend and may experience physiological and psychological symptoms and illnesses from the high level of anxiety they undergo (Williams, 1994). Issues of anxiety can be incapacitating to individuals with ASD (Klin, Paula, Schultz, & Volkmar, 2005). Some of the more frequent situations individuals with ASD experience anxiety are; separation anxiety, generalized worries about life situations, obsessive and compulsive thoughts about personal well-being, social concerns, and worries of discussing their special interests (Sze & Wood, 2007).

Burnette et al. (2005) used student self-reports to study the correlation between anxiety in children with high functioning autism (HFA) and those experiencing challenges with weak central coherence(WCC). As the theory of WCC considers how individuals with ASD may interpret information as unique pieces and not be able to assimilate the parts together as parts of a whole concept cohesively, therefore, they may experience frustration and/or anxiety as a result.
Although the children with HFA in the study scored higher in anxiety measures than their peers on the Behavior Assessment System for Children (BASC), the difference was not significant. In contrast, Bellini’s 2004 study identified 49% of that sample as having significantly high social anxiety while exploring the relationship among the prevalence and types of anxiety and the types of factors involved in anxiety in high functioning adolescents with ASD.

The cause of behavioral difficulties intermittently experienced by individuals with AS may differ from Asperger’s (1944) original view of AS children as being malicious and mean people, but rather “their problems are typically due to social ineptness, an obsessive and single-minded pursuit of a certain interest, or a defensive panic reaction” (Myles & Simpson, 1998, p.4). Anxiety producing situations, experienced by students in the school setting are especially relevant and problematic for students with AS (Myles & Southwick, 2005; Siegel, 1996). Specific events that elicit feelings of anxiety can often be anticipated such as having a substitute teacher for the day or class period, unexpected changes in routines, transitional activities, public criticism or praise, or a sensory experience (Myles & Southwick, 2005).

**Psychiatric Problems**

Bradley and Bolton (2006) conducted a study of episodic psychiatric disorders of teenagers with learning disabilities, 36 with autism and 36 without autism where the mean chronological age was 16.6 years of age. Researchers discovered that the most common psychiatric disorders were mood (major depressive and bipolar affective) disorders. Findings revealed that depressive disorders occurred more than twice the frequency for students with autism than students with disabilities but without autism.

Research suggests that many adolescents with ASD may also suffer from psychiatric issues and some may have multiple issues (Baron-Cohen & Bolton, 1993; Harper et al. 2006).
Severe psychological problems such as social anxiety disorder, panic attacks, generalized anxiety disorder, obsessive compulsive disorder, depression, attention deficit hyper-activity disorder (ADHD), oppositional defiance disorder, tics and Tourette’s syndrome, and to a lesser degree schizophrenia and manic depressive illness all have been documented among students with AS (Harpur et al., 2006).

Russell et al. (as cited in Attwood, 2007, p.138) found that “about 25 percent of adults with AS also have clear clinical signs of Obsessive Compulsive Disorder” (OCD). Children with Asperger’s Syndrome who are also identified as having OCD type behaviors typically experience behaviors of repetition and compulsion in thoughts and actions. They may hoard items, count and recount items and display ritualistic behaviors (Attwood, 2007; Siegel, 1996).

**Physiological Issues**

Researchers have reported that young people with ASD experience differences in their responses to sensory experiences in different ways than do their peers that are not on the autism spectrum. Tomcheck and Dunn (2007) reported results of a study of 281 children with autism between the ages of 3-6 years compared to age-matched peers who were typically developing. Results indicate that 95% of the children with ASD demonstrated some degree of sensory processing dysfunction, with the greatest differences on the Under Responsiveness seeks Attention, Auditory Filtering, and Tactile Sensitivity sections.

Individuals with ASD have sensitivity to various sensory stimuli that can significantly affect their day to day interactions (Williams, 1994). Certain sounds, experiences with touch, taste and food texture, lighting, and even smell, lead to an undesirable sensitivity. The overwhelming fear that may be experienced by many on the spectrum of touching others or animals or being touched, can be an anxiety producing event that leads to psychological
abnormalities and social withdrawal (Williams, 1994). Over or under reacting to painful stimuli and bodily movement and balance have also been reported in individuals with ASD. These issues often decrease as the individual ages; however, they can be lifelong issues (Attwood, 2007; Jordan & Powell, 1995; Siegel, 1996).

Sound sensitivity can be grouped into three categories; sudden, high-pitched or confusing. Olfactory and dietary sensitivity primarily occur with young children with ASD. They are capable of detecting odors that are not conspicuous to others and can become very fastidious in their food preferences. Visual sensitivity occurs in about 20% of children with ASD as visual distortions or perceptions can result from glare or extremely strong sunlight. As children or adults with ASD can be non responsive to painful stimuli and not respond to painful situations, serious injuries may occur often (Attwood, 2007, pp. 290-1).

Students on the autism spectrum often experience difficulties with planning, organization and following through with their thoughts and behaviors, leading to increased challenges with academic and socialization learning. Given that how children with ASD think and function may impact the learning process, understanding key cognitive theories in students with ASD is essential for parents, educators and primary care givers.

Cognitive Theories of Autism

The importance of discussing Cognitive Theories (Table 2-1) as related to the learning of students with ASD centers on the wide variation of cognitive abilities and how students with ASD may experience tremendously different approaches to how they process information as compared to like peers and other children with ASD. Cognitive difficulties impact a student’s ability in planning, organizing, and transitioning thoughts and memory between activities.
Meltzer (2007) described the Executive Function (EF) theory with its key concepts of planning, organizing, prioritizing, shifting, memorizing and checking, in relation to an individual's behaviors, brain functioning and cognitive functioning abilities. EF theory is based on the premise that in order to react to social stimuli, individuals need to be able to control their thoughts and actions. The ability to plan out decisions, internalize memories and handle situations with others is categorized as executive function (Goldberg et al., 2005; Happe', 1994; Harpur et al., 2006; Ozonoff et al., 2004). EF considers how awareness of the way that an individual is able to manage themselves takes specific abilities such as planning and learning how not to react to situations.

"Executive Functioning is hypothesized as necessary to allow us to step back from a situation, from the environment, in order to frame our actions, our responses" (Harpur et al., 2006, p.53). Development of executive function abilities may be greatly impaired in children and adults with ASD (Attwood, 2007). In the educational milieu, children must be able to multitask and transition between ideas and activities. As these transitions can be subtle, such as changing
from one activity to another within the same class, to more complex transitions such as packing up their materials, moving through the hallways and/or buildings, going to another room and getting set up for a new subject with another teacher and new set of peers. These transitory times require the student to be able to compartmentalize tasks within specific situational venues and make quick adjustments to their thinking and behaving for each transitory period (Howlin, 1998). One of the greater challenges for individuals with ASD is that redirecting their thinking from one idea or concept to another is extremely difficult without being able to put closure on the first idea (Attwood, 2007; Howlin, 1998).

Impairments in executive function are identified as psychological characteristics that include:

- organization and planning abilities
- working memory
- inhibition and impulse control
- self-reflection and self-monitoring
- time management and prioritizing
- understanding complex or abstract concepts
- using new strategies.

(Attwood, 2007, p. 234)

One of the most effective approaches to minimize the effects of executive function in individuals with ASD is to have another person (peers, paraprofessionals, teachers and/or parents) be of assistance with monitoring and organization (Attwood, 2007). Individuals with ASD experience difficulties with organizing and monitoring concepts, ideas and relationships, and understanding how concepts and ideas can be compartmentalized. The issues causing them
to be unable to separate and draw together concepts and ideas stems from difficulties with executive function (Happe’, 1994).

Goldberg et al. (2005) conducted an exploratory study to assess the level of executive function impairments in children with autism and in children with attention deficit hyperactivity disorder (ADHD). The rationale for the exploration was based on reports that neurodevelopmental disorders of executive functioning affect working memory, inhibition, the ability to adjust thoughts and actions and the ability to plan activities in individuals with ASD and ADHD (Goldberg et al., 2005). The study involved 17 children between 8-12 years of age diagnosed High Functioning Autism (HFA) and 21 children of the same age group diagnosed Attention Deficit Hyperactivity Disorder (ADHD).

Measures of response inhibition were assessed with the Stroop Color and Word Test. Problem solving skills, non-verbal memory, and set-shifting were measured by subtests of the CANTAB (Cambridge Automated Neuropsychological Test and Battery). The most significant results found that the children with HFA made more errors between searching for information mistakes on the most difficult problems than children in the other groups. The study found that both the ADHD and HFA groups experience impairments in spatial working memory, however, the impairments in spatial working memory were more noticeable in the individuals with HFA. In other areas of executive function inhibition such as, planning, and set-shifting, no significant differences were found.

Theory of Weak Central Coherence

The theory of Weak Central Coherence (WCC) is based upon the assumption that the individual with ASD assimilates information as separate pieces and is not able to integrate all the parts of an experience into one cohesive message (Attwood, 2007). Based on WCC theory, the
person with ASD might fixate on a specific item instead of internalizing how all the factors in a
given situation are cohesive (Happe’, 1994; Harpur et al., 2006). The concept of WCC as a
weakness in the ability to bring together local details into a global perspective, may in part
explain why individuals with ASD have such a difficulty with global perception (Attwood, 2007;

Key characteristics of how WCC impacts individuals with ASD include:

- WCC has an indirect influence on fundamental aspects of symptom presentation in
  autism through its association with language and social cognition (Burnette et al., 2005,
p.72)
- Children with AS can be remarkably good at attending to detail but appear to have
  considerable difficulty perceiving and understanding the overall picture or gist.
- Parents of a child or adult with AS often remark on their son or daughter’s ability to give
  vivid and accurate descriptions of events that occurred during infancy.

Burnette et al. (2005) sought to validate the theory of weak central coherence (WCC) as
an underlying perceptual disturbance in autism through a longitudinal study. The investigators
additionally studied the relationship between WCC and Theory of Mind as they relate to the
socio-emotional functioning in a group of individuals with ASD as compared to a control group.
Theory of Mind (ToM) is characterized as the ability to comprehend the intentions of others
(Martin & McDonald, 2004). Four hypotheses were tested by Burnette et al. (2005)

Hypothesis 1: High functioning children with autism were expected to differ from age
and IQ matched controls on multiple measures of WCC.
Hypothesis 2: WCC and ToM measures would reflect common cognitive processes in both groups.

Hypothesis 3: High functioning children with autism would display increased levels of anxiety and mood disturbance relative to matched comparison children without ASD.

Hypothesis 4: If WCC is central to the core pathology of autism, then individual differences in WCC task performance will be correlated with symptom presentation in a sample of high functioning children with autism.

The sample consisted of 31 high functioning children with autism (26 males) and 33 children in the control group (24 males) and their parents. The control group consisted of both children with learning disabilities (17) and children with typical development (16). Measures were obtained using a number of testing instruments. Independent variables included age, verbal IQ, and performance IQ for both groups. A large number multitude of variables were used to evaluate the measures of WCC and emotional functioning for both groups.

The results of the study supported significance of the WCC hypothesis (hypothesis 1), high functioning children with autism were expected to differ from age and IQ matched controls on multiple measures of WCC, however, moderate correlations were found between verbal WCC and the theory of mind measure. Significant relationships were not found between the WCC measures and the measures of social-emotional functioning in students with High Functioning Autism.

Future recommendations included a need for further study of verbal and visual spatial measures of weak central coherence and the nature and understanding of WCC. Weak central coherence in part involves the use of contextually imbedded information and could serve as a factor as to why individuals with ASD experience from Theory of Mind challenges (Baron-
Cohen et al., 1993; Happe’, 1994). WCC may also serve as a factor in the existence of some non-social characteristics of autism spectrum disorder such as limited set of interests and narrowed abilities (Happe’, 1994).

**Theory of Mind (Social Inference Theory)**

“Social inference theory posits an underlying deficit in understanding speaker intentions” (Martin & McDonald, 2004, p.315). The inability of individuals with autism to relate to how others perceive social situations is commonly referred to as theory of mind (ToM) (Attwood, 1998; Happe’, 1994; Myles & Southwick, 2005; Williams, 1998.). “The psychological term Theory of Mind (ToM) means the ability to recognize and understand thoughts, beliefs, desires and intentions of other people in order to make sense of their behavior and predict what they are going to do next” (Attwood, 2007, p.112).

Work with individuals with autism spectrum disorder by Baron-Cohen et al. (1993) and Frith and Happe’ (1994) led to their hypothesizing that ToM is not adequately developed in people with autism spectrum disorder. This underdevelopment prevents individuals from being able to take into consideration the thoughts, beliefs and intentions of others they interact with. This lack of ToM leads to socialization and functional abnormalities (Baron-Cohen et al., 1993). Difficulties with ToM often lead to academic, behavioral and social difficulties (Happe’, 1994; Jordan & Powell, 1995; Myles & Southwick, 2005). Burnette and associates explained how the ToM hypothesis “grew out of the notion that ability to represent the thoughts or feelings of others is critical to understanding social behavior” (Brunette et al., 2005, p.63).

Happe’ (1994) described two orders or levels of ToM. The first order involves an ability to be able to comprehend beliefs about the functionality of the environment. The second order is related to the ability to comprehend beliefs about the thoughts and intentions of others. The
ability to function at different levels of ToM creates differences between individuals with ASD and their ability to be socially active participants. The inability to understand what others are thinking and feeling is sometimes referred to as “mindreading” (Baron and Cohen, 1995). Individuals need to be able to make sense of what others are doing based on their internal motivations. The ability to think about the intentions of others is impaired in people with autism spectrum disorder as understanding, emotions, and beliefs, and the functions of make believe play, are typically challenging for individuals with ASD (Howlin et al., 1998; Kuoch & Mirenda, 2003).

Individuals with ASD experience lifelong difficulties with social interaction (Howlin, 1998). Baron-Cohen (1995) in an essay on the topic of the theory of mind and “mindblindness” discussed how this ToM inability to relate to the thoughts and intentions of others affects the abilities of the individuals with ASD. Leslie (as cited in Kuoch & Mirenda, 2003) found that ToM is influential in social story conceptualization and the lack of development in the individuals with ASD can start as early as 18 months of age. ToM abilities can be developed as an individual matures, although the rate or level that can be reached and how to predict the likelihood of such development is still unknown (Happe’, 1994).

Burnette et al. (2005) examined how ToM impairments in individuals with ASD can profoundly impact the child’s ability to interact socially with others. The need for children with ASD to be able to understand how others perceive events is necessary to social interaction but typically lacking in ASD children. Similarly, Baron-Cohen (1995) conducted research and found that the foundation and principle behind ToM is that children with ASD do not have the ability to identify and conceptualize the mental states of other individuals at the same level as others in the same age group (Attwood, 2007; Harpur et al., 2006; Howlin et al, 1998; Williams, 1998).
Weakened ToM ability in persons with ASD are extensive. According to Attwood (2007, p. 127) impaired ToM abilities include:

- difficulties reading the messages in someone's eyes
- a tendency to make a literal interpretation of what someone says
- a tendency to be inconsiderate, disrespectful, and rude
- being remarkably honest
- a sense of paranoia
- an inability to see that another person may have the knowledge and desire to be of help
- delay in the development and understanding of persuasion, compromise and conflict resolution
- a different form of introspection and self-consciousness
- unaware of being involved in situations that others interpret as embarrassing
- feelings of anxiety
- a longer time to process social information, due to trying to analyze the situation rather than using intuition
- physical and emotional exhaustion.

Some theorists believe that ToM is the primary cognitive deficit in a person with autism. However, the supporting research is not conclusive (Baron-Cohen et al., 1993). Williams (1998) explains the perceptual abilities of individuals with ASD as being a "sensing" type process instead of being an "interpreting" type behavior. The ability to use the senses instead of intellectual rationale in interacting with others is one way of explaining ToM.
Underconnectivity Theory

Brain research in individuals with ASD has found that connections in brain circuitry vary in children on the spectrum. The interregional collaboration that is necessary between linguistic and visualization processing of information in the cortical region of the brain, may be underserved in individuals with autism (Kana et al., 2006). Studies have shown that individuals with ASD may process information in parts of the brain typically utilized for different types of information. Just et al. (2004) studied seventeen high functioning individuals with autism and an equal number of individuals with similar intellectual abilities in a control group. The study found that brain activation levels were statistically different across main language areas and differences in functional connectivity between brain areas. This underconnectivity theory may help to explain why some individuals with ASD possess superior skills in some areas and great deficits in others. Dr. Marcel Just, director of Carnegie Mellon’s Center for Cognitive Brain Imaging, uses a sports analogy to explain this concept: “In the brain of a typical person, the team members work together to coordinate their efforts, whereas in the brain of someone with autism spectrum disorder, they don’t. This may account for difficulties in complex thinking, social skills, and overall behavior” (Exkorn, 2006, p.72).

Studies by Just et al. (2004) and Koshino and colleagues in 2005, have shown that cortical areas in individuals with ASD may be likely to have an underconnectivity and therefore affect the speed and integration of communication in areas of the brain that impact language and imagery processing (Kana et al., 2006).

Kana et al. (2006) conducted a study of 12 high functioning individuals with autism and 13 individuals of similar age and IQ in a control group. An MRI was utilized to measure brain activation and each group contained only one female. The median age of the autism group was
22.05 and the control group was 20.3 years, standard deviations were 8.8 and 4.0 respectively. The variables used to match the two groups were age, Full-Scale IQ, socioeconomic status, family origins, race and gender (Kana et al., 2006). The MRI measured brain activation while the participants judged sentences that were either high or low in imagery content and rated them as true or false.

Baseline readings were taken before the initiation of the experiment. The authors of the study hypothesized that high functioning individuals with autism would display underconnectivity between language and visuospatial neural systems. A second hypothesis involved the approach of the high functioning individuals with autism to a task involving low-imagery conditions with the belief that they will use more visual and spatial imagery to comprehend the sentences. The third hypothesis was that the individuals with autism would have smaller key areas of their corpus callosums than their counterparts.

The results displayed a lower level of synchronization between the language and spatial regions of the autism population than the control group. The autism group showed that they used more imagery while processing low level visual activities such as addition and multiplication than the control group. Supporting the second hypothesis not only “the findings provide further evidence of underintegration of language and imagery in autism (and hence expand the understanding of underconnectivity) but also showed that people with autism are more reliant on visualization to support language comprehension” (Kana et al., 2006, p. 2484). The third hypothesis was not supported as the size of the corpus callosum was not significantly smaller in the individuals with autism. Findings did support the concept that individuals with autism think more in visual imagery due to increased activation in the parietal and occipital regions (Kana et al., 2006).
Problem Solving Theory

For individuals to fit into society they need to be able to evaluate and solve daily problems but individuals with ASD experience a shortcoming in practical application of problem solving skills (Howlin, 1998). By increasing problem solving abilities and developing communication skills to enhance their problem solving effectiveness, social comprehension will increase and strengthen social adjustment skills (Howlin, 1998; Jordan & Powell, 1995). Children with autism experience challenges with problem solving as a direct result of difficulties with comprehending information provided in their environment when interpreting verbal, non verbal, social and written language (Myles et al., 2002). The cognitive ability to solve everyday problems can be extremely challenging for lower functioning individuals on the autism spectrum, especially since three out of four children with autism will also show mental retardation (Frith, 1989, p.54).

The child with ASD has impairments in problem solving abilities that are far reaching, and include:

- a tendency to continue using incorrect strategies and less likely to learn from their mistakes, even when they know their strategy isn’t working.
- a preference to use his or her own idiosyncratic approach to problem solving.
- deficits with being flexible in their thinking and this can start at an early age.


Some students with ASD may utilize one type of problem solving strategy and use it in all situations. Since situations vary and responses to situations depend on the individual, the inability of individuals with ASD to modify their behaviors can lead to frustration and anxiety when they are not able to self monitor their own behavior and utilize different interventions to
solve problems (Howlin, 1998; Myles & Southwick, 2005; Siegel, 1996). These inabilities to self-monitor their own behaviors typically impact their chances to be successful in the educational milieu. Parents and educators that have a conception about the abilities and limitations of the children on the autism spectrum are most apt to be successful in developing and implementing interventions and approaches to use with the students, both at home and at school (Blamires, Robertson & Blamires, 1997). Williams (1996), *Autism: An inside-out approach, an innovative look at the mechanics of autism and its developmental cousins*, analogizes the internal conflicts of the individual with ASD as similar to a telephone call where the wires are switched and connections are distorted. The manner in which the individual with ASD approaches and solves problems may be opposed to societal views; however, the individual has to be able to find their own way to make sense of the world they are a part of.

Channon et al. (2001) conducted a study of young adults with AS compared to a control group on the ability to solve real-life problems. Fifteen young adults between the ages of 11 and 19 (13 male and 2 female) were compared to 15 typically developing peers. The study involved the ability of both groups to handle novel problem-solving tasks through the utilization of video-taped scenarios. The videos were of real life type situations that both groups were individually asked to provide solutions to the issues being experienced.

The results found that the two groups did not differ significantly on the number of solutions provided by each group. Significance was found in the quality of the responses in the categories of fluency problem appreciation, fluency social appropriateness and fluency effectiveness scores, where the Asperger’s groups were significantly below their peer group. The Asperger’s groups also measured significantly below the peer group in social appropriateness and experienced significantly lower scores in producing high-quality solutions to everyday...
problems. Limitations include not being able to evaluate gender differences and small sample size. Wide variance of age was also a possible limitation.

**Socialization Theories of Autism**

Children with ASD face major challenges with interacting with peers, faculty and teachers in the school venue. The perceptual differences these students experience does impact their ability to perform to their maximum potential in school (Holin et al., 1998; Siegel, 1996). An understanding of the types of theories on socialization concepts is beneficial to parents or educators who interact with students with ASD (Bellini, 2004). The theoretical understanding of Socialization Theories (Table 2-2) was essential to the development of practices used with students with ASD.

Table 2-2

Socialization Theories of Autism Spectrum Disorder

<table>
<thead>
<tr>
<th>Social Relations Theory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Competence Theory</td>
</tr>
</tbody>
</table>

**Social Competence Theory**

Social competency theory is based on the premise that performance in social situations and perceptions of social situations cognitively and emotionally are all tied together (Howlin, 1998; Williams, 1996). It also blends the dual aims of generating the essentials for (a) behaviours that will lead to successful social outcomes and (b) abilities to combine cognitive, emotional and behavioural skills flexibly depending on social context and demands (Harpur et al., 2006). Individuals with ASD are lacking in the concept of reciprocity; the understanding that interactions are a two way interaction and not evaluated based upon one persons perceptions, but,

For individuals on the autism spectrum, inabilities to self monitor their own responses and judge the appropriateness of their own communication skills when interacting with others impacts their abilities to be successful in socializing with peers and others. Parents, therapists and educators that are concerned with the ability of the child with autism’s ability to function as a social being, benefit from understanding what motivates them and what perceptions and limitations exist. These caregivers are most likely to be successful in developing and implementing interventions and approaches to use with students who may struggle with communication challenges (Attwood, 2007; Baron-Cohen & Bolton, 1993; Blamires, Robertson & Blamires, 1997; The National Autistic Society, 1997). Individuals on the autism spectrum experience inner conflict when faced with social interactions; having to associate how to connect with others, how to tolerate the various opinions and mannerisms of others and what they can and can not control (Williams, 1996).

LeGoff (2004) assessed the ability of children with ASD and their ability to effectively utilize a social skills intervention in group and individual play situations using LEGO© play. The study involved a total of 47 children diagnosed on the autism spectrum. There were 34 males and 13 female, between the ages of 6 and 16 years. They were separated into 7 play groups and observed in several situations. First, their ability to initiate social contact, with peers based on the desire to interact in the activity was measured. Second, the duration of social contact which indicated their ability to play and socially interact with others was measured. Finally, their stand-alone behaviors and age-appropriate play and social behaviors were measured.
The intervention using the LEGO® toys and therapy groups were initiated over 12 and 24 week spans and lasted about 2 and a half hours per week. Baseline data was taken on the level of play prior to their involvement in the therapy. The evaluation of results was determined using the Gilliam Autism Rating Scale (GARS-SI). Overall results found significant improvement on all three measures of social competence after 12 weeks of therapy and better results after 24 weeks.

**Social Relations Theory**

Individuals with ASD experience perceptual differences from societal norms. “Persons with autism tend to focus on details that may not be perceived by others, and it is from those details that they develop their narrow but logical thinking” (Berand-Ripoll, 2007, p. 100). These perceptual differences manifest themselves in a multitude of settings both within the school arena and in society (Howlin et al., 1998; Jordan & Powell, 1995; Siegel, 1996). For example, a student with ASD may have difficulties understanding the reaction of a peer when someone called him a derogatory name, as a result from the comment the students with ASD may have made that was taken out of context or misunderstood by his classmates (Attwood, 2007; Berand-Ripoll, 2007). The inability of the individual with ASD to understand social rules often leads to them being rejected by others and may cause them to being treated cruelly by peers and other people (Williams, 1994).

The inability to overcome the fear of being in close proximity to other people or of being touched can also sever communication and lead to isolative behaviors and emotional scaring (Williams, 1994). The diminished ability to develop and maintain socially accepted ways of interacting with peers often leads to children with ASD being rejected socially by their peers and making the development of friendships an extremely difficult and frustrating experience (Apple,

Bellini (2004) conducted a correlational study exploring the relationships among the prevalence and types of anxiety, and the types of factors involved in anxiety in high functioning adolescents with ASD. Additionally Bellini was interested in whether or not the parent impacted the level of self reported social anxiety in individuals with ASD.

Bellini (2004) evaluated three questions:

1. Are adolescents diagnosed with autism, AS, or pervasive developmental disorder not otherwise specified (PDD NOS) more likely to experience symptoms of anxiety than members of the general population?
2. What types of anxiety are adolescents with ASD likely to experience?
3. Are social skills deficits associated with social anxiety in adolescents with ASD (p. 80).

The clinical sample consisted of forty-one adolescents between the ages of 12 to 18 and their families. The sample consisted of 35 boys and 6 girls all diagnosed with autism, Asperger syndrome or PDD-NOS. Of the 41 participants, eleven adolescents were previously diagnosed with anxiety and 16 were medicated for anxiety at the time of the collection of data. Data was gathered using the Social Skills Rating System (SSRS) and the Multidimensional Anxiety Scale for Children (MASC) for the adolescents and the Social Skills Rating System and the Behavior Assessment System for Children (BASC) was completed by the parents. To increase the level of accuracy, each instrument was collected two times and on different days. Correlational statistics were utilized to evaluate the results.
Results revealed significantly higher levels of anxiety for the adolescents with autism than the normative sample. The scales that were found to have the greatest significance were Physical Symptoms, Social Anxiety, Separation/Panic and Total Anxiety. The parent versions of the BASC had significant values in Anxiety and Internalizing Problems composite (Bellini, 2004). Forty-nine percent of the sample scored as having significantly high social anxiety. An additional comparison was made between individuals who were and were not taking medication and their levels of anxiety; significant differences were not found. A low negative correlation was found between social skills and social anxiety.

Bellini discussed how “individuals with poor assertion or initiation skills may be more likely to experience anxiety related to social interactions” (Bellini, 2004, p.83). This study suggests that programs that are focused on social skills training may benefit individuals with ASD (Attwood, 1998; Howlin, 1998). As with many studies involving individuals with ASD, sample size is a limitation, as is selection of the samples and the response rate. However, individuals with ASD apparently have a higher likelihood of feeling anxious in all types of social situations. Other limitations may be related to medication issues and normative samples. Future studies would benefit from a larger more diverse sample size, evaluated over a longer period of time. The investigation of the effectiveness of social skills programs used with individuals with ASD and how they may reduce anxiety levels are a valuable area for future research.

*Communication Theories of Autism*

The challenges experienced by individuals with ASD in communicating with peers and others are significant. In the school setting the ability to effectively communicate ideas, thoughts and concerns is essential for student development. Teachers that have significant understanding of the communication challenges students with ASD experience will be better prepared to
enhance the communication abilities and overall academic and social performance of their students with ASD (Baron-Cohen & Bolton, 1993). The theoretical understanding of Communication Theories (Table 2-3) is essential to the development of practices used with students with ASD.

Table 2-3

*Communication Theories of Autism Spectrum Disorder*

<table>
<thead>
<tr>
<th>Theory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Language Development Theory</td>
</tr>
<tr>
<td>Communication Theory</td>
</tr>
<tr>
<td>Chaos Theory</td>
</tr>
</tbody>
</table>

*Cashin Theory*

Cashin and Waters (2006) discussed chaos theory as a mathematical and systematic approach to exploring interaction of components within a system. Individuals with autism spectrum disorder often do not respond well to the intentions of others. They are focused in their own perceptions and not able to make sense of contrasting views of others. This inability to adjust to chaotic interactions can lead to anxiety and frustration and reactive types of behaviors in an effort to control a social situation (Howling, 1996; Myles & Southwick, 2005). Barker (1996) theorized that a small change in a system can lead to unpredictable and chaotic changes. Individuals with autism spectrum disorder experience impairments in social skills interaction, communication skills and attempting to regulate their behaviors and the behaviors of others termed as over-regulation (Baron-Cohen & Bolton, 1993). Individuals with autism spectrum disorder have a need for sameness and do not adjust well to unpredictable situations (Siegel,
1996). They strive to have predictability in their daily activities and experience social difficulties in their inability to adjust to chaotic unexpected interactions. (Howlin, 1996; Howlin et al., 1998; Cashin & Waters, 2006).

The need for individuals with autism spectrum disorder to feel the same as other individuals may be linked to over-regulation. “If the over-regulation is a more precise way to discuss the need for sameness seen as an integral part of autism, the tools of chaos theory may provide a tool to measure and map it” (Cashin & Waters, 2006, p.228). In the discussion of chaos theory proposed by Cashin and Waters they theorized that chaos therapy may be as important to those with autism spectrum disorder as social skills training and speech therapy are in enhancing the abilities of those with autism spectrum disorder.

**Communication Theory**

Interestingly, about 20 to 40% of children diagnosed with ASD initially appear to develop some level of communication skills and then regress in these abilities, loosing most of their communication skills (Attwood, 1998). The loss of gesturing abilities can prevent the nonverbal child from having anyway to express their wants and desires. They may not even respond to their names, nor have the abilities to socialize with peers. Research has noted that about 77% of children who suffer from language loss, lost nonverbal communication skills as well (Exkorn, 2006). Conceptual and literal meaning for those individuals with ASD leads to confusion, frustration and miscommunication. Expression is especially difficult for teenagers on the spectrum which can lead to social anxieties and poor academic performance (Howlin, 1996).

Studies seeking out the cause of the regression of abilities have not generated significant results due in part to the existence of overlapping symptoms (Myles & Southwick, 2005). Research examining regression and gastrointestinal symptoms and family history linked to
thyroid disease has also rendered no significance. Vaccinations were studied in another theoretical approach in the search for the cause of regression and again no significant results were found (Exkorn, 2006).

Ingersoll et al. (2005) conducted a single-subject, multiple baseline design study to examine the effectiveness of a developmental, social-pragmatic (DSP) language intervention on three children with ASD. The children, all male, were 46 months, 32 months and 30 months of age. The first two children were diagnosed with autism and the last child with PDD-NOS. The DSP intervention conducted by a therapist did not focus on specific language targets. The therapist focused on increasing the social interactions of the children and their general communication abilities.

Baseline was collected for each child over 2, 4 and 6 weeks. Therapy was provided during two, 50-minute sessions per week. Each child received 10 weeks of language therapy. Video tapes were made for scoring purposes and to insure inter-rater reliability. Results indicate that the children increased their use of spontaneous speech both with their parents and therapist due to the language therapy intervention. The results support the use of language therapy using a developmental, social-pragmatic intervention with children diagnosed with ASD.

Language Development Theory

Attwood (2007) discussed how Hans Asperger described the language profile of individuals with AS as lacking in conversational smoothness and having rough flow of speech, in addition to unusual language development, either late or early (Attwood, 1998; Howlin, 1996). Several speech and language characteristics are required to diagnose ASD including delayed development in speech, expressive language that is perfect, but not natural, formal, finicky
language, odd characteristics in voice tone and odd prosody and comprehension problems that involve factual and obscure meanings (Attwood, 2007; Siegel, 1996).

Szatmari, Bremner, and Nagy (1989) listed six characteristics for diagnosing ASD related to speech issues; they found that at least two of the following characteristics need to be identified to have a proper diagnosis. Odd speech characteristics include; inflection irregularities, excessive talking, minimal talking, lack of conversational consistency, idiosyncratic word usage and speech patterns that are repetitive (Attwood, 2007; Klin et al., 2000).

Children with ASD experience speech difficulties such as no speech, delayed onset of speech, repetitive or idiosyncratic (peculiar) speech. Approximately 40% of children with ASD are not able to speak (Exhorn, 2006). These potential speech issues impact a child’s ability to communicate and cause additional strain to his/her socialization. Many children with ASD are not able to initiate conversations or be successful in a two-way conversation with peers or adults (Exkorn, 2006; Howlin, 1996; Siegel, 1996). In the social setting the inability to utilize language in a social context is referred to as pragmatic language difficulties and is often encountered by speech language pathologists (Attwood, 2007).

Pragmatics is the social use of language. Individuals with ASD are characterized as experiencing pragmatics impairments that impact their ability to communicate (Attwood, 2007; Exhorn, 2006, Harpur et al., 2006; Klin et al., 2000; Myles & Southwick, 2005). Pragmatics rules when applied allow for abstract communication such as teasing, humor, sarcasm and hidden agendas to be both understood and used (Klin et al, 2000; Myles & Southwick, 2005). Individuals with ASD have difficulties with literal language. They tend to be greatly confused by idioms, irony, figures of speech, innuendo and sarcasm (Attwood, 2007, p. 216).
Charman et al. (2003) evaluated the results of the MacArthur Communicative Development Inventory to assess the development of early language in preschool children with autism. The instrument was completed by the parents of 134 preschool children diagnosed with autism. The sample included 116 boys and 18 girls; the mean chronological age was 3 years and 2 months of age, while the mean non-verbal IQ was 83.2.

The results indicated significant delay in language acquisition compared to normally developing children. Delay was found in word comprehension, production of early gestures and delay in use of gestures involving sharing and objects. Similar levels of development as compared to normally developing peers were found in word comprehension and the use of gestures to link word comprehension and production.

*Gender Theories of Autism*

Teachers of students with ASD are empowered by knowledge, knowledge of how their students think and act. The more understanding the teacher has regarding what factors influence the student’s actions, the more prepared teachers will be. Gender including heritability theories is another category of concepts that may help educators in their understanding of students with ASD. Siblings and family members of students with ASD often experience similar characteristics as the child with ASD and can offer insight and experience to teachers to help with student development (Baron-Cohen, 1993; Folstein & Roney-Sheidley, 2001). The theoretical understanding of Gender Theories (Table 2-4) is essential to the development of practices used with students with ASD.
Baron-Cohen’s Empathizing–Systemizing Theory

The empathizing-systemizing theory of autism is based on psychological functioning and attempts to explain how individuals with autism spectrum disorder have a diminished ability to empathize with the thoughts and actions of others and their enhanced ability to be systematic in daily activities (Howlin et al., 1998). Dennett (1987) discussed how other terms such as taking the intentional stance, theory of mind, mind-reading and empathy are all relative to empathizing. Premack (1990) hypothesized that how an individual relates mental states of others to themselves is so that they can comprehend the actions of others (empathize). Empathy also impacts the way individuals with autism spectrum disorder react to others’ mental states and therefore, impacts their ability to socialize within socially accepted ranges (Baron-Cohen & Belmonte, 2005).

Autism spectrum disorders are often referred to as being a syndrome of deficits and also of considerable strengths (O’Neill, 1998; Baron-Cohen et al., 1993). The concept of systemizing can be viewed as strength in that the ability to create and follow a systematic approach to analyzing situations can lead to a better understanding of events and therefore an increased ability to predict future behavior. Individuals with autism spectrum disorders often become fixated on a topic and tend to learn incredible amount of information about the topic and
therefore better able to make predictions about future actions (Baron-Cohen and Belmonte, 2005). Their ability to systemize and comprehend the relationships between parts of a system leads to having intact or above average abilities to make sense of systems (Baron-Cohen and Belmonte, 2005).

In a schematic diagram of the triads of strengths and deficits Baron-Cohen and Belmonte (2005) described the systemizing-empathizing theory by discussing empathy as a deficit and systemizing as a strength. Under the topic of triad of deficits; empathy is the key component fueled by social, communication and imagining others’ minds. The triad of strengths; systemizing is composed of islets of ability, obsessions with systems and repetitive behaviors (Baron-Cohen and Belmonte, 2005, p. 111).

Although Baron-Cohen and Belmonte (2005) did not discuss issues of reliability and validity in their theory of empathizing-systemizing but they did discussed how other theories such as executive function, weak central coherence, neural connectivity and genetics are all part of the autism spectrum disorder puzzle.

In an experiment of 20 college students where the systemizing and empathizing correlation was studied Carroll and Yunh found that, “theory of mind, social skills and empathizing are associated and that spatial awareness, mechanical reasoning and systemizing are also associated with one another (Carroll and Yunh, 2006, p.957). Additionally they found that women were more likely to develop empathizing than systemizing and men were more likely to develop strengths in systemizing than empathizing (Carroll and Yunh, 2006).

**Baron-Cohen’s Extreme Male Brain Theory**

Prior to Baron-Cohen’s Extreme Male Brain theory the two most prominent theories used to understand the cognitive deficits in individuals with Autism spectrum disorder were Theory
of Mind and Weak Central Coherence theory. Theory of Mind suggests that individuals with autism spectrum disorder have difficulties understanding how others think and the Theory of Weak Central Coherence suggests that individuals think of concepts in individual pieces instead of from a holistic approach (Howlin et al., 1998). The Extreme Male Brain theory is an extension of Baron-Cohen’s Empathizing-Systemizing model. The Empathizing-Systemizing model suggests that females are more likely to be able to empathize or be more socially aware of others and males and more systematic in thoughts and actions (Baron-Cohen et al., 1993; Carroll and Yung, 2006).

The Extreme Male Brain theory suggests that individuals with autism spectrum disorder are extreme in regards to empathizing and systemizing, primarily due to pre-natal testosterone levels. This theory suggests that strong ability in systemizing tasks is due to weak central coherence and a lack of being able to understand the thoughts of others would be typical of weak theory of mind (Carroll and Yung, 2006). This theory makes three claims. 1. There are reliable differences in the ability to measure both systemizing and empathizing in both sexes, 2. The major characteristics of strength and weaknesses of individuals with autism spectrum disorder typically fall into the categories of empathizing or systemizing, and 3. Individual strengths in empathizing and systemizing would be opposed within the individual, one strong while the other measures weak. Some research suggests that levels of systemizing and empathizing should be negatively correlated (Carroll and Yung, 2006).

In summing two studies, one study of 48 college students and the other study with a sample of 20 college students, Carroll and Yung concluded that the two areas of empathizing and systemizing were not closely related, male brain profiles did not provide significant differences that individuals with balanced brains, and systemizing and empathizing were not correlated.
Other specific and important results included that individuals with male brain profiles did not have higher levels of autistic type behaviors than those with balanced brains (Carroll and Yung, 2006).

Future studies would be needed to identify a grouping of symptoms typical of individuals with autism spectrum disorder; a correlation of only two extremes does not appear to be correlated based on limited samples and studies.

**Heritability / Genetic Theory**

Due to the early onset of autism spectrum disorder both Asperger and Kanner reasoned that autism is neuropathological in origin, however, studies by Bernard Rimland and Michael Rutter explained that the parents of children with autism are not different than other parents. These findings lead to compelling thoughts about the linkage of autism and genetics/heredity (Folstein & Ronen-Sheidley, 2001). Separate studies by A. Pickles and P.V. Eedewegh both found ASD is most likely to occur when a child inherits three or four genes from a parent with ASD; however, they are not certain of what specific genes. Another possible factor of heritability is due to genetic predisposition to social or language impairments and possibly additional affects from environmental factors or immunological factors (Folstein & Ronen-Sheidley, 2001; Baron-Cohen & Bolton, 1993).

As of this time the genes that cause autism have not been identified. Folstein and Ronen-Sheidley (2001) explain how once the genes that cause autism spectrum disorder are identified and how they are linked to heritability the methods of treating and perhaps lessening the severity of the disorder might be manageable. The research from the past few decades has yielded genetic factors as being the leading etiology for autism. The complexity of hereditary patterns has made finding the right combination of linking genes difficult. Although specific genes have not been
identified research has lead to interest and further investigation on chromosomes 2, 7, 15 and X (Folstein & Ronen-Sheidley, 2001). Genetic theory has shown progress however, it is not significant and offers little reliability and is not conclusive (Baron-Cohen & Bolton, 1993; Folstein & Roney-Sheidley, 2001).

As cited by Harper et al. (2006) the linkage between heredity and parents and heir offspring with autism spectrum disorder has been recognized in studies by Busceam et al. (1999), Cederlund and Gillberg (2004); Charman (1999); Constantino et al. (2004); Dorris et al. (2004); Happe’ (1994); Korvatska et al. (2002); Muhle, Trentacoste and Rapin (2004) and Rubenstein and Merzenich (2003). Additionally many parents with autism spectrum disorder have reported that they are able to identify similar characteristics in their children on the autism spectrum that they themselves have. Along the lines of the genetic perspective of autism, many parents of children with ASD that seem to be uncooperative and awkward in social settings may be on the autism spectrum themselves (Bashe and Kirby, 2005). These parents could possibly benefit from the same type of direct communication interventions that benefit their children (Howlin, 1998).

In 2005 Santangelo and Tsatsanis reported that the likelihood of an individual with autism spectrum disorder having a sibling with autism spectrum disorder are between 10 and 60 times greater than society at large (Harpur et al. 2006). Heritability theory does have significant supportive literature support for the linkage of ASD and inheritability. Folstein (1977) and Ritvo et al. (1985) found that likelihood of siblings having autism is greater if they are twins from a single egg 69-95%. Rivito et al. (1985), Folstein & Rutter (1977), Bailey et al. (1995) and Steffenberg et al. (1989) discovered that twins that are conceived from two eggs are 0-24% likely to both be autistic (as cited in Schellenberg, et al., 2006). Although no single gene or
definite combination of genes have been identified as being linked to autism spectrum disorder there is some evidence of chromosomal linkage. International Molecular Genetics Study of Autism Consortium (2001), Lamb et al. (2005) and IMGSAC (1998) along with the study by Schellenberg et al. (2006) all found strong evidence of genetic linkage to autism with chromosome 7q (Schellenberg et al., 2006).

Results pertinent to the genetic/heritability theory of autism based on the study by Schellenberg et al. (2006) conclude that other factors besides genetics can be linked to autism spectrum disorder heritability. The findings that gender composition, regression and language factors can affect the likely of linkage. Other factors such as intelligence, family size and ethnic origin may also be pertinent. Larger sample sizes in future studies can help lead to more conclusive results (Baron-Cohen & Bolton, 1993; Schellenberg et al. (2006). Boys tend to be diagnosed with all forms of Autism spectrum disorder more frequently than girls; 4 to 1. Asperger’s Syndrome diagnosed in boys to girls is at a ratio of 15:1 (Exkorn, 2006).

**Physiological Theories of Autism**

Teachers and parents of students with ASD experience many daily challenges with communication and socialization. By obtaining theoretical knowledge of physiological theories pertinent to students with ASD teachers and parents can be empowered to understand how brain function and nervous system development in individuals with ASD is different from their peers and affects the students in areas of emotion, perception and self regulation. The theoretical understanding of Physiological Theories (Table 2-5) is essential to the development of practices used with students with ASD.
Table 2-5

*Physiological Theories of Autism Spectrum Disorder*

| Limbic System (Amygdale) Theory | Nutritional/Opioid Theory |

*Limbic System (Amygdale) Theory*

The limbic system theory of autism is derived from the neurodevelopmental abnormality hypothesis which is derived from theory on brain function in individuals with autism (Harpur et al., 2006). Management of emotions, specifically anger management is often a problem for children and adults with AS, in part due to abnormal functioning of the amygdale part of the brain (Attwood, 2007). “The amygdale has many functions, including the perception and regulation of emotions, especially fear and anger” (Attwood, 2007, p.145). The lack of the indication that an individual is feeling increasingly stressed, can lead to erratic behaviors, however, since the function of the amygdale is theoretical, it should not be used as an excuse for inappropriate behaviors (Attwood, 2007). Research suggests that the functionality of the amygdale, which is associated with social intelligence, operates differently in individuals with AS than like peers (Harpur et al., 2006).

The mechanics as to how people think and learn is especially difficult to understand based on the conception of brain activity, this includes how the brain functions to organize, plan and execute tasks including learning (Meltzer, 2007). How the brain functions in processing executive function concepts involves the use of the prefrontal cortex, how it pulls together all sources of information to perform high level activities is not clear (Gray, Chabris & Braver, 2003).
Bernier et al. (2005) conducted an experimental study to examine the fear/startle responses of individuals with autism and a control group. The amygdale has been shown to mediate the startle response in normal functioning individuals. Two groups ranging in age from 12 to 45 participated in the study. Average age of control group was 19.7 years and autism group was 18.4 years of age. Both groups consisted of 12 males and 2 females. Two hypotheses were explored. One hypothesis stated that the amygdale was under-responsive in individuals with autism, resulting in a lesser fearful response to stimulus and the second hypothesis stated that the amygdale was over-responsive and would result in over responsiveness to startle stimuli in individuals with autism.

Results concluded no significant difference of response to either group. Both groups responded in similar fashion. This suggests that the amygdale functioning, specifically fear response and the ability to be startled were intact for the autism group. Neither hypothesis could be substantiated. Limitations include how the IQ of the autism group was in the average range and might not be typical of other groups of autism individuals with lower cognitive abilities to evaluate if either hypothesis could be re-evaluated.

**Nutritional/Opioid Theory**

The opioid theory in the treatment of autism explains how defective enzymes in the digestive system prevent the complete digestion of gluten and/or casein containing foods. This lack of digestion causes opioid like behaviors such as attentional issues, irritability, lack of social awareness and self-stimulation (Knittel, 2007). The use of dietary interventions in the management of ASD is being explored. Since autism has no clear etiology and no cure has yet to be found, the realization that dietary interventions have met with some successes is encouraging. Evidence has shown that foods containing gluten (wheat) or casein (milk), when removed from
the diets of individuals with ASD lead to improvements in symptoms (Adams & Conn, 1997; Knivsberg, 2002; Rimland, 2000; Whiteley, 1999). Following a rigorous removal of gluten or casein from their diets, as many as 80 percent of individuals with ASD exhibited a significant improvement in symptoms (Kidd, 2002). The types of symptoms that have been identified as being affected by the gluten-free or casein-free diets include; behavioral improvements, decreased seizure activity, improvement in gross motor behaviors, increased social contact, improvements in eye contact and language and sleep patterns normalized (Kidd, 2002).

The hypothesis posed by Knivsberg et al (2003) that dietary interventions would have a positive effect on individuals with autism was substantiated by several other researchers. Published studies that found positive effects of dietary interventions include; Adams and Conn, 1997; Cade et al, 1999, Klaveness and Bigam, 2002; Knivsberg et al., 2002; Knivsberg et al., 1999; Knivsberg et al., 1995; Knivsberg et al., 1990; Lucarelli et al., 1995; K.L. Reichelt et al., 1990; Rimland, 1988; R. Shattock, 1995; Whiteley et al., 1999.

Knivsberg et al. (2003) conducted a single blind controlled study with two groups of ten children each. The mean age of the control group was 7 years 2 months and the diet group 7 years 6 months. Each group of children was assigned to either a control or diet intervention group. The intervention of a gluten-free and casein-free diet was measured with pre and post tests one year apart. Measurements were obtained using the DIPAB (Diagnosis of Psychotic Behavior in Children) and parent reports. Results were significant. The group with the intervention decreased in areas of social isolation and strange behaviors and increase in willingness and abilities to communicate.

Elder et al. (2006) conducted a randomized, double blind repeated measures crossover design study to measure the efficacy of a gluten-free and casein-free diet in treating children with
autism. The sample included fifteen children between the ages of 2-16 with a mean age of 7.32 years, all of which were diagnosed with autism spectrum disorder. Results were based on urinary peptide levels collected in the homes of the participants. Results were not significant; however, several parents did report positive behavior change from their children. Limitations to the study include small sample size, short duration (12 weeks) and a lack of behavioral data analysis.

**INTERVENTIONS and PRACTICES**

The theories previously discussed impart influenced the creation and adaptation of interventions and practices teachers use to educate students with ASD. Each of the practices was created based on a conceptualization of fundamental ideas of specific challenges students with ASD experience and possible methods to transform academic and behavioral deficiencies that impact the educational process of the student with ASD. The 42 practices explored in this study are categorized according to their level of efficacy as presented by Simpson and associates (2005).

We define *scientifically based practices* as those that have significant and convincing empirical efficacy and support. A *promising practice* refers to a method that appears to have efficacy and utility with individuals with ASD, even though the intervention requires additional scientific support to be considered a *scientifically based practice*. A practice for which there is *limited supporting information* is used to describe interventions and treatments for which there is little or no scientific evidence. We use the descriptor *not recommended* to refer to interventions and treatments that have been shown to lack efficacy and that may have the potential to harm (Simpson et al., 2005, p.9).
Scientifically-Based Practices

Scientifically-based practices are identified as those practices that have a superior amount of empirical support. The use of these practices has undergone a substantial amount of thorough research (Table 2-6). The evidence repeatedly and consistently provides similar results that educators who use these practices consistently find that their students display a significant increase in skill acquisition as a direct result of the practice (Simpson et al., 2005).

Table 2-6

<table>
<thead>
<tr>
<th>Scientifically-based Practices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applied Behavioral Analysis (ABA)</td>
</tr>
<tr>
<td>Discrete Trial Teaching</td>
</tr>
<tr>
<td>LEAP (Learning Experiences: An Alternative Program for Preschoolers and Parents)</td>
</tr>
<tr>
<td>Pivotal Response Training (PRT)</td>
</tr>
</tbody>
</table>

Applied Behavioral Analysis

With nearly forty years of research ABA is recognized as an effective approach for those with ASD and other disabilities (Heflin & Simpson, 1998; Rimland, 1999; Simpson & Myles, 1998). ABA has proven successful as an intervention to use with students with ASD (Anderson, Avery, DiPietro, Edwards, & Christian, 1987). Applied Behavioral Analysis (ABA) is a child-centered, positively reinforced approach to teaching that promotes a change of behavior and learning in students with ASD. By utilizing the physical environment and managing time, activities prior to events can be evaluated and used to manage student’s behavior and encourage positive behaviors. By breaking tasks into small manageable parts, each task can be monitored and improved upon. Implementation strategies and student’s behaviors are closely monitored and a causal relationship is identified to help shape effective learning behaviors (Heflin & Alberto, 2005).
In order for ABA strategies to be effectively implemented, students must be in a learning environment that will promote the development of learning new concepts. These classrooms need to be “creating a supportive classroom environment and creating a systematic instructional environment” (Heflin & Alberto, 2001, p. 94).

Skill-based practices focus on a specific skill the individual displays. “Skill-based approaches assess the individual’s performance and target specific skills to teach to improve adaptive functioning” (Heflin & Simpson, 1998, p.197). Some of the most commonly known interventions used with students with ASD that derive from the skills-based Applied Behavior Analysis (ABA) include, Discrete Trail Teaching, Picture Exchange Communication System (PECS), Incidental Teaching, Social-behavioral Learning Strategy Intervention (SODA), Structure Teaching (TEACCH), and Pivotal Response Training (PRT). ABA principles can be utilized by educators to pick strategies that may be successful in managing the behavior and learning of their students. Educators are also able to study the strategies in comparison to the outcomes and make evaluations as to whether or not the strategies are providing the desired outcomes (Heflin & Alberto, 2001).

Anderson, Avery, DiPietro, Edwards, and Christian (1987), Lovaas, Koegel, Simmons and Long (1973), and Lovaas (1987) conducted three separate studies with 20, 38 and 14 children with autism at or below first grade. All three studies yielded positive results and found that the participants experience significant gains in academic development, social abilities and language skills. Although other researched questioned the amount of time needed for the intervention, sometimes up to forty hours a week, results were impressive (Simpson, 2005).
**Discrete Trial Training**

Children with ASD often experience challenges with learning new information and may find themselves acting out due to their frustration and in an effort to avoid other tasks that could also be frustrating. One of the challenges for educators who work with children with ASD is to find ways to be able to motivate children so that they can be academically successful (Smith, 2001).

Discrete trial training (DTT) is an approach used to change individual behaviors of children and simplifying teaching so that children are better able to learn. It is frequently used to enhance new behavior learning, teach complex concepts, and teach children to discriminate between options (Smith, 2001).

Discrete trial teaching was utilized prior to the implementation of social story intervention for 3 young individuals with ASD. Prior to the social story interventions conducted by Kuoch & Mirenda (2003), discrete trial teaching was used in a variety of settings including home-based, one to one, an inclusive preschool classroom, a one-to-one method, and at home on a one-to-one basis. Conclusions and discussion of the findings of Kuoch & Mirenda (2003) suggest that discrete trial teaching may or may not influence the results of social story interventions.

**LEAP (Learning Experiences: An Alternative Program for Preschoolers and Parents)**

The Learning Experiences: An Alternative Program for Preschoolers and Parents (LEAP) intervention is a peer-mediated, cognitive-based intervention that may be recommended for use with individuals in the early childhood age group, with children with moderate to mild forms of ASD (Simpson et al., 2005). Individuals with severe cognitive functioning levels to
above average intellectual abilities that are experiencing challenges with appropriate socialization and behavior may benefit from social problem-solving strategies.

The LEAP curriculum seeks to develop social and emotional growth, enhance language and communication abilities, increase independence in work and play activities, facilitate choice making, increase capacity to cope with transitions and improve behavior, and improve overall cognition and physical abilities (Simpson et al, 2005, p.163). As the LEAP intervention has empirical significance Simpson (2005) categorized the intervention as a scientifically-based practice.

**Pivotal Response Training (PRT)**

Pivotal response training (PRT) utilizes educational approaches and techniques in specific areas that have an effect in multiple target behavior areas. The intervention focuses on three areas of progress; to teach students to learn from social and learning opportunities that occur around them, to minimize the amount of one-on-one supervision they need from caretakers, and to minimize the amount of extra services that need to be utilized for the students advancement in areas that removes them from the classroom (Koegel et al., 1999). The behavioral modifications focus on communication skill advancement, use positive interactions, and are family centered (Koegel et al., 1999; Simpson et al., 2005).

Pierce and Scheibman (1995) conducted a multiple baseline, experimental study in a classroom setting with 2 male children who were both 10 years of age and diagnosed with autism in a classroom setting. The intent of the study was to evaluate the effectiveness of the PRT treatment in teaching social skills (complex social behaviors and complex attention behaviors) to autistic children. Their method entailed having peers utilize scripts to help model desired behaviors. Results showed that the use of PRT did yield positive results with both outcome
variables and the behaviors were maintained after 2 months in a follow-up evaluation. Furthermore, the results were generalized into other areas of the subjects’ lives.

Koegel, Koegel, Shoshan and McNerney (1999) reported the results of a study of six children diagnosed with autism between the ages of 3 years-1 month and 3 years-10 months in clinical and home settings. Observations of children before and after intervention found that control and study children had similar adaptive behavior ratings, but study children had higher levels of spontaneous interactions after the intervention. Study children were able to participate in social activities at a higher rate than the control group. Pierce and Schreibman (1997) conducted a study of 2 children with autism and eight typical peers, between 7 and 8 years of age, in both classroom and recreation room settings. The use of the PRT found overall increases in the frequency of word usage after intervention and generalization of new skill to peers. The PRT intervention was initiated through peer training.

**Promising Practices**

*Promising practices* are methods educators use to teach students with ASD. These practices have met at least one of two criteria to be categorized as a *promising practice* 1) they have been widely used for several years with little or no adverse outcomes and/or 2) research suggests that children with ASD have positive experiences with these practices including enhanced skill acquisition (Table 2-7). These practices are lacking in scientific support to be considered a *scientifically-based practice* (Simpson et al., 2005).
Assistive Technology

Table 2-7

Promising Practices

<table>
<thead>
<tr>
<th>Promising Practices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assistive Technology</td>
</tr>
<tr>
<td>Augmentative Alternative Communication</td>
</tr>
<tr>
<td>Cognitive Behavior Modification</td>
</tr>
<tr>
<td>Incidental Teaching</td>
</tr>
<tr>
<td>Joint Action Routines (JAR)</td>
</tr>
<tr>
<td>Picture Exchange Communication System (PECS)</td>
</tr>
<tr>
<td>Play-Oriented Strategies</td>
</tr>
<tr>
<td>Sensory Integration</td>
</tr>
<tr>
<td>Social Decision-Making Strategies</td>
</tr>
<tr>
<td>Social Stories</td>
</tr>
<tr>
<td>Structure Teaching (TEACCH)</td>
</tr>
</tbody>
</table>

Assistive Technology

Assistive technology is described as any type of aid that is used to assist with the functional abilities of a child with any disability (Individuals With Disabilities Education Act Amendments, 1997). Devices can be high-tech or low-tech, or electronic. They may be complicated and technical computerized type devices or as simple as pencil grips that make holding a pencil possible. Overall, results of studies tend to conclude that the use of assistive technology with students with ASD and other disabilities has a positive impact. Price and complexity of devices vary greatly and the level of training needed to use and instruct individuals on their correct usage ranges from extremely limited to intensive. (Battenberg & Merbler, 1989; Hagiwara & Myles, 1999; Simpson et al., 2005).

Myles, Ferguson and Hagiwara (2007) examined the use of a personal digital assistant (PDA) by a 17 year-old boy in the eleventh grade in a Public School in the Midwest part of the United States. The student, having been diagnosed with AS and having organizational difficulties was the subject used to measure the effectiveness of the utilization of the PDA in recording
homework assignments. The duration of the observation was twenty-five school days. The study used a single case, multiple-baseline-across settings design in three academic subjects, science, history and English to evaluate the effectiveness of recording homework assignments (dependent variable) using a PDA. The results displayed a noticeable increase in the ability of the student to record homework assignments when comparing baseline and intervention phases (Myles, Ferguson & Hagiwara, 2007).

**Augmentative Alternative Communication**

The augmentative and alternative communication (AAC) intervention is recommended for use with individuals from preschool age until adulthood on the autism spectrum with cognitive functioning levels from severely impaired to moderately impaired intellectual abilities (Simpson, 2005). Research suggests that individuals on the autism spectrum who are nonverbal or who experience deficits in their communication skills may benefit from AAC. The ability for an individual with ASD to be able to find some method to be able to communicate and express themselves is essential. A student on the autism spectrum that has no way of communicating is more likely to display behavioral difficulties in the academic setting and therefore the use of a system such as AAC may help enhance the academic process (Attwood, 2007).

McCormick and Shane (1990) explained the two parts of AAC in the following way; *augmentative* referring to approaches and apparatus used to assist with the speech production of individuals and *alternative* as a variety of techniques used to take the place of speech for the individual who has not been able to acquire the ability to speak or does not yet have the ability. They also discussed the two main components of the intervention as systems of symbols and devices to aid in communication. Unaided types of devices are not technology based and may be as simplistic as body language and gestures. Aided types of devices include apparatus outside of
the individual's body. The unaided type of devices are perhaps the simplest and most accessible to use since they require no support from a technological perspective, they are easy to transport and are cost free (Simpson et al., 2005). Simpson (2005) categorized this practice as one that is a promising practice and with additional research may develop into a scientifically based practice.

**Cognitive Behavior Modification**

Cognitive behavior modification (CBM) is a behavior modification practices composed of three parts: pre-training, training and generalization (Simpson et al., 2005). The idea is that individuals with ASD they have the cognitive ability to change their behaviors once they are identified, are taught to monitor their new responses to situations and bring these new behaviors into other areas of their lives (Simpson et al., 2005). Lopata, Thomeer, Volker & Nida (2006) conducted a pretest/posttest experimental design that studied the effects of how a cognitive-behavioral treatment program affected the social skills abilities of ASD children between the ages of 6 and 13. Twenty-one children were studied at a summer program during 2003 and 2004. Two types of treatments were enacted; social skills instruction and behavioral treatments and only social skills instruction. The hypothesis was that both methods of treatments would lead to decreased behavioral problems and an increase in social skills and adaptability. The dependent variables were the social skills and adaptability ratings as measured by select components of the Behavior Assessment System for Children, Parent Rating Scales, and Teacher Rating Scales. The independent variables were the specific implementation of interventions that were selected from the Skillstreaming program used to teach a social skills group curriculum developed by the staff additionally. Therapeutic activities sessions also created by the staff at the summer program were employed. Children participating in the socials skills and behavioral therapy also received behavior management training utilizing a token economy system.
The results, based on parent and staff observations, included improvement in overall social skills and parents reported a significant improvement in the ability of the children to adapt to new situations, and also had a decrease in unusual behaviors. These results are consistent with the findings of Howlin (1998) that emphasized how positive behavior modifications and communication skills can help increase performance and decrease behavior issues. Staff reports expressed an insignificant change in adaptability and an increase in the frequency of unusual behaviors. Comparing the results of the two types of programs found no significance in levels of improvement between them. Therefore, the results did not support the hypothesis.

In evaluating the findings it is important to understand the significance of the parent’s reports of witnessing a decrease in unusual behaviors and an increase in adaptability that were not witnessed by the staff. This maybe due in part to the limited interaction time the staff had with the children compared to the time the parents spend with their children. Future studies should include larger sample sizes and a longer duration as these variables may provide results more in line with the original hypothesis. Additionally, future studies where these types of programs are integrated into the educational environment over the course of a semester or year or longer, would prove beneficial.

**Incidental Teaching**

Individuals with ASD experience difficulties in learning incidental social skills. They often replicate and produce socially appropriate or inappropriate behaviors without understanding their meaning and how it applies to a specific context. The challenges occur as they learn a broad strategy to follow in a social situation; however, when an unstructured situation arises, they are less capable of adjusting their thinking from a learned social environment to a different set of stimuli and least capable of modifying their responses in a
different social context. As individuals with ASD value their social interactions, self-knowledge and self-control, these varied situations become facilitators of stress and anxiety (Myles & Simpson, 1998, p.4).

Incidental teaching intervention utilizes a student’s individual interest and own motivations to provide instruction when the student is performing a typical behavior (McGee, Daly, & Jacobs, 1994). Typically employed in an academic environment, teachers provide the student with opportunities to learn and seek to motivate them by focusing on the interests of the child with ASD. The student is able to receive the preferred item as a reward based on his or her appropriate response (Simpson et al., 2005). According to Farmer-Dougan (1994) and Simpson et al. (2005) advantages to incidental teaching intervention begin with the increased ability for the child to interact in an inclusive environment, especially during early childhood education, although older children and adults can also benefit from this approach. Secondly, social skills’ training is a key component to incidental teaching. Lastly, the routine of incidental teaching can be carried outside of the classroom to the homes for parents to initiate and continue with to help encourage generalization of pertinent skills.

Charlop-Christy and Carpenter (2000) conducted a multiple baseline, alternating treatment, single subject design study with three males between the ages of 6 years and 9 years 8 months diagnosed with autism. The researchers used a modified incidental teaching method in a home setting. The modified method was defined as using interventions more times per day than in the traditional incidental teaching methods. Parents stated that the techniques were easy to perform in a home environment and resulted in an increase in the development of spontaneous speech.
Joint Action Routines (JAR)

Joint Action Routines is a skill-based practice and is recommended as an intervention for use with individuals from preschool age until age 16 with severe to mild autism (Simpson, 2005). These individuals with cognitive functioning levels from severely impaired to average intellectual abilities who are nonverbal or not making progress with their current speech therapy, to improve communication skills.

The underlying idea is that children with ASD do not understand the function of communication and the components that make communication effective, such as active listening and reciprocity (Koegel and Koegel, 1995). The opportunity and need to communicate is the center force of this child-centered practice that heavily relies on pragmatic principals that focus to attain expressive and receptive language skills to enable them to communicate. The major components of the JARs approach are:

1. preparation or fabrication of a specific end product, such as art, and product assembly
2. story or central plotline, including pretend play and community living skills; and
3. Cooperative turn-taking games, which may occur during activities such as morning circle routine, group music therapy, and recreational therapy sessions (Simpson et al., 2005, p.106).

The goal of this approach is to improve the expressive and receptive communication abilities of individuals with ASD. JARs offers some promise as a proven intervention, with minimal empirical studies to substantiate the efficacy of the practice, Simpson (2005) categorized the approach as having promising practice and worthy of use.
Picture Exchange

Picture exchange communication system (PECS) have been used to teach children of different ages to be able to acquire an item they want by exchanging a picture of the item for the actual item. PECS is often used in preschool and elementary school settings with children with autism and other disabilities where expressive language is impaired (Simpson et al., 2005). Teachers, paraprofessionals, parents, relatives and even other students can be trained to utilize PECS with students with autism. Physical prompts, shaping, fading and backward chaining can all be used as behavioral type interventions to help implement the PECS (Heflin & Simpson, 1998).

Schwartz, Garfinkle, and Bauer (1998) conducted a study of 31 children between the ages of 3 and 6, including 22 males and 9 females. Sixteen of the children had autism or PDD-NOS, fifteen had either Down syndrome, Angelman syndrome, or were developmentally delayed. On average, 14 months after the initiation of the PECS intervention the results of their functional communication were apparent in the children. The study only reported means and ranges; specific data was not included making generalization of the results unreliable.

Another published study displaying significant support for the PECS system was Charlop-Christy et al. (2002). In a study of three, 3-12 years old males with autism, in clinical settings and free play, their findings included improvement in behavior, socio-communicative skills and an increase in imitated and spontaneous speech. One of the advantages of the PECS system over other communication systems is that no prerequisite skills need to be taught prior to its implementation (Simpson et al., 2005).
**Play-Oriented Strategies**

Play-Oriented interventions and practices have been found to work with all students with ASD, although those students with the greatest amount of cognitive impairments may benefit the least (Simpson et al., 2005). Play in and of itself is a key component of childhood and is conducive to the development of cognitive, social and socialization abilities (Wolfberg, 1999). Unlike play-based therapies, play-oriented interventions do not have to be conducted by a therapist or occur in a therapeutic environment and may be more useful for children with ASD (Wolfberg, 1999).

One method of employing play-oriented interventions involves making play groups where students with ASD are paired up with students that are able to guide the students to appropriate interaction in play groups. Play-oriented interventions can be implemented in a variety of settings including schools, home, hospitals and other types of facilities where children interact (Simpson et al., 2005). Expense should be considered in the use of play-oriented strategies since training, materials and time are the primary resources needed.

Although empirical support to the effectiveness of play-oriented interventions is not currently available, the efficacy of the intervention has been documented based on the long duration these interventions have in helping develop appropriate play behaviors, Simpson (2005) categorize the intervention as a promising practice.

**Sensory Integration**

Rimland (1990) found that close to 40 percent of individuals with autism experience some level of abnormal receptivity to sensory sensitivity. Sensory integration is the ability of an individual to be able to organize sensory information. Sensory integration intervention was developed based upon the premise that a neural dysfunction experienced by some children, leads
to a problem with the reception and processing information obtained from external stimuli from the child's environment (Attwood, 1998; Exhorn, 2005; Kutscher, 2005; Simpson, 1995).

Sensory input is obtained through the body's ability to perceive outside stimuli. According to Myles et al. (2000) senses can be categorized in the following way; tactile (touch), vestibular (balance), proprioception (awareness of one's own body), visual (sight), auditory hearing, gustatory (taste) and olfactory (smell). Many children throughout the autism spectrum are especially sensitive to external stimuli. They may experience either oversensitivity or undersensitivity to external stimuli. Communication difficulties experienced by many individuals may exist in part linked to sensory integration dysfunction as a response to brain overload or under-stimulation. Either condition can result in poor academic and social performance (Attwood, 1998; Simpson, 1995).

Reports by practitioners experienced with sensory integration intervention have found the methods highly individualized structuring to be beneficial to the individual. Sensory integration intervention is used in a way that the specific issues of the individual can be focused on and therefore, results can be optimized. Practitioners of SI can use a variety of methods to enhance sensory experiences including: riding scooter boards, using swings, and using trampolines in a form of child-directed play (Simpson et al., 2005). A disadvantage to the intervention includes the intense level of training that is needed by the interventionist and the level of knowledge of neural systems that are needed to be able to implement the intervention.

McClure and Holtz-Yotz (1990), Ray, King and Grandin (1988), and Zisserman (1992), all conducted single case studies of children between the ages of 8 and 13 diagnosed with autism. Each study produced favorable results in the ability of the sensory integration intervention to help decrease self-stimulatory behavior, decrease self-stimulation behaviors and self-injurious
behaviors, increase social behaviors, and increase vocalization abilities. All study limitations included such small sample sizes from which generalizations of results were not able to be made. Studies involving large sample sizes and long-term duration were found in the literature. Simpson (2005) rated this practice as a promising practice due to multiple studies yielding positive results.

**Social Decision-Making Strategies**

Social Decision-Making Strategies are a cognitive-based intervention that may be recommended for use with individuals with mild to high functioning ASD from elementary school age to adult. Individuals with cognitive functioning levels of moderate to above average intellectual abilities that are experiencing challenges with appropriate socialization and behavior may benefit from social problem-solving strategies. This practice uses verbal or written methods to help individuals with ASD identify problem behavior, identify what corrective actions need to be taken and develop a plan to rectify the situation (Myles and Simpson, 1998). Simpson et al. (2005) identified three forms of social decision-making strategies; (1) social autopsies, (2) situation-options-consequences-choices-strategies-simulation (SOCCSS), and (3) stop, observe, deliberate, and act (SODA) and categorized them as being promising practices to use with individuals with ASD.

As all three approaches have similarities and may be useful in a variety of social situations, the costs are low and they are typically easy to employ these are promising practices to use in the social skills area. Perhaps the most outstanding of the three methods is the stop, observe, deliberate, and act (SODA) intervention.

Bock (2007) conducted an experimental single-subject study about the utilization of the social-behavioral learning strategy intervention; stop, observe, deliberate, and act (SODA) on
four students in elementary school diagnosed with AS and their social interaction skills. The foundation of the SODA intervention was founded in the Theory of Mind “mind reading” intervention method (Howlin et al., 1998). Prior to the SODA intervention all participants participated in the Theory of Mind training for a year at the rate of 2.5 hours a week. A control group was created from classmates exposed to the same training that did not have a disability.

The dependent variable is the level of student social interaction skill, the independent variables are; the percentage of time spent interacting with peers during lunch time, the time spent in organized sport types of games and the amount of time spent in productive cooperative learning activities with their peers. The SODA stories were created by both the special educators with certification to work with AS children and the author. The replacement behaviors were directly linked to the independent variables. Results indicate that the subjects did increase the amount of time they spend in the three settings with their peers in appropriate and productive interaction. Additionally all four subjects’ maintained improvement one month after the intervention ceased. The results do suggest that the incorporation of the SODA intervention along with the prior intervention of the Theory of Mind “mind reading” intervention can make a significant improvement in the ability of students with AS to make improvements in social interaction with their peers (Howlin et al., 1998). Simpson (2005) rated the social-decision making strategy as a promising practice to use with children with ASD.

**Social Stories™**

The creation and utilization of social stories, as identified by Carol Gray in 1991, as an intervention can give direction and teach students systematic methods for social skill’s development. Individuals with ASD need to be taught how to respond in a socially appropriate manner in social settings. Utilizing social stories to teach social cues, feelings, cognitive
processes and appropriate behaviors in a variety of settings is a useful strategy that is constructed in three parts; the introduction, the body and the conclusion (Attwood, 1998; Attwood, 2007; Autism Information Center, 2007). The usefulness of social stories has met with difference of opinion based on the limited studies to date. Heflin and Simpson concluded that “in spite of this positive perception, social stories as interventions for students with autism remain no more than a promising method” (Heflin & Simpson, 1998, p. 198). On the other hand Kuoch and Mirenda (2003), found that not only is the social story intervention a significant factor in decreasing undesirable behaviors in young children with ASD, but the behaviors were maintained over time after the interventions were ended and may have lead to “irreversible learning of appropriate behaviors that may have occurred during the course of the interventions” (Kuoch & Mirenda, 2003, p. 219). Gray and Gerard, 1993 and Swagger et al., 1995 concur with Kouch and Mirenda (2003) that social stories are based on directives and guidance about social situations and are an effective tool for individuals with ASD (Attwood, 1998; Myles & Simpson, 1998).

Sansosti & Powell-Smith (2006) studied the effects of social story interventions on social behavior of 3 students diagnosed with AS over a period of thirty five school days. The purpose of the study was to measure the social story effectiveness as it relates to the target behaviors of sportsmanship, maintaining conversation and joining in. In a social story study by Barry and Burlew (2004) the dependent variables were the amount of prompting needed for making choices independently and the amount of time the child would act appropriately in the play, and if the play center was effectively utilized. The sample population was three boys between the ages of nine and eleven. They were all former clients, over a year earlier, from a hospital in the southeastern part of the United States associated with a child development center. In order to participate in the study students had to have basic reading skills, sufficient oral communication
abilities, at least average cognitive abilities, and a diagnosis of AS. The researchers employed “a multiple-baseline-across-participants” (Sansosti & Powell-Smith, p. 48, 2006) experimental design study with interventions that were introduced to one student at a time, which increased the strength of the internal validity of the independent variables. Using a similar approach, Barry & Burlew (2004) conducted an ABCD multiple-baseline design to measure the effectiveness of social story implementation with students with autism in an Exceptional Student Education (ESE) classroom utilizing four distinct phases. Kuoch and Mirenda (2003) utilized two experimental designs ABA for two children and ACABA for the third child.

Sansosti and Powell-Smith’s (2006) independent variables were the frequency and time of day the social stories were read by the students, and the attainment of the target behavior during baseline, intervention, and follow-up phases. Social story journals were kept by both the parents and the students. Data was collected via a direct system of observation by a lead investigator using an interval recording system from 15, 10 and 5 seconds when the target behavior was engaged. Observations were conducted three times a week for 15 minutes at a time. The results indicated that two of the three students had minimal success with social story influence on the target behaviors of sportsmanship, maintaining conversation and joining in and no significant change for the third student. For two of the students treatment integrity was 88% and 92% respectively and the third student did not have measures for treatment integrity since no records were kept of when and how often he read his social story. Follow-up data for two of the students found significant increases from baseline to follow-up measures, although the behaviors decreased slightly from the intervention to follow-up phase.

The data suggests that incorporating social stories as an intervention increased the target behaviors for two of the three students and may be a valuable tool to use to increase social skills
in students with AS (Attwood, 1998). Similar findings were replicated in the study by Barr and Burlew (2004) where the use of social stories in an ESE classroom significantly improved two autism students' abilities to make choices independently and to play appropriately with peers. This resulted in one first grade student to be advanced from a self contained ESE class to an inclusion class and the second student to be able to choose which activities he would want to interact in without prompting or avoidance behaviors. Findings of the study by Kuoch and Mirenda (2003) were similar to other studies on this topic. Kuoch and Mirenda's findings are consistent with the benefits of social story interventions which include the learning and maintenance of increases in social skills for children with ASD. All three participants not only displayed a significant decrease in inappropriate behaviors after the social story intervention, they also maintained the low levels during follow-up measures where no intervention was utilized, suggesting that irreversible learning of effective social interaction skills may have occurred (Kouch & Mirenda, 2003).

Limitations of Sansosti and Powell-Smith (2006) include a small sample of only three students with AS, and a relatively short duration time of thirty-five school days from intervention to follow-up. Limitations of the study of Kouch and Mirenda (2003) were that all three subjects had over a year of discrete trial teaching on a one–to-one basis prior to the study and this may have influenced the level of the children's susceptibility to social story intervention. Additionally the stories used were based on specific issues relevant to each child; results may have been different if the stories were generalized and not specific to each child. All three children were evaluated over different time spans; 17 sessions, 29 sessions and 39 sessions leading to a lack of consistency in duration. Although the small sample size of three children was apparently a limitation, it was not specifically mentioned by the authors. Sansosti and Powell-Smith (2006)
suggested that in future studies it may be helped by employing larger sample sizes, increased variables to be used to influence the strength of the social stories and a study of longer duration. Barr and Burlew (2004) stated that future studies should include larger sample sizes and group design studies. Kuoch and Mirenda (2003) discussed future study needs to include how the special interests of the participants in the development of social stories may influence results, and collecting data in less restricted environments to evaluate the overall impact of the stories in varied areas.

Structured Teaching (TEACCH)

In the educational setting, many children with autism have been educated following the TEACCH (Treatment and Education of Autistic and Communication Handicapped Children) approach. TEACCH is known as a global approach to educating individuals with autism based on cooperative interaction between parents and teachers or professionals. It is used as a life-long approach that can be implemented from pre-school into adult life. The program can help individuals become prepared to function in the work-world and enjoy independent living (Smith, 1999). The utilization of highly structured and continuous interventions, adaptations to the environment, and alternative forms of communication training are incorporated to decrease the amount and intensity of difficulties, and focus on their strengths to produce a more effective educational experience (Jordan, 2003; Schopler et al., 1980).

The ability to lessen the impact of the specific challenges individuals with ASD possess, has been helpful in increasing positive abilities and leading to greater successes. Verbal and non-verbal interventions, visual time-tables, and highly structured routines are used to increase planning and organization and transitioning between activities and locations. Aids are used to
assist with development of sensory and cognitive processing and reducing student levels of anxiety in and out of the school environment.

The TEACCH program was developed in 1972 at the University of North Carolina. Many specialist units worldwide have used the TEACCH program and its concepts (Lord & Schopler, 1994). TEACCH is an intervention model used throughout the United States and Europe and is considered the most influential program used as an intervention for students with autism (Smith, 1999). As the TEACCH program is a lifelong program and involves fluctuating variables over time, it is difficult to study and evaluate its effectiveness (Mesibov, 1997).

Ozonoff and Cathcart (1998) conducted a matched control study involving twenty-two children. Eleven of the students received the TEACCH program at home provided by their parents, in addition to their daily behavior based program at school. The second group of 11 students received only the behavior based program at school. The results showed an improvement in the development of non-verbal communication, motor skills, and imitation at over three times the rate of the control group without the TEACCH intervention being implemented at home. Limitations to the study include the increased interaction of parents, skewed the overall results.

**Limited Supporting Information for Practice**

Practices that are categorized as having *limited supporting information for practice* are identified as interventions and treatments for which there is little or no scientific evidence (Table 2-8). They have not been widely used or may have reports of having minimal effectiveness (Simpson et al., 2005).
Art therapy as an intervention may be recommended for use with individuals with severe to high functioning levels of ASD of all ages starting with preschool (Simpson et al., 2005). Individuals with severe cognitive functioning levels to above average intellectual abilities that are experiencing challenges with verbally expressing themselves may benefit from Art therapy (Simpson et al., 2005).

Rubin (1984) found that clinicians can use art therapy as a psychotherapeutic and educational process that uses art as a mechanism to help the individual with ASD communicate without using verbal communication. In order to use art therapy the clinician should identify a problem behavior or deficiency and a system for continuous measurement should be in place to identify the level of progress in the individual (Simpson et al., 2005). There appears to be no risks involved in using art therapy, providing a trained clinician employs the intervention, and the cost varies depending on the therapist fees. Some parents and professionals identified art
therapy as an effective intervention, however, there is limited supporting information for practice as identified by Simpson (2005).

**Auditory Integration Training (AIT)**

Auditory Integration Training is a method of treatment performed on individuals with disabilities including ASD. The treatment is biological in nature and designed to modify the auditory system of an individual by listening to sessions of where the listener identifies peaks in sounds and is evaluated with hearing tests later to see if the high points still exist. It is believed by some professionals that individuals on the autism spectrum experience problems with sound sensitivity that may affect their ability to learn (Rimland & Edelson, 1994; Simpson et al., 2005). The price of treatment is costly, often between $1000 and $2000 per treatment and while 10 or more sessions of treatments may be recommended. Due to the method of initiating the treatment, if the sound equipment is not used correctly by an AIT specialist, hearing damage may occur. At this time, there is no scientific evidence that AIT works, although multiple studies have been performed.

Edelson et al. (1999) conducted a study of 19 individuals with autism between the ages of 4 and 39 (17 males and 2 females with a mean age of 11.58 years) to evaluate the effectiveness of auditory integration training on people with autism. Their results were consistent with findings of several other researchers that there were no significant effects associated with auditory system improvement. Mudford et al. (2000) conducted a similar study to Edelson et al. (1999), where 16 individuals with autism between the ages of 5 and 14 years of age (17 males and 2 females, mean age 9.42) were studied at a university office. The participants had no benefits from the treatment. Additional studies by Rimland and Edelson (1995) resulted in no change to sound sensitivity and
some positive behavioral functioning results, and Zollweg et al. (1997) discovered no significant changes in behavior or hearing.

**Cartooning**

The cartooning intervention is a visual, cognitive-based intervention that may be recommended for use with individuals with ASD from elementary school age into adulthood, and with individuals with mild to high functioning forms of ASD (Simpson et al., 2005). These individuals with cognitive functioning levels from moderate to above average intellectual abilities that are experiencing challenges with appropriate socialization and behavior may benefit from the intervention. Cartooning works by encouraging the individual with ASD to visualize a concept or method or completing a desired task. Cartooning is a low cost method that is often a typical part of university-course content related to ASD or easily taught through workshops (Simpson et al., 2005). Simpson (2005) categorized this practice as one that is has limited supporting information for practice due to a weakness of empirical support for the intervention.

**Fast ForWord**

The FAST ForWord intervention is a skill-based intervention that may be recommended for use with individuals from 5-18 years of age, with children with mild to high functioning ASD. These individuals with cognitive functioning levels from mildly impaired to above average intellectual abilities that are experiencing challenges with reading and language. The FAST ForWord intervention may be used for children with ASD with language and reading problems with auditory processing deficiencies.

This intervention is an Internet-based CD-Rom computer program. Specific exercises are preformed to enhance temporal processing and phoneme identification (Richard, 2000). The program is unique to each child as it adjusts to the individual needs and abilities of the child. As
certified trainers are required to implement the intervention and proprietary programming is involved, the cost of the program is costly and may be too expensive for public schools to have. Although, there is no empirical evidence to support the effectiveness of the intervention, based non case studies Simpson (2005) categorized this practice as having limited supporting information for practice.

**Floor Time**

Commonly referred to as the Developmental, Individual-Difference, Relationship-Based Model (DIR), “floor time” is a play-oriented intervention for individuals with ASD and other developmental disorders. The floor time method is focused on the individual differences of the child and their relationship to the caregiver.

This method is child focused and affective interactions between the child and caregiver take place in learning and playing situations, typically performed on the floor (Greenspan & Wieder, 1997; Greenspan, Wieder & Simons, 1998; Heflin & Simpson, 1998; Messina, 1999; Siegel, 1999).

Based on the developmental theory proposed by Greenspan, it is thought that through intensive interaction between the child and caregiver, functional development that has not been previously acquired will be systematically developed (Greenspan et al., 1998). The theory is composed of six fundamental developmental milestones that are the targets of floor time treatment:

- The dual ability to take an interest in the sights, sounds, and sensations of the world and to calm oneself down
- The ability to engage in relationships with other people
The ability to engage in two-way communication
The ability to create complex gestures and to string together a series of actions into an elaborate and deliberate problem-solving sequence
The ability to create ideas
The ability to build bridges between ideas to make them reality-based and logical (Simpson et al., 2005, p. 27).

The floor time method is mainly used with infants, toddlers and preschoolers. The key components are based around the ability of the caretaker or therapeutic partner to take an active role in the activities and to provide consistent and spontaneous fun activities that are child centered (Greenspan, Wieder & Simons, 1998; Heflin & Simpson, 1998). Individual based treatments that focused on development and affective interaction may have some promise when providing interventions for students with ASD. Simpson et al. (2005) identified the Floor Time intervention as having limited supporting information for practice.

Gentle Teaching

Gentle teaching is a philosophy for managing behavior in individuals with ASD. Gentle teaching intervention focuses on both the interpersonal relationships of individuals with ASD and other disabilities and the people caring for them as well as with environmental factors that may influence their interactions (Jones et al., 1991; Jordan et al., 1989; McGee, 1985). Behaviors that prevent the individual with ASD from participating in social activities such as inclusive education and socialization activities with peers may benefit from Gentle Teaching interventions (Simpson, 2005). Several of the integral parts of the gentle teaching approach for students with autism i.e., task analysis and prompting, have been proven successful in skill-based approaches. The Gentle Teaching approach has not proven itself successful in the development of
relationships or developing or promoting bonding between adults and children with autism (Heflin & Simpson, 1998).

McGee (1985) conducted a seminal study of 600 individuals, both males and females, between the ages of 16 and 44 where the Gentle Teaching intervention was studied. The individuals had a variety of mild to severe mental disabilities including schizophrenia and manic depression. Participants resided in community based programs, group home environments, and state sanctioned institutions. Although there was no reported baseline data, the findings implied that all types of maladaptive behaviors were reduced to a lower level. The intervention was utilized in a one-to-one teaching situation with each participant.

**Music Therapy**

Music therapy as an intervention is categorized under the heading of “Other” types of practice to use these individuals with ASD. Music therapy as an intervention may be recommended for use with individuals of all ages starting with preschool, with severe to high functioning levels of ASD (Simpson et al., 2005). Music therapy is used to enhance relaxation and to reinforce behavior in individuals with severe cognitive functioning levels to above average intellectual abilities that are experiencing challenges with auditory and visual discrimination as well as sensory reception control (Thaut, 1999).

Studies have been conducted since 1969 to current day involving music therapy; however, all of these studies involve very small sample sizes. Although some studies identified some benefits associated with the use of music therapy, the lack of empirical evidence to support the intervention lead to Simpson (2005) categorizing music therapy as having limited supporting information for practice.
Option Method (Son-Rise Program)

The Option Method (Son –Rise Program) intervention for children on the autism is categorized as an Interpersonal Relationship Intervention (Simpson et al., 2005). This intervention is recommended especially for children with mild to severe autism with low to average intelligence and some level of language and socialization challenges (Simpson et al., 2005). The developers of the program, Kaufman in the mid 1970’s, used this approach with their own child. The intervention is a home-based practice where the parent follows the lead of the child, observing what they do in their daily interaction with others and their environment. The child is able to choose the direction of their own learning, the adult is only the facilitator.

The parent joins in to the activity the child has chosen to engage in. By the parent joining in the activity this allows the child to feel that the behaviors they are engaged in are not unusual, even though the repetitive or excessive nature of the activity may be considered unusual. Ideally the joining in behavior increases the bond between parent and the child with ASD. Another component of the intervention is to utilize materials of instruction that are aimed at the specific interests of the child. The sense of empowerment that child may experience is one factor that may lead to increased child performance (Autism Treatment Center of America, 2007).

The principal foundation of this intervention is based on the bonding of parent(s) and the child with ASD. Although some parents have found success with this intervention, empirical evidence to support the effectiveness is not available. The concept of bonding of the child with ASD and parent(s) is not a new idea. Interpersonal Relationship interventions often have this same component.
Pet/animal Therapy

The practice of using pet and/or animals in the therapeutic process for children with all types of ASD's and with all levels of cognitive functioning has been tried for decades (Cochrane and Callen, 1992). The most common animals that have been used to help children with ASD better express themselves are cats, dogs, horses, and dolphins. Law and Scott (1995) found that the use of this practice may help children with ASD decrease anxiety and stress, develop responsibility, increase problem-solving abilities, and increase self-confidence.

Current research does not support the idea that great benefits are achieved when using this type of intervention with children with ASD, although research indicates that some children with ASD do benefit in physiological and psychological terms from this intervention (Simpson et al., 2005). There does not appear to be any known risks, and the only potential danger is in the use of dolphin therapy, the individual with ASD must be on the water and capable of swimming and staying afloat. Animal and pet therapy can be rather costly, and the benefits are not conclusive. Due to the lack of empirical support, the pet and animal therapy practice has been categorized as an intervention with limited supporting information for practice by Simpson (2005).

Power Cards

The Power Cards intervention is a cognitive-based intervention that may be recommended for use with individuals with mild to high functioning levels of ASD from elementary school age into adolescents (Simpson et al., 2005). This intervention focuses on the specific behaviors and special interests of the individual with ASD. The two components of this practice are a personalized script and a Power Card (Gagnon, 2001). Power Cards use a script that is read to the child prior to the start of a problematic situation to help facilitate a changing
perspective and a Power Card is made to highlight the key ideas. The actual card is small in size and can be carried around to by the individual to support changing thoughts and actions by having the card to refer to (Simpson et al., 2005). These individuals with cognitive functioning levels from moderate to above average intellectual abilities that are experiencing challenges with appropriate socialization and behavior may benefit from the intervention.

The Power Cards intervention is relatively new since 2001. The use of the special interests of the child may help the child find appropriate solutions to troubling situation, is low cost and has no apparent risks and the need for further empirical evidence to support its’ effectiveness is needed. Simpson (2005) categorized this practice as one that is has limited supporting information for practice.

**Relationship Development Intervention (RDI)**

The relationship development intervention is designed to be used with individuals from preschool age until adolescents on the autism spectrum with at least moderate cognitive impairment to those with above average intellectual abilities. Gustein and Sheely (2002) discussed RDI as having many target areas that may help the child be more effective in the academic venue. The focus of the intervention is to target the social skills deficiencies with emotional relationships individuals with ASD typically exhibit. Simpson et al. (2005) identified 10 areas that should be taught to improve relationships in individuals with ASD’.

- **Enjoyment:** companionship interest and display of positive friendship-related emotions
- **Referencing:** activities and ideas of friends and social acquaintances and reference points for an individual’s behavior
- **Social reciprocity:** maintaining a give-and-take relationship with others
- **Repair:** conflict management
• Improvisation and cocreation: creative sharing of perceptions and experiences
• We-go: an awareness of the importance of groups
• Social memories: memories of favorable experiences and shared events
• Maintenance: a willingness to voluntarily participate in relationships independent of rewards
• Alliance: maintaining relationship honesty and integrity in relationships with others
• Acceptance: acceptance of individuals’ strengths, weaknesses, and other unique personal qualities (p.43).

The RDI approach is another method used to help improve social skills with individuals with ASD, however, at this time empirical support of the effectiveness of this intervention is not substantial. This intervention has been categorized as an intervention with limited supporting information for practice by Simpson (2005).

**Scotopic Sensitivity Syndrome: Irlen Lenses**

The Scotopic Sensitivity Syndrome (SSS): Irlen Lenses Sensory Integration intervention is categorized under the heading of physiological/biological/neurological type of practice to use with individuals with ASD. The SSS intervention may be recommended for use with individuals from preschool until adulthood, with mild to high functioning levels of ASD (Simpson et al., 2005). Individuals with severe cognitive functioning levels to above average intellectual abilities that are experiencing challenges with facets of reading, strain and fatigue and difficulties with depth perception may benefit from the use of tinted lenses to help lessen the problems associated with visual-perceptual dysfunction (Simpson et al., 2005).

The Irlen lenses serve as filters and do not correct visual problems or the need the individuals may have for corrective lenses, however, they change the way the brain perceives
outside visual stimuli. The primary purpose of the intervention is to help the individuals with ASD be able to read for longer periods of time due to a decrease in symptoms that may interfere with the reading process. Simpson (2005) categorized this practice as one that is has limited supporting information for practice due to Simpson (2005) categorized this practice as one that is has limited supporting information for practice due to little scientific support as an effective intervention to use with individuals with ASD.

van Dijk Curricular Approach

The van Dijk curricular approach is a skill-based practice and is categorized as having limited supporting information for practice and could be recommended as an intervention for use with individuals from preschool age until adolescence with severe to mild autism with cognitive functioning levels from severely impaired to moderate intellectual abilities (Simpson et al., 2005). This approach was initially used with populations of children who became deaf-blind as a result of an illness in the mid-1960’s to target sensory-motor challenges (MacFarland, 1995).

MacFarland (1995) found that people with severe sensory deprived challenges struggle to make connections between people and things in their environment. The intent of this intervention is to use joint encounters of adult and the child with ASD to allow the adult to experience situations the way the child does and therefore increasing the likelihood that a bond between the two will grow and become a foundation for communication between the two people.

The promising components of the approach is that individuals with ASD may benefit from the visual components, the concreteness, and the use of naturalistic environment as well as the basic application of applied behavioral analysis components to this intervention (Simpson et al., 2005). As the desired result is to improve the five primary senses of individuals with ASD, the van Dijk approach offers some promise, however, the lack of empirical evidence to
substantiate the validity of the approach caused Simpson (2005) to categorize the approach only as having limiting supporting information for practice.

**Not Recommended Practices**

Practices categorized as *not recommended practices* include those practices that have scientific evidence to support their inability to increase skill acquisition or do not produce favorable results with children with ASD (Table 2-9). Additionally, the use of these practices may have resulted in serious detrimental effects and have the potential to harm (Simpson et al., 2005).

Table 2-9

*Not Recommended Practices*

| Facilitated Communication | Holding Therapy |

**Facilitated Communication**

The facilitated communication intervention is recommended for use with individuals from preschool age until adulthood on the autism spectrum with cognitive functioning levels from severely impaired to above average intellectual abilities (Simpson, 2005). This practice uses a typing type device and a trained facilitator. The severe communication deficit many individuals with ASD experience has lead to the search for some way for these people to communicate. By using an augmentive typing device the facilitator uses a hands-on approach to help the individual with ASD type out their thoughts and ideas (Simpson et al., 2005).

The costs of this intervention can be substantial. The cost of the communication device, the training of the facilitator and the time of the facilitator all lead to a costly proposition. Bilken
(1993) focused on three potential issues of an ethical concern. First the ability of the testing participant, the perceived understanding of what the individual with ASD may or may not be saying can be invalid. Secondly the individual with ASD is capable of lying and may misdirect the communication and thirdly, the facilitator may intentionally or unintentionally manipulate the expression of the individual with ASD, resulting in misinformation.

There have been many studies, both qualitative and quantitative to try and substantiate the value of this method, surprisingly; the qualitative studies have all found a need to continue with training whereas all of the quantitative studies have found no validity to the method. The lack of being able to communicate is frustrating to parents, teachers and the individuals themselves and the desire to have the individual be able to communicate may be a factor leading to a willingness of parents and educators to try this method, although the empirical evidence does not support it's validity. Simpson (2005) categorized this practice as one that is not recommended.

**Holding Therapy**

Practitioners that subscribe to the holding therapy method of treatment find that a child that does not make eye contact with their caregiver is indicating that the bond between the child and the caregiver is broken. As there no longer exists a connection between the child and caregiver, communication is lost. “The caregiver must not force the child to make eye contact, but must first reestablish body contact and physical attachment” (Heflin & Simpson, 1998, p. 195). Holding therapy is typically performed by the mother and individual with ASD with support of the family and therapist. The aim is to re-establish a bond between the mother and child. Most of the published data is based on anecdotal case studies, and experimental support data is not available to verify the claims of holding therapy.
Welch (1988) studied ten children, both boys and girls, with autism between the ages of 3 and 13. The children were evaluated in either their homes or clinical settings. There was no control group. The instrument used to evaluate results was the Behavior Rating Instrument for Autistic and Other Atypical Children (BRIAAC). The results indicated some improvement in multiple areas according to the BRIAAC. Due to the intense physical nature and forcefulness of the intervention and lack of supporting literature evidence to validate its success, holding therapy is not supported as a valued intervention for autistic populations (Heflin & Simpson, 1998; Simpson et al., 2005).

Not Rated Practices

Those practices identified as *not rated* in this study include practices that were not rated by Simpson et al. (2005) although their level of usefulness is often discussed by other researchers as they explore the impact the practice has on increasing skill acquisition in students with ASD (Table 2-10).

Table 2-10

<table>
<thead>
<tr>
<th>Not Rated Practices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assessment of Basic Language and Learning Skills (ABLLS)</td>
</tr>
<tr>
<td>Azrin 24-hour Toilet Training</td>
</tr>
<tr>
<td>Bolles Sensory Learning</td>
</tr>
<tr>
<td>Integrated Movement Therapy</td>
</tr>
<tr>
<td>Interactive Metronome</td>
</tr>
<tr>
<td>Lindamood-Bell</td>
</tr>
<tr>
<td>Naturalistic Language Paradigm</td>
</tr>
<tr>
<td>Neurofeedback (biofeedback)</td>
</tr>
<tr>
<td>Rapid Prompting Method</td>
</tr>
</tbody>
</table>
Assessment of Basic Language and Learning Skills (ABLLS)

Partners in Excellence (2009) described the Assessment of Basic Language and Learning Skills (ABLLS) intervention as a skill-based intervention in the form of an assessment, curriculum guide and a skills tracking system that may be used for children with ASD of school age. Individuals with ASD that are experiencing challenges reaching educational objectives may benefit from the intervention. The educational objectives that may be identified could be used in the construction of the educational and behavioral goals on the IEP of the child. Secondly, the ABLLS can help identify strategies that may be used by parents and educators to help in goal acquisition. The ABLLS can help with scoring and the effectiveness of the ABLLS assessment was not rated as an intervention by Simpson (2005).

Azrin 24-hour Toilet Training

The Azrin 24-hour Toilet Training intervention care taker directed skill-based intervention that may be recommended for use with individuals in the process of independent toilet training. Heflin and Simpson (1998) believe the more likely individuals with low functioning autism are able to care for themselves, the greater the opportunity for them to participate in normalized activities, such as attending school and participating in social activities. The intervention uses a variety of behavior modification techniques including prompting, shaping, fading and overcorrection. Heflin and Simpson (1998) found the intervention to be a best practice, although, Simpson (2005) did not rate this intervention.

Bolles Sensory Learning

The Bolles Sensory Learning method is a non-cognitive, educational approach that is believed by some people to stimulate the sensory system of individuals with ASD. This practice uses a computer controlled program to enhance the sensory system of the individual with ASD.
The individual is exposed to a variety of stimuli: movement, light and sound to learn or relearn subconscious sensory abilities and to process and integrate these sensory experiences. Believers of this approach may support the idea that the approach re-educates emergent faculties by stimulating the sensory systems to learn or relearn subconscious reception, processing and integration skills (Hunt, 2007). Empirical evidence to support this claim could not be found at this time. Simpson (2005) did not rate the method.

**Integrated Movement Therapy**

The Integrated Movement Therapy approach is an individual and group approach that involves the areas of speech-language pathology, behavioral and mental health counseling, and yoga. In an attempt to view the individual with ASD in a holistic manner, social and language deficits, sensory integration deficits, motor coordination challenges and self-esteem issues are all taken into consideration. Six core areas are involved in this therapeutic practice: structure and continuity, social interaction, language stimulation, self-calming, physical stimulation, and directed self-esteem building (Kenny, 2002). Simpson (2005) did not rate this intervention.

**Interactive Metronome**

The Interactive Metronome Therapy intervention is a non-academic intervention that may be recommended for use with individuals experiencing motor control and motor coordination difficulties (Myomancy, 2009). The approach uses interactive exercises and a patented auditory guidance system to measure and improve the rhythm and timing abilities of the individual with ASD. Supporters of this approach believe that by improving the functional abilities of the individual with autism improvements in academic performance may result (Developmental Rehabilitation and Learning Center, 2009; Myomancy, 2009). Simpson (2005) did not rate this approach, as significant empirical support was not available.
Lindamood-Bell

The Lindamood-Bell program is a facilitator directed skill-based intervention that some individuals with ASD who experience difficulties with communication including phonemic awareness and the ability to visualize whole concepts in reading may benefit from (Simpson et al., 2005). This practice is delivered as a tutorial type program where a trained facilitator helps the individual with ASD to use visualization and imagery to increase critical thinking and comprehension skills. The Lindamood-Bell method has similarities to the Fast ForWord method except that is does not need a computer. Heflin and Simpson (1998) question how individuals with ASD develop concept imagery and suggested that this approach be viewed as only experimental until empirical support suggests that the intervention has more validity. Simpson (2005) did not rate this method.

Naturalistic Language Paradigm

The Naturalistic Language Paradigm intervention is a skill-based, communication strategy that may be recommended for use with individuals with ASD that are experiencing challenges with language and communication development. The approach is centered upon child and caregiver interaction in a setting that is natural to the child. Key components of the approach include stimulus items that are chosen by the child or are found in the child’s environment. The stimulus item is a functional part of the child’s environment where both caregiver and child use the item and activities as outcome-based (Burkhart Center for Autism Education and Research, 2009). Simpson (2005) did not rate this intervention.

Neurofeedback (biofeedback)

The Drake Institute (2009) discussed the Neurofeedback (biofeedback) treatment intervention is a neurological type intervention that may be recommended for use with
individuals with high functioning forms of autism, individuals with severe impairments in functioning pertinent to concentration, distractibility and hyperactivity may benefit from this approach. Findings report that some individuals involved in this form of treatment may experience benefits in improved language, emotional and social skill development in addition to attentional, impulsivity and hyperactivity benefits (The Drake Institute, 2009). Simpson (2005) did not rate this intervention.

**Rapid Prompting Method**

The Rapid Prompting Method for treating individuals with ASD is a skill-based intervention that is caretaker guided. It may be useful for individuals with severe communication challenges as individuals with severe cognitive functioning impairments and self-stimulating behaviors may benefit from this method (Rudy, 2007). The method involves constant, fast-paced questioning, prodding, and engaging, combined with the use of a simple spelling board to enhance communication (Rudy, 2007). Unfortunately, there is no empirical evidence to support this method. Simpson (2005) did not rate this approach.

**Self-Injurious Behavior Inhibiting System (SIBS)**

The Self-Injurious Behavior Inhibiting System (SIBS) is an aversive intervention used to stop or minimize severe or life threatening self-injurious behavior (SIB) in individuals with ASD. SIBS is a mechanical devise designed to provide electric stimulation to the individual when it detects a blow to the head or extremities. The strategic placement of sensors on the individuals’ body identifies if blows to the body are occurring and feeds this information to a devise that delivers a controlled electrical stimulation to the individual with hopes of extinguishing the behavior. Researchers have studied a few cases of minimal participants to explore this intervention and found that in severe cases of SIB, the SIBS devise may reduce the

**Verbal Behavior**

The Verbal Behavior intervention is a child centered naturalistic approach that uses the child’s interests and activities to shape the teaching. It is a skill-based intervention that may be recommended for use with individuals with ASD. Bashe and Kirby (2005) explained how the Verbal Behavior intervention uses the same basic principals as applied behavioral analysis (ABA) to encourage children to speak. By setting-up a situation where a child with ASD wants a particular item, they are encouraged to request it. Verbal behavior may also be used to encourage higher levels of thought and comprehension by encouraging higher level thought in response to answering complex questions. Simpson (2005) did not rate this intervention.

**Visual Schedules**

The Visual Schedules intervention is a skill-based approach that may be useful for individuals with any form of ASD to organize their activities, create routines, predict the sequence of activities and make more sense of their daily activities. Depending on the level of functioning of the individual pictures, words, symbols or icons may be useful in making a picture display of activities that need to be done and in what order they should occur. Visual schedules are widely utilized in home and school settings to help individuals with ASD make sense of their world. Helfin and Simpson (1998) consider visual schedules to be a promising practice, although, Simpson (2005) did not rate this approach.

**Conclusion (Discussion of the Literature)**

To recapitulate the information presented above, the needs of students with autism and those that serve to educate them is an ongoing matter. As the increase of diagnosed cases of
individuals on the autism spectrum increases, it is essential that researchers, educators, and other professionals collaborate in the search for the most effective and efficient intervention methods for treating those with all forms of ASD. Supportive research concurs, that at this time, the most promising category of intervention are intensive behavioral interventions that start early in the individuals life (Attwood, 2007; Autism Information Center, 2007; Bolton & Baron-Cohen, 1993; Goodman & Williams, 2007; Simpson et al., 2005).

The first researchable topic in this review is to identify the challenges faced by educators in the pursuit of educating students on the autism spectrum. Federal legislation PL-142 (1975), IDEA (1997), NCLB (2001) and IDEIA (2004) all ensure that students with any type of disability, including autism, are educated in the least restrictive environment. Educators are expected to teach students with a multitude of abilities and disabilities in a variety of classroom setting. Students with autism, depending on their level of need and functional abilities, may need small specialized classroom settings or may be able to be included in inclusion classrooms. Classroom settings and expectations vary greatly as a result of a diverse level of needs considering that 70-75% of students diagnosed with autism are also identified as being mentally retarded (APA, 1994). The research has found that students with high functioning autism and AS, are the most likely to be successfully included in general education classes (Attwood, 2007; Harpur et al., 2006). Regardless of the abilities of the students, school districts need to create and implement programs to ensure the greatest success of the students. General education teachers as well as special education teachers need to be trained to use research based interventions and practices to be able to increase the rate of success with their students with ASD.

One of the greatest challenges for educators in working with students with ASD is the ability to understand the needs of the students. Unlike many other types of educational
disabilities, students with ASD do not respond to a few select types of approaches. Since autism is a spectrum disorder, variation in abilities and difficulties is extremely diverse. Some students with autism are very intelligent, while some are cognitively impaired. Some have communication abilities, while some are greatly impaired in the area of communication. Language is utilized by some and not utilized by others (Siegel, 1996). Socialization issues are predominant factors for those on the autism spectrum. Since autism is a developmental disorder, a variety of areas that affect the physiological, psychological and emotional aspects of the student can be impaired. Teachers with strong theoretical understanding of autism may be best prepared to help their students with ASD reach their maximum potential (Jones et al., 1991; Jordan et al., 1989; McGee, 1985; Simpson et al., 2005).

In order for a teacher to be successful with students with ASD, they need to be trained and have the necessary resources, including staff support in the classroom. Educators that are flexible in the manner they present information, accept assignments, administer tests and take pleasure in working with students tend to get the best results (Attwood, 1998; Harpur et al., 2006). Educators that understand how students with ASD function and can accept their uniqueness are the most successful (Attwood, 2007; Leicester City Council and Leicestershire County Council, 1998).

Theories on students with ASD development are useful for educators in their pursuit to teach students on the spectrum. Theories pertinent to students with autism provide essential information in the formation of successful educational practices. Literature suggests that students with ASD experience a wide spectrum of challenges in functioning levels which vary from severely impaired to gifted (Baron-Cohen & Bolton, 1993).
Theories targeting socialization abilities, communication needs, behavior issues and special interests of students with ASD are the most pertinent and of most value to educators (Attwood, 1998; Howlin, 1998; Jordan & Powell, 1995; Myles & Simpson, 1998; Siegel, 1996; Wing, 1995). Theories can be categorized in the following way according to a review of the literature; cognitive, socialization, communication, gender and physiological.

Gaps in the literature based on cognitive theories focus on the wide deviation of cognitive abilities and how students with ASD experience great disparities in the way they process information. Cognitive theories involve such variables as planning, organizing, shifting thought and memorization. These factors affect the student’s ability to transition between activities and settings in the school environment, although, they are not conclusive factors (Goldberg et al., 2005; Meltzer, 2007).

Socialization theories related to individuals with autism focus on perceptual differences. These differences in perception are a significant factor in the functioning abilities of students with ASD in the educational setting (Howlin et al., 1998; Jordan & Powell, 1995; Siegel, 1996). Study limitations include issues of co-existence of conditions such as attention and anxiety that have been found to be possible outcomes relating to socials interactions (Bellini, 2004).

Communication theories offer some explanation as to why individuals with ASD may experience inner turmoil in interacting and regulating experiences that are unpredictable and new and be a part of student’s daily interaction (Baron-Cohen & Bolton, 1993; Siegel, 1996). The challenges experienced by individuals with autism in communicating with peers and others and witnessed by educators, family members and others are significant. However, the literature does little to provide supportive evidence regarding the characteristic of all individuals with ASD. The level of severity is as diverse as the individuals themselves.
Gender theory literature suggests gaps in the literature centered on concepts of heritability and genetics. The literature suggests mild significance, although, little reliability of linkage of heritability and genetics in autism (Baron-Cohen, 1993; Folstein & Roney-Sheidley, 2001). Studies also suggest that there may be some level of similarity in familial characteristics of those with autism.

Physiological theories pertaining to abnormal brain and nervous system functioning of those with autism suggests that development that affects management of emotions, perceptions and regulation is different from their peers (Attwood, 2007; Harpur et al., 2006; Meltzer, 2007). Studies have revealed that individuals with autism have different brain functions than peers in many areas, especially areas that relate to socialization and communication, which are key areas in education. Although studies of nutritional theory have yielded non-significant results, some parents reported witnessing positive results in student performance and management in nutritional theory implementation and interventions (Elder et al., 2006).

A general understanding of theoretical perspectives that shed light into the particulars of autistic functioning and how educators can better their pedagogy in working with this population is essential. Theoretical comprehension is a prerequisite to be able to address the third researchable topic of what interventions educators can use in and out of the classroom to educate students with ASD in the school setting.

The U.S. office of Special Education (2008) reported that in 2004 there were approximately 166,000 students between the ages of 6 and 21 were receiving special education services under the “Autism Spectrum Disorder” category. This statistic is limited in scope since children under the age of 6 were not included and the Center for Disease Control and Prevention (CDC) reported that autism diagnosis has risen to 1 in 150 children (Autism Information Center,
In Florida, incidents of students on the autism spectrum receiving special education services has risen to nearly 11,000 in 2006 from 4328 in 2002 and 582 in 1993 a 1890% increase in just 13 years (Florida Department of Educational Statistical Brief, 2007). These alarming facts, along with Federal legislative acts and laws such as; Public Law 94-142, IDEA, IDEIA and NCLB, support the beliefs that we have a societal need and educators must have proven educational interventions to include in their pedagogy to educate this growing population. A multitude of studies conducted over the years with students on all levels of the autism spectrum support the findings that early intervention greatly improves their level of performance (Attwood, 2007).

Simpson (2005) ranked the practices in order from most empirical support to least support as: scientifically-based practices, promising practices, limited supporting information for practice, and not recommended, the Autism Treatment Survey (Hess et al., 2008) added the additional category of not rated practices based on the work of Simpson (2005). Supporting literature suggest that educational interventions can be grouped together in the following categories; interpersonal relationship interventions, skill-based interventions, cognitive interventions, and physiological/biological/neurological interventions.

Interpersonal relationship interventions focus on the students with ASD ability to interact with peers, faculty and parents and how environmental factors in the school environment may impact their ability to be educated (Jones et al., 1991; Jordan et al., 1989; McGee, 1985; Simpson et al., 2005). Interpersonal Relationship practices and interventions include: Play-oriented Strategies, Gentle Teaching, Option Method Program, Floor Time, Pet/animal Therapy, Relationship Development Intervention and Holding Therapy. One of the limitations of interpersonal relationships interventions is that the successes can not be generalized to all
individuals with autism. The great disparity of the level of success and functioning of students with ASD increases the challenges for educators to be successful in teaching this population in inclusion classes and other types of educational classes. According to the literature, the ability for educators to find the right combination of interpersonal relationship interventions and how to successfully implement them is in need of further study (Greenspan et al., 1998; Gustein & Shelly, 2002; Heflin & Simpson, 1998; Simpson et al., 2005).

Skills-based interventions have the most numerous types of interventions and practices incorporated in the educational process. Skill-based interventions and practices include: Applied Behavioral Analysis, Discrete Trial Teaching, Pivotal Response Training, Picture Exchange Communication System, Incidental Teaching, Structured Teaching, Assistive Technology, Joint Action Routines, Augmentive Alternative Communication, van Dijk Cirricular Approach, Fast ForWord, Facilitated Communication, Assessment of Basic Language, Azrin 24-Hour Toilet, Lindamood-Bell, Naturalistic Language Paradigm, Rapid Prompting Method, Verbal Behavior and Visual Schedules. Skill-based interventions and practices are directed at specific skills in adaptive functioning exhibited by the individual. Research has found that educators can use skill-based interventions to change behaviors that are not conducive to learning and overall functioning (Heflin & Alberto, 2001; Lovaas, 1987; Smith, 2001; Myles, Ferguson & Hagiwara, 2007). Academic skills, social abilities, and language skills have all been found to benefit from different types of skill-based interventions with students with ASD in the classroom. Results of interventions yield significant and positive results in a variety of settings, resulting in better adjustment and lower classroom frustration for students with autism (Anderson, Avery, DiPietro, Edwards & Christian, 1987). The literature suggests another benefit of skill-based interventions
is that the positive changes can be generalized into areas other than the school setting, such as home and in the community (Farmer-Dougan, 1994; Simpson et al., 2005).

Research has found that students with ASD respond best to interventions that are aimed at their specific interests (Jordan, 2003; Schopler et al., 1980). Incidental teaching intervention has provided positive results in and out of the classroom, where the educator used the students own interests to aid in academic achievement (McGee, Daly & Jacobs, 1994). The TEACCH program approach has a history beginning in 1972, and is perhaps the most widely known and implemented global intervention model used with students with ASD in the United States and Europe (Smith, 1999).

Cognitive research discussing Social Stories™, Cognitive Learning Strategies, Cognitive Behavioral Modifications, Social Decision Making Strategies, Cartooning, Power Cards and Learning Experiences: An Alternative Program for Preschoolers and Parents interventions and practices focus on socialization and thought process interaction for students with autism, to help their overall functioning in and out of the school setting. The literature suggests that educators can use these interventions with students with ASD to help them be successful in the general education setting (Attwood, 1998; Lopata, Thomeer, Volher & Nida, 2006; Myles & Simpson, 1998; Sansosti & Powell-Smith, 2006). Studies have been predominantly successful in providing hope for students using these interventions. Visual type approaches are often used in cognitive interventions. Additionally, some generalizations of acquired skills were made into other areas. Reports of Social Stories™ effectiveness remain mixed, based on current literature.

Physiological, biological and neurological interventions can yield positive influence on academic achievement and social performance. Sensory Integration, Scotopic Sensitivity Syndrome: Irlen Lenses, Auditory Integration Training, Bolles Sensory Learning and
Neurofeedback interventions and practices are the most common types of interventions and practices. Rimland (1990) found that 40 percent of individuals with autism experience some abnormal receptivity to sensory sensitivity. This sensitivity, if properly addressed, can be lessened and allow greater performance in school as well as other settings. Limitations to these interventions include the need for an intense amount of training and financial resources.

Interventions such as Auditory Integration Training (ATI), biological in nature, can cost upwards of $1000 to $2000 per treatment and require 10 or more treatments. Studies have yet to show evidence of any physiological/biological/neurological scientifically based practices (Simpson, 2005). Some behaviors exhibited by those on the autism spectrum, which impact their ability to be successful in their academic pursuits, are depression, obsessive-compulsive disorder, hyperactivity, anxiety, mood disorders, sleep disturbances, tics and self-injurious behaviors. All of these can all be treated to some degree, increasing the likelihood that educators can teach the children in their classes (Tsai, 1996).

Table 2-11 gives a visual description of research-based practices used to support individuals with ASD. The practices are categorized according to their level of empirical support. Simpson (2005) ranked the practices in order from most support to least support as: scientifically-based practices, promising practices, limited supporting information for practice, and not recommended. The Autism Treatment Survey (ATS) (Morrier, Hess, and Heflin, 2006) used the same categorization and included a category of not rated practices for those practices included on the ATS although not rated by Simpson (2005). This organization is extremely useful in order to comprehend the level of effectiveness of the practices and their classifications. Table 2-11 will be used to structure the categorization of practices for the remained of this study.
Chapter II presented a review of literature on the relationship of factors pertinent to the use of research-base practices for students with autism spectrum disorder. The chapter began with a discussion of factors that influence the various challenges in educating students with ASD. It was further developed with an examination of theories pertinent to autism spectrum disorder, and concluded with examination of interventions, treatments and practices used to improve the education of students on the autism spectrum.

Chapter III presents the research design, population and sampling plan, data collection procedures, and evaluation of research methods used in this study.
<table>
<thead>
<tr>
<th>Classification</th>
<th>Interpersonal Relationship</th>
<th>Skill-based</th>
<th>Cognitive</th>
<th>Physiological/biological neurological</th>
<th>Other</th>
</tr>
</thead>
</table>
| Scientifically Based Practice |                           | -Applied Behavior Analysis  
|                               |               | -Discrete Trial Teaching  
|                               |               | -Pivotal Response Training |   |                                   |       |
| Promising Practice | -Play-Oriented Strategies | -Picture Exchange Communication System  
|                       |               | -Incidental Teaching  
|                       |               | -Structured Teaching (e.g., TEACCH;  
|                       |               | -Assistive Technology  
|                       |               | -Joint Action Routines  
|                       |               | -Augmentive Alternative Communication | | -Sensory Integration | |
| Limited Supporting Information for Practice | -Gentle Teaching Option Method (e.g., Son-Rise Program; Floor Time Pet/Animal Therapy Relationship Development Intervention | -van Dijk Curricular Approach  
|                               |               | -Fast ForWord |   |                                   |       |
| Not Recommended | -Holding Therapy | -Facilitated Communication | | | |
| Not Rated |                           | -Assessment of Basic Language (ABLLS)  
|               |               | -Azrin 24-Hour Toilet  
|               |               | -Lindamood-Bell  
|               |               | -Naturalistic Language Paradigm  
|               |               | -Rapid Prompting Method  
|               |               | -Verbal Behavior  
|               |               | -Visual Schedules | | -Bolles Sensory Learning Neurofeedback (Biofeedback) | -Integrated Movement Therapy -Interactive Metronome -Self-Injurious Behavior Inhibiting System (SIBS) |
Chapter III

RESEARCH METHODOLOGY

Chapter III presents a description of the methodology that will be utilized in this study. The research questions and hypotheses were derived from the gaps in the literature and the need to study interventions and treatments, identified foreword as practices (Simpson, 2005), used by educators when teaching students with ASD. This chapter is composed in the following way: a discussion of the research design, identification of the population and sampling plan, instrumentation, data collection procedures, ethical aspects, data analysis methods, and evaluation of the research methods used in the study.

Research Design

This study utilizes a quantitative, non-experimental, and explanatory (correlational) research design. This exploration used correlation and regression statistics to determine if there is a relationship among teachers’ years of experience educating students with ASD, student age, amount of teacher training, type of school where teachers work practices used by teachers when educating students with ASD. The Autism Treatment Survey (ATS) was the instrument utilized by the researcher to survey special education teachers in grades K-12 in a school district in Southeast Florida. The ATS is a web-based survey containing four areas of exploration: characteristics of the teacher’s classroom, teacher demographics, teacher usage of specific practices when teaching students with ASD, and teacher type of training regarding specific practices for students with ASD (Morrier, Hess, & Heflin, 2006).

Based on the review of the literature and the theoretical framework guiding this exploration, research questions and hypotheses were generated on the possible relationship among teacher years of experience educating students with ASD, teacher training, student age,
and school type in relation to the research-based practices teachers use when educating students with ASD.

**Research Questions**

1. Will teacher experience and teacher training influence the type of practices (categorized as not rated, not recommended, limited supporting information for practice, promising practices and scientifically-based practices) teachers use when educating students with ASD?

2. Will student age influence the type of practices (categorized as not rated, not recommended, limited supporting information for practice, promising practices and scientifically-based practices) teachers use when educating students with ASD?

3. Will school type (public vs. choice) influence the type of practices (categorized as not rated, not recommended, limited supporting information for practice, promising practices and scientifically-based practices) teachers use when educating students with ASD?

**Research Hypotheses**

1. Teacher experience and teacher training positively correlates with the number of practices (categorized as not rated, not recommended, limited supporting information for practice, promising practices and scientifically-based practices) teachers use when educating students with ASD.

2. Student age positively correlates with the types of practices (categorized as not rated, not recommended, limited supporting information for practice, promising practices and scientifically-based practices) teachers use when educating students with ASD.
3. School type (public vs. choice) can predict the types of practices (categorized as not rated, not recommended, limited supporting information for practice, promising practices and scientifically-based practices) teachers use when educating students with ASD.

The single dependent variable in this study is the type of research-based practices used by classroom teachers of students with ASD from a list of 5 categories a) not rated, b) not recommended practices, c) limited supporting information for practice, d) promising practices, and e) scientifically-based practices. There are four independent variables that were explored in this study; (1) the number of years of experience participants have educating students with ASD, (2) the amount of training participants have in practices used with students with ASD, (3) age of students with ASD currently being educated by participants, and (4) the type of school (public or choice) where participants currently work.

**Population and Sampling Plan**

**Target Population**

In this study, the target population consists of all special education teachers in a school district in Southeast Florida. As of August 2008, there were approximately 1,700 K-12 special education teachers in the targeted area public schools (charter, choice and magnet are included as public schools) and approximately 62 K-12 special education teachers in private schools (Table 3-1).
Table 3-1

Target Population: K-12 Special Education Teachers in a school district in Southeast Florida

<table>
<thead>
<tr>
<th>School Setting</th>
<th>Estimated Target Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Schools</td>
<td>1,700</td>
</tr>
<tr>
<td>Private Schools</td>
<td>62</td>
</tr>
<tr>
<td>Total</td>
<td>1,762</td>
</tr>
</tbody>
</table>

**Inclusion Criteria (Special Education Teachers)**

The targeted population was further limited to:

1. Those who were working with students with ASD during the 2008-2009 school year.
2. Those who were hired at public (border) of choice schools.
3. Those who attended the 2009 CARD (Center for Autism and Related Disorders) conference in West Palm Beach Florida.

**Exclusion Criteria (Special Education Teachers)**

The investigator did not include the following participants in this study:

1. Any teacher outside of the targeted school district.
2. Teachers who do not have interaction with students with ASD.
3. Paraprofessionals working with students with ASD.
4. Teachers whose primary responsibility is administrative or guidance oriented.

**Accessible Population**

Eligible K-12 special education teachers in a school district in Southeast Florida that attended the CARD conference in January 2009 were given the opportunity to complete an online survey at the conference or to take a flyer (see Appendix D) explaining the purpose of the
study and how to access the web based survey online at their own convenience. The rationale for using the CARD conference to initiate the survey was that everyone from the targeted population was invited to attend this free annual conference strictly designed for teachers of students with ASD, therefore it was anticipated that the majority would attend. All K-12 special education teachers from a targeted Southeast Florida region attending the conference were asked to participate by completing the Autism Treatment Survey (ATS). The ATS was made available to participants through a web-based survey (see Appendix A). Accessibility to the survey was limited to special education teachers in the targeted school district.

**Sampling Plan and Setting**

This study involves a self-selection, convenience sampling plan without replacement. Potentially, the entire target population included approximately 1,700 Public School K-12 special education teachers from a school district in Southeast Florida and 62 private school special education teachers from the same region who currently work with students with ASD. The special education teachers were invited to participate in the online survey through their attendance at the 2009 CARD conference. As the entire targeted population was invited and attendance was free, it was expected that there would be a large turn-out. The researcher did perform the following steps of the sampling plan to identify eligible special education teachers:

1. Set up a display table and flyers at the CARD conference on January 16th, 2009 in West Palm Beach, Florida with laptop computers connected to the Internet for participants to use to complete the survey in 15 minutes or less.

2. At the display table eligible participants (teachers from a specific South Florida region who interact with students with ASD) were requested to complete the survey on location or take a flyer explaining the purpose and specifics of the
survey and how to gain access to the ATS at a later date, not to extend past January 30th, 2009. (Appendix D).

3. Provided eligibility criteria to the teachers within the first two pages of the survey to lessen the chance of teachers not meeting the criteria to complete the survey. (Appendix A)

4. If the participant met the criteria and wished to continue the online survey, they read the Voluntary Consent Form and indicated they agreed by pressing “Next” to take the survey. If the participant did not agree, they pressed “Exit this survey” to exit the survey.

Setting

The data collection procedure was highly confidential. This data was attained via a web-based survey available to all K-12 special education teachers that interact with students with ASD in the targeted Southeast Florida region who attended the CARD conference in January 2009.

Instrumentation

The Autism Treatment Survey (ATS) was created by the authors Hess, Morrier and Heflin. The utility of the ATS is to identify the types of practices being used by educators who work with students with ASD. The ATS consists of a comprehensive list of educational practices, interventions, therapies and treatments often used by teachers and other professional when working with students with ASD. The original 43 types of practices included in the survey were chosen after intensive research by the authors and by the reviews of Green et al. (2006), the review of the National Research Council (2001) text, and the works of Simpson et al. (2005), the majority of the practices 69% were found in the works of Simpson et al. (2005) (as cited in Hess
et al., 2008). Measures of validity and reliability were obtained by the authors. The ATS was used in Georgia with teachers who work with students with ASD (both general education teachers and special education teachers) throughout 156 Georgia Counties. A total of 185 teacher responses were used for the final analysis.

The adapted ATS includes 99 questions separated into four sections. The first section, “About Your Class”, consists of six multiple choice/fill-in type questions involving classroom demographics. The second section, “About You”, contains eight multiple choice/fill-in type questions involving teacher demographics. The third section, “Classroom Strategies Utilized”, is composed of 43 questions divided into seven sub-sections of various types of practices used in the education setting. Specific types of practices are listed and the participant reports on their use as: (1) Yes, currently (since August 2008), (2) in the past but not now (anytime prior to August 2008), (3) No, never. The fourth and final section, “Training Received”, addresses the type of training teachers have completed for the practices listed response choices were adapted by the researcher and were presented this way:

1. “College Graduate Program Course”
2. “College Undergraduate Program Course”
3. “During an ASD Endorsement Course”
4. “In a Workshop”
5. “Self Taught”
6. “Other”
7. “No Training Received”

The rationale for the restructuring of the response choices for types of training participants received is to easily identify greater and lesser levels of intensity in training methods.
and more conducive to potential participants in the target area. Whereas the college graduates program course is understood to be the greatest level of training and in a workshop or self taught is believed to be a lower level of training. The ATS concludes with a space for participants to ask questions regarding the ATS, should they desire additional information about the survey. This last question may help lead to areas of future inquiry by enhancing the comprehensive view of practices being used.

The ATS was adapted for this study to help participants in Florida better identify with the terminology used in the State compared to the original ATS which was used in Georgia. Additional adaptations were included to cut down the anticipated time of the survey from approximately 30 minutes to approximately 10-15 minutes, without impacting the validity of the survey.

**Internal and External Validity of the Instrument**

The Autism Treatment Survey (ATS) underwent content validity by gathering the opinions of inclusiveness from five experts in the field of ASD. After gathering the first round of opinions from the experts the final draft of the ATS was created. The ATS was once again reviewed for content validity by five experts. According to the authors, all five experts agreed that the ATS had content validity in representing treatments used with individuals with ASD (Morrier, Hess & Heflin, 2006). Adaptations to the ATS for this study were reviewed by four experts in the field of ASD. The review found that adaptations did not appear to affect the content validity of the instrument. The questions that were being asked and how they were asked was clear to the experts reviewing the adapted ATS.
Data Collection Procedures

The ability to use computer and internet-based research comes with the responsibility to review the ethical considerations of the study. The power of an internet-based method of research calls for careful consideration and accountability in the areas of access, control of information, privacy, informed consent, data collection safeguards, storage and disposal.

Data Collection Methods

Ethical considerations are included in the following procedures to protect the subjects involved in this research. The procedures are put in place to maintain privacy for the participants in the study and those individuals that may be affected by the outcomes. The investigator did do the following:

1. Acquired authorization to use the *Autism Treatment Survey* instrument in this study as the first priority before collecting data. (see approval Appendix B).

2. Adapted the *Autism Treatment Survey* instrument from Microsoft Word format to online form to meet the specific needs of the study. The web service *SurveyMonkey.com* was used to host and post the data on their secure website. The survey contains consent information, study purpose, and procedures.

3. Obtained permission from the Center for Autism and Other Related Disabilities (CARD) conference director to recruit participants at the January 2009 CARD conference in West Palm Beach, Florida and to set-up computers and hand-out flyers to potential participants of the survey (Appendix D).

4. Obtained Institutional Review Board approval from Lynn University (Appendix F).
5. Following IRB approval, the researcher prepared a poster display, flyers and set-up procedures to be able to have functioning computers at the conference for participants to complete the survey.

   a. Potential participants received a flyer (see Appendix D) explaining the purpose, procedure, risks, benefits, financial considerations, confidentiality, right to withdraw, who to contact should problems arise and how to attain the web link to take the survey.

   b. The potential participants were required to read a voluntary consent form before being able to access the web-based survey. The consent form describes the purpose, procedures, and duration of the Autism Treatment Survey instrument. The consent form informed the participants of the minimal risk (time to complete the survey) and the potential benefits associated with the study. The participant’s rights to voluntary participation and their ability to ask questions about the research was fully addressed. Participants were advised their participation would result in no financial gain or loss.

   c. SurveyMonkey uses Secure Sockets layer (SSL) encryption to encrypt both the survey link and survey pages during transmission to ensure participant confidentiality and survey security. Participants were advised of the browser type and version necessary for proper encryption on the consent form.

   d. Participants in this survey did participate in the survey voluntarily. Anonymity was maintained to the degree permitted by the technology used. Specifically, no guarantees were made regarding the interception of data sent via the
Internet by any third parties. All participant information is anonymous and confidential.

6. The SurveyMonkey software was programmed to not track participant’s IP addresses or other personal identification information.

7. SurveyMonkey.com stored collected data on a professionally administered server. Data was stored in an encrypted format.

8. All participants completed an identical Autism Treatment Survey instrument.

9. The data collection process was conducted over a 2 week period.

10. The start of data collection of the survey was on January 16, 2009 and ended on January 30th, 2009.

11. The online Autism Treatment Survey was closed to participants at 11:59 a.m. eastern standard time on the last day of data collection.

12. Prior to one month after data collection was completed, the researcher submitted the Lynn University IRB Report of Termination of the Project.

13. Data was exported from SurveyMonkey.com website into an Excel coded spreadsheet in preparation for importing data into the Statistical Program for the Social Sciences (SPSS) 15.0 version for data analysis. A hard copy of the Autism Treatment Survey instrument was printed to be used for coding variables.

14. Data was copied and pasted into SPSS from the Excel coded spreadsheet. Coding and recoding of variables was done with SPSS “recode” feature.

15. Data analysis was performed as described in the data analysis section using SPSS 15.0.
16. Data downloaded from SurveyMonkey.com is stored on password protected computers.

17. Printouts of survey and test data is to be kept at the researchers’ home office in a locked file cabinet.

18. Data will be destroyed after five years.

Data Analysis

Data was entered into SPSS version 15.0 for Windows. Descriptive statistics were conducted on demographic data. Descriptive statistics did include frequency and percentages for nominal (categorical/dichotomous) data and means/standard deviations for continuous (interval/ratio) data. Standard deviation measures statistical dispersion, or the spread of values in a data set. If the data points are all close to the mean, then the standard deviation is close to zero. The arithmetic mean is defined as the sum of scores divided by the number of scores.

Research Question 1: Will teacher experience and teacher training influence the type of practices (categorized as not rated, not recommended, limited supporting information for practice, promising practices and scientifically-based practices) teachers use when educating students with ASD?

Hypothesis 1: Teacher experience and teacher training positively correlates with the number of practices (categorized as not rated, not recommended, limited supporting information for practice, promising practices and scientifically-based practices) teachers use when educating students with ASD

To examine hypothesis 1, five multiple regressions were conducted to assess if teacher experience and teacher training correlates to the type of practices used with students with ASD
Numerous bivariate observations increased the risk of Type I errors or the probability of rejecting the hypothesis when it is false; this suggests that a relationship exists when it does so only by chance. For this reason, multiple regressions/multivariate comparisons were also conducted to assess the collective effect the independent variables/dependent variables (Stevens, 2002). Multiple regressions were conducted to assess if the independent variables predict the dependent variable. Multiple regressions are an appropriate analysis when the goal of research is to assess the extent of a relationship among a set of dichotomous or interval/ratio predictor variables on an interval/ratio criterion variable. The following regression equation was used: \( y = b_1 x_1 + b_2 x_2 + c \); where \( Y \) = estimated dependent, \( c \) = constant, \( b \) = regression coefficients and \( x \) = independent variables (Tabachnick & Fidell, 2001).

Standard multiple regression—the enter method—was used. The standard method enters all independent variables (predictors) simultaneously into the model. Unless theory sufficiently supports the method of entry, the standard multiple regression is the appropriate method of entry. Variables should be evaluated, “in terms of what it adds to prediction of the dependent variable that is different from the predictability afforded by all the other predictors,” (Tabachnick & Fidell, 2001, p.131). The \( F \) test was used to assess whether the set of independent variables collectively predicts the dependent variable. R-squared—the multiple correlation coefficient of determination—was reported and used to determine how much variance in the dependent variable can be accounted for by the set of independent variables. The \( t \)-test was used to determine the significance of each predictor and beta coefficients was used to determine the extent of prediction for each independent variable. For significant predictors, every one unit
increase in the predictor, the dependent variable did increase or decrease by the number of unstandardized beta coefficients.

Research Question 2: Will student age influence the types of practices (categorized as not rated, not recommended, limited supporting information for practice, promising practices and scientifically-based practices) teachers use when educating students with ASD?

Hypothesis 2: Student age positively correlates with the types of practices (categorized as not rated, not recommended, limited supporting information for practice, promising practices and scientifically-based practices) teachers use when educating students with ASD.

To examine hypothesis 2, five linear regressions were conducted to assess if student age correlates with the type of practices used with students with ASD (categorized as not recommended, limited support, not rated, promising practice and scientifically-based practices).

Research Question 3: Will school type (public vs. choice) influence the types of practices (categorized as not rated, not recommended, limited supporting information for practice, promising practices and scientifically-based practices) teachers use when educating students with ASD?

Hypothesis 3: School type (public vs. choice) can predict the types of practices (categorized as not rated, not recommended, limited supporting information for practice, promising practices and scientifically-based practices) teachers use when educating students with ASD.

To examine hypothesis 3, five linear regressions were conducted to assess if school type (public vs. choice) can predict the type of practices used with students with ASD (categorized as
not recommended, limited support, not rated, promising practice and scientifically-based practices).

**Evaluation of Research Methods**

In this section, both the internal and external validity strengths and weaknesses are explored. The internal validity refers to the strength of the relationship between the dependent and independent variables. The external validity refers to the level the results can be generalized to other populations and settings. The research methods that may strengthen or weaken internal or external validity may include:

**Internal Validity: Strengths**

1. The use of a quantitative, non-experimental, correlational research design has higher internal validity than a qualitative design.

2. An explanatory (correlational) design which analyzes causal relationships is a stronger measure than an exploratory (correlational) design that studies functionality between variables.

3. The *Autism Treatment Survey* instrument that was utilized in this study has evidence of content validity in representing treatments teachers use with students with ASD, providing strength to the study (Morrier, Hess & Heflin, 2006).

4. The use of an online research method for the purpose of collecting data represents strength to the study by permitting participants to complete the survey on their own time (during their planning periods and before and after school hours) in privacy.

5. The use of an online questionnaire avoids the type of researcher bias that may result from researcher and participant contact.
Internal Validity: Weaknesses

1. As this research design is non-experimental, it is a weaker design than an experimental design.

2. The use of a new instrument (only used in one other study) with no prior estimates of reliability and construct validity.

3. The adaptation of several subscales in the instrument to better identify with the population in the study.

4. The method of online data collection has an inherent threat to internal validity. Certain variables cannot be controlled, such as the participants consulting with each other or other individuals, and the individual’s level of truthfulness while taking the online survey.

External Validity: Strengths

1. The entire target population of special education teachers in a Southeast Florida region in both public and private schools that attend the 2009 CARD conference were invited to participate in this study. Therefore, this is a strong sampling design that allows for limited generalizability of results.

2. The Autism Treatment Survey instrument was completed in a natural environment avoiding the threat to external validity associated with laboratory type settings.

External Validity: Weaknesses

1. The sample from which data is drawn is self-selected to participants choosing to take the survey and could lead to selection bias and pose a threat to the validity of the study.
2. The study is limited to K-12 public and private school special education teachers attending the 2009 CARD conference in a Southeast Florida region school district and not other teachers who may have experience in teaching students with autism. Therefore, the results may not be representative of all teachers that teach students with ASD.

3. The *Autism Treatment Survey* is a self-reporting instrument that may influence validity. The newness of the instrument and the lack of reliability and validity information may affect the validity of the data. To date, the ATS has only been used in one other study; therefore, generalizability of results is limited.
CHAPTER IV
RESULTS

The purpose of this study was to determine if specific variables influenced the types of practices utilized by teachers when educating students with autism spectrum disorder (ASD). Of the 62 participants that completed the autism treatment survey, 60 surveys were completed to include all pertinent questions and they were utilized in this study. The independent variables studied were (1) the years of experience teachers have educating students with ASD, (2) the types of training teachers have had on practices that can be used with students with ASD, (3) student age and (4) type of school where teachers work with students with ASD. The dependant variables are practices used with students with ASD during the current 2008-2009 school year, these practices are categorized as: not rated practices, not recommended practices, limited supporting information for practice practices, promising practices, and scientifically-based practices.

This study was conducted using an adapted version of the Autism Treatment Survey (ATS) as a web-based survey utilized by the researcher to survey special education teachers who work with students with ASD in grades K-12 in a school district in Southeast Florida. The ATS contains four areas of exploration: a) characteristics of the teachers’ classroom, b) teacher demographics, c) teacher usage of targeted practices and d) type of training received in such practices (Morrier, Hess, & Heflin, 2006).

Some key demographic information will be briefly discussed prior to the discussion of the findings of the research questions. Descriptive statistics was conducted on demographic data. Descriptive statistics does include frequency and percentages for nominal (categorical/dichotomous) data and means/standard deviations for continuous (interval/ratio)
Sixty individuals participated in the survey. 55 (91.7%) were female and 5 (8.3%) were male, see Table 4-1.

Table 4-1

*Gender of Participants*

<table>
<thead>
<tr>
<th>Gender</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>55</td>
<td>91.7</td>
</tr>
<tr>
<td>Male</td>
<td>5</td>
<td>8.3</td>
</tr>
</tbody>
</table>

Frequencies and percents for participants' level of education are presented in Table 4-2, where the majority 38 (63.6%) of participants has gone back to school for a degree higher than a bachelor's.

Table 4-2

*Education Level of Participants*

<table>
<thead>
<tr>
<th>Education Level</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bachelor's</td>
<td>22</td>
<td>36.7</td>
</tr>
<tr>
<td>Masters</td>
<td>31</td>
<td>51.7</td>
</tr>
<tr>
<td>Educational Specialist</td>
<td>5</td>
<td>8.5</td>
</tr>
<tr>
<td>Doctorate</td>
<td>2</td>
<td>3.4</td>
</tr>
</tbody>
</table>

Frequencies and percents for participant ethnicity are presented in Table 4-3, where the majority 50 (84.7%) of participants were Caucasian.
Table 4-3

Ethnicity of Participants

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>African American</td>
<td>2</td>
<td>3.4</td>
</tr>
<tr>
<td>Asian/Pacific Islander</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Caucasian</td>
<td>50</td>
<td>84.7</td>
</tr>
<tr>
<td>Hispanic</td>
<td>5</td>
<td>8.5</td>
</tr>
<tr>
<td>Multiracial</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Other</td>
<td>2</td>
<td>3.4</td>
</tr>
</tbody>
</table>

Percents of the types of school settings participants work in. The majority (50.6%) of the participants are elementary school teachers and only (11.1%) of the teachers work at high schools. Middle school teachers represent (38.3%) of the participants.

Figure 2: School types where participants work in

To examine if there was a significant difference with the variables in this study multiple chi-square test of independence were conducted. Chi-square tests results yielded non-significant effects between variables of teacher experience, student age, school type and the types of interventions used by the participants. Test of independence did indicate significance in the
amount teacher’s use or do not use research-based practices, therefore, tables and a discussion of
the test of independence for the dependent variable of types of practices teachers use with
students with ASD are represented.

To examine if there was a significant difference on the frequency of use of scientifically-based practices, teachers used or did not use, a chi-square test of independence was conducted Table 4-4. The results of the test of independence were not significant, $x^2 (1) = 0.73$, ns, suggesting that the combined amount of scientifically-based practices teacher used was not statistically different from the combined amount of scientifically-based practices they did not use when educating students with ASD.

Table 4-4

<table>
<thead>
<tr>
<th>'Scientifically-Based’ Practices Used</th>
<th>No Never</th>
<th>Never</th>
<th>Yes in the Past</th>
<th>Yes Currently</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>Percent</td>
<td>Frequency</td>
<td>Percent</td>
</tr>
<tr>
<td>Applied Behavior Analysis</td>
<td>12</td>
<td>20.3</td>
<td>15</td>
<td>25.4</td>
</tr>
<tr>
<td>Discrete Trial Training</td>
<td>26</td>
<td>44.1</td>
<td>15</td>
<td>25.4</td>
</tr>
<tr>
<td>Pivotal Response Training</td>
<td>35</td>
<td>61.4</td>
<td>8</td>
<td>14.0</td>
</tr>
<tr>
<td>LEAP</td>
<td>49</td>
<td>84.5</td>
<td>6</td>
<td>10.3</td>
</tr>
</tbody>
</table>

$x^2 (1) = 0.73$, $ns$

To examine if there was a significant difference on the frequency of use of promising practices, teachers used or did not use, a chi-square test of independence was conducted Table 4-5. The results of the test of independence were significant, $x^2 (1) = 45.90$, suggesting that the total combined amount of promising practices teachers used was statistically larger compared to the combined amount of promising practices they did not use when educating students with ASD.
Table 4-5

'Promising Practices' Used

<table>
<thead>
<tr>
<th></th>
<th>No Never</th>
<th></th>
<th>Yes in the Past</th>
<th></th>
<th>Yes Currently</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Frequency</td>
<td>Percent</td>
<td>Frequency</td>
<td>Percent</td>
<td>Frequency</td>
</tr>
<tr>
<td>PECS</td>
<td>16</td>
<td>27.1</td>
<td>19</td>
<td>32.2</td>
<td>24</td>
<td>40.7</td>
</tr>
<tr>
<td>Incidental Teaching</td>
<td>26</td>
<td>45.6</td>
<td>3</td>
<td>5.3</td>
<td>28</td>
<td>49.1</td>
</tr>
<tr>
<td>Structured Teaching</td>
<td>18</td>
<td>30.5</td>
<td>14</td>
<td>23.7</td>
<td>27</td>
<td>45.8</td>
</tr>
<tr>
<td>Assistive Technology</td>
<td>7</td>
<td>11.9</td>
<td>21</td>
<td>35.6</td>
<td>31</td>
<td>52.5</td>
</tr>
<tr>
<td>Joint Action Routines</td>
<td>50</td>
<td>89.3</td>
<td>1</td>
<td>1.8</td>
<td>5</td>
<td>8.9</td>
</tr>
<tr>
<td>Augmentative Alternative</td>
<td>17</td>
<td>29.3</td>
<td>15</td>
<td>25.9</td>
<td>26</td>
<td>44.8</td>
</tr>
<tr>
<td>Cognitive Behavioral Modification</td>
<td>16</td>
<td>28.1</td>
<td>15</td>
<td>26.3</td>
<td>26</td>
<td>45.6</td>
</tr>
<tr>
<td>Social Stories</td>
<td>11</td>
<td>19.0</td>
<td>15</td>
<td>25.9</td>
<td>32</td>
<td>55.2</td>
</tr>
<tr>
<td>Social Decision Making</td>
<td>27</td>
<td>46.6</td>
<td>8</td>
<td>13.8</td>
<td>23</td>
<td>39.7</td>
</tr>
<tr>
<td>Play Oriented Strategies</td>
<td>22</td>
<td>37.3</td>
<td>12</td>
<td>20.3</td>
<td>25</td>
<td>42.4</td>
</tr>
<tr>
<td>Sensory Integration</td>
<td>23</td>
<td>40.4</td>
<td>16</td>
<td>28.1</td>
<td>18</td>
<td>31.6</td>
</tr>
</tbody>
</table>

$x^2 (1) = 45.90$

To examine if there was a significant difference on the frequency of use of limited supporting information for practice approaches, teachers used or did not use, a chi-square test of independence was conducted Table 4-6. The results of the test of independence were significant, $x^2 (1) = 153.81$, suggesting that the combined amount of limited supporting information for practices approaches teachers used was statistically smaller compared to the total number of limited supporting information for practices approaches they did not use when educating students with ASD.
To examine if there was a significant difference on the frequency of use of **not recommended practices**, teachers used or did not use, a chi-square test of independence was conducted Table 4-7. The results of the test of independence were significant, $x^2 (I) = 20.52$, suggesting that the combined amount of **not recommended practices** teachers used was statistically smaller compared to the combined amount of **not recommended practices** they did not use when educating students with ASD.

Table 4-7

<table>
<thead>
<tr>
<th>Practice</th>
<th>No Never</th>
<th>Never</th>
<th>Yes in the Past</th>
<th>Yes Currently</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>Percent</td>
<td>Frequency</td>
<td>Percent</td>
<td>Frequency</td>
</tr>
<tr>
<td>Holding Therapy</td>
<td>48</td>
<td>81.4</td>
<td>9</td>
<td>15.3</td>
</tr>
<tr>
<td>Facilitated Communication</td>
<td>35</td>
<td>60.3</td>
<td>12</td>
<td>20.7</td>
</tr>
</tbody>
</table>

$x^2 (I) = 20.52$
To examine if there was a significant difference on the frequency of use of *not rated* practices, teachers used or did not use, a chi-square test of independence was conducted Table 4-8. The results of the test of independence were significant, $\chi^2 (1) = 101.10$, suggesting that the combined amount of *not rated practices* teachers used was statistically smaller compared to the combined amount of *not rated practices* they did use when educating students with ASD.

Table 4-8

'*Not Rated’ Practices Used*

<table>
<thead>
<tr>
<th></th>
<th>No Never</th>
<th></th>
<th>Yes in the Past</th>
<th></th>
<th>Yes Currently</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>Percent</td>
<td>Frequency</td>
<td>Percent</td>
<td>Frequency</td>
<td>Percent</td>
</tr>
<tr>
<td>ABLLS</td>
<td>23</td>
<td>39.0</td>
<td>15</td>
<td>25.4</td>
<td>21</td>
<td>35.6</td>
</tr>
<tr>
<td>Azrin 24hour Toilet Training</td>
<td>54</td>
<td>91.5</td>
<td>4</td>
<td>6.8</td>
<td>1</td>
<td>1.7</td>
</tr>
<tr>
<td>Floor Time Greenspan</td>
<td>40</td>
<td>67.8</td>
<td>9</td>
<td>15.3</td>
<td>10</td>
<td>16.9</td>
</tr>
<tr>
<td>Naturalistic Language</td>
<td>43</td>
<td>72.9</td>
<td>9</td>
<td>15.3</td>
<td>7</td>
<td>11.9</td>
</tr>
<tr>
<td>Rapid Prompting Method</td>
<td>45</td>
<td>77.6</td>
<td>4</td>
<td>6.9</td>
<td>9</td>
<td>15.5</td>
</tr>
<tr>
<td>Verbal Behavior</td>
<td>20</td>
<td>35.1</td>
<td>10</td>
<td>17.5</td>
<td>27</td>
<td>47.4</td>
</tr>
<tr>
<td>Visual Schedules</td>
<td>12</td>
<td>20.7</td>
<td>8</td>
<td>13.8</td>
<td>38</td>
<td>65.5</td>
</tr>
<tr>
<td>Lindamood Bell</td>
<td>46</td>
<td>82.1</td>
<td>9</td>
<td>16.1</td>
<td>1</td>
<td>1.8</td>
</tr>
<tr>
<td>Bolles Sensory Learning</td>
<td>51</td>
<td>89.5</td>
<td>4</td>
<td>7.0</td>
<td>2</td>
<td>3.5</td>
</tr>
<tr>
<td>Neurofeedback biofeedback</td>
<td>45</td>
<td>78.9</td>
<td>9</td>
<td>15.8</td>
<td>3</td>
<td>5.3</td>
</tr>
<tr>
<td>Integrated Movement Therapy</td>
<td>41</td>
<td>71.9</td>
<td>9</td>
<td>15.8</td>
<td>7</td>
<td>12.3</td>
</tr>
<tr>
<td>Interactive Metronome</td>
<td>50</td>
<td>87.7</td>
<td>5</td>
<td>8.8</td>
<td>2</td>
<td>3.5</td>
</tr>
<tr>
<td>SIBIS</td>
<td>42</td>
<td>73.7</td>
<td>10</td>
<td>17.5</td>
<td>5</td>
<td>8.8</td>
</tr>
</tbody>
</table>

$\chi^2 (1) = 101.10$

The following research questions guided this study:

**Question 1:** Will teacher experience and teacher training influence the type of practices (categorized as not rated, not recommended, limited supporting information for practice, promising practices and scientifically-based practices) teachers use when educating students with ASD?
Question 2: Will student age influence the types of practices (categorized as *not rated, not recommended, limited supporting information for practice, promising practices and scientifically-based practices*) teachers use when educating students with ASD?

Question 3: Will school type (public vs. choice) influence the type of practices (categorized as *not rated, not recommended, limited supporting information for practice, promising practices and scientifically-based practices*) teachers use when educating students with ASD?

**Research Question 1**

Will teacher experience and teacher training influence the types of practices (categorized as *not rated, not recommended, limited supporting information for practice, promising practices and scientifically-based practices*) teachers use when educating students with ASD?

In order to determine if the years of experience teachers have educating students with ASD and the types of training the teachers have in educating students with ASD are predictors to the types of practices they use with students with ASD, survey questions from three of the four sections of the adapted Autism Treatment Survey (ATS) were analyzed. To explore the question of how many years a teacher has educating students with ASD, participants responded to a question in the survey section “About You” asking for total amount of years the participants had teaching students with ASD, (see figure 3).

3. How many years total have you been teaching children with autism spectrum disorder?

Figure 3: Question 3 from section 1 in the ATS.
Participants were asked for the "total years of teaching experience" by typing in the sum total of years they have as teachers (this included time they have taught both students with ASD and time teaching students without ASD). The mean response for total years of teaching experience was $14.60 (SD = 10.20)$ while the mean response for years of teaching children with autism was $8.97 (SD = 7.07)$ see Table 4-9.

Table 4-9

<table>
<thead>
<tr>
<th></th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total years teaching</td>
<td>14.60</td>
<td>10.20</td>
</tr>
<tr>
<td>Teaching children with Autism</td>
<td>8.97</td>
<td>7.07</td>
</tr>
</tbody>
</table>

In order to determine the types of training participants have received in each of the practices listed under each category (not rated, not recommended, limited supporting information for practice, promising practices and scientifically-based practices) in the section titled Training You Have Received, participants were asked to identify the type of training they may have on 42 types of practices, see figure 4.

As participants responded to whether they have received training on each type of practice, they were provided with two options, yes or no. If they chose "yes" a drop down menu would appear with the following training methods college graduate program course, college undergraduate program course, during an ASD endorsement course, in a workshop, self taught or other. They clicked on the method of training where they have received the most training in for the particular practice and then automatically brought to the next question. If they chose "no"
the drop down menu would display no training received, as the only choice to select, after
clicking on it they would automatically be brought to the next question.

<table>
<thead>
<tr>
<th>7. Relational Development Intervention (RDI)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>College Graduate Program Course</td>
<td>No Training Received</td>
</tr>
<tr>
<td>College Undergraduate Program Course</td>
<td></td>
</tr>
<tr>
<td>During an ASD Endorsement Course</td>
<td></td>
</tr>
<tr>
<td>In a Workshop</td>
<td></td>
</tr>
<tr>
<td>Self Taught</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
</tr>
</tbody>
</table>

Figure 4: Sample item from ATS under training you have received.

The 42 practices listed on the ATS were grouped in the following categories: interpersonal relationship interventions and treatments, skill-based interventions and treatments, cognitive interventions and treatments, physiological/biological/neurological interventions and treatments, and other interventions and treatments. These categories were derived from research of Simpson et al. (2005).

In order to keep the fluidity of the study, the forty-two types of practices were divided into the 5 categories that form the dependent variable guiding the study: not rated practices, not recommended practices, limited supporting information for practice, promising practices, and scientifically-based practices.

Type of Training Received for Scientifically-Based Practices are summarized in Table 4-10, where (N) is the number of participants responding to type of training received for each of the practices listed. The type of training is categorized into 1) no training, 2) workshop, 3) college graduate program course, 4) college undergraduate program course, 5) during an ASD
endorsement course, 6) self taught, 7) other form of training. Results conclude that for all of the four practices in this category at least 50% of the participants do not have any training in each of the selected practices and the predominant method of training was in workshops and not college coursework.

Table 4-10

<table>
<thead>
<tr>
<th>Type of Training Received for Scientifically-Based Practices</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>A</td>
</tr>
<tr>
<td>B</td>
</tr>
<tr>
<td>C</td>
</tr>
<tr>
<td>D</td>
</tr>
</tbody>
</table>

Note: A) Applied behavioral Analysis, B) Discrete Trial Teaching, C) Pivotal Response Training, D) Learning Experiences: An Alternative Program for Preschoolers and Parents

The Applied Behavioral Analysis practice is the practices with the greatest amount of participant training where 76% of the participants report having training. The specific breakdown of training methods for Applied Behavioral Analysis displayed in figure 5.
Figure 5
Training Received for Applied Behavioral Analysis Practice

Type of Training Received for Promising Practices are summarized in Table 4-11 where (N) is the number of participants responding to type of training received for each of the practices listed. The type of training is categorized into 1) no training, 2) workshop, 3) college graduate program course, 4) college undergraduate program course, 5) during an ASD endorsement course, 6) self taught, 7) other form of training.
<table>
<thead>
<tr>
<th>No Training</th>
<th>Workshop</th>
<th>Graduate</th>
<th>Undergrad</th>
<th>ASD Course</th>
<th>Self Taught</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>A</td>
<td>24</td>
<td>50.0</td>
<td>7</td>
<td>14.6</td>
<td>9</td>
<td>18.8</td>
</tr>
<tr>
<td>B</td>
<td>17</td>
<td>34.7</td>
<td>22</td>
<td>44.9</td>
<td>5</td>
<td>10.2</td>
</tr>
<tr>
<td>C</td>
<td>27</td>
<td>56.3</td>
<td>6</td>
<td>12.5</td>
<td>5</td>
<td>10.4</td>
</tr>
<tr>
<td>D</td>
<td>18</td>
<td>36.7</td>
<td>20</td>
<td>40.8</td>
<td>5</td>
<td>10.2</td>
</tr>
<tr>
<td>E</td>
<td>11</td>
<td>22.4</td>
<td>16</td>
<td>32.7</td>
<td>5</td>
<td>10.2</td>
</tr>
<tr>
<td>F</td>
<td>41</td>
<td>87.2</td>
<td>2</td>
<td>4.3</td>
<td>2</td>
<td>4.3</td>
</tr>
<tr>
<td>G</td>
<td>18</td>
<td>37.5</td>
<td>18</td>
<td>37.5</td>
<td>4</td>
<td>8.3</td>
</tr>
<tr>
<td>H</td>
<td>18</td>
<td>37.5</td>
<td>13</td>
<td>27.1</td>
<td>5</td>
<td>10.4</td>
</tr>
<tr>
<td>I</td>
<td>16</td>
<td>32.0</td>
<td>13</td>
<td>26.0</td>
<td>3</td>
<td>6.0</td>
</tr>
<tr>
<td>J</td>
<td>29</td>
<td>61.7</td>
<td>10</td>
<td>21.3</td>
<td>3</td>
<td>6.4</td>
</tr>
<tr>
<td>K</td>
<td>28</td>
<td>59.6</td>
<td>9</td>
<td>19.1</td>
<td>2</td>
<td>4.3</td>
</tr>
</tbody>
</table>


Results suggest that for all the eleven practices the type of practice with the greatest occurrence of participant training at 78% is derived from the Assistive Technology practice.

Although the prevalence of training in this category continues to be greatest in workshop type of training, graduate level college coursework is apparent with every type of practice. The specific breakdown of training methods for Assistive Technology practice is displayed in figure 6.
Type of Training Received according to participant response for Limited Supporting Information for Practice practices are summarized in Table 4-12 where (N) is the number of participants responding to type of training received for each of the practices listed. The type of training is categorized into 1) no training, 2) workshop, 3) college graduate program course, 4) college undergraduate program course, 5) during an ASD endorsement course, 6) self taught, 7) other form of training. Results indicate that participants receive training in these interventions and practices predominantly in workshop situations.
Table 4-12  
Type of Training Received for Limited Supporting Information for Practice

<table>
<thead>
<tr>
<th></th>
<th>No Training N</th>
<th>No Training %</th>
<th>Workshop N</th>
<th>Workshop %</th>
<th>Graduate N</th>
<th>Graduate %</th>
<th>Undergrad. N</th>
<th>Undergrad. %</th>
<th>ASD Course N</th>
<th>ASD Course %</th>
<th>Self Taught N</th>
<th>Self Taught %</th>
<th>Other N</th>
<th>Other %</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>34</td>
<td>75.6</td>
<td>4</td>
<td>8.9</td>
<td>3</td>
<td>6.7</td>
<td>--</td>
<td>--</td>
<td>1</td>
<td>2.2</td>
<td>--</td>
<td>--</td>
<td>3</td>
<td>6.7</td>
</tr>
<tr>
<td>B</td>
<td>43</td>
<td>93.5</td>
<td>1</td>
<td>2.2</td>
<td>1</td>
<td>2.2</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>1</td>
<td>2.2</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>32</td>
<td>66.7</td>
<td>4</td>
<td>8.3</td>
<td>6</td>
<td>12.5</td>
<td>1</td>
<td>2.1</td>
<td>1</td>
<td>2.1</td>
<td>2</td>
<td>4.2</td>
<td>2</td>
<td>4.2</td>
</tr>
<tr>
<td>D</td>
<td>38</td>
<td>79.2</td>
<td>1</td>
<td>2.1</td>
<td>3</td>
<td>6.3</td>
<td>1</td>
<td>2.1</td>
<td>1</td>
<td>2.1</td>
<td>1</td>
<td>2.1</td>
<td>3</td>
<td>6.3</td>
</tr>
<tr>
<td>E</td>
<td>41</td>
<td>87.2</td>
<td>3</td>
<td>6.4</td>
<td>3</td>
<td>6.4</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>45</td>
<td>97.8</td>
<td>--</td>
<td>--</td>
<td>1</td>
<td>2.2</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>42</td>
<td>89.4</td>
<td>2</td>
<td>4.3</td>
<td>1</td>
<td>2.1</td>
<td>1</td>
<td>2.1</td>
<td>--</td>
<td>--</td>
<td>1</td>
<td>2.1</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>40</td>
<td>83.3</td>
<td>2</td>
<td>4.2</td>
<td>1</td>
<td>2.1</td>
<td>--</td>
<td>--</td>
<td>2</td>
<td>4.2</td>
<td>2</td>
<td>4.2</td>
<td>1</td>
<td>2.1</td>
</tr>
<tr>
<td>I</td>
<td>42</td>
<td>89.4</td>
<td>3</td>
<td>6.4</td>
<td>1</td>
<td>2.1</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>1</td>
<td>2.1</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>J</td>
<td>44</td>
<td>93.6</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>1</td>
<td>2.1</td>
<td>--</td>
<td>--</td>
<td>1</td>
<td>2.1</td>
<td>1</td>
<td>2.1</td>
</tr>
<tr>
<td>K</td>
<td>34</td>
<td>69.4</td>
<td>5</td>
<td>10.2</td>
<td>1</td>
<td>2.0</td>
<td>1</td>
<td>2.0</td>
<td>1</td>
<td>2.0</td>
<td>2</td>
<td>4.1</td>
<td>5</td>
<td>10.2</td>
</tr>
<tr>
<td>L</td>
<td>23</td>
<td>50.0</td>
<td>4</td>
<td>8.7</td>
<td>3</td>
<td>6.5</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>6</td>
<td>13.0</td>
<td>21.7</td>
</tr>
<tr>
<td>M</td>
<td>34</td>
<td>69.4</td>
<td>2</td>
<td>4.1</td>
<td>2</td>
<td>4.1</td>
<td>1</td>
<td>2.0</td>
<td>2</td>
<td>4.1</td>
<td>6</td>
<td>12.2</td>
<td>2</td>
<td>4.1</td>
</tr>
</tbody>
</table>


The greatest amount of training is in the Music Therapy practice where 50% of the participants report having training. The specific breakdown of training methods for Music Therapy practice is displayed in figure 7.
Type of Training Received for Not Recommended Practices are summarized in Table 4-13 where (N) is the number of participants responding to type of training received for each of the practices listed. The types of training is categorized into 1) no training, 2) workshop, 3) college graduate program course, 4) college undergraduate program course, 5) during an ASD endorsement course, 6) self taught, 7) other form of training.

Table 4-13

<table>
<thead>
<tr>
<th>Type of Training</th>
<th>No Training</th>
<th>Workshop</th>
<th>Graduate</th>
<th>Undergrad.</th>
<th>ASD Course</th>
<th>Self Taught</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>A 39</td>
<td>83.0</td>
<td>3</td>
<td>6.4</td>
<td>2</td>
<td>4.3</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>B 31</td>
<td>64.6</td>
<td>5</td>
<td>10.4</td>
<td>4</td>
<td>8.3</td>
<td>2</td>
<td>4.2</td>
</tr>
</tbody>
</table>

Note: (A) Holding Therapy, (B) Facilitated Communication

Results indicate that the Facilitated Communication and Holding Therapy practices categorized by Simpson (2005) as practices not recommended to be used with individuals with
ASD was reportedly learned by 17% and 35% respectively, of the participants. Surprisingly, four participants were trained in the Facilitated Communication practice while taking ASD endorsement courses. The specific breakdown of training methods for Facilitated Communication is displayed in figure 8.

![Facilitated Communication Graph](image)

**Figure 8**

*Training Received for Facilitated Communication Practice*

Type of Training Received for *Not Rated* practices by Simpson (2005) are summarized in Table 4-14 where (N) is the number of participants responding to the question of which types of training they received for each of the practices listed. The types of training is categorized as 1) no training, 2) workshop, 3) college graduate program course, 4) college undergraduate program course, 5) during an ASD endorsement course, 6) self taught, 7) other form of training. Results indicate that workshops are the most prevalent training venue.
Table

4-14
Type of Training Received for Not Rated Types of Practices

<table>
<thead>
<tr>
<th>No Training</th>
<th>Workshop</th>
<th>Graduate</th>
<th>Undergrad.</th>
<th>ASD Course</th>
<th>Self Taught</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>A</td>
<td>23</td>
<td>47.9</td>
<td>11</td>
<td>22.9</td>
<td>3</td>
<td>6.3</td>
</tr>
<tr>
<td>B</td>
<td>45</td>
<td>97.8</td>
<td>--</td>
<td>--</td>
<td>1</td>
<td>2.2</td>
</tr>
<tr>
<td>C</td>
<td>41</td>
<td>89.1</td>
<td>2</td>
<td>4.3</td>
<td>1</td>
<td>2.2</td>
</tr>
<tr>
<td>D</td>
<td>37</td>
<td>80.4</td>
<td>3</td>
<td>6.5</td>
<td>4</td>
<td>8.7</td>
</tr>
<tr>
<td>E</td>
<td>40</td>
<td>85.1</td>
<td>1</td>
<td>2.1</td>
<td>1</td>
<td>2.1</td>
</tr>
<tr>
<td>F</td>
<td>19</td>
<td>38.8</td>
<td>12</td>
<td>24.5</td>
<td>5</td>
<td>10.2</td>
</tr>
<tr>
<td>G</td>
<td>11</td>
<td>22.4</td>
<td>21</td>
<td>42.9</td>
<td>3</td>
<td>6.1</td>
</tr>
<tr>
<td>H</td>
<td>44</td>
<td>93.6</td>
<td>--</td>
<td>--</td>
<td>1</td>
<td>2.1</td>
</tr>
<tr>
<td>I</td>
<td>38</td>
<td>82.6</td>
<td>1</td>
<td>2.2</td>
<td>3</td>
<td>6.5</td>
</tr>
<tr>
<td>J</td>
<td>37</td>
<td>78.7</td>
<td>3</td>
<td>6.4</td>
<td>1</td>
<td>2.1</td>
</tr>
<tr>
<td>K</td>
<td>42</td>
<td>87.5</td>
<td>1</td>
<td>2.1</td>
<td>1</td>
<td>2.1</td>
</tr>
<tr>
<td>L</td>
<td>36</td>
<td>76.6</td>
<td>4</td>
<td>8.5</td>
<td>2</td>
<td>4.3</td>
</tr>
</tbody>
</table>

Note: (A) Assessment of Basic Language (ABLLS), (B) Azrin 24-Hour Toilet, (C) Lindamood-Bell, (D) Naturalistic Language Paradigm, (E) Rapid Prompting Method, (F) Verbal Behavior, (G) Visual Schedules, (H) Bolles Sensory Learning, (I) Neurofeedback (Biofeedback), (J) Integrated Movement Therapy, (K) Interactive Metronome (L) Self-Injurious Behavior Inhibiting System (SIBS)

Visual Schedules practices are the most widely studied approach in this category with 78% of the participants report having this type of training. The specific breakdown of training methods for Visual Schedules is displayed in figure 9.
The third component to the first question in the study was to determine the types of practices teachers use with their students with ASD. Responses were obtained by participant completion of survey section *Classroom Strategies Utilized*, where they were asked about their use of 42 types of practices. Participants' responses were limited to three choices, *yes* participants use the specific practice during the current school year, they have used the practice in the past, but not in the current school year (this response is regarded as a *yes* response since the practice has been used by the participant), or *no* the participant never used the practice, see figure 10.

**6. Discrete Trail Training:**
- Yes, currently (since August 2008)
- In the past but not now (anytime prior to August 2008)
- No, never

Figure 10: Sample item from ATS under classroom strategies utilized.
To better understand the organization of the research questions the following explanation of the structure is offered. The ATS categorized the 42 practices based on the model by Simpson et al. (2005) according to practice type 1) interpersonal relationship practices, 2) skill-based practices, 3) cognitive practices, 4) physiological/biological/neurological practices and 5) other types of practices (see Table 4-15). The dependent variable in this study is the type of practices that are commonly used by educators who teach students with autism spectrum disorder. The adapted ATS categorized these practices into 5 sections of research-based interventions and practices for possible use with students with ASD (Morrier, Hess, & Heflin, 2006). In order to keep the fluidity of this study, the 42 practices were grouped into 5 categories that define the dependent variable (1) scientifically-based promises, (2) promising practices, (3) limited supporting information for practice practices, (4) not recommended practices and (5) not rated practices. Table 4-15 represents a visual description of the categories of practices as represented in the ATS and as categorized by Simpson (2005).

In order to perform the multiple linear regressions (research question 1) the participants’ responses from the ATS were coded according to their classification as a) not rated, b) not recommended, c) limited supporting information for practice, d) promising practices and e) scientifically-based practices. Each of these categories was examined individually as dependent variable “a” through “e” (see Table 4-15).
Table 4-15

Practices as Categorized on ATS as Dependent Variables

<table>
<thead>
<tr>
<th>Classification</th>
<th>Interpersonal Relationship</th>
<th>Skill-based</th>
<th>Cognitive</th>
<th>Physiological/biological neurological</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scientifically-based Practices</td>
<td>(Dependent Variable E)</td>
<td>-Play-Oriented Strategies</td>
<td>-Picture Exchange Communication System -Incidental Teaching -Structured Teaching (e.g., TEACCH) -Assistive Technology -Joint Action Routines -Augmentive Alternative Communication</td>
<td>-Learning Experiences: An Alternative Program for Preschoolers and Parents</td>
<td>-Sensory Integration</td>
</tr>
<tr>
<td>Promising Practices</td>
<td>(Dependent Variable D)</td>
<td>-Gentle Teaching -Option Method (e.g., Son-Rise Program; -Floor Time -Pet/Animal Therapy -Relationship Development Intervention</td>
<td>-van Dijk Curricular Approach -Fast ForWord</td>
<td>-Cartooning -Power Cards</td>
<td>-Scotopic Sensitivity Syndrome: Irlen lenses -Auditory Integration Training</td>
</tr>
<tr>
<td>Limited Supporting Information for Practice</td>
<td>(Dependent Variable C)</td>
<td>-Holding Therapy</td>
<td>-Facilitated Communication</td>
<td>-Bolles Sensory Learning (Biofeedback)</td>
<td>-Integrated Movement Therapy -Interactive Metronome -Self-Injurious Behavior Inhibiting System (SIBS)</td>
</tr>
<tr>
<td>Not Recommended Practices</td>
<td>(Dependent Variable B)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not Rated Practices</td>
<td>(Dependent Variable A)</td>
<td>-Assessment of Basic Language (ABLLS) -Azrin 24-Hour Toilet -Lindamood-Bell Naturalistic Language Paradigm -Rapid Prompting Method -Verbal Behavior -Visual Schedules</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Tables 4-16 through 4-20 display participant responses to use of practice. The tables display the findings of the actual data collected where the first two choices *Yes, currently (since August 2008)* and *In the past but not now (anytime prior to August 2008)* are displayed as independent responses, however, to analyze the data these two choices were combined to represent one score of “yes” and will be discussed in this fashion as the results are discussed. The third option *No, never* was not affected by the pooling of data. The rationale for leaving the tables in their original format is to enable the reader to see the breakdown of actual participant responses.

Results of the first category of practices, *scientifically-based practices*, suggests that the Applied Behavioral Analysis practices are the most widely used practice by the participants with 79.8% of participants using it at some point while the Learning Experiences: An Alternative Program for Preschoolers and Parents (LEAP) was the least utilized practice with only 15.5% of participants ever using it, see Table 4-16. As this study was intended for teachers of students with ASD in grades K-12 and the LEAP program is designed for preschoolers and parents, it is not unexpected that few participants have used the practice, however, a concern is that non-preschool teachers have been using the practice with students in grades above preschool level.
Table 4-16

**Scientifically-Based Practices Used by Participants**

<table>
<thead>
<tr>
<th>Type/Answer Options</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Applied Behavior Analysis:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes, currently (since August 2008)</td>
<td>54.20%</td>
<td>32</td>
</tr>
<tr>
<td>In the past but not now (anytime prior to August 2008)</td>
<td>25.40%</td>
<td>15</td>
</tr>
<tr>
<td>No, never</td>
<td>20.30%</td>
<td>12</td>
</tr>
<tr>
<td><strong>Discrete Trial Training:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes, currently (since August 2008)</td>
<td>30.50%</td>
<td>18</td>
</tr>
<tr>
<td>In the past but not now (anytime prior to August 2008)</td>
<td>25.40%</td>
<td>15</td>
</tr>
<tr>
<td>No, never</td>
<td>44.10%</td>
<td>26</td>
</tr>
<tr>
<td><strong>Pivotal Response Training:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes, currently (since August 2008)</td>
<td>24.60%</td>
<td>14</td>
</tr>
<tr>
<td>In the past but not now (anytime prior to August 2008)</td>
<td>14.00%</td>
<td>8</td>
</tr>
<tr>
<td>No, never</td>
<td>61.40%</td>
<td>35</td>
</tr>
<tr>
<td><strong>LEAP (Learning Experiences: An Alternative Program for Preschoolers and Parents):</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes, currently (since August 2008)</td>
<td>5.20%</td>
<td>3</td>
</tr>
<tr>
<td>In the past but not now (anytime prior to August 2008)</td>
<td>10.30%</td>
<td>6</td>
</tr>
<tr>
<td>No, never</td>
<td>84.50%</td>
<td>49</td>
</tr>
</tbody>
</table>

Results of reported participants usage of the second category of research-based practices *promising practices* suggests that the Assistive Technology practices are the most widely used practice by the participants with approximately 88.1% of the participants using it at some point followed by the Social Stories practices where approximately 81% of participants have used it at some point, while the Joint Action Routine practice is the least utilized practices where only 10.7% of the participants have ever used it, see Table 4-17.
<table>
<thead>
<tr>
<th>Type/Answer Options</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Play-oriented Strategies:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes, currently (since August 2008)</td>
<td>42.40%</td>
<td>25</td>
</tr>
<tr>
<td>In the past but not now (anytime prior to August 2008)</td>
<td>20.30%</td>
<td>12</td>
</tr>
<tr>
<td>No, never</td>
<td>37.30%</td>
<td>22</td>
</tr>
<tr>
<td><strong>Assistive Technology (AT; for example adapted utensils, talking calculators, pencil grips, audible word scanning devices, software, talking word processors with text, or van adaptations):</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes, currently (since August 2008)</td>
<td>52.50%</td>
<td>31</td>
</tr>
<tr>
<td>In the past but not now (anytime prior to August 2008)</td>
<td>35.60%</td>
<td>21</td>
</tr>
<tr>
<td>No, never</td>
<td>11.90%</td>
<td>7</td>
</tr>
<tr>
<td><strong>Augmentative Alternative Communication (AAC; aided and unaided communication devices and symbol systems, excluding Picture Exchange Communication System - PECS):</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes, currently (since August 2008)</td>
<td>44.80%</td>
<td>26</td>
</tr>
<tr>
<td>In the past but not now (anytime prior to August 2008)</td>
<td>25.90%</td>
<td>15</td>
</tr>
<tr>
<td>No, never</td>
<td>29.30%</td>
<td>17</td>
</tr>
<tr>
<td><strong>Incidental Teaching:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes, currently (since August 2008)</td>
<td>49.10%</td>
<td>28</td>
</tr>
<tr>
<td>In the past but not now (anytime prior to August 2008)</td>
<td>5.30%</td>
<td>3</td>
</tr>
<tr>
<td>No, never</td>
<td>45.60%</td>
<td>26</td>
</tr>
<tr>
<td><strong>Joint Action Routines (JAR):</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes, currently (since August 2008)</td>
<td>8.90%</td>
<td>5</td>
</tr>
<tr>
<td>In the past but not now (anytime prior to August 2008)</td>
<td>1.80%</td>
<td>1</td>
</tr>
<tr>
<td>No, never</td>
<td>89.30%</td>
<td>50</td>
</tr>
<tr>
<td><strong>Picture Exchange Communication System (PECS):</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes, currently (since August 2008)</td>
<td>40.70%</td>
<td>24</td>
</tr>
<tr>
<td>In the past but not now (anytime prior to August 2008)</td>
<td>32.20%</td>
<td>19</td>
</tr>
<tr>
<td>No, never</td>
<td>27.10%</td>
<td>16</td>
</tr>
<tr>
<td><strong>Structured Teaching (TEACCH):</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes, currently (since August 2008)</td>
<td>45.80%</td>
<td>27</td>
</tr>
<tr>
<td>In the past but not now (anytime prior to August 2008)</td>
<td>23.70%</td>
<td>14</td>
</tr>
<tr>
<td>No, never</td>
<td>30.50%</td>
<td>18</td>
</tr>
<tr>
<td><strong>Cognitive Behavioral Modification (includes cognitive learning strategies, cognitive scripts):</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes, currently (since August 2008)</td>
<td>45.60%</td>
<td>26</td>
</tr>
<tr>
<td>In the past but not now (anytime prior to August 2008)</td>
<td>26.30%</td>
<td>15</td>
</tr>
<tr>
<td>No, never</td>
<td>28.10%</td>
<td>16</td>
</tr>
</tbody>
</table>
Table 4-17 (Cont’d)

Promising Practices Used by Participants

<table>
<thead>
<tr>
<th>Type/Answer Options</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Decision-Making Strategies:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes, currently (since August 2008)</td>
<td>39.70%</td>
<td>23</td>
</tr>
<tr>
<td>In the past but not now (anytime prior to August 2008)</td>
<td>13.80%</td>
<td>8</td>
</tr>
<tr>
<td>No, never</td>
<td>46.60%</td>
<td>27</td>
</tr>
<tr>
<td>Social Stories (Social Narratives):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes, currently (since August 2008)</td>
<td>55.20%</td>
<td>32</td>
</tr>
<tr>
<td>In the past but not now (anytime prior to August 2008)</td>
<td>25.90%</td>
<td>15</td>
</tr>
<tr>
<td>No, never</td>
<td>19.00%</td>
<td>11</td>
</tr>
<tr>
<td>Sensory Integration (including weighted vests, brushing, joint compressions, sensory diet):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes, currently (since August 2008)</td>
<td>31.60%</td>
<td>18</td>
</tr>
<tr>
<td>In the past but not now (anytime prior to August 2008)</td>
<td>28.10%</td>
<td>16</td>
</tr>
<tr>
<td>No, never</td>
<td>40.40%</td>
<td>23</td>
</tr>
</tbody>
</table>

Results of reported participant’s usage of the third category of research-based practices limited supporting information for practice suggests that the Music Therapy practice is the most widely used practices by the participants with 64.3% of participants using it at some point while Option Method (Son-Rise Program) is used the least utilized practices with only 6.9% of participants ever using it, see Table 4-18.
### Table 4-18

**Limited Supporting Information for Practice Approaches Used by Participants**

<table>
<thead>
<tr>
<th>Type/Answer Options</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Floor Time (Greenspan; Developmental, Individual-Difference, Relationship-Based Model):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes, currently (since August 2008)</td>
<td>16.90%</td>
<td>10</td>
</tr>
<tr>
<td>In the past but not now (anytime prior to August 2008)</td>
<td>15.30%</td>
<td>9</td>
</tr>
<tr>
<td>No, never</td>
<td>67.80%</td>
<td>40</td>
</tr>
<tr>
<td>Gentle Teaching:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes, currently (since August 2008)</td>
<td>25.40%</td>
<td>15</td>
</tr>
<tr>
<td>In the past but not now (anytime prior to August 2008)</td>
<td>8.50%</td>
<td>5</td>
</tr>
<tr>
<td>No, never</td>
<td>66.10%</td>
<td>39</td>
</tr>
<tr>
<td>Option Method (Son-Rise Program):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes, currently (since August 2008)</td>
<td>5.20%</td>
<td>3</td>
</tr>
<tr>
<td>In the past but not now (anytime prior to August 2008)</td>
<td>1.70%</td>
<td>1</td>
</tr>
<tr>
<td>No, never</td>
<td>93.10%</td>
<td>54</td>
</tr>
<tr>
<td>Pet/Animal Therapy:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes, currently (since August 2008)</td>
<td>6.90%</td>
<td>4</td>
</tr>
<tr>
<td>In the past but not now (anytime prior to August 2008)</td>
<td>22.40%</td>
<td>13</td>
</tr>
<tr>
<td>No, never</td>
<td>70.70%</td>
<td>41</td>
</tr>
<tr>
<td>Relational Development Intervention (RDI):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes, currently (since August 2008)</td>
<td>13.60%</td>
<td>8</td>
</tr>
<tr>
<td>In the past but not now (anytime prior to August 2008)</td>
<td>5.10%</td>
<td>3</td>
</tr>
<tr>
<td>No, never</td>
<td>81.40%</td>
<td>48</td>
</tr>
<tr>
<td>Fast ForWord:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes, currently (since August 2008)</td>
<td>5.10%</td>
<td>3</td>
</tr>
<tr>
<td>In the past but not now (anytime prior to August 2008)</td>
<td>8.50%</td>
<td>5</td>
</tr>
<tr>
<td>No, never</td>
<td>86.40%</td>
<td>51</td>
</tr>
<tr>
<td>Van Dijk Curricular Approach:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes, currently (since August 2008)</td>
<td>3.40%</td>
<td>2</td>
</tr>
<tr>
<td>In the past but not now (anytime prior to August 2008)</td>
<td>5.10%</td>
<td>3</td>
</tr>
<tr>
<td>No, never</td>
<td>91.50%</td>
<td>54</td>
</tr>
<tr>
<td>Cartooning (Cartoon Conversations):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes, currently (since August 2008)</td>
<td>8.80%</td>
<td>5</td>
</tr>
<tr>
<td>In the past but not now (anytime prior to August 2008)</td>
<td>17.50%</td>
<td>10</td>
</tr>
<tr>
<td>No, never</td>
<td>73.70%</td>
<td>42</td>
</tr>
<tr>
<td>Power Cards:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes, currently (since August 2008)</td>
<td>5.30%</td>
<td>3</td>
</tr>
<tr>
<td>In the past but not now (anytime prior to August 2008)</td>
<td>8.80%</td>
<td>5</td>
</tr>
<tr>
<td>No, never</td>
<td>86.00%</td>
<td>49</td>
</tr>
</tbody>
</table>
Table 4-18 (Cont’d)

Limited Supporting Information for Practice Approaches Used by Participants

<table>
<thead>
<tr>
<th>Type/Answer Options</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auditory Integration Training:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes, currently (since August 2008)</td>
<td>10.50%</td>
<td>6</td>
</tr>
<tr>
<td>In the past but not now (anytime prior to August 2008)</td>
<td>17.50%</td>
<td>10</td>
</tr>
<tr>
<td>No, never</td>
<td>71.90%</td>
<td>41</td>
</tr>
<tr>
<td>Irlen Lenses (Scotopic Sensitivity Syndrome):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes, currently (since August 2008)</td>
<td>1.80%</td>
<td>1</td>
</tr>
<tr>
<td>In the past but not now (anytime prior to August 2008)</td>
<td>8.90%</td>
<td>5</td>
</tr>
<tr>
<td>No, never</td>
<td>89.30%</td>
<td>50</td>
</tr>
<tr>
<td>Art Therapy:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes, currently (since August 2008)</td>
<td>26.30%</td>
<td>15</td>
</tr>
<tr>
<td>In the past but not now (anytime prior to August 2008)</td>
<td>19.30%</td>
<td>11</td>
</tr>
<tr>
<td>No, never</td>
<td>54.40%</td>
<td>31</td>
</tr>
<tr>
<td>Music Therapy:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes, currently (since August 2008)</td>
<td>30.40%</td>
<td>17</td>
</tr>
<tr>
<td>In the past but not now (anytime prior to August 2008)</td>
<td>33.90%</td>
<td>19</td>
</tr>
<tr>
<td>No, never</td>
<td>35.70%</td>
<td>20</td>
</tr>
</tbody>
</table>

Results of reported participants usage of the fourth category of research-based practices not recommended practices suggests that the Facilitated Communication practice is the most widely used practice by the participants with 39.7% of participants using it at some point while Holding Therapy practice is the least utilized practice with only 18.7% of participants ever using it, see Table 4-19. Results further indicate that slightly less than one out of every five participants (18.7%) have used Facilitated Communication practices at some point, a not recommended practice when educating students with ASD.
Table 4-19

**Not Recommended Practices Used by Participants**

<table>
<thead>
<tr>
<th>Type/Answer Options</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facilitated Communication:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes, currently (since August 2008)</td>
<td>19.00%</td>
<td>11</td>
</tr>
<tr>
<td>In the past but not now (anytime prior to August 2008)</td>
<td>20.70%</td>
<td>12</td>
</tr>
<tr>
<td>No, never</td>
<td>60.30%</td>
<td>35</td>
</tr>
<tr>
<td>Holding Therapy:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes, currently (since August 2008)</td>
<td>3.40%</td>
<td>2</td>
</tr>
<tr>
<td>In the past but not now (anytime prior to August 2008)</td>
<td>15.30%</td>
<td>9</td>
</tr>
<tr>
<td>No, never</td>
<td>81.40%</td>
<td>48</td>
</tr>
</tbody>
</table>

Results of reported participants usage of the final category of research-based practices not rated practices, consist of practices that were not grouped on the before mentioned categories. Participant responses suggest that the Visual Schedules practice are the most widely used practice by the participants with 89.3% of participants using it at some point while Azrin 24-Hour Toilet Training practice was the least utilized practice with only 8.5% of participants ever using it, see Table 4-20.
Table 4-20

*Not Rated Practices Used by Participants*

<table>
<thead>
<tr>
<th>Type/Answer Options</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assessments of Basic Language and Learning Skills (ABLLS):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes, currently (since August 2008)</td>
<td>35.60%</td>
<td>21</td>
</tr>
<tr>
<td>In the past but not now (anytime prior to August 2008)</td>
<td>25.40%</td>
<td>15</td>
</tr>
<tr>
<td>No, never</td>
<td>39.00%</td>
<td>23</td>
</tr>
<tr>
<td>Azrin 24-hour Toilet Training:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes, currently (since August 2008)</td>
<td>1.70%</td>
<td>1</td>
</tr>
<tr>
<td>In the past but not now (anytime prior to August 2008)</td>
<td>6.80%</td>
<td>4</td>
</tr>
<tr>
<td>No, never</td>
<td>91.50%</td>
<td>54</td>
</tr>
<tr>
<td>Bolles Sensory Learning:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes, currently (since August 2008)</td>
<td>3.50%</td>
<td>2</td>
</tr>
<tr>
<td>In the past but not now (anytime prior to August 2008)</td>
<td>7.00%</td>
<td>4</td>
</tr>
<tr>
<td>No, never</td>
<td>89.50%</td>
<td>51</td>
</tr>
<tr>
<td>Integrated Movement Therapy:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes, currently (since August 2008)</td>
<td>12.30%</td>
<td>7</td>
</tr>
<tr>
<td>In the past but not now (anytime prior to August 2008)</td>
<td>15.80%</td>
<td>9</td>
</tr>
<tr>
<td>No, never</td>
<td>71.90%</td>
<td>41</td>
</tr>
<tr>
<td>Interactive Metronome:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes, currently (since August 2008)</td>
<td>3.50%</td>
<td>2</td>
</tr>
<tr>
<td>In the past but not now (anytime prior to August 2008)</td>
<td>8.80%</td>
<td>5</td>
</tr>
<tr>
<td>No, never</td>
<td>87.70%</td>
<td>50</td>
</tr>
<tr>
<td>Lindamood-Bell:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes, currently (since August 2008)</td>
<td>1.80%</td>
<td>1</td>
</tr>
<tr>
<td>In the past but not now (anytime prior to August 2008)</td>
<td>16.10%</td>
<td>9</td>
</tr>
<tr>
<td>No, never</td>
<td>82.10%</td>
<td>46</td>
</tr>
<tr>
<td>Naturalistic Language Paradigm:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes, currently (since August 2008)</td>
<td>11.90%</td>
<td>7</td>
</tr>
<tr>
<td>In the past but not now (anytime prior to August 2008)</td>
<td>15.30%</td>
<td>9</td>
</tr>
<tr>
<td>No, never</td>
<td>72.90%</td>
<td>43</td>
</tr>
<tr>
<td>Neurofeedback (biofeedback):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes, currently (since August 2008)</td>
<td>5.30%</td>
<td>3</td>
</tr>
<tr>
<td>In the past but not now (anytime prior to August 2008)</td>
<td>15.80%</td>
<td>9</td>
</tr>
<tr>
<td>No, never</td>
<td>78.90%</td>
<td>45</td>
</tr>
<tr>
<td>Rapid Prompting Method:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes, currently (since August 2008)</td>
<td>15.50%</td>
<td>9</td>
</tr>
<tr>
<td>In the past but not now (anytime prior to August 2008)</td>
<td>6.90%</td>
<td>4</td>
</tr>
<tr>
<td>No, never</td>
<td>77.60%</td>
<td>45</td>
</tr>
</tbody>
</table>
Table 4-20 (Cont’d)

Not Rated Practices Used by Participants

<table>
<thead>
<tr>
<th>Type/Answer Options</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-Injurious Behavior Inhibiting System (SIBIS):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes, currently (since August 2008)</td>
<td>8.80%</td>
<td>5</td>
</tr>
<tr>
<td>In the past but not now (anytime prior to August 2008)</td>
<td>17.50%</td>
<td>10</td>
</tr>
<tr>
<td>No, never</td>
<td>73.70%</td>
<td>42</td>
</tr>
<tr>
<td>Verbal Behavior</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes, currently (since August 2008)</td>
<td>47.40%</td>
<td>27</td>
</tr>
<tr>
<td>In the past but not now (anytime prior to August 2008)</td>
<td>17.50%</td>
<td>10</td>
</tr>
<tr>
<td>No, never</td>
<td>35.10%</td>
<td>20</td>
</tr>
<tr>
<td>Visual Schedules:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes, currently (since August 2008)</td>
<td>65.50%</td>
<td>38</td>
</tr>
<tr>
<td>In the past but not now (anytime prior to August 2008)</td>
<td>13.80%</td>
<td>8</td>
</tr>
<tr>
<td>No, never</td>
<td>20.70%</td>
<td>12</td>
</tr>
</tbody>
</table>

In the analysis of the three research questions regressions were conducted to identify relationships between the independent and dependant variables. As the dependent variable identified as the types of practices teachers use when educating students with ASD were categorized into five categories not rated, not recommended, limited supporting information for practice, promising practices and scientifically-based practices, the regressions for each of the research questions were separated according to the before mentioned categories, see Table 4-15. Analysis of research question one, “DV 1 A” is referring to the multiple regression conducted with the dependant variable of not rated practices and independent variables of teacher years of experience educating students with ASD and teacher amount of training, “DV 1 B” is referring to the multiple regression with the dependent variable of not recommended practices and independent variables of teacher years of experience educating students with ASD and teacher amount of training. “DV 1 C” identifies multiple regression with dependent variable of limited supporting information for practice, and independent variables of teacher years of experience educating students with ASD and teacher amount of training.
educating students with ASD and teacher amount of training, “DV 1 D” multiple regression with dependent variable of promising practices and independent variables of teacher years of experience educating students with ASD and teacher amount of training, and “DV 1 E” multiple regression with dependant variable of scientifically-based practices and independent variables of teacher years of experience educating students with ASD and teacher amount of training. All three research questions were analyzed in this same manner.

**DV 1 A: Not Rated Practices**

A multiple linear regression was conducted results indicated a significant \( F(2, 42) = 11.54, p < .001 \) relationship between teacher experience and training and that the independent variables account for 35.5% of the variance of the dependent variable. Table 4-21 presents the beta coefficients and suggests that for every one unit increase in training (each additional practice the teacher has training with) the use of *not rated practices* increases by a significant 0.02 units. The negative B coefficient value of teacher experience (-.004) indicates that a greater amount of teacher experience yields less use of *not rated practices*. Alternatively, the positive B value (.02) indicates that the more training a teacher has the greater the usage of *not rated practices*. Beta coefficients also suggest that for every unit increase in teacher experience (additional year of teaching students with ASD) the use of *not rated practices* was not significant, therefore, concluding that the more training a teacher has the more likely they will use *not rated practices* and the amount of years teaching students with ASD in not a significant indicator of the use of *not rated practices*.

Beta weight analysis (\( \beta \)) is used to show the magnitude and direction of the relationship between all variables in a model (George & Mallery, 2003). Beta weight results suggest that for one of the independent variables, amount of teacher training \( \beta (.586) \) a positive direction and
strong magnitude of relationship between teacher training and use of *not rated practices* exists, where as the Beta weight indicates that years of teacher experience $\beta (-.106)$ is a negative relationship indicating that as teacher experience decreases use of *not rated practices* increases.

The results suggest that the independent variables do predict the use of *not rated practices* and the hypothesis, *teacher experience* and *teacher training* positively correlates with the number of *not rated practices* teachers use when educating students with ASD, was accepted.

Table 4-21

*Regression with Teacher Experience and Teacher Training Predicting Use of Not Rated Practices*

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>B</th>
<th>SE</th>
<th>$\beta$</th>
<th>$t$</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>1.256</td>
<td>.067</td>
<td></td>
<td>18.742</td>
<td>.000</td>
</tr>
<tr>
<td>Teacher Experience</td>
<td>-.004</td>
<td>.004</td>
<td>-.106</td>
<td>-.853</td>
<td>.399</td>
</tr>
<tr>
<td>Training</td>
<td>.016</td>
<td>.003</td>
<td>.586</td>
<td>4.726</td>
<td>* .000</td>
</tr>
</tbody>
</table>

*Note. F (2, 42) = 11.54, p* < .001, $R^2 = .355$

*DV 1B: Not Recommended Practices*

A multiple linear regression was conducted results indicated a significant $[F (2, 44) = 9.29, p < .001]$ relationship between teacher experience and training and that the independent variables account for 29.7% of the variance of the dependent variable. Table 4-22 presents the beta coefficients and suggests that for every one unit increase in training (each additional practice the teacher has training with) the use of *not recommended practices* increased by a significant 0.02 units. The negative B coefficient value of teacher experience (-.007) indicated that a greater amount of teacher experience yields less use of *not recommended practices*. Alternatively, the positive B value (.02) indicates that the more training a teacher has the greater the usage of *not recommended practices*. Beta coefficients also suggest that for every unit
increase in teacher experience (additional year of teaching students with ASD) the use of *not recommended practices* was not significant, therefore, concluding that the greater the training a teacher has the more likely they will use practices categorized as *not recommended practices* and the amount of years teaching students with ASD is not a significant indicator of the use of *not recommended practices*.

Beta weight analysis (β) is used to show the magnitude and direction of the relationship between all variables in a model (George & Mallery, 2003). Beta weight results suggest that for the independent variable of amount of teacher training β(.527) a positive direction and strong magnitude of relationship between teacher training and use of *not recommended* practices exists, where as the Beta weight indicates that years of teacher experience β(-.136) is a negative relationship indicating that as teacher experience decreases use of *not rated practices* increases. The results suggest that the independent variables do predict the use of *not recommended practices* and the hypothesis, *teacher experience* and *teacher training* positively correlates with the number of *not recommended practices* teachers use when educating students with ASD, was accepted.

Table 4-22

*Regression with Teacher Experience and Teacher Training Predicting Use of Not Recommended Practices*

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>B</th>
<th>SE</th>
<th>β</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>1.075</td>
<td>.098</td>
<td></td>
<td>10.996</td>
<td>.000</td>
</tr>
<tr>
<td>Teacher Experience</td>
<td>-.007</td>
<td>.006</td>
<td>-.136</td>
<td>-1.077</td>
<td>.288</td>
</tr>
<tr>
<td>Training</td>
<td>.020</td>
<td>.005</td>
<td>.527</td>
<td>4.169</td>
<td>* .000</td>
</tr>
</tbody>
</table>

*Note. F (2, 44) = 9.29, p* < .001, R² = .297*
DV 1 C: Limited Supporting Information for Practice

A multiple linear regression was conducted results indicated a significant $[F(2, 39) = 25.34, p < .001]$ relationship between teacher experience and training and that the independent variables account for 56.5% of the variance of the dependent variable. Table 4-23 presents the beta coefficients and suggests that for every one unit increase in training (each additional practice the teacher has training with) use of limited supporting information for practice increase by a significant 0.02 units. The negative B coefficient value of teacher experience (-.002) indicates a nearly insignificant finding that the amount of teacher experience does not influence the use of limited supporting information for practice. Alternatively, positive B value (.02) indicates that the more training a teacher has the greater the usage of limited supporting information for practice. Beta coefficients also suggest that for every unit increase in teacher experience (additional year of teaching students with ASD) the use of limited supporting information for practice was not significant, therefore, concluding that the greater the amount of training a teacher has the more likely they will use practices categorized as limited supporting information for practice and the amount of years teaching students with ASD in not a significant indicator of the use of limited supporting information for practice approaches.

Beta weight analysis ($\beta$) is used to show the magnitude and direction of the relationship between all variables in a model (George & Mallery, 2003). Beta weight results suggest that for the independent variable, amount of teacher training $\beta (.743)$ a positive direction and strong magnitude of relationship between teacher training and use of limited supporting information for practice practices exists, where as the Beta weight indicates that years of teacher experience $\beta (-.072)$ is a insignificant negative relationship indicating that as teacher experience decreases use of limited supporting information for practice practices increases minimally. The results suggest
that the independent variables do predict the use of limited supporting information for practice practices and the hypothesis, teacher experience and teacher training positively correlates with the number of limited supporting information for practice practices teachers use when educating students with ASD, was accepted.

Table 4-23

Regression with Teacher Experience and Teacher Training Predicting Use of Limited Supporting Information for Practice

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>B</th>
<th>SE</th>
<th>β</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>1.058</td>
<td>.050</td>
<td>21.053</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td>Teacher Experience</td>
<td>-.002</td>
<td>.003</td>
<td>-.072</td>
<td>-.677</td>
<td>.502</td>
</tr>
<tr>
<td>Training</td>
<td>.018</td>
<td>.003</td>
<td>.743</td>
<td>7.020</td>
<td>* .000</td>
</tr>
</tbody>
</table>

Note. F (2, 39) = 25.34, p* < .001, R^2 = .565

DV l D: Promising Practices

A multiple linear regression was conducted results indicated a significant [F (2, 40) = 26.40, p < .001] relationship between teacher experience and training and that the independent variables account for 56.9% of the variance of the dependent variable. Table 4-24 presents the beta coefficients and suggests that for every one unit increase in training (each additional practice the teacher has training with), teacher use of promising practices increases by 0.02 units and for every one unit increase in teaching experience (additional year of teaching students with ASD), teacher use of promising practices decreases by 0.01 units. The negative B coefficient value of teacher experience (-.01) indicates that a greater amount of teacher experience yields a slight negative influence on the use of promising practices. Alternatively, the positive B value (.02) indicates that the more training a teacher has the greater the usage of promising practices.
Beta coefficients also suggest that for every unit increase in teacher experience (additional year of teaching students with ASD) the use of promising practices was significant, however, the value was slightly negative (-.01) indicating that as teachers gained more years experience they used slightly less promising practices.

Beta weight analysis (β) is used to show the magnitude and direction of the relationship between all variables in a model (George & Mallery, 2003). Beta weight results suggest that for the amount of teacher training β (.697) a positive direction and strong magnitude of relationship between teacher training and use of promising practices exists, where as the Beta weight indicates that years of teacher experience β (-.289) is a negative relationship with a fairly strong magnitude indicating that as teacher experience decreases use of not rated practices increases.

Results concluding that the greater the training a teacher has the more likely they will use practices categorized as promising practices and the greater the amount of years teaching students with ASD the less likely they are to use promising practices. The results suggest that the independent variables do predict the use of promising practices and the hypothesis, teacher experience and teacher training positively correlates with the number of promising practices teachers use when educating students with ASD, was accepted.

Table 4-24

Regression with Teacher Experience and Teacher Training Predicting Use of Promising Practices

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>B</th>
<th>SE</th>
<th>β</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>1.360</td>
<td>.050</td>
<td></td>
<td>27.391</td>
<td>.000</td>
</tr>
<tr>
<td>Teacher Experience</td>
<td>-.009</td>
<td>.003</td>
<td>-.289</td>
<td>-2.781</td>
<td>.008</td>
</tr>
<tr>
<td>Training</td>
<td>.018</td>
<td>.003</td>
<td>.697</td>
<td>6.711</td>
<td>* .000</td>
</tr>
</tbody>
</table>

Note. F (2, 40) = 26.40, p* <.001, R² = .569.
A multiple linear regression was conducted results indicated a significant $F(2, 43) = 13.54, p < .001$ relationship between teacher experience and training and the independent variables account for 38.6% of the variance of the dependent variable. Table 4-25 presents the beta coefficients and suggests that for every one unit increase in training (each additional practice the teacher has training with) teacher use of scientifically-based practices increases by 0.03 units. The negative B coefficient value of teacher experience (-.01) indicates that the greater amount of teacher experience yields a slightly less usage of scientifically-based practices. Alternatively, the positive B value (.03) indicates that the more training a teacher has the greater the usage of scientifically-based practices. Beta coefficients also suggest that for every unit increase in teacher experience (additional year of teaching students with ASD) the use of scientifically-based practices was minimally negatively related, concluding that the greater the training a teacher has the more likely they will use practices categorized as scientifically-based practices and the amount of years teaching students with ASD is a slight negative indicator of the use of scientifically-based practices.

Beta weight analysis ($\beta$) is used to show the magnitude and direction of the relationship between all variables in a model (George & Mallery, 2003). Beta weight results suggest that for the amount of teacher training $\beta (.579)$ a positive direction and strong magnitude of relationship between teacher training and use of scientifically-based practices exists, where as the Beta weight indicates that years of teacher experience $\beta (-.214)$ is a negative relationship indicating that as teacher experience decreases use of scientifically-based practices increases. The results suggest that the independent variables do predict the use of scientifically-based practices and the
hypothesis, teacher experience and teacher training positively correlates with the number of scientifically-based practices teachers use when educating students with ASD, was accepted.

Table 4-25

Regression with Teacher Experience and Teacher Training Predicting Use of Scientifically-based Practices

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>B</th>
<th>SE</th>
<th>β</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>1.768</td>
<td>.103</td>
<td></td>
<td>17.148</td>
<td>.000</td>
</tr>
<tr>
<td>Teacher Experience</td>
<td>-.012</td>
<td>.007</td>
<td>-.214</td>
<td>-1.788</td>
<td>.081</td>
</tr>
<tr>
<td>Training</td>
<td>.025</td>
<td>.005</td>
<td>.579</td>
<td>4.849</td>
<td>*.000</td>
</tr>
</tbody>
</table>

Note. F (2, 43) = 13.54, p* <.001, R² = .386

Research Question 2

Will student age influence the types of practices (categorized as not rated, not recommended, limited supporting information for practice, promising practice and scientifically-based practices) teachers use when educating students with ASD?

In order to determine if the age of the children participants are currently working with predicts the types of practices being used, survey questions from two of the four sections of the adapted Autism Treatment Survey (ATS) were analyzed. First participants were asked to identify the age range of students they currently teach, (see figure 11).
1. What are the chronological ages of the students in your class this year? (check all that apply)

- 5-7 years (K-2\textsuperscript{nd} grade)
- 8-10 years (3\textsuperscript{rd}-5\textsuperscript{th} grade)
- 11-13 years (6\textsuperscript{th}-8\textsuperscript{th} grade)
- 14-21 years (9\textsuperscript{th}–graduation)

Figure 11: Sample item from ATS of chronological ages of students in participant classrooms.

Participant responses of the ages of the students with ASD they teach are displayed in Figure 12. Frequency of groupings based on age can be viewed as follows; ages 5-7 are typically grades K-2, ages 8-10 are typically grades 3-5, both of these groups typically receive academic services in elementary school settings. Ages 11-13 are typically grades 6-9 and most likely to receive services in middle schools, and ages 14-21 are typically grades 9-12 and typically receive services in high schools.

Figure 12: Frequencies for Chronological Ages of Students Being Taught by Participants in 2008-9
Next, participants were asked to identify the type of practices they use from a list of 42 practices during the 2008-2009 school year, in the past or never (see figure 13).

### 6. Play-oriented Strategies:
- Yes, currently (since August 2008)
- In the past but not now (anytime prior to August 2008)
- No, never

Figure 13: Sample item from ATS under Interpersonal Relationship Interventions and Strategies

To answer the second research question the question was separated into 5 categories (not rate practices, not recommended practices, limited supporting information for practice practices, promising practices and scientifically-based practices). The ATS categorized the 42 practices according to practice type 1) interpersonal relationship practices, 2) skill-based practices, 3) cognitive practices, 4) physiological/biological/neurological practices and 5) other types of practices. In order to perform the linear regressions, the participant’s responses from the ATS were coded according to their classification as: a) not rated practices, b) not recommended practices, c) limited supporting information for practice practices, d) promising practices and e) scientifically-based.

Data were collected to assess if the independent variable of the student age is a predictor of the dependent variables of practices not rated practices, not recommended practices, limited supporting information for practice practices, promising practices and scientifically-based practices for use with students with ASD during the 2008-2009 school year. The results of five linear regressions did not find significance in the predictive value of the age of students and the types of practices teachers use during the 2008-2009 school year.
Participant responses to the types of practices they use with their students with ASD during the 2008-2009 school year have been presented as part of the discussion of the first research question and are displayed as: Table 4-15 *scientifically-based practices*, Table 4-16 *promising practices*, Table 4-17 *limited supporting information for practice*, Table 4-18 *not recommended practices*, and Table 4-19 *not rated practices*.

**DV 2 A: Not Rated Practices**

A linear regression was conducted to assess if the independent variable of *student age* grouped as 5 to 7, 8 to 10, 11 to 13, and 14-21 predicts the dependent variable of participant use of *not rated practices* during the 2008-2009 school year. The results of the regression were not significant $F (1, 50) = 0.04, p = .837$, and that the independent variable account for 0.1% of the variance of the dependent variable. In view of the fact that the results of statistical analysis were non-significant, no conclusions were derived with regard to the viable relationships of the variables and a discussion of beta weight ($\beta$) or B values would not be appropriate. The results suggest that the independent variable *student age*, does not positively correlate with the type of *not rated practices* and the hypothesis, *student age* does positively correlate with the type of *not rated practices* teachers use when educating students with ASD, was rejected. Table 4-26 presents the beta coefficients.

Table 4-26

<table>
<thead>
<tr>
<th>Regression with Student Age Predicting Participant Use of Not Rated Practices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independent Variable</td>
</tr>
<tr>
<td>(Constant)</td>
</tr>
<tr>
<td>Student Age</td>
</tr>
</tbody>
</table>

*Note. $F (1, 50) = 0.04, p = .837, R^2 = .001$*
**DV 2 B: Not Recommended Practices**

A linear regression was conducted to assess if the independent variable of *student age* grouped as ages 5 to 7, 8 to 10, 11 to 13, and 14-21 predicts the dependent variable of participant use of *not recommended practices* during the 2008-2009 school year. The results of the regression were not significant $F(1, 56) = 0.13, p = .725$, and that the independent variable account for 0.02% of the variance of the dependent variable. In view of the fact that the results of statistical analysis were non-significant, no conclusions were derived with regard to the viable relationships of the variables and a discussion of beta weight ($\beta$) or B values would not be appropriate. The results suggest that the independent variable *student age*, does not positively correlate with the type of *not recommended practices* and the hypothesis, *student age* does positively correlate with the type of *not recommended practices* teachers use when educating students with ASD, was rejected. Table 4-27 presents the beta coefficients.

Table 4-27

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>B</th>
<th>SE</th>
<th>$\beta$</th>
<th>$t$</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>1.341</td>
<td>.144</td>
<td></td>
<td>9.296</td>
<td>.000</td>
</tr>
<tr>
<td>Student Age</td>
<td>-.019</td>
<td>.052</td>
<td>-.047</td>
<td>-.354</td>
<td>.725</td>
</tr>
</tbody>
</table>

*Note. F (1, 56) = 0.13, p = .725, $R^2 = .002$*

**DV 2 C: Limited Supporting Information for Practice**

A linear regression was conducted to assess if the independent variable of *student age* grouped as 5 to 7, 8 to 10, 11 to 13, and 14-21 predicts the dependent variable of *limited supporting information practices* during the 2008-2009 school year. The results of the regression were not significant $F(1, 49) = 0.01, p = .929$, and that the independent variable account for 0.0%
of the variance of the dependent variable. In view of the fact that the results of statistical analysis were non-significant, no conclusions were derived with regard to the viable relationships of the variables and a discussion of beta weight (β) or B values would not be appropriate. The results suggest that the independent variable student age, does not positively correlate with the type of limited supporting information for practice practices and the hypothesis, student age does positively correlate with the type of limited supporting information for practice practices teachers use when educating students with ASD, was rejected. Table 4-28 presents the beta coefficients.

Table 4-28
Regression with Student Age Predicting participant Use of Limited Supporting Information for Practice

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>B</th>
<th>SE</th>
<th>β</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>1.260</td>
<td>.087</td>
<td>14.458</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td>Student Age</td>
<td>.003</td>
<td>.031</td>
<td>.013</td>
<td>.090</td>
<td>.929</td>
</tr>
</tbody>
</table>

Note. (1, 49) = 0.01, p = .929, R^2 < .001

A linear regression was conducted to assess if the independent variable of student age grouped as 5 to 7, 8 to 10, 11 to 13, and 14-21 predicts the dependent variable of participant use of promising practices during the 2008-2009 school year. The results of the regression not were significant F (1, 49) = 0.05, p = .828, and that the independent variable account for 0.1% of the variance of the dependent variable. In view of the fact that the results of statistical analysis were non-significant, no conclusions were derived with regard to the viable relationships of the variables and a discussion of beta weight (β) or B values would not be appropriate. The results suggest that the independent variable student age, does not positively correlate with the type of promising practices and the hypothesis, student age does positively correlate with the type of
promising practices teachers use when educating students with ASD, was rejected. Table 4-29 presents the beta coefficients.

Table 4-29

Regression with Student Age Predicting Participant Use of Promising Practices

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>B</th>
<th>SE</th>
<th>β</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>1.486</td>
<td>.101</td>
<td>14.750</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td>Student Age</td>
<td>.008</td>
<td>.036</td>
<td>.031</td>
<td>.218</td>
<td>.828</td>
</tr>
</tbody>
</table>

Note. $F(1, 49) = 0.05$, $p = .828$, $R^2 = .569$

DV 2 E: Scientifically-based Practices

A linear regression was conducted to assess if the independent variable of student age grouped as 5 to 7, 8 to 10, 11 to 13, and 14-21 predicts the dependent variable of participant use of scientifically-based practices during the 2008-2009 school year. The results of the regression were not significant $F(1, 54) = 0.39$, $p = .536$, and that the independent variable account for 0.07% of the variance of the dependent variable. In view of the fact that the results of statistical analysis were non-significant, no conclusions were derived with regard to the viable relationships of the variables and a discussion of beta weight ($\beta$) or B values would not be appropriate. The results suggest that the independent variable student age, does not positively correlate with the type of scientifically-based practices and the hypothesis, student age does positively correlate with the type of scientifically-based practices teachers use when educating students with ASD, was rejected. Table 4-30 presents the beta coefficients.
Table 4-30

Regression with Student Age Predicting Participant Use of Scientifically-based Practices

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>B</th>
<th>SE</th>
<th>β</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>2.060</td>
<td>.164</td>
<td>12.557</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td>Student Age</td>
<td>-.037</td>
<td>.060</td>
<td>-.085</td>
<td>-.623</td>
<td>.536</td>
</tr>
</tbody>
</table>

Note. $F(1, 54) = 0.39, p = .536, R^2 = .007$

Research Question 3

Will school type (public vs. choice) influence the types of practices (categorized as not rated, not recommended, limited supporting information for practice, promising practices and scientifically-based practices) teachers use when educating students with ASD?

In order to determine if the type of school where teachers currently work with students with ASD predicts the types of practices they currently use, survey questions from two of the four sections of the adapted Autism Treatment Survey (ATS) were analyzed. To determine the type of school participants are currently employed by, participants were asked to select from a list of the choices (see figure 14).

3. I teach at a school:
   - Public (border school)
   - Charter
   - Choice
   - Magnet
   - Private

Figure 14: Sample item from ATS of school type participants teach in

Results indicate that most participants work at public school (81.7%), while 18.3% indicated to work for any of the other type of schools (see Table 31).
Table 4-31

<table>
<thead>
<tr>
<th>Type of School Where Participants Teach Students with ASD</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public (border school)</td>
<td>49</td>
<td>81.7</td>
</tr>
<tr>
<td>Charter</td>
<td>2</td>
<td>3.3</td>
</tr>
<tr>
<td>Choice</td>
<td>9</td>
<td>15</td>
</tr>
<tr>
<td>Magnet</td>
<td>0</td>
<td>--</td>
</tr>
<tr>
<td>Private</td>
<td>0</td>
<td>--</td>
</tr>
</tbody>
</table>

To answer the third research question the question was separated into 5 sections based on type of practice (not rate practices, not recommended practices, limited supporting information for practice practices, promising practices and scientifically-based practices). The ATS categorized the 42 practices according to practice type 1) interpersonal relationship practices, 2) skill-based practices, 3) cognitive practices, 4) physiological/biological/neurological practices and 5) other types of practices. In order to perform the linear regressions, the participant’s responses from the ATS were coded according to their classification as: a) not rated practices, b) not recommended c) limited supporting information for practice, d) promising practices and e) scientifically-based practices.

Data were collected to assess if the independent variables of school type is a predictor of the dependent variables of practices not rated, not recommended, limited supporting information for practice practices, promising practices and scientifically-based practices for use with students with ASD during the 2008-2009 school year.

Participant responses to the types of practices they use with their students with ASD during the 2008-2009 school year have been presented as part of the discussion of the first research question and are displayed as: Table 4-16 scientifically-based practices, Table 4-17 promising practices, Table 4-18 limited supporting information for practice, Table 4-19 not recommended practices, and Table 4-20 not rated practices (see pp. 161-167).
In order to answer the question of whether or not the types of school settings the
participants teach at influences the types of practices they use, the researcher used the categories
of *public (border school)* and *choice school*. Although a *choice school* is a type of public school,
the *public (border school)* is described as a neighborhood school where students that live in the
proximity of the school attend strictly based on home address. The choice school is described as
a public school that students living in virtually any area in the school district may apply to attend.

**DV 3 A: Not Rated Practices**

A linear regression was conducted to assess if the independent variables of *school type*
(*public vs. choice*) predicts the dependent variable of teacher use of *not rated practices* with their
students with ASD, results indicated a significant \(F (1, 48) = 4.91, p < .05\), relationship between
the independent variables and the dependent variable and that the independent variable accounts
for 9.3% \(R^2 = .093\) of the variance of the dependent variable. Table 4-32 presents the beta
coefficients and suggests when school type is *public (border school)*, participant use of *not rated
practices* increases by 0.20 units over participants teaching students with ASD at *choice schools*
during the 2008-2009 school year.

Beta weight analysis (β) is used to show the magnitude and direction of the relationship
between all variables in a model (George & Mallery, 2003). Analysis of school types (public and
choice) predicting the use of *not rated practices* resulted in a beta weight \(\beta (-.305)\) signifying
with significance (.031) that as the frequency of *choice schools* decreased the use of *not rated
practices* used by teachers increased during the 2008-2009 school year. The results suggest that
the independent variable of *school type* does predict the use of *not rated practices* and the
hypothesis, school type (public) predicts the use of not rated practices teachers use when educating students with ASD was accepted.

Table 4-32

Regression with School Type (Public vs. Choice) Predicting Participant Use of Not Rated Practices

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>B</th>
<th>SE</th>
<th>β</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>1.641</td>
<td>.110</td>
<td>14.888</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td>School Type</td>
<td>-.201</td>
<td>.091</td>
<td>-.305</td>
<td>-2.217</td>
<td>* .031</td>
</tr>
</tbody>
</table>

Note. \( F (1, 48) = 4.91, p^* < .05, R^2 = .093 \)

DV 3 B: Not Recommended Practices

A linear regression was conducted to assess if the independent variables of school type (public vs. choice) predicts the dependent variable of teacher use of not recommended practices with their students with ASD, results indicated a significant \( F (1, 53) = 4.27, p < .05 \), relationship between the independent variables and the dependent variable and that the independent variable accounts for 7.5\% \((R^2 = .075)\) of the variance of the dependent variable. Table 4-33 presents the beta coefficients and suggests that as school type tended to be public (border school), participant use of not recommended practices increases by 0.27 units over participants teaching students with ASD at choice schools during the 2008-2009 school year.

Beta weight analysis (β) is used to show the magnitude and direction of the relationship between all variables in a model (George & Mallery, 2003). Analysis of school types (public and choice) predicting the use of not recommended practices resulted in a beta weight β (-.273) signifying with significance (.044) that as the frequency of choice schools decreased the use of not recommended practices used by teachers increased during the 2008-2009 school year. The
results suggest that the independent variable of school type does predict the use of not recommended practices and the hypothesis, school type (public) predicts the use of not recommended practices teachers use when educating students with ASD was accepted.

Table 4-33

Regression with School Type (Public vs. Choice) Predicting Participant Use of Not Recommended Practices

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>B</th>
<th>SE</th>
<th>β</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>1.597</td>
<td>.160</td>
<td>1.597</td>
<td>9.993</td>
<td>.000</td>
</tr>
<tr>
<td>School Type</td>
<td>-.271</td>
<td>.131</td>
<td>-.273</td>
<td>-2.067</td>
<td>*.044</td>
</tr>
</tbody>
</table>

Note. (1, 53) = 4.27, p* < .05, R^2 = .075

DV 3 C: Limited Supporting Information for Practice

A linear regression was conducted to assess if the independent variables of school type (public vs. choice) predicts the dependent variable of teacher use of limited supporting information for practice approaches with their students with ASD, results indicated a significant [F (1, 46) = 7.23, p < .01], relationship between the independent variables and the dependent variable and that the independent variable accounts for 13.9% (R^2 = .139) of the variance of the dependent variable. Table 4-34 presents the beta coefficients and suggests that as school type tended to be public (border school), participant use of limited supporting information for practice approaches increases by 0.17 units over participants teaching students with ASD at choice schools during the 2008-2009 school year.

Beta weight analysis (β) is used to show the magnitude and direction of the relationship between all variables in a model (George & Mallery, 2003). Analysis of school types (public and choice) predicting the use of limited supporting information for practice approaches resulted in a
beta weight $\beta (-.373)$ signifying with significance (.009) that as the frequency of choice schools decreased the use of limited supporting information for practice approaches used by teachers increased during the 2008-2009 school year. The results suggest that the independent variable of school type does predict the use of limited supporting information for practice practices and the hypothesis, school type (public) predicts the use of limited supporting information for practice practices teachers use when educating students with ASD was accepted.

Table 4-34

Regression with School Type (Public vs. Choice) Predicting Participant Use of Limited Supporting Practices

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>B</th>
<th>SE</th>
<th>$\beta$</th>
<th>$t$</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>1.446</td>
<td>.079</td>
<td>18.379</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td>School Type</td>
<td>-.172</td>
<td>.063</td>
<td>-.373</td>
<td>-2.725</td>
<td>*.009</td>
</tr>
</tbody>
</table>

Note. $F (1, 46) = 7.23$, p* < .01, $R^2 = .139$

DV 3 D: Promising Practices

A linear regression was conducted to assess if the independent variables of school type (public vs. choice) predicts the dependent variable of teacher use of promising practices with their students with ASD, results indicated a significant [$F (1, 46) = 7.01$, p < .05], relationship between the independent variables and the dependent variable and that the independent variable accounts for 13.2% ($R^2 = .132$) of the variance of the dependent variable. Table 4-35 presents the beta coefficients and suggests that as school type tended to be public (border school), participant use of promising practices increases by 0.24 units over participants teaching students with ASD at choice schools during the 2008-2009 school year.
Beta weight analysis ($\beta$) is used to show the magnitude and direction of the relationship between all variables in a model (George & Mallery, 2003). Analysis of school types (public and choice) predicting the use of *promising practices* resulted in a beta weight $\beta$ (-.364) signifying with significance (.011) that as the frequency of choice schools decreased the use of *promising practices* used by teachers increased during the 2008-2009 school year. The results suggest that the independent variable of school type does predict the use of *promising practices* and the hypothesis, school type (public) predicts the use of *promising practices* teachers use when educating students with ASD was accepted.

Table 4-35

*Regression with School Type (Public vs. Choice) Predicting Participant Use of Promising Practices*

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>B</th>
<th>SE</th>
<th>$\beta$</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>1.771</td>
<td>.111</td>
<td></td>
<td>15.983</td>
<td>.000</td>
</tr>
<tr>
<td>School Type</td>
<td>-.240</td>
<td>.090</td>
<td>-.364</td>
<td>-2.648</td>
<td>* .011</td>
</tr>
</tbody>
</table>

Note. $F (1, 46) = 7.01, p^* < .05, R^2 = .132$

*DV 3 E: Scientifically-based Practices*

A linear regression was conducted to assess if the independent variables of school type (public vs. choice) predicts the dependent variable of teacher use of scientifically-based practices with their students with ASD, results indicated a significant [$F (1, 51) = 6.82, p < .05$], relationship between the independent variables and the dependent variable and that the independent variable accounts for 11.8% ($R^2 = .118$) of the variance of the dependent variable. Table 4-36 presents the beta coefficients and suggests that as school type tended to be public
participant use of scientifically-based practices increases by 0.38 units over participants teaching students with ASD at choice schools during the 2008-2009 school year.

Beta weight analysis (β) is used to show the magnitude and direction of the relationship between all variables in a model (George & Mallery, 2003). Analysis of school types (public and choice) predicting the use of scientifically-based practices resulted in a beta weight β (-.273) signifying with significance (.044) that as the frequency of choice schools decreased the use of scientifically-based practices used by teachers increased during the 2008-2009 school year. The results suggest that the independent variable of school type does predict the use of scientifically-based practices and the hypothesis, school type (public) predicts the use of scientifically-based practices teachers use when educating students with ASD was accepted.

Table 4-36

Regression with School Type (Public vs. Choice) Predicting Participant Use of Scientifically-based Practices

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>B</th>
<th>SE</th>
<th>β</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>2.386</td>
<td>.178</td>
<td>13.413</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td>School Type</td>
<td>-.378</td>
<td>.145</td>
<td>.343</td>
<td>-2.611</td>
<td>.012</td>
</tr>
</tbody>
</table>

Note. F (1, 51) = 6.82, p* < .05, R² = .118
CHAPTER V

Summary of the Study

The purpose of this study was to determine if (1) the amount of experience and training teachers have educating students with ASD, (2) student age and (3) type of school where participants teach students with ASD influenced the types of practices utilized by teachers when educating students with autism spectrum disorders.

The adapted Autism Treatment Survey (ATS) was initiated at the 2009 Center for Autism and Related Disorders (CARD) convention in West Palm Beach, Florida. A display table with two laptop computers and flyers were set-up in the main hallway of the convention where the laptop computers were available for potential participants to complete the online survey. Potential participants included only those teachers that worked with students with ASD in the targeted Southeast Florida County. For those potential participants that did not want to complete the survey at the convention, a flyer was available with a web-link to be accessed at a later time, prior to the end of the survey collection date. Three questions guided this study:

Question 1: Will teacher experience and teacher training influence the type of practices (categorized as not rated, not recommended, limited supporting information for practice, promising practices and scientifically-based practices) teachers use when educating students with ASD?

Question 2: Will student age influence the type of practices (categorized as not rated, not recommended, limited supporting information for practice, promising practices and scientifically-based practices) teachers use when educating students with ASD?

Question 3: Will school type (public vs. choice) influence the types of practices (categorized as not rated, not recommended, limited supporting information for practice, scientifically-based practices) teachers use when educating students with ASD?
promising practices and scientifically-based practices) teachers use when educating students with ASD?

Summary and Implications of Findings

Research Question 1

Will teacher experience and teacher training influence the type of practices (categorized as not rated, not recommended, limited supporting information for practice, promising practices and scientifically-based practices) teachers use when educating students with ASD?

The results presented in Chapter Four were based on responses from 60 participants. The researcher used an adapted version of the Autism Treatment Survey (ATS) as a web-based survey to obtain data from special education teachers, who work with students with autism spectrum disorder (ASD) in grades K-12 in a school district in Southeast Florida. The ATS contains four areas of exploration: a) characteristics of the teachers’ classroom, b) teacher demographics, c) teacher usage of targeted practices and d) type of training received in such practices (Morrier, Hess, & Heflin, 2006).

The first part of research question one explored the amount of years teachers have educating students with ASD. Participants were asked to respond to questions in the About You section of the ATS to gather data about years of experience teachers have educating students with ASD. Interesting teacher demographic information data include: frequencies and percents for participant’s level of education where the majority 31 (51.7%) of participants had a masters degree. The mean response for years of teaching experience was 14.60 ($SD = 10.20$) while the mean response for years of teaching children with autism was 8.97 ($SD = 7.07$). Frequencies and percents for participant ethnicity resulted in the majority (84.7%) of participants to be Caucasian.
The question of *types of training participants received* was answered in the section titled *Training You Have Received*, where participants were asked to identify the type of training they may have on each of the 42 types of practices.

The *type of practices teachers use* with their students with ASD was obtained by participant completion of survey section *Classroom Strategies Utilized*, where participants were asked about their usage of each of the same 42 practices. The 42 types of practices were grouped into 5 categories, *a) not rated, b) not recommended, c) limited supported information for practice practices, d) promising practices, and e) scientifically-based practices.*

*Type of training received for Not Rated practices:* results indicate that workshops are the most prevalent training venue. The use of Visual Schedules was the most widely studied approach in this category with 78% of the participants reporting having this type of training.

*Type of training received for Not Recommended Practices:* results indicated that the Facilitated Communication and Holding Therapy practices categorized by Simpson (2005) as practices *not recommended* to be used with individuals with ASD was reportedly learned by 17% and 35% respectively, of the participants. Surprisingly, four participants were trained in the Facilitated Communication practice while taking ASD endorsement courses.

*Type of training received for Limited Supporting Information for Practice:* results indicate that participants received training in these interventions and practices predominantly in workshop situations and the greatest amount of training was in Music Therapy where 50% of the participants report having training.

*Type of training received for Promising Practices:* results suggest that for all the eleven practices the type of practice with the greatest occurrence of participant training (78%) was Assistive Technology. Although the primary method of training in this category continues to be
greatest as a workshop type of training, graduate level college coursework was the form of training many participants used.

The type of training received for practices in the scientifically-based practices: category concluded that at least 50% of the participants do not have any training in each of the four practices under this category and most of those participants that did have training had it in the form of a workshop. From the four practices listed, Applied Behavioral Analysis is the practice with the greatest amount of participant training where 76% of the participants report having training.

The third component of this question involved the type of practices participants use when educating students with ASD. Results of reported participants usage of the first category of practices, not rated practices, suggest that Visual Schedules is the most widely used practice by the participants during the 2008-9 school year (65.5%) and the Azrin 24-Hour Toilet Training practice is the least utilized where (18.5%) of the participants have used it.

Results of reported participants usage of the second category of research-based practices, not recommended, suggests that Facilitated Communication is the most widely used practice by participants during the 2008-9 school year (19%) and that Holding Therapy is the least utilized practice with only (18.6%) of the participants have used it. Results further indicate that nearly one out of every five participants utilizes Facilitated Communication practices, a not recommended practice when educating students with ASD.

Results of reported participants usage of the third category of research-based practices, limited supporting information for practice, suggests that Music Therapy is the most widely used practice by participants during the 2008-9 school year (30.4%). The van Dijk Curricular Approach is used the least used with only (8.5%) of the participants have used it.
Results of reported participants usage of the fourth category of research-based practices, promising practices suggests that the Social Stories is the most widely used practice by the participants during the 2008-9 school year (55.2%) followed closely by Assistive Technology (52.50%) while Joint Action Routine is the least utilized practice where only (10.7%) of the participants have used it.

Results of the fifth category practices, scientifically-based practices, indicated that Applied Behavioral Analysis was the practice under this category that was widely used by the participants during the 2008-9 school year (54.2%) and that Learning Experiences: An Alternative Program for Preschoolers and Parents (LEAP) is the least utilized practices (15.5%) of the participants have used it.

In order to explore the first research question and determine if the years of experience teachers have educating students with ASD and if the type of training teachers have in practices used in educating students with ASD are predictors to the types of practices they use with students with ASD, survey questions from three of the four sections (About You, Training You Have Received, Classroom Strategies Utilized) of the ATS were analyzed using multiple regressions.

Results of five multiple regressions indicated that quantity of years of experience teachers have educating students with ASD was not a significant predictor of the types of practices the teacher utilizes (not rated practices, not recommended practices, limited supporting information for practice practices, promising practices and scientifically-based practices.

The negative B coefficient value of teacher experience (-0.004) indicates that a greater amount of teacher experience yields less use of not rated practices. Alternatively, the positive B
value (.02) indicates that the higher the amount of types of training a teacher has the greater the usage of *not rated practices*. Beta coefficients also suggest that for every unit increase in *teacher experience* (additional year of teaching students with ASD) the use of *not rated practices* was not significant, therefore, concluding that the higher the amount of training a teacher has the more likely they will use *not rated practices* and that the *amount of years of experience teaching students with ASD* is not a significant indicator of the use of *not rated practices*. Since not rated practices are not rated a clear conclusion as to the result can not be explained.

The negative B coefficient value of *teacher experience* teaching students with ASD (-.007) indicated that a greater amount of *teacher experience* yields to less use of *not recommended practices*. Alternatively, the positive B value (.02) indicated that the higher the amounts of types of training a teacher has the greater the usage of *not recommended practices*. Beta coefficients also suggest that for every unit increase in *teacher experience* (additional year of teaching students with ASD) the use of *not recommended practices* was not significant, therefore, concluding that the higher the amount of training a teacher has the more likely they will use practices categorized as *not recommended practices* and that the *amount of years of experience teaching students with ASD* is not a significant indicator of the use of *not recommended* practices. Possible explanation of these results may be that in some training situations participants are being taught not recommended practices and therefore, as participants receive more training they use *not recommended practices* more often.

The negative B coefficient value of *teacher experience* is extremely low (-.002) indicating that the amount of *years of teacher experience* does not influence the use of *limited supporting practices*. Alternatively, positive B value (.02) indicated that the higher the amount of types of *training* a teacher has the greater the usage of *limited supporting practices*. Beta
coefficients also suggest that for every unit increase in years of teacher experience (additional year of teaching students with ASD) the use of limited supporting information for practice was not significant, therefore, concluding that the higher the amount of types of training a teacher has the more likely they will use practices categorized as limited supporting information for practice and that the amount of years teaching students with ASD is not a significant indicator of the use of limited supporting information for practice. Possible explanation of these results are that as teachers are taught practices that are categorized as limited supporting information for practice they are more likely to use these practices. As these practices do not scientific support, yet, they still may prove to be useful as further exploration and scientific observations occur. As these practices are used more by teachers they may prove to have efficacy and be useful.

The negative B coefficient value of teacher experience (-.01) indicated that a greater amount of teacher experience educating students with ASD yields a small negative influence on the use of promising practices. Alternatively, the positive B value (.02) indicates that the higher the amount of training a teacher has the greater the usage of promising practices. Beta coefficients also suggest that for every unit increase in teacher experience (additional year of teaching students with ASD) the use of promising practices was significant, however, the value was slightly negative (-.01) indicating that as teachers gained more years experience they used slightly less promising practices. Although the rationale for these findings can only be speculative, it appears that as teachers gain more years experience working with students with ASD they are using more practices categorized as scientifically-based, and limited supporting information for practice and not rated slightly decreasing the use of promising practices.

The negative B coefficient value of teacher experience (-.01) indicates that the greater amount of teacher experience yields a slightly less usage of scientifically-based practices.
Alternatively, the positive B value (.03) indicates that the higher the amount of types of training a teacher has the greater the usage of scientifically-based practices. Beta coefficients also suggest that for every unit increase in teacher experience (additional year of teaching students with ASD) the use of scientifically-based practices was minimally negatively related, concluding that the higher the amount of types of training a teacher has the more likely they will use practices categorized as scientifically-based practices and the amount of years teaching students with ASD is a slight negative indicator of the use of scientifically-based practices. An explanation of these results appear to be that the more training a teacher has in practices to use with students with ASD the more they will use scientifically-based practices, this indicates that although, some not recommended practices may be taught to the participants, scientifically-based practices are primarily taught and used. Additionally, teachers with more training may be more in tune with what practices work with their students and consciously choose to use the scientifically-based practices over other practices they have experience with.

Several other interesting points of information from the responses of types of training offered by the participants include: a) it appears that only 4 of the 60 participants have taken ASD endorsement courses, b) 10 participants have some graduate courses where they were taught about ASD practices, and c) 5 participants have some undergraduate courses where they were taught about ASD practices. These results suggest that less than 20% of the participants that educate students with ASD have college coursework that specifically taught them about practices to use with students with ASD to enhance their theoretical and practical knowledge.

The overall results of research question one suggests that the amount of training a teacher has is a more significant indicator of teacher usage of practices with students with ASD than the amount of years of teaching experience an educator has. These findings support current research
findings which agree that preservice and inservice educator training is essential to empower
teachers to use evidence-based practices when educating students with ASD (Hess et al., 2007).

Research Question 2

Will student age influence the types of practices (categorized as not rated, not recommended, limited supporting information for practice, promising practices and scientifically-based practices) teachers use when educating students with ASD?

By exploring teacher response to the ages of the students with ASD participants teach
certain conclusions were drawn. Findings indicated that 89% of teacher responses showed that
they teach students with ASD that are 13 years of age or younger and only 11% educate students
with ASD that are 14 years of age or older. Results of this survey suggest that teachers of
younger students (under 14 years of age) are more actively seeking resources to use with their
students with ASD as indicated by their willingness to attend the 2009 CARD conference and
participate in this survey.

High school teachers (typically student ages 14 and up) are the least represented group of
educators in this survey, suggesting that they have either less desire, need or resources to acquire
additional information to use with their students with ASD. Research suggests that teachers that
are most likely to be successful educating students with ASD must be able to identify the special
interests of the student and incorporate these interests into their teaching pedagogy (Attwood,
1998). Teacher awareness, training, patience and companion are necessary components to
effective teaching students with ASD (Attwood, 1998; Harpur, Lawlor, & Fitzgerald, 2006).
Traits of compassion and patience are traits that may be more prevalent in lower and middle
grades and less predominant in upper grades. As research has also indicated early interventions
are the most promising approach to intervention and most likely to be initiated in early grades (Attwood, 1998, Simpson et al., 2005).

To explore if student age will influence participant use of not rated practices, linear regressions were conducted. The results of the regression were not significant $F (1, 50) = 0.04$, $p = .837$, the independent variable accounted for 0.1% of the variance of the dependent variable, suggesting that student age does not predict participant use of not rated practices and the hypothesis, student age positively correlates with participant use of not rated practices teachers use when educating students with ASD was rejected.

To explore if student age will influence teacher use of not recommended practices, a linear regression was conducted to assess if student age predicted participant use of not recommended practices during the 2008-2009 school year. The results of the regression were not significant $F (1, 56) = 0.13$, $p = .725$, the independent variable accounted for 0.02% of the variance of the dependent variable. The results suggest that student age, does not predict participant use of not recommended practices and the hypothesis, student age positively correlates with participant use of not recommended practices teachers use when educating students with ASD was rejected.

To explore if student age will influence teacher use of limited supporting information for practice, a linear regression was conducted to assess if student age predicted participant use of limited supporting information for practices during the 2008-2009 school year. The results of the regression were not significant $F (1, 49) = 0.01$, $p = .929$, the independent variable accounted for 0.0% of the variance of the dependent variable. The results suggest that student age does not predict participant use of limited supporting information for practices and the hypothesis, student
age positively correlates with participant use of limited supporting information for practice practices teachers use when educating students with ASD was rejected.

To explore if student age will influence the use of promising practices, a linear regression was conducted to assess if student age predicted the participant use of promising practices during the 2008-2009 school year. The results of the regression not were significant $F(1, 49) = 0.05, p = .828$, the independent variable accounted for 0.1% of the variance of the dependent variable. The results suggest that student age does not predict participant use of promising practices and the hypothesis, student age positively correlates with participant use of promising practices teachers use when educating students with ASD was rejected.

To explore if student age will influence the use of scientifically-based practices, a linear regression was conducted to assess if student age predicted the participant use of scientifically-based practices during the 2008-2009 school year. The results of the regression were not significant $F(1, 54) = 0.39, p = .536$, the independent variable account for 0.07% of the variance of the dependent variable. The results suggest that student age does not predict participant use of scientifically-based practices and the hypothesis, student age positively correlates with participant use of scientifically-based practices teachers use when educating students with ASD was rejected.

The results of the linear regressions did not find significance in the predictive value of the age of students and the types of practices the teachers use, results suggest that that age is not a predictor of the types of interventions and practices used by educators. Therefore, as these findings are not conclusive and results do not support which practices may be best when used with different age groups it is suggested that all forms of scientifically-based practices and promising practices should be taught to teachers of students with ASD in all grade levels. By
increasing the skills of the teachers, teachers of students will be better prepared to educated students with ASD and be better able to choose which practices to use with each individual. Factors such as students ability and specific needs may influence which practices are the most likely to produce the desired response teachers are looking for, including which practices can be generalized into other classes and life situations.

Research Question 3

Will school type (public vs. choice) influence the types of practices (categorized as not rated, not recommended, limited supporting information for practice, promising practices and scientifically-based practices) teachers use when educating students with ASD?

Participants were asked to provide information as to the type of school setting they work in. The choices were a) public (border school), b) charter, c) choice, d) magnet, and e) private. Magnet, Private, and Charter School types were omitted from statistical analysis. Results indicated that nearly 82% of the participants teach students with ASD at public (border schools) and 15% teach students with ASD at choice schools. The difference between the two school settings is that the public (border school) is the neighborhood school that students attend strictly due to school board border lines and where the student’s primary domicile is located. Students that attend choice schools may attend schools that are not located in the general proximity of their homes, but the school offers some type of programming at those schools that the student would like to be exposed to. To gain access to a choice school the students’ parents must fill-out an application and be selected randomly through a selection process such as a “lottery”.

To explore if school type (public vs. choice) will influence participant use of not rated practices results of a linear regression indicated that attendance at a public (border school) does
predict the use of *not rated practices* by participants. The variance of the participant working at public school usage of *not rated practices* increased by 13.9% over those who work at choice schools. Results were significant $F(1, 48) = 4.91, P<.05$, indicating that participants that work at public (border school) are more frequently using *not rated practices* than those working at choice schools. The results suggest that school type (public vs. choice) does predict participant use of not rated practices and the hypothesis, school type (public vs. choice) predicting *not rated practices* teachers use when educating students with ASD was accepted. As *not rated practices* may be a combination of empirically-based and not empirically-based practices, no clear implications can be drawn from these results as to whether these results are truly beneficial.

To explore if school type (public vs. choice) will influence participant use of *not recommended practices*, results of a linear regression indicate that the school type of public (border school) does predict the use of *not recommended practices* by participants. The variance of the participant working at usage of *not recommended practices* is increased by 7.5% over those who work at choice schools. Results were significant $F(1, 53) = 4.27, P<.05$, indicating that participants that work at public (border schools) are more frequently using *not recommended practices* than those working at choice schools. The results suggest that school type (public vs. choice) predicts the use of *not recommended practices* and the hypothesis, school type (public vs. choice) predicting *not recommended practices* teachers use when educating students with ASD was accepted. This is not inspiring news for public schools (border school), but inspiring to find the choice school participants use *not recommended practices* less frequently than their counterparts.

To explore if school type (public vs. choice) will influence participant use of *limited supporting information for practice* practices results of a linear regression indicate that public
(border school) does predict the use of _limited supporting practices_ by participants. The variance of the participants working at public school usage of _limited supporting information practices_ increased by 13.9% over choice schools. Results were significant $F(1, 46) = 7.23, P<.01$, indicating that participants that work at public (border schools) are more frequently using _limited supporting information for practice_ practices than those working at choice schools. The results suggest that _school type (public vs. choice) _does predict participant use of _limited supporting information for practice_ practices and the hypothesis, _school type (public vs. choice) _predicting _limited supporting information for practice_ practices teachers use when educating students with ASD was accepted. As limited supporting information practices have some empirical support, it is positive news to public schools (border school) that they use these research-based practices more frequently than choice schools.

To explore if _school type (public vs. choice) _will influence participant use of promising practices results of a linear regression indicate that public (border school) does predict the use of _promising practices_ by participants. The variance of the participant usage of _promising practices_ increased by 13.2% over choice schools. Results were significant $F(1, 46) = 7.01, P<.05$, indicating that participants that work at public (border schools) are more frequently using promising practices than those working at choice schools. The results suggest that _school type (public vs. choice) _does predict participant use of _promising practices_ and the hypothesis, _school type (public vs. choice) _predicting _promising practices_ teachers use when educating students with ASD was accepted. Once again good news for the public (border school) school type, since participant use of _promising practices_ when teaching students with ASD is empirically-based and likely to produce significant academic and social gains.
To explore if school type (public vs. choice) will influence participant use of scientifically-based practices results of a linear regression indicate that public (border school) does predict the use of scientifically-based practices by participants. The variance of the participant working at public school usage of scientifically-based practices increased by 11.8% over choice schools. Results were significant F (1, 51) = 6.82, P<.05, indicating that participants that work at public (border schools) are more frequently using scientifically-based practices than those working at choice schools. The results suggest that school type (public vs. choice) does predict participant use of scientifically-based practices and the hypothesis, school type (public vs. choice) predicting scientifically-based practices teachers use when educating students with ASD was accepted. Once again good news for the public (border school) school type, since participant use of scientifically-based practices when teaching students with ASD is an example of participants using the most research-based and empirically sound practices and most likely to improve the ability of educators to be successful in educating their students with ASD.

Measures of predictability of the scientifically-based practices indicate that the greatest level of influence at 0.38 (beta coefficient) and the smallest level of influence to be with the limited supporting information practices category at 0.17 (beta coefficient). These results suggest that in public schools (border school), scientifically-based practices are used by teachers more than any other category of practices and the limited supporting information practices are being used the least. This is a promising finding, suggesting that public schools (border schools) are using more scientifically-based practices than choice schools.

Limitations of Study

There are several limitations to this study:
1. The sample size was small relative to the total number of special education teachers in the surveyed County. Due to small sample size, results may not be indicative of the entire population of special education teachers.

2. Participants already had a special interest in autism spectrum disorder evidenced by their attendance at the 2009 Center for Autism and Related Disabilities conference in West Palm Beach, Florida and therefore, may have more experience with the type of practices that are recommended to be used when working with students with ASD.

3. Due to space constraints at the conference only two computers were available for potential participants to use to complete the survey at the conference, limiting the number of participants who completed the survey right away.

4. The names of the practices and interventions were not clarified by actual examples or descriptions, where participants might have benefited by additional clarification.

5. The survey identified the types of school participants teach at into five categories: Public (border), Charter, Choice, Magnet, and Private. Due to response rate only Public (border) school and Choice school type were used in the analysis, causing a major limitation to this study.

**Implications for Practice**

The U.S. Department of Special Education (2008) reported that during the 2004 school year, approximately 166,000 students between the ages of 6 and 21 were receiving special education services under the category of “autism spectrum disorder”. As the prevalence of autism is increasing the school system must be better suited to educate and provide services for these children (Attwood, 1998; Baron-Cohen & Bolton, 1993; Howlin, 1998; Jordan & Powell, 1995; Myles & Simpson, 1998; Siegel, 1996). This study indicates that the amount of years a
teacher has educating students with ASD does not influence the types of practices they use with their students with ASD, however, results suggest that the more training a teacher has in practices to use with students with ASD, the more likely they are to use scientifically-based practices across all grade levels.

The results of this study also suggest that public schools in Southeast Florida do use scientifically-based practices more frequently than any other category of practices. This is inspiring news; however, there are still a substantial amount of teachers using practices other than scientifically-based practices. These findings suggest that there is no significant predictability between students’ age and the types of practices teachers use with them. Legislations such as No Child Left Behind Act (NCLB) of 2001 calls for increased accountability of the educational system and supports the use of research-based strategies, methods, interventions and practices to enhance the educational advancement of students with disabilities, including ASD (Simpson, 2005). The findings of this study imply that teacher preparation programs in the University system need to update their methodology to include teaching inspiring teachers how to educate students with ASD. The teachers of the future, whether they are general education or special education teachers must have practical and specific knowledge about students with ASD and how to successfully utilize scientifically-based practices into their teaching pedagogy.

Much of the training teachers receive is in the form of workshops during professional development days (PDD) or half days or they teach themselves through training opportunities they typically have to pay for themselves or may be Internet based activities. Some of the challenges with school based trainings are that there is little or no pre-education and little or no follow-through. Additionally trainers may have limited experience with specific grade levels and
teach generalized approaches that are often not specific enough for the population the teachers are responsible to teach.

Administrative rulings from the Florida Department of Education (FLDOE) introduced a ruling to enhance the ability of teachers who educate students with ASD to be “highly qualified” and require teachers who predominantly teach students with ASD to have an autism endorsement on their teaching certificates by June 2011 (Florida Department of Education’s: Educator Certification Administrative Rule 6A-4.01796, 2008). Additionally, research indicates that teachers who educate students with ASD that understand the mind-set of these children and their unique mannerisms are most likely to be the most successful in educating them (Attwood, 2007; Leicester City Council and Leicestershire County Council, 1998). Therefore, findings support the notion that the more training in scientifically-based practices school teachers are provided with the more effective they may be in educating students with ASD.

**Recommendations for Future Study**

Future research is needed in this area due the increasing prevalence of ASD in children and the need to be able to provide them with substantial educational experience (Autism Information Center, 2007; Talk About Curing Autism, 2008). Future studies are recommended to further explore the relationship between teacher experience and training, school type and students age as predictors of practices used by teachers with their students with ASD.

By further examining the relationship between teacher demographics factors (gender, age, race, education, and certifications) and student demographic factors (gender, grade placement, diagnosis/label, services receiving, socioeconomic status) and teacher use of research-based practices to use with students with ASD using a larger population, results are more likely to be able to be generalized.
Further study of the entire population of teachers in a school district to attain a more comprehensive view of the relationship of the variables, would increase the likelihood of generalized results and stronger relationships between predictor variables and their relationship to practices used by teachers working with students with ASD.

Additional study of factors influencing the use of practices teachers use with students with ASD to compare the differences and similarities of practices used by teachers in different settings such as general education classrooms vs. self-contained special education classrooms. Although, the size of the sample in the study was not large, generalizability to other populations might be limited, results suggest the most significant findings to support the premise that the more training with specific research-based practices a teacher has the more likely they are to use research-based practices, especially promising practices and scientifically based practices.

Researcher objectives for this study were to contribute to the literature on relationship between teacher and student demographic factors and teacher use of research-based practices to use with students with ASD. Further research is recommended to explore the significance of a wider array of independent variable of teacher and student demographic factors and how they influence the use of research-based practices when educating students with ASD in a variety of school settings.

Recommendations of a study with a larger target population is encouraged to help identify areas of greatest need of teacher training and to best utilize resources. As several researcher objectives have been met, much more research is yet to be had. It is my hope that school districts throughout the state would be willing to conduct similar studies to empower teachers of ASD students, promote successful allocation of resources and ultimately enhances the education of students with ASD now and into the future.
References


BIBLIOGRAPHY


Appendix A

Autism Treatment Survey
Voluntary Consent Form

Please click "NEXT" at the end of this consent form if you wish to participate in the AUTISM TREATMENT SURVEY, otherwise click "Exit this survey".

DIRECTIONS FOR THE PARTICIPANT:

You are being asked to participate in my research study. Please read this carefully. This form provides you with information about the study. The Principal Investigator (Eric J. Nach, M.Ed. or his representative if applicable) will answer all of your questions. Ask questions about anything you don't understand before deciding whether or not to participate. You are free to ask questions at any time before, during, or after your participation in this study. Your participation is entirely voluntary and you can refuse to participate without penalty or loss of benefits to which you are otherwise entitled. You acknowledge that you are at least 18 years of age, and that you do not have medical problems or language or educational barriers that precludes understanding of explanations contained in this authorization for voluntary consent.

PURPOSE OF THIS RESEARCH STUDY: The study is about the amount of years a teacher has educating students with autism spectrum disorder (ASD), teacher training, classroom demographics and school demographics. There will be approximately 1762 special education teachers invited to participate in this survey. Public and private school special education teachers for a Southeast Florida region that attend the 2009 CARD conference sponsored by Florida Atlantic University will be invited to participate in this survey, however, only those teachers that interact with students with ASD will be encouraged to take the survey.

PROCEDURES:

The survey is completed electronically and begins by clicking the "Next" button at the end of this form. You will complete the questionnaire and test in private. If you choose not to participate click "Exit This Survey".

The web-based survey instrument utilized from SurveyMonkey.com. SurveyMonkey uses Secure Socket layer (SSL) encryption for both the survey link and survey pages during transmission to ensure participant confidentiality and survey security. SurveyMonkey will not record personal identification information. Participants will be advised of the browser type and version necessary for proper encryption on the consent form. All participants will remain confidential to the primary researcher.

If you agree to participate after reading this consent form, then you may proceed to the Autism Treatment Survey (ATS). You will complete the Autism Treatment Survey that contains four parts with a total of 99, predominantly multiple choice type questions. The questions are separated into four sections. The Autism Treatment Survey should take no more than 15 minutes to complete. You will submit your questionnaire by clicking on "Submit" at the end of the survey.

POSSIBLE RISKS OR DISCOMFORT: This study involves minimal risk. You may find that some of the questions are sensitive in nature. In addition, participation in this study requires a minimal amount of your time and effort.

POSSIBLE BENEFITS: There may be no direct benefit to you in participating in this research. But knowledge may be gained which may help you identify your own strengths and opportunities for growth in relation to teaching students with autism spectrum disorder.

FINANCIAL CONSIDERATIONS: There is no financial compensation for your participation in this research. There are no costs to you as a result of your participation in this study.

CONFIDENTIALITY

Every effort will be made to maintain confidentiality. Your identity in this study will be treated as confidential. Only the researcher (Eric J. Nach) will know who you are, if you choose to disclose that information. During the survey you will automatically be assigned a code number. Data will be coded with that number. Confidentiality will be maintained to the degree permitted by the technology used. Specifically, no guarantees can be made regarding the interception of data sent via the Internet by any third parties. Participation in this study is voluntary and agreeing to the consent form will constitute your informed consent to participate in the study. Your email address and individual responses will not be identified nor tracked as part of data collection.

The results of this study may be published in a dissertation, scientific journals or presented at professional meetings. In addition, your individual privacy will be maintained in all publications or presentations resulting from this study.

All the data gathered during this study, which were previously described, will be kept strictly confidential by the researcher. Data will be collected using Secure Sockets layer (SSL) encryption form the online web survey host, SurveyMonkey.com and stored on a password protected computer at the home of the primary researcher and hard copies of cumulative survey results will be stored in locked files and destroyed five years after the end of the research collection. All information will be held in strict confidence and will not be disclosed unless required by law or regulation.

RIGHT TO WITHDRAW: You are free to choose whether or not to participate in this study. There will be no penalty or loss of benefits to which you are otherwise entitled if you choose not to participate.

CONTACTS FOR QUESTIONS/ACCESS TO CONSENT FORM: Any further questions you have about this study or your participation in it, either now or any time in the future, will be answered by Eric J. Nach (Principal Investigator) who may be reached at: [contact information] and Dr. Mayra Ruiz Camacho, faculty advisor who may be reached at: [contact information]. For any questions regarding your rights as a research subject, you may call Dr. Farideh Fararmand, Chair of the Lynn University Institutional Review Board for the Protection of Human Subjects, at: [contact information]. If any problems arise as a result of your participation in this study, please call the Principal Investigator (Eric J. Nach) and the faculty advisor (Dr. Mayra Ruiz Camacho) immediately.

Please print off a copy of this consent for your records.

If you wish to participate, you must click "NEXT" , otherwise click "Exit this survey" if you do not wish to participate.
About Your Class

*1. What are the chronological ages of the students in your class this year? (check all that apply)

☐ 5-7 years (K-2nd grade)
☐ 8-10 years (3rd - 5th grade)
☐ 11-13 years (6th - 8th grade)
☐ 14-21 years (9th grade - graduation)

*2. My student(s) with autism are best described as having: (check all that apply)

☐ Asperger's Disorder
☐ Mild or high functioning Autism
☐ Moderate Autism
☐ Severe Autism
☐ Other developmental disability

*3. My district calls my class (choose all that apply):

☐ General Education
☐ Full inclusion (more than 1/2 of the day)
☐ Collaborative
☐ Resource
☐ Self-Contained Autism
☐ Other Self-Contained

If other Self-Contained, please explain

*4. I teach at a ___________ school:

☐ Public (border school)
☐ Charter
☐ Choice
☐ Magnet
☐ Private

*5. My classes contain this many students:

Total enrollment
Children with an Autism Spectrum Disorder
6. The approximate percentages of children in my classes are:

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>African American</td>
<td></td>
</tr>
<tr>
<td>Asian/Pacific Islander</td>
<td></td>
</tr>
<tr>
<td>Caucasian</td>
<td></td>
</tr>
<tr>
<td>Hispanic</td>
<td></td>
</tr>
<tr>
<td>Multiracial</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
</tr>
<tr>
<td>About You</td>
<td></td>
</tr>
<tr>
<td>-----------</td>
<td></td>
</tr>
<tr>
<td>* 1. I am:</td>
<td></td>
</tr>
<tr>
<td>□ Male</td>
<td></td>
</tr>
<tr>
<td>□ Female</td>
<td></td>
</tr>
<tr>
<td>* 2. How many years have you been teaching?</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
</tr>
<tr>
<td>* 3. How many years total have you been teaching children with autism spectrum disorder?</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4. My race/ethnicity is:</td>
<td></td>
</tr>
<tr>
<td>□ African American</td>
<td></td>
</tr>
<tr>
<td>□ Asian/Pacific Islander</td>
<td></td>
</tr>
<tr>
<td>□ Caucasian</td>
<td></td>
</tr>
<tr>
<td>□ Hispanic</td>
<td></td>
</tr>
<tr>
<td>□ Multiracial</td>
<td></td>
</tr>
<tr>
<td>□ Other</td>
<td></td>
</tr>
<tr>
<td>* 5. My education level is:</td>
<td></td>
</tr>
<tr>
<td>□ Bachelor’s level</td>
<td></td>
</tr>
<tr>
<td>□ Master’s level</td>
<td></td>
</tr>
<tr>
<td>□ Educational Specialist level</td>
<td></td>
</tr>
<tr>
<td>□ Doctorate level</td>
<td></td>
</tr>
<tr>
<td>6. My certification category is:</td>
<td></td>
</tr>
<tr>
<td>□ Professional</td>
<td></td>
</tr>
<tr>
<td>□ Temporary</td>
<td></td>
</tr>
<tr>
<td>Other (please specify)</td>
<td></td>
</tr>
<tr>
<td>7. My primary certification area is:</td>
<td></td>
</tr>
</tbody>
</table>
8. I have the following endorsements:

<p>| | | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
We would like to get a general idea of the specific strategies, interventions or practices that you use with children with Autism Spectrum Disorders in your classroom. Please indicate whether or not you have used the following interventions, treatments or practices in your classroom **this school year (since August 2008),** **in the past, but not this school year (before August 2008),** **or have not used this treatment.**

Remember: If you have not heard of the option, click "No, never".

<table>
<thead>
<tr>
<th>1. Floor Time (Greenspan; Developmental, Individual-Difference, Relationship-Based Model):</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes, currently (since August 2008)</td>
</tr>
<tr>
<td>In the past but not now (anytime prior to August 2008)</td>
</tr>
<tr>
<td>No, never</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. Play-oriented Strategies:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes, currently (since August 2008)</td>
</tr>
<tr>
<td>In the past but not now (anytime prior to August 2008)</td>
</tr>
<tr>
<td>No, never</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3. Gentle Teaching:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes, currently (since August 2008)</td>
</tr>
<tr>
<td>In the past but not now (anytime prior to August 2008)</td>
</tr>
<tr>
<td>No, never</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4. Holding Therapy:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes, currently (since August 2008)</td>
</tr>
<tr>
<td>In the past but not now (anytime prior to August 2008)</td>
</tr>
<tr>
<td>No, never</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5. Option Method (Son-Rise Program):</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes, currently (since August 2008)</td>
</tr>
<tr>
<td>In the past but not now (anytime prior to August 2008)</td>
</tr>
<tr>
<td>No, never</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>6. Pet/Animal Therapy:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes, currently (since August 2008)</td>
</tr>
<tr>
<td>In the past but not now (anytime prior to August 2008)</td>
</tr>
<tr>
<td>No, never</td>
</tr>
</tbody>
</table>
7. Relational Development Intervention (RDI):

- Yes, currently (since August 2008)
- In the past but not now (anytime prior to August 2008)
- No, never
<table>
<thead>
<tr>
<th>Classroom Strategies Utilized 2. Skill-Based Int...</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Applied Behavior Analysis:</strong></td>
</tr>
<tr>
<td>- Yes, currently (since August 2008)</td>
</tr>
<tr>
<td>- In the past but not now (anytime prior to August 2008)</td>
</tr>
<tr>
<td>- No, never</td>
</tr>
<tr>
<td><strong>2. Assessments of Basic Language and Learning Skills (ABLLS):</strong></td>
</tr>
<tr>
<td>- Yes, currently (since August 2008)</td>
</tr>
<tr>
<td>- In the past but not now (anytime prior to August 2008)</td>
</tr>
<tr>
<td>- No, never</td>
</tr>
<tr>
<td><strong>3. Assistive Technology (AT; for example adapted utensils, talking calculators, pencil grips, audible word scanning devices, software, talking word processors with text, or van adaptations):</strong></td>
</tr>
<tr>
<td>- Yes, currently (since August 2008)</td>
</tr>
<tr>
<td>- In the past but not now (anytime prior to August 2008)</td>
</tr>
<tr>
<td>- No, never</td>
</tr>
<tr>
<td><strong>4. Augmentative Alternative Communication (AAC; aided and unaided communication devices and symbol systems, excluding Picture Exchange Communication System - PECS):</strong></td>
</tr>
<tr>
<td>- Yes, currently (since August 2008)</td>
</tr>
<tr>
<td>- In the past but not now (anytime prior to August 2008)</td>
</tr>
<tr>
<td>- No, never</td>
</tr>
<tr>
<td><strong>5. Azrin 24-hour Toilet Training:</strong></td>
</tr>
<tr>
<td>- Yes, currently (since August 2008)</td>
</tr>
<tr>
<td>- In the past but not now (anytime prior to August 2008)</td>
</tr>
<tr>
<td>- No, never</td>
</tr>
<tr>
<td><strong>6. Discrete Trial Training:</strong></td>
</tr>
<tr>
<td>- Yes, currently (since August 2008)</td>
</tr>
<tr>
<td>- In the past but not now (anytime prior to August 2008)</td>
</tr>
<tr>
<td>- No, never</td>
</tr>
<tr>
<td><strong>7. Facilitated Communication:</strong></td>
</tr>
<tr>
<td>- Yes, currently (since August 2008)</td>
</tr>
<tr>
<td>- In the past but not now (anytime prior to August 2008)</td>
</tr>
<tr>
<td>- No, never</td>
</tr>
</tbody>
</table>
8. Fast ForWord:
   - Yes, currently (since August 2008)
   - In the past but not now (anytime prior to August 2008)
   - No, never

9. Incidental Teaching:
   - Yes, currently (since August 2008)
   - In the past but not now (anytime prior to August 2008)
   - No, never

10. Joint Action Routines (JAR):
    - Yes, currently (since August 2008)
    - In the past but not now (anytime prior to August 2008)
    - No, never

11. Lindamood-Bell:
    - Yes, currently (since August 2008)
    - In the past but not now (anytime prior to August 2008)
    - No, never

12. Naturalistic Language Paradigm:
    - Yes, currently (since August 2008)
    - In the past but not now (anytime prior to August 2008)
    - No, never

13. Picture Exchange Communication System (PECS):
    - Yes, currently (since August 2008)
    - In the past but not now (anytime prior to August 2008)
    - No, never

14. Pivotal Response Training:
    - Yes, currently (since August 2008)
    - In the past but not now (anytime prior to August 2008)
    - No, never

15. Rapid Prompting Method:
    - Yes, currently (since August 2008)
    - In the past but not now (anytime prior to August 2008)
    - No, never
16. Structured Teaching (TEACCH):
- Yes, currently (since August 2008)
- In the past but not now (anytime prior to August 2008)
- No, never

17. Van Dijk Curricular Approach:
- Yes, currently (since August 2008)
- In the past but not now (anytime prior to August 2008)
- No, never

18. Verbal Behavior:
- Yes, currently (since August 2008)
- In the past but not now (anytime prior to August 2008)
- No, never

19. Visual Schedules:
- Yes, currently (since August 2008)
- In the past but not now (anytime prior to August 2008)
- No, never
<table>
<thead>
<tr>
<th>Classroom Strategies Utilized 3. Cognitive Int...</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Cartooning (Cartoon Conversations):</strong></td>
</tr>
<tr>
<td>☐ Yes, currently (since August 2008)</td>
</tr>
<tr>
<td>☐ In the past but not now (anytime prior to August 2008)</td>
</tr>
<tr>
<td>☐ No, never</td>
</tr>
<tr>
<td><strong>2. Cognitive Behavioral Modification (includes cognitive learning strategies, cognitive scripts):</strong></td>
</tr>
<tr>
<td>☐ Yes, currently (since August 2008)</td>
</tr>
<tr>
<td>☐ In the past but not now (anytime prior to August 2008)</td>
</tr>
<tr>
<td>☐ No, never</td>
</tr>
<tr>
<td><strong>3. LEAP (Learning Experiences: An Alternative Program for Preschoolers and Parents):</strong></td>
</tr>
<tr>
<td>☐ Yes, currently (since August 2008)</td>
</tr>
<tr>
<td>☐ In the past but not now (anytime prior to August 2008)</td>
</tr>
<tr>
<td>☐ No, never</td>
</tr>
<tr>
<td><strong>4. Power Cards:</strong></td>
</tr>
<tr>
<td>☐ Yes, currently (since August 2008)</td>
</tr>
<tr>
<td>☐ In the past but not now (anytime prior to August 2008)</td>
</tr>
<tr>
<td>☐ No, never</td>
</tr>
<tr>
<td><strong>5. Social Decision-Making Strategies:</strong></td>
</tr>
<tr>
<td>☐ Yes, currently (since August 2008)</td>
</tr>
<tr>
<td>☐ In the past but not now (anytime prior to August 2008)</td>
</tr>
<tr>
<td>☐ No, never</td>
</tr>
<tr>
<td><strong>6. Social Stories (Social Narratives):</strong></td>
</tr>
<tr>
<td>☐ Yes, currently (since August 2008)</td>
</tr>
<tr>
<td>☐ In the past but not now (anytime prior to August 2008)</td>
</tr>
<tr>
<td>☐ No, never</td>
</tr>
</tbody>
</table>
### 4. Physiological/ Biological/ Neurological Interventions and Treatments

<table>
<thead>
<tr>
<th>1. Auditory Integration Training:</th>
</tr>
</thead>
<tbody>
<tr>
<td>○ Yes, currently (since August 2008)</td>
</tr>
<tr>
<td>○ In the past but not now (anytime prior to August 2008)</td>
</tr>
<tr>
<td>○ No, never</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. Bolles Sensory Learning:</th>
</tr>
</thead>
<tbody>
<tr>
<td>○ Yes, currently (since August 2008)</td>
</tr>
<tr>
<td>○ In the past but not now (anytime prior to August 2008)</td>
</tr>
<tr>
<td>○ No, never</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3. Irlen Lenses (Scotopic Sensitivity Syndrome):</th>
</tr>
</thead>
<tbody>
<tr>
<td>○ Yes, currently (since August 2008)</td>
</tr>
<tr>
<td>○ In the past but not now (anytime prior to August 2008)</td>
</tr>
<tr>
<td>○ No, never</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4. Neurofeedback (biofeedback):</th>
</tr>
</thead>
<tbody>
<tr>
<td>○ Yes, currently (since August 2008)</td>
</tr>
<tr>
<td>○ In the past but not now (anytime prior to August 2008)</td>
</tr>
<tr>
<td>○ No, never</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5. Sensory Integration (including weighted vests, brushing, joint compressions, sensory diet):</th>
</tr>
</thead>
<tbody>
<tr>
<td>○ Yes, currently (since August 2008)</td>
</tr>
<tr>
<td>○ In the past but not now (anytime prior to August 2008)</td>
</tr>
<tr>
<td>○ No, never</td>
</tr>
</tbody>
</table>
## 5. Other Interventions and Treatments

1. **Art Therapy:**
   - [ ] Yes, currently (since August 2008)
   - [ ] In the past but not now (anytime prior to August 2008)
   - [ ] No, never

2. **Integrated Movement Therapy:**
   - [ ] Yes, currently (since August 2008)
   - [ ] In the past but not now (anytime prior to August 2008)
   - [ ] No, never

3. **Interactive Metronome:**
   - [ ] Yes, currently (since August 2008)
   - [ ] In the past but not now (anytime prior to August 2008)
   - [ ] No, never

4. **Music Therapy:**
   - [ ] Yes, currently (since August 2008)
   - [ ] In the past but not now (anytime prior to August 2008)
   - [ ] No, never

5. **Self-Injurious Behavior Inhibiting System (SIBIS):**
   - [ ] Yes, currently (since August 2008)
   - [ ] In the past but not now (anytime prior to August 2008)
   - [ ] No, never
You may have indicated that you currently use, or have used specific interventions/treatments or practices in your classroom with children with Autism Spectrum Disorder. We are interested in the method of training you received for implementing these approaches.

Please choose the primary training methods that you have received.

Explanation of Choices:

* College Graduate Program Course
* College Undergraduate Program Course
* During an ASD Endorsement Course
* In a Workshop
* Self Taught
* Other
* No Training Received

<table>
<thead>
<tr>
<th>Question</th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Floor Time (Greenspan; Developmental, Individual-Difference, Relationship-Based Model):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Play-oriented Strategies:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Gentle Teaching:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Holding Therapy:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Option Method (Son-Rise Program):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Pet/Animal Therapy:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Relational Development Intervention (RDI):</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
2. Skill-Based Interventions and Treatments

1. Applied Behavior Analysis:

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
</table>

2. Assessments of Basic Language and Learning Skills (ABLLS):

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
</table>

3. Assistive Technology (AT):

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
</table>

4. Augmentative Alternative Communication (AAC):

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
</table>

5. Azrin 24-hour Toilet Training:

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
</table>

6. Discrete Trial Training:

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
</table>

7. Facilitated Communication:

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
</table>

8. Fast ForWord:

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
</table>

9. Incidental Teaching:

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
</table>

10. Joint Action Routines (JAR):

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
</table>

11. Lindamood-Bell:

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>---</td>
<td>--------------------------------</td>
</tr>
<tr>
<td></td>
<td>YES</td>
</tr>
</tbody>
</table>


### 3. Cognitive Interventions and Treatments

1. Cartooning (Cartoon Conversation):
   - [ ] YES
   - [ ] NO

2. Cognitive Behavior Modification (includes cognitive learning strategies, cognitive scripts):
   - [ ] YES
   - [ ] NO

3. LEAP (Learning Experiences: An Alternative Program for Preschoolers and parents)
   - [ ] YES
   - [ ] NO

4. Power Cards:
   - [ ] YES
   - [ ] NO

5. Social Decision-Making Strategies:
   - [ ] YES
   - [ ] NO

6. Social Stories (Social Narratives):
   - [ ] YES
   - [ ] NO
### 4. Physiological/Biological/Neurological Interventions and Treatments

1. Auditory Integration Training:

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
</table>

2. Bolles Sensory Learning:

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
</table>

3. Irlen Lenses (Scotopic Sensitivity Syndrome):

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
</table>

4. Neurofeedback (biofeedback):

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
</table>

5. Sensory Integration (including weighted vests, brushing, joint compressions, sensory diet):

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
</table>
### 5. Other Interventions and Treatments, and Related Agents

<table>
<thead>
<tr>
<th></th>
<th>Art Therapy:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>YES</td>
<td>NO</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Integrated Movement Therapy:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>YES</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Interactive Metronome:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>YES</td>
<td>NO</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Music Therapy:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>YES</td>
<td>NO</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Self-Injurious Behavior Inhibiting System (SIBIS):</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>YES</td>
</tr>
</tbody>
</table>
1. Did you have any questions or issues with completing this survey? Please describe as detailed as possible and provide contact information if you would like a response.

Thank you for your time and participation in completing this survey.
Appendix B

Permission to Use Instrument
B. Permissions to Use Instrument

October 8, 2008

C/O:
Eric Nach

To Whom It May Concern:

This letter serves as formal documentation that I, Kristen Hess, one of the co-creators and copyright holders of the Autism Treatment Survey (ATS), give permission to Eric Nach that he may adapt the ATS survey for the purposes of continued research and development. I am aware that this survey will be used in Palm Beach County Florida to collect data for dissertation purposes. I look forward to hearing the results and wish Eric the best of luck! Please let me know if I can be of further assistance.

Sincerely,

Kristen Hess
October 13, 2008

Eric Nash

Dear Mr. Nash,

As a co-creator and copyright holder of the Autism Treatment Survey (ATS; Hess, Morrier, Heffin, & Ivey, 2008; Morrier, Hess, & Heffin, in press), I give permission for you to use and adapt the survey for your dissertation data collection. Your work will help us to build reliability and validity on the ATS, as well as assist us with continued research on its development. I am aware that you will be using the ATS in Palm Beach County, Florida. I look forward to seeing your results and wish you the best of luck in your research endeavors. Please let me know if I can be of further assistance.

Sincerely,

Michael J. Morrier, Ph.D., BCBA
Assistant Director, Research and Program Evaluation
Emory Autism Center
michael.j.morrier@emory.edu
9 October 2008

Eric Nach

Dear Mr. Nach:

We were pleased to learn of your interest in using the Autism Treatment Survey (ATS) in your dissertation research. I am writing to attest to the following:

1. I am one of the co-creators and copyright holders of the ATS.
2. I am aware that you will be using the ATS in your dissertation and give my permission for such use.
3. I am aware that you will be conducting your dissertation research in Palm Beach County, Florida.

I hope the ATS is helpful in your research and look forward to seeing the results of your study published in a professional journal in the near future. My best wishes as you complete the final phase for acquiring your terminal degree.

Cordially,

Juanita Helms, Ph.D.
Associate Professor
Appendix C

Draft of Voluntary Consent Form
C. Draft of Voluntary Consent Form

Institutional Review Board for the Protection of Human Subjects
Lynn University
3601 N. Military Trail Boca Raton, Florida 33431

THIS DOCUMENT SHALL ONLY BE USED TO PROVIDE AUTHORIZATION FOR VOLUNTARY CONSENT

PROJECT TITLE: Instructional Use of Research-Based Practices for Students with Autism Spectrum Disorder

Project IRB Number: 2009-002 Lynn University 3601 N. Military Trail, Boca Raton, Florida 33431

I Eric J. Nach, M.Ed., am a doctoral student at Lynn University. I am studying Global Leadership, with a specialization in Educational Leadership. One of my degree requirements is to conduct a research study. I am also a special education department chairperson and special education teacher for a Southeast Florida school district.

DIRECTIONS FOR THE PARTICIPANT:

You are being asked to participate in my research study. Please read this carefully. This form provides you with information about the study. The Principal Investigator (Eric J. Nach, M.Ed. or his representative if applicable) will answer all of your questions. Ask questions about anything you don’t understand before deciding whether or not to participate. You are free to ask questions at any time before, during, or after your participation in this study. Your participation is entirely voluntary and you can refuse to participate without penalty or loss of benefits to which you are otherwise entitled. You acknowledge that you are at least 18 years of age, and that you do not have medical problems or language or educational barriers that precludes understanding of explanations contained in this authorization for voluntary consent.

PURPOSE OF THIS RESEARCH STUDY: The study is about the amount of years a teacher has educating students with autism spectrum disorder (ASD), teacher training, classroom demographics and school demographics. There will be approximately 1762 special education teachers invited to participate in this study. Special education teachers for a Southeast Florida region schools will be invited to participate in this survey. Public and private school special education teachers for a specific Southeast Florida region that attend the 2009 CARD conference sponsored by Florida Atlantic University will be invited to participate in the survey.

PROCEDURES:
The survey is competed electronically and begins by clicking the “Next” button at the end of this form. You will complete the questionnaire and test in private.
The web-based survey instrument utilized from SurveyMonkey.com. SurveyMonkey uses Secure Socket layer (SSL) encryption for both the survey link and survey pages during transmission to ensure participant confidentiality and survey security. SurveyMonkey will not record personal identification information. Participants will be advised of the browser type and version necessary for proper encryption on the consent form. All participants will remain confidential to the primary researcher.

If you agree to participate after reading this consent form, then you may proceed to the Autism Treatment Survey (ATS). You will complete the Autism Treatment Survey that contains four parts with a total of 99,
predominantly multiple choice type questions. The questions are separated into four sections. The Autism Treatment Survey should take no more than 15 minutes to complete. You will submit your questionnaire by clicking on “submit” at the end of the survey.

POSSIBLE RISKS OR DISCOMFORT: This study involves minimal risk. You may find that some of the questions are sensitive in nature. In addition, participation in this study requires a minimal amount of your time and effort.

POSSIBLE BENEFITS: There may be no direct benefit to you in participating in this research. But knowledge may be gained which may help you identify your own strengths and opportunities for growth in relation to teaching students with autism spectrum disorder.

FINANCIAL CONSIDERATIONS: There is no financial compensation for your participation in this research. There are no costs to you as a result of your participation in this study.

CONFIDENTIALITY
Every effort will be made to maintain confidentiality. Your identity in this study will be treated as confidential. Only the researcher (Eric J. Nach) will know your response as your identity will remain anonymous unless you choose to disclose it in the last question in the survey. During the survey you will automatically assigned a code number. Data will be coded with that number. Confidentiality will be maintained to the degree permitted by the technology used. Specifically, no guarantees can be made regarding the interception of data sent via the Internet by any third parties. Participation in this study is voluntary and agreeing to the consent form will constitute your informed consent to participate in the study. Your email address and individual responses will not be identified nor tracked as part of data collection.

The results of this study may be published in a dissertation, scientific journals or presented at professional meetings. In addition, your individual privacy will be maintained in all publications or presentations resulting from this study.

All the data gathered during this study, which were previously described, will be kept strictly confidential by the researcher. Data will be collected stored on password protected computer at the home of the primary researcher and hard copies of cumulative survey results will be stored in locked files and destroyed five years after the end of the research collection. All information will be held in strict confidence and will not be disclosed unless required by law or regulation.

RIGHT TO WITHDRAW: You are free to choose whether or not to participate in this study. There will be no penalty or loss of benefits to which you are otherwise entitled if you choose not to participate.

CONTACTS FOR QUESTIONS/ACCESS TO CONSENT FORM: Any further questions you have about this study or your participation in it, either now or any time in the future, will be answered by Eric J. Nach (Principal Investigator) who may be reached at: [REDACTED] and Dr. Mayra Ruiz Camacho, faculty advisor who may be reached at: [REDACTED]. For any questions regarding your rights as a research subject, you may call Dr. Farideh Farazmand, Chair of the Lynn University Institutional Review Board for the Protection of Human Subjects, at [REDACTED]. If any problems arise as a result of your participation in this study, please call the Principal Investigator (Eric J. Nach) and the faculty advisor (Dr. Mayra Ruiz Camacho) immediately.

Please print off a copy of this consent for your records.
INVESTIGATOR'S AFFIDAVIT: I hereby certify that a written explanation of the nature of the above project has been provided to the person participating in this project. A copy of the written documentation provided is attached hereto. By the person's consent to voluntary participate in this study, the person has represented that he/she is at least 18 years of age, and that he/she does not have a medical problem or language or educational barrier that precludes his/her understanding of my explanation. Therefore, I hereby certify that to the best of my knowledge the person participating in this project understands clearly the nature, demands, benefits, and risks involved in his/her participation.

Signature of Investigator

Date of IRB Approval: 1/13/2009

If you wish to participate, you MUST click “NEXT” or “Exit This Survey” if you do not wish to participate.
Appendix D

Draft of Flyer Distributed at CARD (2009) Conference
AUTISM SURVEY

Are you a Palm Beach County Special Education teacher who interacts with students on the autism spectrum? If so, please take about 10 minutes to complete this survey.

My name is Eric Nach.
I am a Ph.D. candidate from Lynn University.

I am an ESE teacher and Department Chairperson at Don Estridge High Tech Middle School in Palm Beach County.

This short survey asks questions regarding the types of ASD training you have had and which interventions you use with your students on the autism spectrum. All responses are anonymous.

It is my hope that my study “Instructional Use of Research-Based Practices for Students with Autism Spectrum Disorder” will help us help our students in the classroom and beyond.

To take the survey please go to: www.surveymk.com/atssurvey before January 30, 2009.

Yours in Education,
Eric
Appendix E

Permission to Conduct Survey at 2009 CARD Conference
E. Permission to Conduct Survey at 2009 CARD Conference

November 26, 2008

Eric Nach, Lynn University Ph.D. Candidate

The Florida Atlantic University Center for Autism and Related Disabilities (CARD) will allow Eric Nach, Lynn University Ph.D. candidate, permission to distribute information pertaining to his doctoral dissertation survey at the 16th Annual CARD Conference on January 16, 2009. He will be allowed to recruit participants, namely Palm Beach County and other ESE teachers, attending this conference for his study. This permission is contingent on Mr. Nach providing me with an approved copy of his IRB from Lynn University prior to any recruitment or information distribution for questions you may have of me, please contact me by email or by phone.

Sincerely,

Jack Scott, Ph.D., BCBA
Director, FAU CARD
Appendix F

IRB Approval
F. IRB Approval

Lynn University

Principal Investigator: Eric J. Nach
Project Title: Instructional Use of Research-Based Practices for Students with Autism Spectrum Disorder
IRB Project Number: 2009-002 REQUEST FOR EXPEDITED REVIEW of Application and Research Protocol for a New Project

IRB Action by the IRB Chair or Another Member or Members Designed by the Chair

Expeditied Review of Application and Research Protocol and Request for Expedited Review (FORM 3): Approved X Approved; w/provision(s) __

COMMENTS:
Consent Required: No ____ Yes ____ X Not Applicable ____ Written ____ Signed ____
Consent forms must bear the research protocol expiration date of 01/13/2010.
Application to Continue/Renew is due:
1) For an Expedited IRB Review, one month prior to the due date for renewal ___.
2) Other:
Other Comments:

Name of IRB Chair: Farideh Farazmand
Signature of IRB Chair: ____________________________ Date: 01/13/2009
Cc. Dr. Camacho

Institutional Review Board for the Protection of Human Subjects
Lynn University
3601 N. Military Trail Boca Raton, Florida 33431

268