General education teachers' knowledge, training, and perspectives of children with autism spectrum disorders and evidence-based interventions: an exploratory study

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General Education Teachers’ Knowledge, Training, and Perspectives of
Children with Autism Spectrum Disorders and Evidence-Based Interventions:
An Exploratory Study

by

Jeannette L. Cahill

A Dissertation Submitted to the University at Albany,
State University of New York in Partial Fulfillment of
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2015
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Acknowledgements

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Abstract

Federal law requires that children with disabilities, including those with autism spectrum disorders (ASDs), receive their education in the least restrictive environment, which frequently includes general education settings. Children with ASDs characteristically exhibit difficulties in social interaction, communication, and restricted interests. Consequently, general educators may face various challenges when teaching this population of students. Teachers’ opinions regarding the general practice of inclusion have been thoroughly researched, and they generally express positive views. The goal of the current study was to expand upon previous research about general educators’ perspectives regarding teaching students with ASDs. More specifically, this study investigated general educators’ level of knowledge and understanding of ASDs, their level of understanding and use of the available evidence-based interventions for ASDs, their perspectives of included students with ASDs, as well as their opinions about the different factors that help and hinder the education of students with ASDs in inclusion classrooms. Because this study had a limited response rate of 11.16%, the results can only be generalized to those participants who completed the survey. Based on the survey results of this study, most teachers viewed the practice of including students with ASDs positively. Regarding training, almost half of teachers in this study responded that they had not received education in ASDs or their major/associated characteristics; however, the overwhelming majority of teachers indicated that training in ASDs is critical. The current study also found that the majority of general educators had not received training in providing evidence-based interventions to students with ASDs. A significant relationship was found, however, in that teachers with a master’s degree were more likely to utilize certain evidence-based interventions for ASDs that have been identified by national research centers. This study also investigated the different factors that influence general
education teachers’ perspectives of students with ASDs. Implications for the field of education were identified for both training and practice. In particular, general education teachers need ample opportunities for professional development and training through their educational programs and school districts. Additionally, they need support from other key individuals, including administrators, parents, support staff, colleagues, and school psychologists.
TABLE OF CONTENTS

TITLE PAGE .......................................................................................................................... i
COPYRIGHT ........................................................................................................................ii
ACKNOWLEDGEMENTS ..................................................................................................... iii
ABSTRACT .......................................................................................................................... v
TABLE OF CONTENTS ...................................................................................................... vii
LIST OF TABLES ............................................................................................................... xiii
LIST OF FIGURES ............................................................................................................ xiv
LIST OF APPENDICES ..................................................................................................... xv
CHAPTER 1 – INTRODUCTION ......................................................................................1
      Problem Statement and Objectives .........................................................................3
      Significance of Study ...............................................................................................4
CHAPTER 2 – REVIEW OF RELEVANT LITERATURE ................................................6
      Overview ..................................................................................................................6
      Autism Spectrum Disorders (ASDs) ......................................................................7
          Etiology ...............................................................................................................8
          Prevalence .........................................................................................................10
      Autistic Disorder (Autism) ..................................................................................11
          Major Characteristics and Features of AD .......................................................14
          Associated Characteristics and Features of AD .............................................15
      Asperger Syndrome .............................................................................................19
      Associated Characteristics and Features of AS ...............................................21
      Pervasive Developmental Disorder Not Otherwise Specified ......................22
CHAPTER 3 – METHODOLOGY .................................................................67

Overview .............................................................................................67

Associated Characteristics and Features of PDD-NOS ...............24

Section Summary ...................................................................................25

Intervention and Treatment Options for ASDs.................................25

Efficacy Studies of Treatments for ASDs ........................................28

Complementary and Alternative Treatments for ASDs ..................35

Section Summary ...................................................................................37

General Education Teachers and ASDs: Training and Attitudes ....37

Section Summary ...................................................................................55

Survey Research .....................................................................................56

Advantages ............................................................................................56

Disadvantages .......................................................................................57

Internet Surveys .....................................................................................59

Tailored Design Method .......................................................................60

Section Summary ...................................................................................62

Chapter Summary ...................................................................................62

Research Questions ................................................................................63

Teachers’ Knowledge and Training Regarding Students with ASDs ..64

Teachers’ Familiarity with and use of ASD Interventions in their
Classrooms ...........................................................................................64

Teacher Preparedness, Experience, and Perspectives Regarding Teaching
Students with ASDs ............................................................................65

CHAPTER 3 – METHODOLOGY .................................................................67

Overview .............................................................................................67
Participants

Instrumentation

Survey

Electronic Cover Letter Email

Electronic Follow-Up Email

Pilot Study

Procedure

CHAPTER 4 – RESULTS

Overview

Response Rates

Statistical Analyses

Treatment of Missing Data

Demographic Data

Questions 1, 2, and 3: General knowledge and training in identifying the different types of ASDs and the major/associated characteristics

Question 4: How did general education teachers receive their training about special education and students with ASDs?

Question 5: Does the level of knowledge general education teachers have regarding students with ASDs vary by demographic differences?

Question 6: How important is training in ASDs to general education teachers?

Questions 7 and 8: Which evidence-based ASD interventions are general education teachers familiar with and/or have used in their classrooms?
Question 9: Have general education teachers received training in selecting and providing interventions to students with ASDs? ........................................87

Question 10: Does general education teacher use of evidence-based interventions for students with ASDs vary by demographic characteristics? ..................87

Question 11: How well trained/prepared do general education teachers believe they are to work with students with ASDs? .........................................................89

Question 12: What percentage of general education teachers have completed specific courses in special education? ...........................................................89

Question 13: What percentage of general education teachers participate in professional development activities to enhance their knowledge of students with ASDs? ................................................................................92

Question 14: How much support do general education teachers perceive from administrators (e.g., school principal) to teach students with ASDs? ......92

Question 15: What percentage of general education teachers collaborate with other school staff (such as special education teachers, classroom aides, school psychologists) when teaching students with ASDs? ....................92

Question 16: What types of facilitators and barriers do general education teachers identify when teaching students with ASDs? .........................94

Question 17: To what degree do general education teachers report that the severity of the ASD affects their perspectives of the students? ................94

Question 18: How important is parental support to general education teachers when working with students with ASDs? .................................97
Question 19: How important are the roles of support staff (such as classroom aides and monitors) to teachers when educating students with ASDs? ....97

Question 20: Overall, what are general educators’ thoughts regarding the inclusion of students with ASDs in inclusive/mainstream settings? ........97

Question 21: Do general education teacher views on different factors that enhance the success of students with ASDs vary by demographic characteristics? .........................................................................................100

Feedback and Additional Comments from Survey Participants ..................100

CHAPTER 5 – DISCUSSION .........................................................................................107

Overview ..............................................................................................................107

Respondent Characteristics ..................................................................................108

Teacher Knowledge and Training Related to ASDs ............................................109

Interventions for ASDs: Teacher Use and Familiarity ........................................112

Factors Influencing Teachers’ Perspectives of Students with ASDs.................113

Severity of the ASD................................................................................................113

Perceived Support From Administrators ............................................................114

Collaboration and Work With Colleagues .........................................................115

Parental and Staff Support ...............................................................................115

Facilitators and Barriers to Including Students with ASDs .........................116

Implications for Education: Training and Practice ..............................................116

Teacher Training and Professional Development on ASDs and Interventions ......................................................................................117

Support From Other Professionals and Key Individuals ...............................118
Limitations and Future Research .................................................................119

Survey Research Limitations .................................................................119

Small Sample Size and Low Response Rate ..........................................120

Grade Levels Served, Experiences Teaching Students with ASDs, and
Years of Teaching Experience .............................................................122

Teachers’ Perspectives of Facilitators and Barriers to Teaching
Students with ASDs ...........................................................................122

Other School Professionals who Implement Interventions to
Students with ASDs and Provide Support to Teachers .......................123

Individual State Teaching Certification Requirements and Courses ......123

New Interventions Identified by the NPDC .............................................124

Diagnostic and Statistical Manual of Mental Disorders – Fifth Edition..124

Section Summary .........................................................................................125

REFERENCES .................................................................................................128

APPENDICES .................................................................................................................143
# LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Diagnostic Criteria for 299.0 Autistic Disorder</td>
<td>13</td>
</tr>
<tr>
<td>2. Overlap Between Evidence-Based Practices Identified by the National Professional Development Center (NPDC) on ASD and the National Standards Project (NSP)</td>
<td>30</td>
</tr>
<tr>
<td>3. NPDC Definitions of Evidence-Based Practices for Children and Youth with ASDs</td>
<td>31</td>
</tr>
<tr>
<td>4. Studies of Teacher Attitudes/Perspectives on Inclusion Practices of Students with Disabilities and/or those with ASDs</td>
<td>43</td>
</tr>
<tr>
<td>5. Summary of Electronic Mailing and Response Rate Data</td>
<td>74</td>
</tr>
<tr>
<td>6. Non-response Rate Data by Survey Question</td>
<td>76</td>
</tr>
<tr>
<td>7. Summary of Demographic Data</td>
<td>78</td>
</tr>
<tr>
<td>8. Other Types of Training Identified by Teachers</td>
<td>83</td>
</tr>
<tr>
<td>9. Evidence-based ASD Interventions General Education Teachers are Familiar with and/or Use in their Classrooms</td>
<td>86</td>
</tr>
<tr>
<td>10. Other Types of Interventions Used by Teachers</td>
<td>88</td>
</tr>
<tr>
<td>11. Chi-square Analyses Comparing Teachers’ Use of ASD Interventions by Training Level</td>
<td>90</td>
</tr>
<tr>
<td>12. Facilitators and Barriers to Teaching Students with ASDs</td>
<td>95</td>
</tr>
<tr>
<td>13. Examples of Feedback/Comments from Survey Respondents</td>
<td>101</td>
</tr>
</tbody>
</table>
LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Teachers’ Knowledge and Training in Identifying ASDs</td>
<td>80</td>
</tr>
<tr>
<td>2. Types of Teacher Training Experiences in ASDs</td>
<td>82</td>
</tr>
<tr>
<td>3. Teachers’ Perceived Importance in Receiving ASD Training</td>
<td>85</td>
</tr>
<tr>
<td>4. Teachers’ Reported Level of Preparedness in Teaching Students with ASDs</td>
<td>91</td>
</tr>
<tr>
<td>5. Teachers’ Perceived Level of Support from School Administrators</td>
<td>93</td>
</tr>
<tr>
<td>6. Frequency in Which Teachers Collaborate with Other School Staff</td>
<td>93</td>
</tr>
<tr>
<td>7. Degree to Which Teachers Report the Severity of the ASD Affects their Perspectives of These Students</td>
<td>96</td>
</tr>
<tr>
<td>8. Teachers’ Beliefs Regarding the Importance of Parental Support in Educating Students with ASDs</td>
<td>98</td>
</tr>
<tr>
<td>9. Teacher’s Perceptions Regarding the Importance of Support Staff When Working with Students with ASDs</td>
<td>98</td>
</tr>
<tr>
<td>10. General Teacher Perspectives Regarding the Inclusion of Students with ASDs in Their Classrooms</td>
<td>99</td>
</tr>
</tbody>
</table>
### LIST OF APPENDICES

<table>
<thead>
<tr>
<th>Appendix</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. General Education Teacher Survey</td>
<td>143</td>
</tr>
<tr>
<td>B. Submission of Responses</td>
<td>151</td>
</tr>
<tr>
<td>C. General Education Teacher Electronic Cover Letter</td>
<td>152</td>
</tr>
<tr>
<td>D. Web-Based Informed Consent</td>
<td>153</td>
</tr>
<tr>
<td>E. Gift Card Drawing</td>
<td>156</td>
</tr>
<tr>
<td>F. Electronic Follow-Up Message</td>
<td>157</td>
</tr>
<tr>
<td>G. Preview Questions</td>
<td>158</td>
</tr>
<tr>
<td>H. Data Analyses</td>
<td>159</td>
</tr>
<tr>
<td>I. Non-Significant Chi-Square Analyses</td>
<td>164</td>
</tr>
</tbody>
</table>
Chapter 1: Introduction

Autism spectrum disorders (ASDs) are neurodevelopmental disorders characterized by severe and pervasive impairments in social reciprocity, communication skills, and the presence of repetitive behaviors, interests, and attitudes (APA, 2000, Hyman & Towbin, 2007; Lord et al., 2006; Newsom & Hovanitz, 2006). According to the APA (2000), there are five disorders classified under the category of pervasive developmental disorders (PDDs; also commonly referred to as ASDs): Autistic Disorder (AD), Rett’s Disorder, Childhood Disintegrative Disorder, Asperger’s Disorder (AS), and Pervasive Developmental Disorder Not Otherwise Specified (PDD-NOS). The development of ASDs usually becomes noticeable within the first few years of life, and they are often associated with degrees of intellectual disability (APA, 2000), as well as psychiatric and behavioral difficulties (Ozonoff, Goodlin-Jones, & Soloman, 2007). Currently, the exact cause of ASDs is unknown, but researchers believe that genetic factors play a strong role in their development (Hyman & Towbin, 2007; Ozonoff et al., 2007). In addition to the complex etiology of ASDs, the prevalence of these disorders seems to be increasing at an alarming rate. The most recent statistics indicated that approximately one in 68 children have been identified as having an ASD (CDC, 2014).

Clearly, children with ASDs present with complex backgrounds, behaviors, and needs. The significant symptoms that accompany ASDs, as well as their increasing prevalence rates, highlight the need to effectively diagnose and treat children with ASDs as soon as possible (Hyman & Towbin, 2007; Ozonoff & Rogers, 2003). There is an abundance of available treatment options available to help support children with ASDs and their families. Most research concerning ASD treatment options has involved behavioral interventions, but individuals with ASDs (regardless of age and level of severity) have shown improvements with many types of
treatments (Ozonoff & Rogers, 2003). While several of these interventions have been closely examined in the research literature for level of effectiveness, there are also many treatments without evidence circulating that may appeal to parents and families (Ozonoff & Rogers, 2003). Importantly, school professionals are often involved in treatment plans for students with ASDs (Brock, Jimerson, & Hansen, 2006). Thus, it is imperative for teachers working with these students and their families to have a solid understanding and knowledge base of the available interventions, especially those that are efficacious, though it is unknown whether they possess this knowledge. Although there are some available studies regarding general education teachers and students with ASDs (e.g., Barnes, 2008; Messemer, 2010; Robertson, Chamberlain, & Kasari, 2003), it is important to gain more information about teachers’ perceptions and knowledge about these students, as well as their knowledge regarding the interventions that are used to treat them.

Because federal law requires children with disabilities be taught in their least restrictive learning environment, they are often included within general education settings (Chmiliar, 2009; Friedlander, 2009; Williams, Fan, & Goodman, 2011). Due to the characteristic impairments in social interaction and communication, as well as restrictive interests and attitudes of children with ASDs, teachers and other students in general education classrooms may experience tension and challenges as a result of their inclusion (Horrocks, White, & Roberts, 2008; Robertson et al., 2003). Further, students with ASDs may have difficulty developing social relationships with their peers, and this is often a main factor in promoting their achievement in general education classrooms (Horrocks et al., 2008). Another confounding roadblock in the inclusion of students with ASDs in general education settings is the limited training that general education teachers receive in special education. More specifically, most general education teacher preservice
programs require only one special education course, typically involving broad coverage of
students with disabilities in addition to those with ASDs (Simpson, Mundschenk, & Heflin,
2011).

Classroom teachers’ views regarding the broad practice of inclusion have been
comprehensively evaluated in the research literature (Chmiliar, 2009). Studies have found
teachers to express generally positive opinions regarding the inclusion of students with
disabilities and perceived various benefits to the educational practice (Scruggs & Mastropieri,
1996). Although many studies have found that educators view inclusion in a positive light, some
research has indicated that teachers may express more reluctance to teaching students with
severe disabilities (Cook, 2001). Teachers’ attitudes and perceptions, however, are unfixed and
can be altered as a result of experience and/or training (Martin, Ireland, Johnson, & Claxton,
2003).

Currently, inclusion practices are the preferred method for educating students with ASDs,
but Robertson et al. (2003) reported that the number of investigations regarding general
education teachers’ perceptions, social interactions, and relationships with the ASD population is
inadequate. Since Robertson et al.’s (2003) work, several authors have further examined the
perceptions and relationships of general education teachers and students with ASDs (e.g.,
Barnes, 2008; Messemer, 2010).

**Problem Statement and Objectives**

The purpose of this study was to expand upon previous research that has examined the
perceptions and relationships of general education teachers with students with ASDs
mainstreamed in general education classrooms. More specifically, this study sought to
investigate general education teachers’ level of knowledge and understanding of ASDs, their
level of understanding and use of the available interventions for ASDs in their classrooms, their perspectives of included students with ASDs, as well as their opinions regarding different factors that affect the success and difficulties of students with ASDs in general education settings.

**Significance of Study**

There are two major reasons why this investigation concerning the knowledge and views of general education teachers regarding students with ASDs was warranted. First, the research literature concerning general education teachers and included students with ASDs is somewhat limited (Robertson et al., 2003). Many previous studies have examined this topic, but they have had limitations such as small sample sizes (e.g., Messemeser, 2010), as well as restricted generalizability to certain geographic areas or states (e.g., Skuller, 2011). At present, to this author’s knowledge, there is no study that has examined these topics at a national level. The present study added to the scarce research literature by utilizing a national sample in an attempt to increase the generalizability of the results, however; the sample size of the current study remained low. This study also aimed to enhance the previous knowledge regarding general education teachers and their level of their knowledge of ASDs, the intervention/treatment options, as well as their attitudes regarding teaching these students.

Second, the results of this study may aid in closing the research to practice gap that often exists in education and psychology. Because children spend a significant part of their day in school, it is a natural place for interventions to be implemented and monitored. It is crucial for general education teachers, and all individuals working with students with ASDs in schools, to be keenly aware of the evidence-based interventions that are available, as well as the strategies that have not been found to be effective. Moreover, this information could potentially benefit school districts and teachers in determining the current levels of teacher knowledge about ASDs.
and interventions. It is critical to identify which types of available treatments teachers are familiar with and which types they may require additional training to increase their knowledge base. In a broad sense, the information gained from this study may help to disseminate knowledge to general education teachers and help them identify their own personal strengths and areas for improvement when working with children with ASDs in their classrooms.
Chapter 2: Review of Relevant Literature

Overview

Autism spectrum disorders (ASDs) are neurologically based disorders that are characterized by severe, pervasive impairments in social and communication skills, as well as the presence of restricted behaviors and interests (APA, 2000). The etiology of ASDs is complicated and currently unclear, but genetic factors largely contribute to their development (Hyman & Towbin, 2007; Ozonoff et al., 2007). Prevalence rates of ASDs are on the rise (CDC, 2012), and schools are required by federal law to educate students with ASDs in their least restrictive learning environment (Chmiliar, 2009; Williams et al., 2011). There have been some previous investigations regarding teachers and students with ASDs (e.g., Barnes, 2008; Messemer, 2010; Skuller, 2011). A national study is needed, however, to investigate general education teachers’ level of knowledge of ASDs, the available treatment options (as well as which types of treatments they use in the classroom), and their attitudes about these students in inclusion settings.

This chapter provides a review of the research literature regarding ASDs and is comprised of four major sections. First, it provides information about the history and current definition of ASDs, as well as their etiology, prevalence rates, and major/associated conditions. Second, it describes the major intervention and treatment options currently available for ASDs, including information about evidence-based practices and complimentary or alternative treatments. Third, it provides information pertaining to general education teachers’ views of teaching students with disabilities in general education settings, including those with ASDs. Fourth, it defines and describes survey research, as well as its advantages and disadvantages, and
strategies for implementing effective research surveys. This chapter concludes with a summary and the research questions for this investigation.

**Autism Spectrum Disorders (ASDs)**

Autism spectrum disorders (ASDs) are broadly classified as neurodevelopmental disorders that are characterized by severe and pervasive impairments in social reciprocity, communication skills, and the presence of repetitive behaviors, interests, and attitudes (APA, 2000, Hyman & Towbin, 2007; Lord et al., 2006; Newsom & Hovanitz, 2006). The term *autism spectrum* indicates that the disorders in this category occur along a continuum, and is often used interchangeably for the category *pervasive developmental disorders* (Hyman & Towbin, 2007). The term autism spectrum disorders (ASDs) will be used throughout this chapter; however, the *American Psychiatric Association’s Diagnostic and Statistical Manual of Mental Disorders – Fourth Edition Text Revision* (*DSM-IV-TR*; American Psychiatric Association [APA], 2000) uses the term pervasive developmental disorders (PDDs) when describing these disorders.

According to the APA (2000), there are currently five disorders classified under the category of PDDs (or ASDs): Autistic Disorder (AD), Rett’s Disorder, Childhood Disintegrative Disorder, Asperger’s Disorder (AS), and Pervasive Developmental Disorder Not Otherwise Specified (PDD-NOS). This chapter will focus specifically on AD, AS, and PDD-NOS. ASDs are typically apparent within the first few years of life and they are frequently associated with varying degrees of intellectual disability (APA, 2000). In addition to intellectual disability, children with ASDs are likely to be diagnosed with anxiety disorders and depressed mood (Ozonoff et al., 2007).

Throughout the past several decades, it was commonly thought that these impairments can begin with or without a previous normal period of development, depending on the type of
disorder (House, 2002). Results from studies involving the use of home videos, however, indicated that the period of normal development in children with ASDs may be questionable and that children may be exhibiting characteristics early in infancy (Baird et al., 2001). In another more recent study, Saint-Georges et al. (2010) reviewed all prior investigations that were conducted on family home movies of infants who would be later diagnosed with an ASD. Saint-Georges and colleagues (2010) found that in the first two years of life, signs that differentiated children with ASD from children with developmental delays included the following: less of a response to their name, less looking at others, lower eye contact quality and quantity, and less positive facial expression, as well as intersubjective behaviors (e.g., showing shared attention).

**Etiology.** ASDs have been established in the research literature to be neurodevelopmental conditions that have biological bases (Kundert & Trimarchi, 2006). Although these disorders were once thought to have been a result of inadequate parenting and a lack of a nurturing environment, there is no empirical evidence suggesting that social-environmental factors cause ASDs (Ozonoff et al., 2007). Because ASDs do not comprise a single disorder, they do not have a single etiology (Happé, Ronald, & Plomin, 2006; Hyman & Towbin, 2007). Also, ASDs do not have a single pathogenesis, clinical presentation, or treatment approach, and they comprise a group of disorders that share many clinical features and fundamental social-communicative impairments (Bregman & Higdon, 2012). Although the exact cause of ASDs is currently unclear, researchers and scientists believe that genetic factors play a strong role in their development (Hyman & Towbin, 2007; Ozonoff et al., 2007). It is probable that a combination of genetic predispositions and gene by environmental interactions result in brain abnormalities, which then result in the causes of the various behaviors currently considered ASDs (Brock et al., 2006).
Additionally, it is likely that there are also unknown environmental variables that may impact gene expression and brain development in these disorders (Hyman & Towbin, 2007). There is currently limited scientific evidence suggesting that any specific environmental variable contributes to the development of ASDs (Brock et al., 2006). It is also noteworthy that various studies have found no empirical evidence to suggest that there is a causal link between ASDs and immunizations (e.g., CDC, 2009; Fombonne & Chakrabarti, 2001; Honda, Shimizu, & Rutter, 2005; Smeeth et al., 2004). Although the research literature does not confirm the relationship between ASDs and vaccines, many parents continue to refrain from having their children vaccinated (Sansosti, Powell-Smith, & Cowan, 2010).

The evidence for a genetic etiology of ASDs stems from both family and twin studies (Hyman & Towbin, 2007). Further, Ozonoff and Rogers (2003) indicated that there are four major lines of research suggesting the role of genetic factors in ASDs. First, they discussed research showing a 3–6% increased risk for autism among siblings of children with an ASD, which far exceeds rates found in the general population. Second, they described studies that investigated identical twins. Results from these studies indicated that the chance identical twins will develop an Autistic Disorder if one twin has the condition is between 60 (Ozonoff & Rogers, 2003) and 65% (Hyman & Towbin, 2007). Importantly, this percentage increases to 90% when both twins are considered from the viewpoint of the broader autism spectrum. Third, Ozonoff and Rogers (2003) identified studies demonstrating ASDs to be related to a variety of genetic and chromosomal abnormalities. Specifically, definitive neurodevelopmental genetic disorders (e.g., tuberous sclerosis, fragile X) have been identified in 10–20% of children diagnosed with ASDs. Finally, Ozonoff and Rogers (2003) discussed research that found that
the families of individuals with ASDs tend to display certain cognitive and social differences that are not commonly seen in other family groups.

According to Muhle, Trentacoste, and Rapin (2004), researchers currently use several methods to better understand the genetics of ASDs. These methods can be divided into the following categories: (a) cytogenic studies, (b) genome searches, and (c) candidate gene searches (Muhle et al., 2004). Cytogenic studies are helpful in identifying regions of interest in chromosomes, but they cannot identify the specific genes that may cause ASDs. Genome searches examine the genetic material of families that include individuals with ASDs, and they investigate differences in chromosomes (called polymorphisms). Muhle and colleagues (2004) reported that at least 10 different genes have been associated with ASDs using this technique. Candidate gene searches assume that certain specific genes are likely to be associated with ASDs based on previous scientific findings and empirical evidence. Using these methods, many researchers have found associations between ASDs and at least six different genes or gene groups (Brock, et al., 2006). Importantly, there has been no reliable replication of positive findings for any of these genes (Newschaffer, Fallin, & Lee, 2002).

Prevalence. Throughout the years, epidemiological studies of autism and related spectrum disorders have been carried out in several countries. The methodological differences in case definitions and procedural methodology, however, have created difficulties with comparisons across studies (Fombonne, 2005). According to the Autism and Developmental Disabilities Monitoring (ADDM) Network of the Centers for Disease Control and Prevention (CDC, 2012), approximately one in 88 children have been identified as having an ASD. In 2014, the CDC reported that one in 68 children have an ASD. In addition, Fombonne (2003) reported that the estimated incidence rate for all types of ASDs is at least 27.5/10,000. Further,
Fombonne (2005) differentiated and summarized the prevalence rates for the different types of ASDs. Conservative prevalence estimates for the different ASDs are as follows: 13/10,000 for AD, 2.6/10,000 for Asperger’s disorder, and 21/10,000 for PDD-NOS (Fombonne, 2005).

Compared to earlier studies (e.g., CDC, 2009a), the prevalence rates of ASDs appear to be on the rise (CDC, 2012). The CDC’s (2012) report illustrated that between 2006 and 2008 there was a 23% increase in children identified as having an ASD in the samples included in the ADDM networks. Further, there was a 78% increase in children identified with an ASD when the 2008 data were compared with data from 2002 (CDC, 2012). Results from this study also indicated that boys are at higher risk than girls for developing an ASD (1 in 54 versus 1 in 252; CDC, 2012). In regard to differences in race and ethnicity, results from the CDC’s (2012) study demonstrated that the estimated prevalence of ASDs in non-Hispanic white children was significantly higher (12.0 per 1,000) than rates among non-Hispanic black children (10.2 per 1,000) and Hispanic children (7.9 per 1,000). As mentioned, updated information from the CDC (2014) indicated that the prevalence of ASDs has increased to one in 68 children being identified as having an ASD.

Although experts disagree about the causes and significance of the recent increases in the prevalence of ASDs, it can be partially attributed to many factors, including greater public awareness of the disorders, broadening ASD diagnostic criteria, younger age at diagnosis, diagnostic substitution (Kim, et al., 2011), as well as newly emerging environmental and biological risk factors (Ozonoff, et al., 2007).

**Autistic Disorder (Autism).** Among the different types of ASDs, the most highly investigated and well-defined is Autistic Disorder (AD) or Autism (House, 2002; Kundert & Trimarchi, 2006). Current understandings of the clinical syndrome of AD are direct expansions
of the works of Leo Kanner, Hans Asperger, and Michael Rutter (Bregman & Higdon, 2012). AD was first described by Kanner in 1943 as a disorder similar to, but distinct from, childhood schizophrenia (Sanders, 2009). In Kanner’s influential paper, he described 11 children who demonstrated behaviors consistent with the present diagnosis of AD. Kanner emphasized the distinctive patterns of the social and affective impairments that the children in his study exhibited, and he viewed them as fundamentally dissimilar from the problems in social and emotional functioning experienced by his patients with other neuropsychiatric conditions (Bregman & Higdon, 2012).

In 1980, AD was first included as a disorder distinct from schizophrenia in the DSM-III, under the name early infantile autism, and was later changed to Autism in the DSM-III revision in 1987 (Bregman & Higdon, 2012; Sanders, 2009). The diagnostic criteria that were included in the DSM-III encompassed those identified originally by Kanner and later expanded by Rutter in the mid-to-late 1970s (Bregman & Higdon, 2012).

According to the APA (2000), manifestations of AD vary greatly depending on developmental level and chronological age. In order for a child to be diagnosed with AD, he or she must exhibit 6 or more of 12 symptoms with at least two being symptoms of impaired social interactions, at least one being a symptom of impaired communication, and at least one being a symptom of restricted collection of interests and activities (see Table 1; APA, 2000).

Rates of AD in children are four to five times more likely in males than in females (APA, 2000). The long-term prognosis for individuals with AD differs tremendously and is often dependent on the timing and efficacy of interventions used, as well as the degree of impairment (Brock et al., 2006). Also, it is well-documented in the research literature that children who are
### Table 1

**Diagnostic Criteria for 299.0 Autistic Disorder**

A. A total of six (or more) items from (1), (2), and (3), with at least two from (1), and one each from (2) and (3):

1. **qualitative impairment in social interaction**, as manifested by at least two of the following:
   - (a) marked impairment in the use of multiple nonverbal behaviors such as eye-to-eye gaze, facial expression, body postures, and gestures to regulate social interaction
   - (b) failure to develop peer relationships appropriate to developmental level
   - (c) a lack of spontaneous seeking to share enjoyment, interests, or achievements with other people (e.g., by a lack of showing, bringing, or pointing out objects of interest)
   - (d) a lack of social or emotional reciprocity

2. **qualitative impairments in communication**, as manifested by at least one of the following:
   - (a) delay in, or total lack of, the development of spoken language (not accompanied by an attempt to compensate through alternative modes of communication such as gesture or mime)
   - (b) in individuals with adequate speech, marked impairment in the ability to initiate or sustain a conversation with others
   - (c) stereotyped and repetitive use of language or idiosyncratic language
   - (d) lack of varied, spontaneous make-believe play or social imitative play appropriate to developmental level

3. **restricted repetitive and stereotyped patterns of behavior, interests, and activities**, as manifested by at least one of the following:
   - (a) encompassing preoccupation with one or more stereotyped and restricted patterns of interest that is abnormal either in intensity or focus
   - (b) apparently inflexible adherence to specific, nonfunctional routines or rituals
   - (c) stereotyped and repetitive motor mannerisms (e.g., hand or finger flapping or twisting, or complex whole-body movements)
   - (d) persistent preoccupation with parts of objects

B. Delays or abnormal functioning in at least one of the following areas, with onset prior to age 3 years: (1) social interaction, (2) language as used in social communication, or (3) symbolic or imaginative play

C. The disturbance is not better accounted for by Rett’s Disorder or Childhood Disintegrative Disorder.

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provided with rigorous, evidence-based early interventions are likely to have better outcomes than those who do not receive early interventions (Brock et al., 2006).

**Major characteristics and features of AD.** Children with AD display gross and sustained impairment in reciprocal social interaction, and many younger individuals may appear to have little or no interest in the establishment of friendships (APA, 2000). Children with AD also demonstrate difficulties in perceiving faces and emotions, which have been documented extensively in the research literature (Ozonoff, 2010). Children who have interest in developing friendships may lack the understanding of the conventions of social interaction and may also lack spontaneous seeking to share enjoyment, interests, or achievements with others (APA, 2000). They may also be unaware of others and have no understanding of others’ needs, especially when emotions are involved (APA, 2000). The social difficulties and other characteristic features observed in individuals with AD are generally persistent throughout the life span, but these presentations may vary depending on age and developmental level (Magnusen, 2005; Volkmar, Klin, Marans, & McDougle, 1996).

According to the APA (2000), children with AD also have impairments in communication that are persistent, noticeable, and affect both verbal and nonverbal areas. Children with AD often exhibit impairments in language that are apparent in early life, and some children will have a total lack of the development of a spoken language (APA, 2000, Ozonoff, 2010; Ozonoff et al., 2007). In fact, as many as 50% of children with AD are mostly or entirely mute (Pennington, 2002). If children with AD develop a spoken language, it will often be delayed (Ozonoff, 2010). Additionally, children with AD who have developed a spoken language may have abnormalities in the pitch, intonation, rhythm, rate, or stress in their voice (APA, 2000). They also have significant delays in language comprehension and may not be
capable of understanding simple questions or directions. They may also lack the ability to initiate or maintain conversations, engage in spontaneous make-believe play, and social imitative play that is developmentally appropriate (APA, 2000).

In addition to social and communication impairments, children with AD also characteristically exhibit restricted, repetitive, or stereotyped patterns of behavior, interests, and activities (APA, 2000; Baird et al., 2001). They may have a severe preoccupation with one or more stereotyped and restricted patterns of interest that are abnormal either in focus or intensity, they may have an apparently inflexible obedience to specific routines or rituals, stereotyped and repetitive motor mannerisms (e.g., hand flapping, rocking, tiptoe walking), or they may have a continuous preoccupation with parts of objects (APA, 2000). Many children with AD may also develop an obsessive interest in numbers, letters, times tables, dinosaurs, and many other unique areas (Newsom & Hovanitz, 2006). According to South, Ozonoff, and McMahon (2005), these restrictive interests seem to intensify over an individual’s lifespan. Further, these restrictive behaviors can be incapacitating for individuals with AD due to the frequency of their occurrence as well as the amount of stress these behaviors cause for individuals and their families (South et al., 2005).

**Associated characteristics and features of AD.** In addition to the major characteristics of AD, there are also several associated characteristics frequently observed in this population. It is noteworthy that in most cases of AD in children, there is an associated diagnosis of intellectual disability, which can range from mild to profound (Ozonoff et al., 2007). In fact, as many as 75–80% of children diagnosed with AD are also diagnosed with an intellectual disability (House, 2002; Hyman & Towbin, 2007; Ozonoff et al., 2007). Individuals who meet the criteria for AD but do not have deficits in intellectual abilities are considered to have “high-functioning” autism
Ozonoff and Rogers (2003) also noted that approximately half of the group functions in the mild to moderate range, while the other half functions in the severe to profound range of intellectual disability. In an epidemiological study with preschool-age children, however, Chakrabarti and Fombonne (2001) found that 31% of children with AD and 94% of children with other ASDs (including Asperger’s Disorder and PDD-NOS) displayed IQ scores above 70.

Cognitive ability scores of individuals with AD (as well as the broader autism spectrum) are generally stable across time and development (Ozonoff, 2010). Further, Lord and Schopler (1989) found that correlations of IQ scores obtained in preschool and school age are generally statistically significant and similar to scores observed in children without disabilities.

An additional major cognitive deficit of children with AD relates to the concept of theory of mind (ToM; Begeer, Rieffe, & Terwogt, 2003; Friend, 2008). More specifically, children on the autism spectrum may not be able to recognize the fact that other people have their own thoughts and opinions, and these children may also have difficulty understanding others’ points of view (Begeer et al., 2003). In Begeer et al.’s (2003) study, ToM competence was investigated by testing children’s understanding of false belief, which is a common method for evaluating the construct. As the researchers predicted, children with AD displayed limited understanding of ToM on tasks presented to them (Begeer et al., 2003). Further, Bergeer et al. (2003) noted that individuals with AD will typically demonstrate poorly developed knowledge of ToM, even when they are adults.

In addition to the cognitive deficits seen in many children with AD, they may sometimes develop what are known as special skills in different areas of ability. Children with AD may display extraordinary skills in the fields of music, the arts, calculation, and memory.
children with AD may have a highly developed ability to calculate calendar dates or they may be able to “decode” written materials with a minimal understanding of what is being read (APA, 2000). In a recent study, Vital, Ronald, Wallace, and Happé (2009) investigated the relationship between special abilities and ASD-like traits in a large population of 8-year-old children. Results indicated that children with special abilities demonstrated significantly more ASD-like traits than children without special abilities. Additionally, special abilities were more strongly associated with the ASD-like trait of restricted and repetitive characteristics than with social or communication skills (Vital et al., 2009).

Besides special abilities and skills, children with AD may also exhibit various externalizing behavioral difficulties, which include hyperactivity, short attention span, impulsivity, aggressiveness, self-injurious behaviors, and temper tantrums (APA, 2000). In a review of the literature, Sturm, Fernell, and Gillberg (2004) examined the records of 101 children with ASDs and found that 95% showed attention problems, 75% demonstrated motor difficulties, 86% exhibited problems in activity level, and 50% displayed problems with impulsivity.

Children with AD have an increased risk of developing other associated conditions, including internalizing behavioral difficulties (e.g., mood and anxiety disorders), as well as schizophrenia (Ozonoff et al., 2007). Individuals with AD who do not have intellectual disabilities may sometimes develop depression during adolescence and young adulthood, which is often attributed to the social difficulties they typically experience as a result of the disorder (Bregman & Higdon, 2012). Bregman and Higdon (2012) also reported that an extensive variety of anxiety symptoms can occur in individuals with AD, including specific phobias, social anxiety, generalized anxiety symptoms, panic-like episodes, and compulsive-like behaviors.
Other behaviors demonstrated by children with AD might include extremely ritualistic ordering and rearranging of items, severe intolerance for subtle changes in immediate environment and routines, a preoccupation with order and symmetry, and in some cases, compulsions (Bregman & Higdon, 2012). If the symptoms are severe enough, a comorbid diagnosis of obsessive-compulsive disorder (OCD) may be warranted (Bregman & Higdon, 2012).

In another study, researchers retrospectively found that children diagnosed with AD and PDD-NOS were both at an increased risk for developing various psychiatric and social problems, but those with AD were at a higher risk for depression, social withdrawal, atypical behaviors, and social skills problems compared to children diagnosed with PDD-NOS (Pearson et al., 2006). Importantly, Pearson et al. (2006) controlled for differences in intellectual ability between the children with AD and PDD-NOS, which suggests that the diagnostic subgroups on the autism spectrum may be able to predict different types of psychopathology.

Regarding the presence of risk factors for maladaptive behavior (i.e., both externalizing and internalizing disorders) in young children with AD, Hartley, Sikora, and McCoy (2008) found that the strongest predictor variable of overall externalizing maladaptive behavior was non-verbal cognitive ability, and the strongest predictor variable of overall internalizing behavior was the total adaptive behavior score on a standardized measurement tool (i.e., the Vineland Adaptive Behavior Scales; Hartley et al., 2008). Interestingly, gender was mostly unrelated to maladaptive behaviors, except for the finding that girls with AD have a greater frequency of sleep difficulties and problems with emotional reactivity compared to boys with AD (Hartley et al., 2008).

Other common characteristics of children with AD include an atypical response to sensory stimuli (e.g., hypersensitivity and hyposensitivity to sounds, light, odors), abnormalities
in eating habits and mood, as well as a lack of fear in dangerous situations (APA, 2000). Children with autism may also exhibit motor and phonic tics, which may warrant a diagnosis of Tourette’s Syndrome (Bregman & Higdon, 2012). Studies also suggest that a seizure disorder may develop in approximately 20% of AD cases, often during adolescence (Tuchman, 2000; Volkmar, 2000).

**Asperger Syndrome.** Hans Asperger, a Viennese physician, first described Asperger Syndrome (AS; also commonly referred to as Asperger’s Disorder) in the research literature in 1944 (Bregman & Higdon, 2012; Kundert & Trimarchi, 2006). In his work, Asperger (1944) described four children who demonstrated prominent impairments in social functioning, but they showed highly-developed language skills, good problem-solving abilities, as well as intense and restrictive patterns of interest (as cited in Wing, 1981). In 1981, Lorna Wing translated Asperger’s work and published it in English, and the American Psychiatric Association did not formally recognize it as a developmental disorder until the publication of the *DSM-IV* in 1994 (as cited in Kundert & Trimarchi, 2006; Pulver-White, 2010).

AS shares the same characteristic features of AD in the areas of social disabilities and restricted behaviors and interests, but children’s language abilities are intact and intellectual functioning is generally not affected (Ozonoff et al., 2007). In fact, symptoms of AS are identical to those of AD, except that there is no requirement that the child demonstrate deficits in communication (Ozonoff et al., 2007). In addition, the *DSM-IV-TR* requires that the diagnosis for AD be ruled out before a diagnosis of AS is given (APA, 2000).

There is inconsistency in the research literature surrounding the validity of AS being a diagnostic category separate from children with high-functioning autism (HFA), which is when the child’s IQ score is above 70 (Bregman & Higdon, 2012). While some studies have supported
the diagnostic distinction, others have not, and the lack of agreement is partly a result of disagreement regarding clinical characteristics that define AS (Bregman & Higdon, 2012). One strategy that helps to differentiate the two disorders is to examine the pattern of associated symptomology (Bregman & Higdon, 2012). Although the *DSM-IV-TR* criteria for AS are quite similar to those listed for AD, the main point of differentiation between the two disorders is that children with AS do not display significant delays in the onset or early course of language (Ozonoff & Rogers, 2003).

As mentioned, there is disagreement in the research community with respect to the validity of AS being diagnostically different from HFA. If there is a history of delays in speech and language development, then a diagnosis of AS cannot be made (based on the specified *DSM-IV-TR* criteria); however, impairments in language and nonverbal communication are present in individuals with AS (Bregman & Higdon, 2012). These impairments may include: (a) poorly modulated prosody (intonation, rate, volume), (b) formal, pedantic and long-winded style of language, (c) poorly-developed or eccentric nonverbal communication (e.g., gestures or facial expressions), as well as (d) developmentally inappropriate phrases and terminology for particular social settings (Bregman & Higdon, 2012). Another important distinguishing characteristic of AS is that there are no clinically significant delays in cognitive development as manifested by expressing normal curiosity about the environment or in acquiring age-appropriate learning skills and adaptive behaviors other than social interaction (APA, 2000).

Based on its definition, children diagnosed with AS will have gross and sustained impairment in reciprocal social interaction, and there may be noticeable impairment in the use of multiple nonverbal behaviors such as eye-to-eye contact, facial expressions, body postures, and body gestures, which are used to control social interaction and communication (i.e., pragmatics;
Similar to children with AD, children with AS will frequently show disinterest in developing friendships, or if they are interested in developing friendships, they may lack the necessary social skills needed to facilitate social interaction. In contrast to children with AD, however, children with AS will more often have social deficits manifested by a peculiar, one-sided social approach to others rather than social and emotional indifference (APA, 2000).

In terms of repetitive and restricted behaviors, children with AS primarily develop “encompassing preoccupations about a circumscribed topic of interest, about which the individual can amass a great deal of facts and information” (APA, 2000, p. 80). As previously mentioned, children with AS will have no clinically significant delays in early language, cognitive development, age-appropriate self-help skills, adaptive behavior (other than social interaction), or curiosity about the environment in childhood (APA, 2000).

Associated characteristics and features of AS. Given the subtle social abnormalities that exist in children with AS, parents are not typically concerned until the child begins preschool or is exposed to same-age peers (APA, 2000). In addition, most parents of children with AS do not express worry regarding early language development and may even report that their children have highly-developed language abilities and extensive vocabularies early in life (Ozonoff et al., 2007). When compared to children with AD, children with AS may not be diagnosed with the disorder until they enter school, which is typically when the social demands of the classroom make the AS symptoms functionally apparent (Hyman & Towbin, 2007).

In contrast to children with AD, children with AS are usually of average or high intelligence, but they may often have specific learning disabilities (Newsom & Hovanitz, 2006). According to the APA (2000), differences in cognitive functioning may be apparent in children with AS. More specifically, children with AS are frequently observed to have strengths in verbal
ability (e.g., vocabulary, rote auditory memory) and weaknesses in nonverbal abilities (e.g.,
visual-motor and visual-spatial skills; APA, 2000). Very young children with AS may
demonstrate hyperlexia, which is the ability to read many words with little or no comprehension
(Newsom & Hovanitz, 2006). In addition, motor clumsiness and awkwardness may occur, but
these difficulties are usually mild although they can create difficulties socially and lead to peer
rejection and isolation (APA, 2000).

Often times, children with AS are also extremely egocentric, socially awkward, and
extremely preoccupied with their special interests, which may lead to social difficulties
(Newsom & Hovanitz, 2006). Newsom and Hovanitz (2006) reported that children with AS may
have appropriate attachment to their family members, but they may also display inappropriate
approaches to same-age peers. Children with AS may also talk incessantly about their personal
interests and display little regard for social gestures or cues from others (e.g., boredom,
disinterest; Newsom & Hovanitz, 2006). Often times, individuals with AS will display a vast
amount of factual knowledge about different topics (usually related to their personal interests),
but this knowledge is not usually used for functional, socially relevant purposes (Bregman &
Hidgon, 2012).

**Pervasive Developmental Disorder Not Otherwise Specified.** Pervasive
Developmental Disorder Not Otherwise Specified (PDD-NOS) is a remainder category for
children who display characteristics of AD, but do not fully meet the criteria for one of the other
autism spectrum diagnoses (Newsom & Hovanitz, 2006). This diagnosis is used for children
who exhibit difficulties in at least two of the three autism-related symptom categories (apparent
difficulty relating to others, as well as either communication deficits or restrictive behaviors and
interests), but who do not satisfy the criteria for any other PDDs (Ozonoff & Rogers, 2003). The
PDD-NOS category includes individuals who do not meet the criteria for AD due to late age of onset, atypical symptomology, and/or subthreshold symptomology (APA, 2000; Ozonoff & Rogers, 2003). The PDD-NOS classification is meant to include cases in which there is a suspicion of the general syndrome being present in the individual, but there is inadequate information available for the clinician to confirm a more specific diagnosis (Bregman & Higdon, 2012).

Ozonoff and colleagues (2007) provided an example of a child who may meet criteria for PDD-NOS. In the example, the child could potentially meet the criteria for PDD-NOS, if he or she displayed only four *DSM-IV-TR* symptoms (which rules out AD), exhibited a delay in language development (which rules out AS), and did not demonstrate any regression in early development (which rules out Rett’s disorder and Childhood Disintegrative Disorder; Ozonoff et al., 2007).

As can be seen from the above example, the diagnostic criteria for PDD-NOS are highly complicated, largely undefined, and variable (Towbin, 1997; Volkmar et al., 1994). Due to the fact that the PDD-NOS diagnosis is defined in relation to the other ASDs, it is dependent on their definitions and criteria (Towbin, 1997). There is no minimum number of symptoms necessary to diagnose PDD-NOS, which results in noteworthy heterogeneity among individuals with this diagnosis (Hyman & Towbin, 2007). Towbin (1997) also stated that the ambiguity of PDD-NOS is most clear when clinicians need to differentiate it from other ASDs as well as other clinical syndromes. Further, there have been unsuccessful attempts to clarify the criteria of PDD-NOS, as well as the other ASD diagnoses, according to Towbin (1997). He also pointed out that “even if the domains could be defined clearly, there would be uncertainty over how much (or how little) impairment is consistent with the diagnosis of PDD-NOS” (Towbin, 1997, pp. 127–128).
Overall, there is a high level of clinical inconsistency and heterogeneity in the PDD-NOS population due to the vastly undefined nature of the category, as well as the multitude of ways in which the category is used (Bregman & Higdon, 2012).

When diagnosing PDD-NOS, it is imperative for the clinician to rule out other major clinical disorders, including schizophrenia, personality disorders (schizoid, schizotypal, avoidant, and obsessive-compulsive), as well as attention deficit/hyperactivity disorder (ADHD; Newsom & Hovanitz, 2006). In recent years, the autism diagnostic category has also been broadened (and the term “autism spectrum” has been adopted). Because of this, some clinicians may rely too heavily on ASD diagnoses (including PDD-NOS), when in reality the child’s diagnosis may be better defined as social phobia and secondary withdrawal, a nonverbal learning disability with secondary depression, or a developmental language disorder with co-morbid ADHD (Bregman & Higdon, 2012).

As mentioned, PDD-NOS is often misdiagnosed, and Ozonoff and Rogers (2003) strongly suggested that professionals thoroughly review any child they are working with who carries a diagnosis of PDD-NOS and apply DSM-IV-TR criteria scrupulously to ensure that the diagnosis is correct. According to Bregman and Higdon (2012), studies are currently being carried out to validate the PDD-NOS diagnosis and to differentiate it from non-autism spectrum disorders that share similar clinical features.

**Associated characteristics and features of PDD-NOS.** Individuals diagnosed with PDD-NOS may have a plethora of co-morbid cognitive, language, and behavioral difficulties (Hyman & Towbin, 2007). Hyman and Towbin (2007) also pointed out that these various symptoms may result in considerable functional impairment, despite the fact that few symptoms of autism are observed in the individual.
Summary. ASDs are a group of developmental disorders that result in characteristic deficits in social and communication abilities, and they include the presence of stereotypic and repetitive behaviors, interests, and attitudes (APA, 2000; Hyman & Towbin, 2007; Lord et al., 2006; Newsom & Hovanitz, 2006). Alarmingly, the prevalence of ASDs continues to be on the rise, and the potential biological and environmental causes are still being identified. Out of the five types of ASDs, AD is the most well-defined (House, 2002; Kundert & Trimarchi, 2006). AD, AS, and PDD-NOS all include the major triad of impairments (i.e., social and communicative deficits and the presence of stereotypical behaviors and interests), as well as numerous associated characteristics. These distinguishing impairments, along with the disturbingly high prevalence rates, highlight the importance for effective interventions and treatment for these individuals.

Intervention and Treatment Options for ASDs

As discussed earlier, ASDs are a group of developmental disorders that characteristically result in social and communicative deficits, as well as a repertoire of restricted behaviors, activities, and interests, depending on the type of disorder diagnosed (i.e., AD, AS, or PDD-NOS). Additionally, there has been a considerable increase in the number of children being diagnosed with ASDs in recent decades (Wilczynski et al., 2011). Due to the significant behavioral difficulties that often accompany ASDs, as well as its increasing prevalence, it is crucial to accurately diagnose and treat children identified with ASDs as early as possible (Hyman & Towbin, 2007; Ozonoff & Rogers, 2003).

In recent years, there has also been an emphasis on implementing “empirically supported” or “empirically validated” interventions to support individuals with ASDs (Ozonoff & Rogers, 2003). Moreover, Wilczynski et al. (2011) noted that professionals working with
children with ASDs are legally and ethically responsible to choose interventions that have a strong base of scientific evidence. Importantly, the movement towards evidence-based practice has often resulted in conflict because countless popular interventions that are not evidence-based frequently appeal to parents, who may be willing to try non-scientific, alternative methods for helping their children (Ozonoff & Rogers, 2003).

According to Brock and colleagues (2006), various treatment options are available to target the behavioral and learning difficulties that children with ASDs frequently exhibit. Ozonoff and Rogers (2003) noted that children with ASDs can demonstrate vast improvements in their behavioral symptoms with certain types of interventions, including (a) intensive early behavioral interventions, (b) psychoactive medication, (c) social skills training, and (d) school-based interventions. Currently, a large debate exists in the research community regarding which type of treatment approach is optimal for individuals with ASDs, and many of the available treatments require further evaluation to determine their effectiveness (Kundert & Trimarchi, 2006).

The majority of the research on ASD treatment options has involved behavioral interventions, but individuals with ASDs (regardless of age and level of severity) have shown improvements with a wide range of treatments (Ozonoff & Rogers, 2003). With respect to psychoactive medication interventions, McPheeters and colleagues (2011) reported that many children with ASDs are currently treated with medication, but there is relatively limited empirical evidence demonstrating any benefits. Medications used to treat difficult behaviors have the strongest scientific evidence (i.e., risperidone and aripiprazole), but significant negative side effects were also noted, such as significant weight gain, sedation, and risk of extrapyramidal symptoms (i.e., movement disorders; McPheeters et al., 2011). No other medical treatments for
ASDs, including serotonin-reuptake inhibitors and stimulant medications, were found to be effective (McPheeters et al., 2011).

Moreover, some ASD treatment approaches focus on underlying etiologic factors, while others strive to improve educational outcomes for children with ASDs (Brock et al., 2006). In fact, educational treatment approaches are currently the primary form of interventions that have been documented to be effective (Brock et al., 2006). In the past, however, students with ASDs were commonly denied education in schools, and their parents were directed to place them in residential institutions (Reichow & Volkmar, 2011). Fortunately, federal laws today require that students with disabilities be educated in their least restrictive learning environment, and autism was added as a handicapping condition to federal education laws in 1990 (Friend, 2008). The current version of this law is the Individuals with Disabilities Education Improvement Act of 2004, which requires that children ages 3–21, including those with autism, be provided with educational programming that best meets their needs (IDEA; PL 108-446). According to IDEA 2004, schools are mandated to identify specific academic goals that relate to the child’s cognitive and functional level, and the educational programming must be implemented in the child’s least restrictive environment.

Children with ASDs may be educated in either small, structured classrooms or inclusive settings, depending on their needs. Inclusive environments are ideal for allowing children to model appropriate behaviors of others and to generalize these behaviors to the community (Hyman & Towbin, 2007). Hyman and Towbin (2007) also pointed out, however, that some children may benefit more from small classrooms due to the structured environment and decreased sensory distractions. Further, a small, structured classroom setting may actually serve as a least restrictive learning environment for some children with ASDs given the predictability
of the schedule, which may lead to decreased levels of personal distress in the child (Hyman & Towbin, 2007).

School professionals are heavily involved in the development, implementation, and monitoring of treatment programs for students with ASDs (Brock et al., 2006). Hartford and Marcus (2011) discussed the importance of engaging children with ASDs during educational treatments in schools by taking their unique learning styles into account. In order to do this, school professionals must build rapport, teach learning-readiness skills, and reinforce positive behaviors (Hartford & Marcus, 2011).

Children with ASDs will typically need to be provided with services from various school professionals, including resource specialists, speech and language pathologists, occupational and physical therapists, and school psychologists (Brock et al., 2006). This team of individuals helps to disseminate knowledge about evidence-based practices to families, teachers, and other school personnel working with students with ASDs (Brock et al., 2006). In addition, a comprehensive approach to treatment is best and often involves a blend of the following: an individualized education program (IEP), behavioral supports, social and pragmatic language skills development, and family supports (Hyman & Towbin, 2007).

**Efficacy studies of treatments for ASDs.** Given the profusion of intervention options available for ASDs, choosing a specific treatment may be a difficult process for those working with this population. In order to effectively address the increasing number of ASD treatments, two independent national research centers in the United States carried out extensive investigations to determine the level of empirical evidence of these treatments, including (a) The National Autism Center’s (NAC; 2009) National Standards Project (NSP), and (b) the National Professional Development Center (NPDC, 2013) on Autism Spectrum Disorders. Importantly,
both the NSP and NPDC involved expert research panels, and they applied strict criteria in determining which ASD interventions and treatments are considered effective or evidence-based (NPDC, 2013; Wilczynski, 2010). In addition, both investigations analyzed the available research literature up to and including 2007 regarding treatment options for individuals with ASDs from birth to 22 years (NPDC, 2013).

Given the similarities between the NSP and NPDC investigations, there is remarkable consistency in the intervention programs that were identified as evidence-based. Provided in Table 2 (which was reproduced with permission from the NPDC on ASD) is a summary of the overlap and differences between the evidence-based practices that were identified by the NPDC and the NSP. As illustrated in Table 2, nine out of the 11 established treatments identified by the NSP were also identified as evidence-based by the NPDC (e.g., Antecedent Package, Modeling, Pivotal Response Treatment, Self-Management).

Despite the similarities between the NSP and NPDC’s results, there are also some notable differences between the investigations. First, the NSP and NPDC used different intervention definitions in their analyses. Second, the NSP used broader treatment categories and included intervention “packages,” while the NPDC used more specific treatment categories. As a result, the NPDC identified a greater number of evidence-based ASD treatments compared to the NSP. More specifically, the NPDC identified 24 treatments as evidence-based compared to the 11 established treatments identified by the NSP. Presented in Table 3 is a description of each type of ASD intervention that has been identified as evidence-based by the NPDC, as well as the age ranges that the various interventions have been shown to be evidence-based.

The NPDC results and intervention descriptions were utilized in this study’s
Table 2

Overlap Between Evidence-Based Practices Identified by the National Professional Development Center (NPDC) on ASD and the National Standards Project (NSP)

<table>
<thead>
<tr>
<th>Evidence-Based Practices Identified by the National Professional Development Center (NPDC) on ASD</th>
<th>Established Treatments Identified by the National Standards Project (NSP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antecedent Package (ages 3-18 with AD)</td>
<td>( X )</td>
</tr>
<tr>
<td>Behavioral Package (ages 0-21 with AD and PDD-NOS)</td>
<td>( X )</td>
</tr>
<tr>
<td>Story-based Intervention Package (ages 6-14 with AD and AS)</td>
<td>( X )</td>
</tr>
<tr>
<td>Modeling (ages 3-18 with AD, AS, and PDD-NOS)</td>
<td>( X )</td>
</tr>
<tr>
<td>Naturalistic Teaching Strategies (ages 0-9 with AD and PDD-NOS)</td>
<td>( X )</td>
</tr>
<tr>
<td>Peer Training Package (ages 3-14 with AD and PDD-NOS)</td>
<td>( X )</td>
</tr>
<tr>
<td>Pivotal Response Treatment (ages 3-9 with AD)</td>
<td>( X )</td>
</tr>
<tr>
<td>Schedules (ages 3-14 with AD)</td>
<td>( X )</td>
</tr>
<tr>
<td>Comprehensive Behavioral Treatment for Young Children (Ages 0-9; AD and PDD-NOS)</td>
<td>( X )</td>
</tr>
<tr>
<td>Joint Attention Intervention (Ages 0-5; AD and PDD-NOS)</td>
<td>( X )</td>
</tr>
</tbody>
</table>

Promoting **X**

Antecedent-Based Intervention **X**

Time Delay **X**

Reinforcement **X**

Task Analysis **X**

Discrete Trial Training **X**

Functional Behavioral Analysis **X**

Functional Communication Training **X**

Response Interruption/Redirection **X**

Differential Reinforcement **X**

Social Narratives **X**

Video Modeling **X**

Naturalistic Interventions **X**

Peer Mediated Intervention **X**

Pivotal Response Training **X**

Visual Supports **X**

Structured Work Systems **X**

Self-Management **X**

Parent Implemented Intervention **X**

Social Skills Training Groups (Social Skills Package) was identified as an emerging practice by the NSP.

Speech Generating Devices (Augmentative and Alternative Communication Device) was identified as an emerging practice by the NSP.

Computer Aided Instruction (Technology-based Treatment) was identified as an emerging practice by the NSP.

Picture Exchange Communication System was identified as an emerging practice by the NSP.

Extinction (Reductive Package) was identified as an emerging practice by the NSP.

**Note.** This table was reproduced with permission from the research developers of the NPDC on ASD; permission conveyed through Cox, A. (2012). Under the NSP interventions, age ranges and the type of ASD the intervention was effective for were added to the table based on information from the NSP.
### Table 3

**NPDC Definitions of Evidence-Based Practices for Children and Youth with ASDs**

<table>
<thead>
<tr>
<th>Evidence-Based Practices</th>
<th>Effective for ages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antecedent-Based Interventions (i.e., strategies used to modify environmental conditions that result in the individual’s interfering behaviors)</td>
<td>3–16</td>
</tr>
<tr>
<td>Computer-Aided Instruction (i.e., the use of computers to teach academic skills and enhance communication and language development)</td>
<td>3–18</td>
</tr>
<tr>
<td>Differential Reinforcement (i.e., reinforcement is given for desired behaviors and undesired behaviors are ignored)</td>
<td>4–12</td>
</tr>
<tr>
<td>Discrete Trial Training (i.e., a one-to-one, systematic instructional method for teaching skills using small repeated steps)</td>
<td>2–9</td>
</tr>
<tr>
<td>Extinction (i.e., a strategy grounded in applied behavior analysis that reduces or eliminates an unwanted behavior by removing the positive reinforcer that maintains the unwanted behavior)</td>
<td>Early childhood, elementary, and middle school levels</td>
</tr>
<tr>
<td>Functional Behavioral Assessment (i.e., a methodical set of strategies that is used to determine the underlying function or reason for behaviors, and an intervention plan can be developed from the assessment of behavior)</td>
<td>3–15</td>
</tr>
<tr>
<td>Functional Communication Training (i.e., a systemic method used to decrease unwanted behavior or subtle communication with more appropriate and effective communication behaviors or skills)</td>
<td>Early childhood and elementary levels</td>
</tr>
</tbody>
</table>

(continued)
Table 3 (continued)

**Evidence-Based Practices**

Naturalistic Intervention (i.e., involves environmental arrangement, interaction techniques, and behavioral strategies to promote appropriate behaviors that are naturally reinforcing. Effective for children at the preschool, elementary, and middle/high school levels).

Parent-Implemented Intervention (i.e., involves parents using individualized intervention strategies with their child to promote positive learning and skills development. Effective for children ages 2–9).

Peer-Mediated Instruction and Intervention (i.e., typically developing peers are taught strategies to interact with and assist children with ASDs in developing social skills and social opportunities within natural settings. Effective for children across the age range).

Picture-Exchange Communication System (PECS; i.e., tool to teach young children to communicate in social contexts by giving a picture of a desired item to another individual in exchange for the item. Effective for children ages 3–12).

Pivotal Response Training (i.e., builds upon applied behavior analysis to help teach communication skills, language, play, and social behaviors using motivation, responding to multiple cues, self-management, and self-initiations. Effective for children ages 2–16).

Prompting (i.e., involves any assistance that is given to children to help them use a specific skill, usually by an adult or peer. Effective for children ages 3–22).

Reinforcement (i.e., identifies the relationship between a child’s behavior and a consequence occurring after the behavior; the goal is to help children learn new skills and maintain them over time. Effective for children ages 3–22).

Response Interruption/Redirection (i.e., practices used to decrease behaviors that are repetitive, stereotypical, and/or self-injurious and are typically sensory-maintained. Effective for children ages 3–21).
## Evidence-Based Practices

<table>
<thead>
<tr>
<th>Evidence-Based Practices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-Management (i.e., interventions that help children with ASDs regulate their own behaviors and act appropriately in various settings and situations by recognizing the difference between appropriate and inappropriate and rewarding themselves for appropriate behavior. Effective for children across the age range).</td>
</tr>
<tr>
<td>Social Narratives (i.e., interventions that help children adjust to changes in routine and adapt their behaviors by explaining social situations in detail, emphasizing relevant cues, and giving examples of appropriate responses. Effective for children ranging in age from early childhood to middle school).</td>
</tr>
<tr>
<td>Social Skills Groups (i.e., strategies used to help children with ASDs appropriately interact with typically developing peers often involving small group instruction, role-playing, and feedback. Effective for children across preschool, elementary, and secondary age ranges).</td>
</tr>
<tr>
<td>Speech Generating Devices (i.e., portable electronic devices that create either synthetic or digital speech sounds using graphic symbols and alphabet keys. Effective for children ages 3–20).</td>
</tr>
<tr>
<td>Structured Work Systems (i.e., an instructional strategy developed by Division TEACCH [Treatment and Education of Autistic and related Communication handicapped CHildren] that utilized visual supports where students independently practice previously mastered skills. Effective for children across the age range).</td>
</tr>
<tr>
<td>Task Analysis (i.e., breaking a skill into smaller, more manageable pieces in order to teach the skill and is often combined with other intervention strategies such as reinforcement and video modeling. Effective for children at the preschool, elementary, and middle school levels).</td>
</tr>
<tr>
<td>Time Delay (i.e., a method used in combination with prompting procedures that involves fading the use of prompts during instructional time. Effective for children ages 6–11).</td>
</tr>
</tbody>
</table>

(continued)
Table 3 (continued)

<table>
<thead>
<tr>
<th>Evidence-Based Practices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Video Modeling (i.e., involves video recording and display technology to supply a visual model of the targeted behavior or skill. Effective for children from early childhood through middle school).</td>
</tr>
<tr>
<td>Visual Supports (i.e., pictures, written words, and/or objects presented visually that help children with ASD navigate throughout their day. Effective for children across the age range).</td>
</tr>
</tbody>
</table>

*Note. All information and definitions were adapted from the NPDC (2013; http://autismpdc.fpg.unc.edu/content/briefs).*
methodology for two reasons. First, the NPDC incorporates and integrates results from the NSP study into their framework (see Table 2). Second, it is thought that general education teachers may be more familiar with some of the less technical terms used in the NPDC’s study, and they may be more likely to use this language in their daily vernacular (prompting, visual supports, peer mediated strategies). In addition, the NPDC’s terms and definitions have already been incorporated into previous research regarding elementary teachers and ASDs in New York State. Specifically, Saddler (2012) investigated teachers’ knowledge regarding the 24 evidence-based ASD treatments as identified by the NPDC, as well as their use of the interventions in their classrooms; however no study has investigated this issue at the national level.

**Complementary and alternative treatments for ASDs.** Although evidence-based practices for the treatment of ASDs are emphasized among the scientific and research community, there are a plethora of popular interventions available that presently are not empirically-validated (Ozonoff & Rogers, 2003). These methods for treating ASDs are referred to as complimentary approaches, or complimentary/alternative medicine (CAM; Hyman & Towbin, 2007; Zimmer, 2011). Hyman and Towbin (2007) indicated that approximately two-thirds of Americans utilize treatments that potentially fall into the CAM category, and up to one-third of families are using CAM interventions at the time their child receives a formal diagnosis of an ASD (Levy, Mandell, Merhar, Ittenbach, & Pinto-Martin, 2003). Zimmer (2011) noted that medical providers are formally trained in the use of CAM approaches, but the general public has instant access to information regarding CAM use in ASDs via the internet. This can be problematic because many parents may have difficulty sifting through the information and separating medical advice from pseudoscience (Zimmer, 2011).
According to Hyman and Towbin (2007), a number of scientific studies have examined the use of CAM therapies for safety and efficiency, and the most useful study design is the double-blind placebo-controlled trial with an acceptable number of participants diagnosed with clearly defined ASDs. In the majority of behavioral studies, up to 33% of participants report a benefit from the placebo, which illustrates the importance that placebo controlled trials be reported for a specific treatment (Hyman & Towbin, 2007).

Popular alternative methods for the treatment of ASDs often include dietary restrictions (e.g., gluten and casein free diets), larger than recommended daily vitamin doses, nontraditional use of prescription medications (e.g., the hormone secretin), facilitated communication, auditory integration training, optometric training, and sensory integration therapy (Hyman & Towbin, 2007; Zimmer, 2011). Zimmer (2011) provided a comprehensive discussion of selected complementary treatments for ASDs, which also included digestive enzymes, probiotics, antibiotics, antifungals, immune treatments, dimethylglycine (similar to the water-soluble B vitamins), heavy metal treatments/detoxification, amino acid cocktails, and chelation therapy to name a few.

Although these methods are often popular among the nonscientific community, there are limited to no data to support the effectiveness of their use in treating individuals with ASDs (Hyman & Towbin, 2007). In fact, gluten- and casein-free diets may be potentially medically harmful according to recent studies (e.g., Arnold, Hyman, Mooney, & Kirby, 2003; Hediger et al., 2008). Future empirical studies must pay close attention to a variety of variables in order to determine the effectiveness of these treatments (including clear diagnostic criteria, adequate sample size, control groups, subject treatment status, and correlation with biochemical and physiological factors; Zimmer, 2011). Hyman and Levy (2013) warned that until there is
scientific evidence to support the use of CAM therapies, it is crucial to evaluate the positive and negative effects of these treatments on a case by case basis. Zimmer (2011) also suggested that it is imperative for professionals (especially medical practitioners who work with children with ASDs and their families) to be keenly aware of the various CAM therapies as well as their potential side effects. Further, serious safety concerns and health risks of CAM therapies must also be clearly communicated to families, according to Zimmer (2011).

**Summary.** A variety of treatment options are available for individuals with ASDs, including intensive early behavioral interventions, psychoactive medication, social skills training, and school-based interventions (Ozonoff & Rogers, 2003). It is important to note the push toward empirically-validated interventions in recent decades. Despite this movement, there are various treatments which do not have scientific bases, but often garner strong anecdotal support from parents (Ozonoff & Rogers, 2003). Two national research centers, the NAC and NPDC, have published wide scale studies that identify the level of empirical effectiveness of available treatments for ASDs. Several types of interventions reviewed in these studies have been identified as evidence-based. As research continues to be published regarding the effectiveness of interventions for ASDs, it is essential for school professionals, such as school psychologists, teachers, and others to be aware of these findings and convey this information to parents and families while facilitating their use in educational practices (Brock et al., 2006).

**General Education Teachers and ASDs: Training and Attitudes**

In American schools today, children with disabilities are required by federal law to be educated in their least restrictive learning environment, and as a result, these children are increasingly educated within general education classrooms (Chmiliar, 2009; Friedlander, 2009; Williams et al., 2011). Traditionally, students with moderate to severe disabilities were educated
in classrooms that were physically and socially secluded from their peers without disabilities (Wisniewski & Alper, 1994). Among the population of students with disabilities, students with ASDs may present unique challenges to teachers and other students in general education classrooms due to their characteristic impairments in social interaction and communication, as well as restrictive interests and attitudes (Horrocks et al., 2008; Robertson et al., 2003). Because students with ASDs may have limited experience in generating relationships with their peers, socialization skills are considered to be a vital concern for their success in general education settings (Horrocks et al., 2008).

The history of educating students with disabilities, including those with ASDs, began with federal legislation several decades ago. More specifically, special education became an integrated component of the United States public education system since the passage of the momentous education law, the Education of the Handicapped Act of 1975 (PL 94-142). PL 94-142 is considered the basis for all successive special education practices, with many refinements and revisions to this education law throughout the past several decades (Friend, 2008). Specifically, special education law was expanded in 1986 to include services for infants and young children (Education for the Handicapped Act Amendments of 1986; PL 99-457). Additionally, in 1990, amendments to this statute included a renaming of the law as the Individuals with Disabilities Education Act (IDEA; PL 101-476), and two additional disability categories, autism and traumatic brain injury, were added (Friend, 2008). Currently, the 2004 reauthorization of the Individuals with Disabilities Education Act (PL 108-446; also commonly referred to as Individuals with Disabilities Education Improvement Act) continues to emphasize the inclusion of students with disabilities in general education settings, including students with ASDs (Friend, 2008).
Although nearly half of the students with ASDs are educated primarily in a setting away from the general education classroom (U.S. Department of Education, 2004), recent legislation and trends emphasize the education of students with ASDs in inclusionary settings (Friend, 2008). Osborne and Reed (2011) noted that children with ASDs who are included in general education settings frequently exhibit behavioral difficulties. Although this is common for students with ASDs, these unwanted behaviors can be decreased over the school year with certain positive factors in the classroom, including adequate levels of support staff and self-perceived levels of teacher training (Osborne & Reed, 2011).

While there are some positive factors that have been found to be predictors of success for students with ASDs in general education, it is also important to note that most general education teacher preservice programs may require only one special education course, which typically involves studying all types of students with disabilities in addition to those with ASDs (Simpson et al., 2011). Furthermore, general education preservice programs that include a field experience component usually only require the teacher trainee to passively observe a classroom of students with disabilities (Leblanc, Richardson, & Burns, 2009; Simpson et al., 2011). Additionally, Simpson and colleagues (2011) argued that simple observations of students with disabilities are insufficient for fostering the specific knowledge and skills general education teachers require for working with students with special needs. Because students with disabilities often present with complex needs, general education teachers’ limited knowledge of special education can be clearly problematic at times.

As previously mentioned, there is a clear trend toward including students with ASDs in general education settings. Despite this trend toward inclusive practices, only a handful of procedures and models are currently available to promote the education and success of students
with ASDs in inclusion settings (Simpson, de Boer-Ott, & Smith-Myles, 2003). Because students with ASDs present with unique needs, it may be difficult for teachers, parents, and other school staff to design effective inclusion programs for these students due to the lack of distinct guidelines and procedures (Simpson et al., 2003).

In order to assist general education teachers in meeting the unique needs of students with ASDs, educational models have been developed in recent years to help guide the implementation of inclusive practices for these students. Research has indicated that ample support for general education classrooms can help promote the success of students with ASDs in the general education setting because these students can increase their ability to learn socially from their peers, and they can benefit from the general education curriculum (Friend, 2008).

One example of an educational model that was designed for general education teachers is Myles and Simpson’s (1998) Autism Inclusion Collaboration Model, which was revised in 2003 and renamed the Autism Spectrum Disorder Inclusion Collaboration Model. This model was developed to support general education teachers who are responsible for teaching students with ASDs (Simpson et al., 2003). Under this particular model, general education teachers are strongly encouraged to collaborate with other school-based professionals, such as special education teachers and helping staff (e.g., teacher assistants or paraprofessionals; Simpson et al., 2003). There are five major components of the Autism Spectrum Disorder Inclusion Collaboration Model, including (a) environmental and curricular modifications, general education classroom support, and instructional methods, (b) attitudinal and social support, (c) coordinated team commitment, (d) recurrent evaluation of inclusion procedures, and (e) home-school collaboration (Simpson et al., 2003).
Importantly, there are three “proactive assumptions” that accompany this model regarding the appropriateness of many students with ASDs being educated in general settings (Simpson et al., 2003, p. 117). These assumptions are as follows: (a) “students with ASD and their nondisabled peers benefit from planned contact with one another,” (b) “given appropriate support and resources, the majority of general education teachers, staff members, and administrators are agreeable to having qualified students with ASD in their classrooms,” and (c) “general educators are willing and able to effectively assume primary teaching responsibility for many students with ASD, contingent upon special educator and ancillary staff support and other resources” (Simpson et al., 2003, p. 117).

Although some students with ASDs may benefit most from small, structured classrooms, Simpson et al. (2003) pointed out that many students with ASDs are clearly capable of being integrated into general education settings with success. As societal and school changes occur currently and in the future, it will continue to be imperative for schools to successfully incorporate students with ASDs in general education, and the use of structured models, such as the Autism Spectrum Disorder Inclusion Collaboration Model, can help achieve this goal (Simpson et al., 2003).

In addition to structured teaching models being available to support general education teachers who work with students with ASDs, Williams, Johnson, and Sukhodolsky (2005) discussed the role of the school psychologist in the inclusive education of students with ASDs. School psychologists are in a position where they are able to provide support, information, and various strategies to teachers, school staff and administration, as well as parents (Williams et al., 2005). As more students with ASDs are being identified and placed in general education
settings, it is likely that school psychologists will continue to be involved with providing strategies for evidence-based interventions and consultation (Williams et al., 2005).

According to Horrocks and colleagues (2008), the attitudes and behaviors of school professionals, including general education teachers, regarding inclusion practices are extremely important. The perceptions of teachers in inclusive classrooms are also imperative because they may have an impact on the attitudes of other students as well (Ferraioli & Harris, 2011). Throughout the years, classroom teachers’ attitudes and views regarding the broad practice of inclusion have been evaluated thoroughly in the research literature (Chmiliar, 2009). Additionally, various studies have been carried out which examine teachers’ perspectives regarding the inclusion of students with ASDs specifically (e.g., Robertson et al., 2003). A summary of relevant research studies and doctoral dissertations that have investigated teacher attitudes and perspectives regarding inclusion practices of students with disabilities and/or students with ASDs specifically is provided in Table 4. These studies occasionally included the perspectives of special education teachers as well (e.g., Martin et al., 2003; Shemesh, 2009; Skuller, 2011).

As illustrated in Table 4, a total of 20 studies were examined regarding teacher perspectives of inclusion practices. Out of these studies, 14 were scholarly research studies (published between 1996 and 2011), five were doctoral dissertations (completed between 2008 and 2011), and one was a poster presentation (presented in 2015). A number of scholarly research studies were published within the last six years (e.g., Chmiliar, 2009; Emam & Farrell, 2009; Finke et al., 2009; Hendricks, 2011; Leblanc et al., 2009), but the majority of them were published prior to 2009 (e.g., Cook, 2001; DeSimone & Parmar, 2006; King & Edmunds, 2001;
Table 4

*Studies of Teacher Attitudes/Perspectives on Inclusion Practices of Students with Disabilities and/or those with ASDs*

<table>
<thead>
<tr>
<th>Author(s)/Type of Research</th>
<th>Focus of study</th>
<th>Method/Sample</th>
<th>Main findings</th>
<th>Future research and/or Implications</th>
</tr>
</thead>
</table>
| **Barnes (2008)**
  Dissertation | • Examined regular educators’ views on including students with AD (based on years of teaching, current placement, gender, previous inclusion experience, and amount of training)  
  • Determined personal attributes affecting teacher attitudes | • Survey Research (quantitative)  
  • 168 regular education teachers from a single school district in Pennsylvania  
  • Participants selected through cluster random sampling | • Results showed that increased training was related to more positive teacher attitudes, and increased number of years teaching was related to more negative teacher attitudes toward inclusion | • Future research suggestions:  
  (a) Investigate administrators’ attitudes regarding inclusion,  
  (b) Examine teachers’ attitudes regarding the severity of the ASD, and  
  (c) Analyze the relationship between teachers’ attitudes and years of experience |
| **Chmiliar (2009)**
  Research Study | • Teacher perceptions of general inclusion practices  
  • Each case consisted of a student with LD, a parent, and a teacher (grades 5 and 6) in one Canadian school district | • Multiple case study ($n = 5$)  
  • The teachers reported positive perspectives regarding inclusion | | • Explore gender differences in perspectives, perspectives of other individuals in inclusive classrooms, and differences between elementary and junior/senior levels  
  • Implications: the teachers in this study identified the need for adequate planning time and access to collaboration with their peers |

(continued)
### Table 4 (continued)

<table>
<thead>
<tr>
<th>Author(s)/Type of Research</th>
<th>Focus of study</th>
<th>Method/Sample</th>
<th>Main findings</th>
<th>Future research and/or Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cook (2001) Research Study</td>
<td>• Examined whether teachers’ attitudes toward their included students with disabilities differed depending on the severity of the disability</td>
<td>• One-tailed chi-square analyses • 70 general education elementary teachers of inclusive classrooms</td>
<td>• Teachers tend to form different attitudes and expectations for included students depending on severity or obviousness of the disability</td>
<td>• Future research should include severity of disability ratings rather than teacher nominations • Use more diverse sample of schools including some schools using full inclusion models</td>
</tr>
<tr>
<td>Cramer, Stepp, Garbe, and Voirin (2015) Poster Presentation</td>
<td>• Explored teachers’ efficacy beliefs toward including students with ASDs</td>
<td>• Categorical regression • 921 teachers across Midwest US</td>
<td>• Teachers had positive efficacy beliefs regarding the inclusion of students with ASDs</td>
<td>• Four predictor variables of teacher efficacy were found: (i.e., attitudes toward inclusion, teaching experience, special education coursework, and setting)</td>
</tr>
<tr>
<td>DeSimone and Parmar (2006) Research Study</td>
<td>• Investigated middle school general education mathematics teachers’ beliefs and self-perceived knowledge regarding teaching students with learning disabilities (LD) in inclusive classrooms</td>
<td>• Descriptive study • 228 general education mathematics inclusion teachers from 19 states (grades 6-8) • Telephone interviews were also conducted with a subset of 26 survey respondents</td>
<td>• Most general education teachers agreed that students with LD should learn mathematics in inclusion settings • Most valuable resource for general educators was colleagues: special education teachers, aides, guidance counselors, and/or school psychologists</td>
<td>• Teachers need to modify the curriculum to meet needs of all students • Pre-service teacher preparation programs must increase the amount of information provided on teaching children with LD • Need for inservice training on teaching students with LD • Teacher collaboration should be created through administrative support</td>
</tr>
</tbody>
</table>
### Table 4 (continued)

#### Relevant research studies and dissertations

<table>
<thead>
<tr>
<th>Author(s)/Type of Research</th>
<th>Focus of study</th>
<th>Method/Sample</th>
<th>Main findings</th>
<th>Future research and/or Implications</th>
</tr>
</thead>
</table>
| Emam and Farrell (2009) Research Study | • Explored tensions general education teachers experience teaching students with ASDs in mainstream schools | • Multiple case study design  
• 17 cases (student observations, teacher/support staff interviews) | • Tensions reported by school staff are related to ASD characteristics (social and emotional understanding)  
• Teachers rely heavily on assistance from teaching assistants to manage tensions | • Recommendations for future research include examining the outcomes of having teaching assistants in the classroom versus other supports (peers, teachers, interdisciplinary)  
• Compare between primary and secondary schools |
| Finke, McNaughton, and Drager (2009) Research Study | • Examined teacher perspectives on students with ASDs who use augmentative and alternative communication (AAC) | • Qualitative online focus group  
• 5 elementary school teachers | • Teachers expressed positive opinions about inclusion  
• Barriers and challenges were noted (e.g., need for more time in planning lessons) | • Future studies should explore the perceptions of general education teachers at different educational levels  
• Investigate the perspectives of parents, general education students, and students with ASDs |
| Hargrove (2010) Dissertation | • Investigated the views of general education teachers on teaching in inclusion classrooms | • Triangulated qualitative research (using interviews, observations, and artifacts)  
• 17 general education teachers in a metropolitan high school | • General education teachers believe professional development is underprovided and that it is imperative for successful inclusion classrooms | • Future research should use quantitative methodology  
• Investigate students’ perceptions of inclusion  
• Survey elementary education teachers’ perceptions on inclusion practices |
Table 4 (continued)

<table>
<thead>
<tr>
<th>Author(s)/Type of Research</th>
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<th>Method/Sample</th>
<th>Main findings</th>
<th>Future research and/or Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hendricks (2011) Research Study</td>
<td>• Surveyed special education teachers who serve students with autism to identify characteristics, specific knowledge, and practices</td>
<td>• Survey Research&lt;br&gt;• 498 special education teachers in a Virginia public school</td>
<td>• Special education teachers have low to intermediate levels of knowledge of autism and effective instruction</td>
<td>• Implications: (a) need for professional development, (b) teachers must be able to meet the learning needs of all students</td>
</tr>
<tr>
<td>King and Edmunds (2001) Research Study</td>
<td>• Examined teachers’ perceptions of inclusion, needs for effective inclusion practice, and their knowledge of inclusion</td>
<td>• Survey research&lt;br&gt;• 61 junior and senior general education teachers from one Canadian high school</td>
<td>• Teachers felt inadequately prepared for inclusion and require more training/professional development to increase their self-confidence and allow them to successfully practice inclusion&lt;br&gt;• Reducing workloads and class sizes were reported by teachers to be beneficial</td>
<td>• Implications: (a) decision-makers should pay closer attention to teachers’ voices, (b) a fundamental philosophical shift must constantly be supported for inclusion to be successful, and teachers need support to increase their self-confidence regarding inclusion practices</td>
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<tr>
<th>Author(s)/Type of Research</th>
<th>Focus of study</th>
<th>Method/Sample</th>
<th>Main findings</th>
<th>Future research and/or Implications</th>
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<tr>
<td>Leblanc et al. (2009)</td>
<td>Examination of autism training sessions on a group of beginning teachers</td>
<td>Survey research: ASD Inventory (researcher-developed instrument) • 105 Canadian university students in a bachelor’s of education degree program (students training to work at the high school level)</td>
<td>Results indicated that even a small amount of professional development and/or training can significantly increase teachers’ perceptions and knowledge of ASDs and evidence-based strategies, as well as reduce overall stress and anxiety levels</td>
<td>Implement a similar but improved study with the population of educational assistants, current teachers, special education teachers, resource teachers, school administrators, and school board personnel (the survey tool was designed for these individuals)</td>
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<td>MacMillan and Meyer (2006)</td>
<td>Investigation of how teachers reacted to inclusion and to the realities of implementing it during difficult budgetary times in Nova Scotia</td>
<td>Focus group interviews • 33 general education teachers in secondary schools</td>
<td>Teachers felt that they had difficulty meeting the needs of all students within their classroom and felt guilty as a result • Not all teachers felt the same degree of guilt and they reacted differently when addressing their guilty feelings</td>
<td>Teachers need professional development opportunities • Collaboration with other colleagues is essential • Teachers need professional counseling when faced with situations out of their professional experience • Administrator support is necessary • Utilization of all available resources is important</td>
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Relevant research studies and dissertations

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<tr>
<td>Malone, Gallagher, and Long (2001) Research Study</td>
<td>• Investigated general education teachers’ perceptions and beliefs about the efficacy of teamwork in supporting children with developmental concerns</td>
<td>Survey research: • Attitudes about Teamwork Survey • Team Characteristics Survey • Team Process Perception Survey • 148 general education teachers serving on teams to support students with developmental concerns</td>
<td>• Teachers had generally positive views about teams supporting children with developmental concerns</td>
<td>• Future research should examine the effects of specific grouping factors on individual outcomes related to the attitudes and perceptions about teamwork • Investigate the goodness-of-fit between teachers perceptions of the team process and the actual practice of teamwork</td>
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| Martin et al. (2003)      | • Investigated: (a) perceptions of regular and special education teachers regarding inclusion, (b) the perceptions of the role and responsibilities of these teachers in implementing inclusion, (c) the effects of inclusion on children with disabilities as perceived by both groups of teachers, and (d) whether training had an effect on the teachers’ attitudes regarding inclusion practices | • Survey Research  
• 100 general education teachers and 50 special education teachers employed in four Midwest rural school districts (elementary, middle, and high school levels) | • Increased training results in greater likelihood that teachers will overcome inclusion obstacles  
• There is some ambiguity and confusion among both groups of teachers in grasping their roles in inclusion  
• Special education teachers tend to report more positive views about inclusion compared to general education teachers  
• Increased training was related to teachers being more willing to practice inclusion | • It is imperative for schools to provide staff development opportunities to teachers with focus on specific skills, including: trust building, communication, problem solving, and conflict mediation. Teachers who receive appropriate training in inclusion practices are key to the successful implementation of these programs in schools |
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<tr>
<td>Messemer (2010) Dissertation</td>
<td>• Examined small sample of general education teachers regarding their beliefs and experiences teaching students with ASDs in general settings</td>
<td>• Phenomenological study (qualitative)</td>
<td>• General education teachers felt competent to teach in inclusion classrooms if they had: (a) regular time for planning, (b) administrator support, and (c) professional development opportunities</td>
<td>• Future research suggestions: (a) utilize a larger sample size (b) examine administrators’ attitudes toward inclusion of students with ASDs, and (c) investigate teachers’ attitudes with respect to the severity of the ASD</td>
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<td>Robertson et al. (2003) Research Study</td>
<td>• Evaluated the perceived relationships between general education teachers and high-functioning students with AD</td>
<td>• Interview and survey research</td>
<td>• Teachers generally expressed positive relationships with students with AD (but behavior problems negatively impacted the relationship)</td>
<td>• Examine the relationship between general education teachers and students with ASDs with larger and more varied samples of both included students with ASDs and paraprofessionals</td>
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<td></td>
<td>• Evaluated the perceived relationships between general education teachers and high-functioning students with AD</td>
<td>• 187 children from second- and third-grade elementary classrooms (including 12 students with AD)</td>
<td>• The quality of the student-teacher relationship was related to the child’s peer status</td>
<td>• Investigate teacher-student relationships throughout the school year over a substantial period of time and exploring the relationship patterns across different teachers and grades</td>
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| Scruggs and Mastropieri (1996) Research Study | • Summary of teacher perceptions of inclusion | • Research synthesis  
• 28 previous research investigations regarding teacher perceptions of inclusion (elementary and secondary levels) | • Two-thirds of teachers expressed positive views toward inclusion | • “Teachers need support in teaching classes that include students with disabilities. These needs relate to time, training, personnel, materials, class size, and consideration of severity of disability” (p. 72) |
| Shemesh (2009) Dissertation | • Explored the views of various types of teachers (i.e., regular education, special education, and special area) regarding inclusion practices in the state of New Jersey | • Survey research (quantitative)  
• 856 general education, special education, and special area teachers were surveyed from seven school districts in New Jersey (elementary, middle, and high schools) | • Special education teachers had more positive views about inclusion  
• Facilitators for inclusion: training, positive attitudes, support from colleagues and administrators  
• Barriers: large class size, insufficient planning time, lack of support from colleagues and administrators, student behavior/ability, and negative attitudes | • Investigate the role of administrator support on influencing teachers’ attitudes regarding inclusion  
• Examine teachers’ attitudes and roles at each educational level (i.e., elementary, middle, and high school)  
• Use consistent definitions of inclusion practices when comparing data from different schools  
• Compare the perceptions and needs of general and special education teachers |
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**Relevant research studies and dissertations**

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| Skuller (2011) Dissertation | • Examined whether special education teachers’ demographic factors and professional characteristics (i.e., teacher self-efficacy and teacher burnout) had an impact on their attitudes toward students with ASDs | • Survey research (quantitative)  
• 267 special education teachers in a large urban district in Kentucky | • The environmental factors examined (i.e., personal identity, educational history, and school setting) were generally not related to special education teachers’ level of self-efficacy, burnout, or their attitudes about ASDs with the exception of the number of hours spent in an autism workshop | • Use qualitative methodology  
• Survey teachers in other types of school districts (e.g., rural)  
• Conduct a national study to improve generalizability  
• Investigate preschool teachers’ attitudes of ASDs  
• Survey regular education teachers about their efficacy, burnout, and attitudes  
• Examine teacher attitudes about ASDs to explore different levels of efficacy (general and personal) and how they impact teachers performance |

| Van Reusen, Shoho, and Barker (2001) Research Study | • Examined the extent high school teacher attitudes regarding inclusion are affected by classroom experience level, gender, amount of special education training, and content area taught | • Survey Research  
• 125 teachers from a large suburban school in San Antonio, Texas | • Teachers who reported increased levels of special education training or experience teaching students with disabilities were found to have more positive views regarding inclusion | • The success of inclusion programs may be highly related to the amount that teachers and other school personnel are provided with training and support in the use of best practices and continual support for their inclusion practices in general education |
Robertson et al., 2003). In addition, one relatively older research study (i.e., Scruggs & Mastropieri, 1996) included a comprehensive review and synthesis of 28 previous research investigations regarding teacher perceptions of inclusion at elementary and secondary levels (from 1958 to 1995).

In examining the relevant literature regarding teacher perspectives toward inclusion practices and students with ASDs, several trends emerged. For example, more relatively recent studies and dissertations (within the past six years) investigated teacher perceptions regarding the inclusion of students with ASDs specifically, while relatively older studies focused on teacher perspectives on broad inclusion practices and students with various disabilities (such as a specific learning disability in mathematics; DiSimone & Parmar, 2006). Depending on the research methodology utilized in the investigations, some sample sizes were quite large (i.e., those using survey methodology; e.g., Barnes, 2008; DiSimone & Parmar, 2006; Hendricks, 2011; Shemesh, 2009; Skuller, 2011) and other sample sizes were much smaller, involving focus groups and/or case studies (e.g., Chmiliar, 2009; Finke et al., 2009; Hargrove, 2009; MacMillan & Meyer, 2006; Messemer, 2010). Some studies surveyed teachers across the K-12 spectrum (e.g., Martin et al., 2003), while others were specific to certain grade levels (e.g., Cook, 2001; Robertson et al., 2003) or preservice teacher trainees (e.g., Leblanc et al., 2009). In addition, one study used multiple case studies consisting of a triad: (a) a student with a learning disability, (b) a parent, and (c) a teacher (grades 5 and 6 only) to garner information regarding perspectives on inclusion of students with learning disabilities (Chmiliar, 2009). Also, depending on the research study or dissertation, some surveyed single schools and/or districts in specific areas of the United States (certain districts in a particular state; e.g., Barnes, 2008; Hargrove, 2010; Hendricks, 2011; Shemesh, 2009), while others covered a broader range of areas and states in the country (e.g.,
DiSimone & Parmar, 2006). A handful of studies included Canadian schools in their samples (e.g., Chmiliar, 2009; King & Edmunds, 2001; Leblanc et al., 2009), while one study was conducted in the United Kingdom (e.g., Emam & Farrell, 2009).

Overall, the results of these studies suggested that teachers often view the inclusion of students with disabilities, including those with ASDs, in a positive manner (e.g., Cramer et al., 2015, Finke et al., 2009; Malone et al., 2001; Robertson et al., 2003; Scruggs & Mastropieri, 1996). Teacher perspectives and preparedness to teach in inclusion classrooms, however, depend greatly on several factors, and many potential barriers to successful inclusion practices emerged. Specifically, teachers commonly reported they do not have ample time or training to support the needs of children with disabilities in inclusion classrooms (e.g., Barnes, 2008; Hargrove, 2010; Macmillan & Meyer, 2006; Scruggs & Mastropieri, 1996). Van Reusen and colleagues (2001) found that the most negative attitudes expressed by teachers were from those who had the least amount of special education training. Also, Hendricks (2011) noted that special education teachers had low to intermediate levels of knowledge regarding ASDs and evidence-based instructional practices for these students. Additionally, the severity of the child’s disability may affect teacher perceptions of inclusion (Cook, 2001).

Because teachers may feel inadequately trained and prepared to teach students with disabilities, they may subsequently experience feelings of guilt (Macmillan & Meyer, 2006), as well as levels of low confidence and efficacy (King & Edmunds, 2001). Further, teachers who held negative views about inclusion believed that inclusion negatively affects (a) the learning environment of the classroom, (b) the instructional time and service delivery, and (c) the general quality of learning classroom (Van Reusen et al., 2001). Other common issues noted by teachers were a lack of necessary support and resources, as well as concerns regarding the increased
workload (Macmillan & Meyer, 2006). Administrator support was identified as especially important to teachers in inclusion settings (e.g., Messemmer, 2010; Shemesh, 2009).

Although there are several factors that may negatively impact teacher perspectives regarding the inclusion of students with disabilities, including those with ASDs, it is important to consider that the attitudes and perceptions of teachers may be somewhat malleable. According to Martin and colleagues (2003), teachers’ attitudes can be altered as a result of experience and/or training. Also, professional development opportunities and/or teacher training, even in small amounts, can significantly increase teachers’ knowledge of ASDs and evidence-based strategies and lower their stress and anxiety levels (Leblanc et al., 2009). Collaboration with other professionals was also reported by teachers to be a facilitator to effective inclusion practices (e.g., DiSimone & Parmar, 2006)

Summary. Children with ASDs are commonly included in general education classrooms. Because these children typically present with unique learning needs and various clinical features (i.e., difficulties with communication and social interactions, as well as the presence of stereotyped behaviors and interests), they may experience distinctive challenges in general education settings (Robertson et al., 2003). Much research has demonstrated that general education teachers hold positive views toward the inclusion of students with disabilities, including those with ASDs. Facilitators to successful inclusion may include support from colleagues, administrators, and others, as well as opportunities for training and professional development. Also, there are some programs available to support general education teachers who are working with these students, such as Simpson et al.’s (2003) Autism Spectrum Disorder Inclusion Collaboration Model. Several barriers to effective inclusion practices have been also identified (e.g., lack of training, time for planning, and resources).
Survey Research

Gall, Gall, and Borg (2007) broadly identified survey research as a method of data collection that utilizes questionnaires or interviews to gather information from a selected sample of individuals that represents a population to which the results of the study can be generalized. Throughout the past several decades, sample survey research has been a practical and efficient method for investigators who seek to examine individuals’ characteristics, opinions, and behaviors (Dillman, Smyth, & Christian, 2009).

Sample surveys have undergone significant transformations given the advances in computer technology and electronic communication (Dillman et al., 2009). Dillman et al. (2009) discussed the 75-year history of sample surveys at length, indicating that survey methods have gradually evolved from in-person interviews to mail and telephone use in the 1970s. Since the explosion of the internet in the 1990s, enormous changes to the design and implementation of survey methods have become apparent. Despite the rapid times of change from the 1990s to the present, Dillman et al. (2009) indicated that the goal of survey research remains unchanged. They argued that the broad goal of survey research is to create scientifically based data collection systems that permit researchers to find “precise estimates of the behaviors and attitudes of all people in a population by sampling and obtaining results from only a fraction of them” (Dillman et al., 2009, p. 11).

Advantages. As mentioned, sample surveys allow researchers to gather quality information regarding people’s opinions and behaviors (Dillman et al., 2009). According to Mangione (1995), there are numerous advantages to using these methods, including the following: (a) they are fairly inexpensive, (b) they allow for many participants to be surveyed in a reasonably short time frame, (c) they allow participants as much time as they need in
answering questions and researching their answers if necessary, (d) they offer privacy to participants, (e) they involve visual input rather than solely auditory input, (f) they let participants to respond at convenient times, (g) they allow participants to see the context of a series of questions, and (h) they protect participants from the interviewer’s expectations.

**Disadvantages.** Although there are several clear advantages to survey research, it can also present multiple, complex problems for researchers. For instance, survey research commonly involves errors related to sampling procedures (Groves, 1989; Mangione, 1995). More specifically, sampling error may occur when all participants in the population are not sampled (Dillman et al., 2009). Additionally, sample selection bias may result from the use of surveys, which involves using a list to draw a sample that may be incomplete, out of date, or the incorrect population of interest for the study (Mangione, 1995). Coverage error is another potential issue that may arise from the use of survey research, and it occurs when certain members of a population are not included and may differ from those who are included (Dillman et al., 2009; Groves, 1989).

Another common issue related to survey research is the biased nature of the responding sample (Mangione, 1995). Individuals filling out surveys may respond in a biased manner, despite using random sampling procedures. In order to combat this issue, it is helpful to sustain a high response rate of approximately 75%, according to Mangione (1995). An additional problem related to survey research is that participants may fail to answer individual questions contained in the survey. For example, participants may leave certain items blank, accidentally skip items, answer items incorrectly by not following instructions, or write comments instead of answering the question categorically (Mangione, 1995). Also, nonresponse error may occur as a
result of participants who do not respond to the survey being different than those who do respond in a way that is central to the study, according to Dillman et al. (2009).

Another issue that commonly arises through the use of survey research is that participants may misunderstand the wording of the questions presented to them and/or answer questions incorrectly (i.e., measurement error, Dillman et al., 2009). It is imperative that all participants understand survey questions in the same manner and that they can provide appropriate answers to the questions; however, Mangione (1995) stated that this can be a difficult task for researchers to achieve. In order to compose high quality questions, survey researchers must write questions clearly and refrain from going beyond what is realistic for participants to remember when answering questions (Mangione, 1995).

An additional potential disadvantage of survey methodology is known as survey fatigue (Porter, Whitcomb, & Weitzer, 2004). Particularly, when individuals receive multiple requests to complete surveys, the perceived benefits of completing surveys may decrease (Dillman et al., 2009). Individuals who have already completed one or two surveys may decide that they have adequately contributed as survey participants and may not desire to complete additional surveys (Dillman et al., 2009; Groves & Magilavy, 1981). In a recent meta-analysis, Van Horn, Green, and Martinussen (2009) investigated the average response rates to postal mail research surveys that were published in counseling and clinical psychology journals over a 20-year time span (1985–2005). Among all the published studies included in the meta-analysis, the authors found a weighted average response rate of 49.6% for postal mail research surveys. Additionally, Cook, Heath, and Thompson (2000) carried out a meta-analysis to investigate the mean response rates of internet-based survey research. A mean response rate of 39.6% was found in reviewing response rates for 68 surveys included in 49 separate studies; however, when the authors
included studies where there were no missing data, the mean response rate was reduced to 34.6% (Cook et al., 2000). When comparing the response rates for different types of surveys (i.e., postal mail, internet-based, or mixed-mode), Greenlaw and Brown-Welty (2009) found that mixed-mode survey techniques (i.e., a combination of internet-based and paper-based methods) had the highest response rate, 60.3%.

**Internet surveys.** Given the vast improvements in technology and electronic communication discussed above, internet-based survey research provides significant advantages compared to traditional mail surveys, which include ease of administration, faster collection of responses, lower costs, response confidentiality, and data management (Van Horn et al., 2009). Although internet survey research can be a useful and efficient method for conducting research, it has noteworthy coverage gaps in the general population, according to Dillman et al. (2009). As mentioned, internet-based survey research can result in low response rates (e.g., Cook et al., 2000), but Bethlehem and Biffingandi (2012) suggested that customized email reminders might help to increase the response rate by reminding participants to complete the survey.

In September 2007, the authors of the Pew Internet and American Life Project published statistics regarding internet usage in the U.S. population. According to Horrigan and Smith (2007), only about 71% of the U.S. population used the internet at least occasionally, and only 67% had internet service in their homes. Further, only 47% of the U.S. population had a high-speed connection at their residence, 23% utilized dial-up services, and the remaining 29% did not have access to the internet (Horrigan & Smith, 2007). Despite the fact that several U.S. households have easy access to the internet, over a quarter of the population does not. In addition, 2% of people who use the internet use it only in their employment setting, (Horrigan & Smith, 2007). This can be problematic because employers often have restrictions and regulations
on the ways in which the internet can be used by employees, which might impede participants' ability to complete web surveys (Dillman et al., 2009). It is evident that researchers employing the use of internet-based surveys must consider this a possible limitation of the methodology.

**Tailored design method.** In general, survey research can be a useful method for investigators, but it does have several drawbacks (e.g., Groves, 1989; Mangione, 1995). Throughout the past several decades, Dillman (1978; 2000; 2007) and Dillman et al. (2009) developed a scientific approach to conducting sample surveys that attempts to reduce the four types of survey errors identified by Groves (1989), which is known as the tailored design method.

In order to decrease the various types of survey errors, the tailored design method involves several components. More specifically, researchers can attempt to decrease coverage error by selecting the survey mode (or combination of modes) that provides sufficient coverage of the whole population (Dillman et al., 2009). In order to minimize sampling error, an adequately sized random sample of the desired population must be taken. Additionally, creating an implementation system that encourages most individuals to respond will reduce nonresponse error. Finally, Dillman et al. (2009) suggested that researchers can lessen measurement error by approaching respondents in the contacts and the questionnaire itself in a manner that encourages and allows them to supply honest and meaningful answers.

According to Dillman et al. (2009), another major function of the tailored design method is to help researchers develop a series of survey procedures (which include the contact letters or e-mails to respondents and the questionnaire) that work to encourage all individuals in the sample to respond to the survey. Additionally, Dillman et al. (2009) indicated that the survey sponsorship, the nature of the survey population and variations within it, as well as the content of
the survey questions are heavily considered under the tailored design method. The tailored design method further aims to facilitate a positive social exchange between the researcher and the respondents by considering several factors (Dillman et al., 2009). Social exchange is considered a “subtle but powerful method” that researchers can use to motivate people to respond to surveys and is especially valuable because the rewards that researchers offer to people are usually small (Dillman et al., 2009, p. 23).

Dillman et al. (2009) also provided many strategies to help establish trust in participants and increase their perceived benefits of responding to surveys. According to the social exchange theory, people are motivated to behave by the benefits they expect to receive (Dillman et al., 2009). In order to highlight the benefits of responding to a survey, researchers must do the following (a) provide information about the survey, (b) ask participants for help or advice, (c) show positive regard towards the participants, (d) say thank you, (e) support group values, (f) give tangible rewards, (g) make the questionnaire interesting, (h) provide social validation, and (i) inform people that opportunities to respond are limited (Dillman et al., 2009). Similarly, Dillman et al. (2009) suggested several methods to decrease the perceived costs of participation in surveys. Specifically, researchers should (a) make it convenient for participants to respond, (b) avoid subordinating language, (c) make the questionnaire short and easy to complete, (d) minimize requests to obtain personal or sensitive information from participants, and (e) emphasize similarity to other requests or tasks to which a participant has previously responded.

Establishing participants’ trust is critically important as well when using survey research (Dillman et al., 2009). The tailored design method helps researchers to facilitate this trust by helping participants believe that overall the benefits of completing the survey will outweigh the costs of doing so. Strategies for increasing participants’ trust include (a) obtain sponsorship by
legitimate authority, (b) provide a token of appreciation in advance, (c) make the task appear important, and (d) ensure confidentiality and security of participants’ information (Dillman et al., 2009).

Summary. In conclusion, survey research has undergone significant transformations with the growth of technology and the development of the internet in the 1990s. More specifically, there has been a major shift in methodology from mail and telephone to internet surveys (Dillman et al., 2009). Dillman and colleagues have provided extensive strategies to help researchers in overcoming the weaknesses of survey research and to draw upon its strengths (i.e., the tailored design method). The tailored design method helps researchers gain participants’ trust and increases the likelihood that they will respond to the survey questionnaire. Overall, survey methodology can be a practical, useful strategy for conducting quality research, although it has several advantages and disadvantages that must be carefully considered and addressed by researchers employing it.

Chapter Summary

This chapter included an overview of ASDs (focusing specifically on AD, AS, and PDD-NOS). It provided a brief history of ASDs, etiological research, prevalence rates, as well as major and associated characteristics of the individual spectrum disorders. Given the severe impairments that are characteristically associated with ASDs, it is essential to select interventions that are effective and evidence-based. Although there is a plethora of scientific and non-scientific interventions available for the treatment of ASDs, the sheer number of available options can be overwhelming and confusing for professionals and families alike. To combat this issue, two national research centers, the NPDC and the NSP, have published comprehensive investigations regarding the effectiveness of current ASD intervention and treatment options.
Results from the NPDC’s study were utilized in this study’s framework given the more teacher-friendly definitions of the interventions. Further, one prior research investigation (e.g., Saddler, 2012) has surveyed New York State elementary teacher’s knowledge and use of the 24 interventions identified as evidence-based by the NPDC.

Most often, students with disabilities, including those with ASDs, are being instructed in general education classrooms. As a result, general education teachers are increasingly called upon to teach students with ASDs. Throughout the past several decades, there has been a great deal of research investigating the views of teachers regarding inclusion and students with disabilities. Less research has focused specifically on the relationships and perspectives of general education teachers and students with ASDs (Robertson et al., 2003). Since Robertson and colleagues’ (2003) study was published, many researchers have expanded upon these ideas by investigating various aspects of teachers’ attitudes and views on the inclusion of students with disabilities and those with ASDs specifically (e.g., Barnes, 2008; Messemer, 2010; Skuller, 2011).

Research Questions

The broad goal of this study was to expand upon previous research that has examined the views teachers have regarding students with ASDs in their classrooms. More specifically, this study aimed to identify general educators’: (a) knowledge and training regarding the characteristics of students with ASDs, (b) familiarity with and use of the available evidence-based interventions for students with ASDs, and (c) preparedness, views, and opinions regarding different factors that affect the success and difficulties of students with ASDs in inclusion settings, as well as the overall climate of the classroom.
Teachers’ knowledge and training regarding students with ASDs. The following questions were used to determine general education teachers’ level of knowledge and understanding regarding the characteristics of children with ASDs.

1. What percentage of general education teachers have knowledge about or have received training in identifying the different types of ASDs (e.g., AD, AS, and PDD-NOS)?

2. What percentage of general education teachers have knowledge about or have received training regarding the major characteristics of students with ASDs (e.g., social and communication difficulties, and restricted behaviors/interests)?

3. What percentage of general education teachers have knowledge about or have received training regarding the associated characteristics of students with ASDs (e.g., intellectual disability, behavioral difficulties, seizure disorders)?

4. How did general education teachers receive their training about special education and students with ASDs?

5. Does the level of knowledge general education teachers have regarding students with ASDs vary by demographic differences (i.e., level of training, experience, type of school)?

6. How important is training in ASDs to general education teachers?

Teachers’ familiarity with and use of ASD interventions in their classrooms. These questions were created to evaluate general education teachers’ knowledge and use of the available evidence-based interventions for ASDs.

7. With which evidence-based ASD interventions are general education teachers familiar?

8. Which evidence-based ASD interventions do general education teachers use in their classrooms (currently or in the past)?
9. Have general education teachers received training in selecting and providing interventions to students with ASDs?

10. Does general education teacher knowledge of evidence-based interventions for students with ASDs vary by demographic differences (i.e., level of training, experience, type of school)?

**Teacher preparedness, experience, and perspectives regarding teaching students with ASDs.** These questions were utilized to gain information regarding general education teachers’ preparedness and views on different factors that affect the success and difficulties of students with ASDs in general education settings as well as the overall climate of the classroom.

11. How well trained/prepared do general education teachers believe they are to work with students with ASDs?

12. What percentage of general education teachers have completed specific courses in special education?

13. What percentage of general education teachers participate in professional development activities to enhance their knowledge of students with ASDs?

14. How much support do general education teachers perceive from administrators (e.g., school principal) to teach students with ASDs?

15. What percentage of general education teachers collaborate with other school staff (such as special education teachers, classroom aides, school psychologists) when teaching students with ASDs?

16. What types of facilitators and barriers do general education teachers identify when teaching students with ASDs?
17. To what degree do general education teachers report that the severity of the ASD affects their perspectives of the students?

18. How important is parental support to general education teachers when working with students with ASDs?

19. How important are the roles of support staff (such as classroom aides and monitors) to teachers when educating students with ASDs?

20. In general, what are general educators’ thoughts regarding the inclusion of students with ASDs in inclusive/mainstream settings?

21. Do general education teacher views on different factors that enhance the success of students with ASDs vary by demographic differences (i.e., level of training, experience, type of school)?
Chapter 3: Methodology

Overview

In this chapter, a description of the research methods and procedures used in this study is included. Specifically, this chapter provides an explanation of (a) the method used for selecting participants, (b) the survey instrument that was used to collect information from general education teachers regarding their experiences with students with ASDs, (c) the pilot study, and (d) the procedure that was used to collect the data.

Participants

The participants in the current study were 2,040 general education teachers across the United States (US) currently employed in public schools. Given the continual increase in prevalence rates of children with ASDs, it was assumed that most, if not all, general education teachers across the country have had at least some prior knowledge and/or experience working with these students in schools.

For the purposes of this study, 40 general education teachers were selected from each state (including Washington, DC) to ensure equal geographic representation. In order to gather participants, the researcher employed a specific procedure (described below) each time a participant was selected. More specifically, the researcher examined the county listings of each of the 50 states in the US via Google. Using a table of random numbers, the researcher selected a random number (for illustrative purposes, the number 5) and selected the fifth county on the state list of counties. After selecting the fifth county, the researcher then obtained a list of all school districts in that particular state’s county (through internet searches). Using the same random number from before (i.e., 5), the researcher selected the fifth school district on the list of districts in the particular county. After selecting the fifth school district, the researcher then
chose the fifth school on the district’s website. Once the fifth school had been chosen, the researcher located the staff list/directory of teachers on the website, selected the fifth teacher on the list, and collected that individual’s email address if it was available (all email addresses were kept in a secure Microsoft Excel workbook file that was organized by state). A different random number was used each time a participant’s email address was found through this process. This entire process was conducted over 1,000 times in order to gather all the participants needed for the study (i.e., at least 20 times for each of the 50 states, including Washington, DC). Each time the process was completed an alternate email address was also collected from each website to obtain a second sample of teachers.

The random sampling procedure listed above required two separate troubleshooting procedures. First, the researcher recognized that not all school districts have listings of teacher email addresses on their websites. In the event that a teacher’s email address could not be located through the school’s website, the researcher reverted back to the original list of counties and selected the next county on the list (i.e., the sixth county, if using the above example of the random number 5). The entire process was then repeated using the original random number (i.e., 5) until a teacher’s email address was located. Second, if the researcher selected a random number that was too high for the purposes of this procedure (e.g., 85), then the last county, district, school, and teacher email address (if available) was selected on each list, respectively.

**Instrumentation**

The research instrumentation that was used in this study included the following: (a) an internet-based survey, (b) an electronic cover letter, and (c) a one-week follow-up email requesting participation in the survey. Additional follow-up emails were also sent to each sample, which is explained in detail in Chapter 4.
Survey of general educators’ knowledge and experience teaching students with ASDs. The survey instrument was created with respect to information in the current literature on ASDs, focusing on the clinical characteristics of ASDs, interventions for these disorders, and general educators’ knowledge and experience working with these students in inclusion settings (see Appendices A and B). It was modeled after a survey from a prior study investigating school psychologists’ training and practices with students with Asperger’s Syndrome (Pulver-White, 2011). Several of the survey questions in the current study were reworded and adapted to align with the research questions outlined in Chapter 2. The electronic survey instrument was generated using the Psychdata website, which automatically transferred to the Microsoft Excel program. Importantly, Psychdata is a secure, trustworthy website that protects participants’ identifying information (please visit www.psychdata.com for more information).

Participants encountered a number of screens as they completed the survey questions. The survey contained open- and close-ended questions using Dillman et al.’s (2009) recommendations and consisted of two parts: (a) demographic information and (b) information related to the aforementioned research questions. More specifically, the demographic section included information on general education teachers’ gender, ethnicity, and level of professional training (e.g., bachelor’s and/or master’s degrees). In addition, the survey contained questions regarding teachers’ years of experience in education, the type of public school where they work (i.e., urban, suburban, rural), and the grade level of the students with whom they work (i.e., elementary, middle, high school). The second section of the survey included questions relating to the research agenda of this study, including general educators’: (a) knowledge and training regarding the characteristics of students with ASDs, (b) familiarity with and use of the available evidence-based interventions for students with ASDs, and (e) preparedness, views, and opinions
regarding different factors that affect the success and difficulties of students with ASDs in inclusion settings, as well as the overall climate of the classroom.

**Electronic cover letter and participants’ informed consent.** A cover letter was provided to participants in order to give them pertinent background information about the study (see Appendix C). Specifically, the cover letter provided information about the researcher, and it gave a description of the study and its importance. It also included a web link to the electronic survey. If participants chose to complete the survey by following the provided web link, they were brought to an electronic informed consent page (shown in Appendix D), which included (a) the significance of the study and benefits for participating, (b) why general education teachers working with the ASD population were asked to complete it, (c) the anonymity of the Psychdata website and how the information would be protected, (d) that participation is entirely voluntary and they may discontinue the survey at any time without adverse effects, and (e) the researcher’s contact information in case any questions or concerns about the study or survey arose. In addition, the participants of this study were given the opportunity to have their name entered into a raffle to win one of two $50 prepaid Visa gift cards (see Appendix E). Based on the principles discussed in Dillman et al.’s (2009) survey research, it was expected that a tangible reward (i.e., the gift card drawing) might serve as an incentive to participate in the study and increase participants’ likelihood of responding to the survey.

**Electronic follow-up email.** Given the fact that many participants in each sample did not respond to the first electronic distribution of the survey, follow-up emails were subsequently sent to participants to remind them that they were requested to respond to an electronic survey one week ago (refer to Appendix F). The follow-up emails included a thank you message to the participants who had already responded to the survey. They also contained an additional request
to participants who had not completed the survey to please respond at their earliest convenience, as their participation was needed to accurately reflect the current practices of general education teachers. In addition, a closing statement was included in the follow-up emails, which thanked participants for their time and willingness to participate, and it reminded them that they had the opportunity to be entered into a drawing to win a $50 prepaid Visa gift card.

**Pilot Study**

In order to determine the clarity and usefulness of the survey, it was initially piloted with a small sample of general education teachers prior to conducting the actual study. Specifically, the researcher contacted a convenience sample of 10 general education teachers via email (see Appendix G). Six out of the 10 teachers completed the internet-based survey and provided feedback regarding the structure, readability, and usefulness of the survey questions.

Based on the results from the pilot study, most of the teachers who completed the survey delivered positive feedback. Two themes emerged from the feedback: (a) the survey was easy to use and navigate, and (b) participants enjoyed taking the survey on the computer. In addition, two participants provided feedback on the formatting of the survey. Based on this feedback, the following changes were made to the survey questions: (a) the phrase “or not” was removed from Question # 9, and (b) an option was added to Question # 42 to include professional development activities that were not related to ASDs.

In addition to these changes, the survey cover letter was modified to account for the length of time it took the pilot study participants to complete the survey. Specifically, the wording in the survey cover letter was changed from “about 20 minutes” to “approximately 10 to 20 minutes.” As previously mentioned, the overall results of the pilot study were positive and supported the decision to proceed with the research study.
Procedure

After the pilot study data were collected and the survey was finalized based on the feedback provided, it was sent to the selected sample of participants (i.e., 2,040 randomly selected general education teachers from the national sample described above). After one week, the follow-up email was sent to remind participants to respond to the survey, if they had not already done so. Additional follow-up emails were sent to each sample (three to the first sample and two to the second sample). After all data were collected, two participants were randomly selected to win a $50 prepaid Visa gift card as a reward for their participation.
Chapter 4: Results

Overview

The purpose of this study was to gather information regarding general educators’ views and experiences teaching students with ASDs in inclusion settings. This chapter provides a summary of the internet-based survey data that correspond to each of the research questions outlined in Chapter 2. The sections in this chapter include (a) response rates, (b) statistical analyses, (c) treatment of missing data, (d) demographic data, (e) quantitative and qualitative results from the internet-based survey, and (f) additional survey comments.

Response Rates

As explained in Chapter 3, an internet-based survey was developed through the secure Psychdata website and emailed to a national total sample of 2,040 general education teachers (1,020 in each sample). Provided in Table 5 are the details regarding the dates of the survey delivery and the response rate data. Due to a low response rate, the first sample of participants was emailed two additional reminders (in June and July 2013). Additionally, a second sample of 1,020 general education teachers was emailed in August 2013 as a means to increase the low response rate. A reminder email was sent to the second sample as well. Across the multiple mailings to both samples, the overall response rate of the survey remained low. Because of this, both samples were emailed a final reminder in September 2013.

Each survey mailing (and reminder mailings) had a certain number of emails that were returned as undeliverable to the sender \( n = 163 \). Because of duplicate returned email addresses, the highest number of undeliverable emails was used to compute the total survey response rate (as noted in Table 5). In addition to the undeliverable emails, other emails were removed for various reasons. Specifically, a small number of participants indicated that they were not general
Table 5

*Summary of Electronic Mailing and Response Rate Data*

<table>
<thead>
<tr>
<th>Sample Mailing (Date of Email)</th>
<th>n Emailed</th>
<th>Returned</th>
<th>Not a General Education Teacher</th>
<th>Requested to be Removed from List</th>
<th>Unavailable/Out of Office</th>
<th>n Responded to Survey</th>
<th>Response Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample 1 Initial Email (6/10/13)</td>
<td>1,020</td>
<td>58</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>30</td>
<td>3.12%</td>
</tr>
<tr>
<td>Sample 1 First Reminder (6/17/13)</td>
<td>1,020</td>
<td>54</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>36</td>
<td>3.73%</td>
</tr>
<tr>
<td>Sample 1 Second Reminder (7/2/13)</td>
<td>1,020</td>
<td>59</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>25</td>
<td>2.60%</td>
</tr>
<tr>
<td>Sample 2 Initial Email (8/15/13)</td>
<td>1,020</td>
<td>74</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>31</td>
<td>3.28%</td>
</tr>
<tr>
<td>Sample 2 First Reminder (8/22/13)</td>
<td>1,020</td>
<td>69</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>46</td>
<td>4.85%</td>
</tr>
<tr>
<td>Final Reminder to both Samples (9/18/13, 9/19/13)</td>
<td>2,037</td>
<td>163</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>41</td>
<td>2.19%</td>
</tr>
<tr>
<td>Overall Total</td>
<td>2,040</td>
<td>163</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>209</td>
<td>11.16%</td>
</tr>
</tbody>
</table>

^a Respondents who indicated they were not a general education teacher or requested to be removed from the email list were not contacted for subsequent reminders; ^b n attempted divided by n emailed (adjusted); ^c the highest number of returned/undeliverable emails was used for the Overall Total to account for any duplicate returned email addresses.
education teachers \((n = 2)\), while others requested to be removed from the survey \((n = 2)\).

Furthermore, one general education teacher’s email account replied automatically that the person was unavailable for the summer due to vacation.

An overall survey response rate of 11.16% was calculated by dividing the total number of participants who responded to the survey \((n = 209)\) by the number of adjusted potential respondents \((n = 1872)\). Additional information regarding the response rates for each individual mailing is provided in Table 5.

**Statistical Analyses**

Descriptive statistics were used to analyze the data regarding general education teachers’ knowledge of ASDs, use of interventions, factors affecting the classroom climate, and their relationships with this population of students. The relationships between demographic information and the aforementioned areas (i.e., teachers’ knowledge, interventions, classroom climate, and perceptions of students) were examined using chi square analyses. Provided in Appendix H is a list of the research questions, the corresponding survey questions, and the statistical analyses used with each research question. Open-ended questions were analyzed qualitatively using the constant comparison method (Glaser & Strauss, 1967).

**Treatment of Missing Data**

The teachers were permitted to choose whether to respond to questions on this survey. As a result, a certain number of participants chose to not respond to every survey question. The reported percentages in the sections below are based on the total number of participants who responded to each specific survey question, rather than on the total sample that responded to the survey (unless the non-response rate for a question was 0% and all 209 respondents answered the question). The non-response rate data for each survey question are provided in Table 6.
Table 6

Non-response Rate Data by Survey Question

<table>
<thead>
<tr>
<th>Survey Question</th>
<th>n missing</th>
<th>Non-response (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Gender</td>
<td>1</td>
<td>0.5</td>
</tr>
<tr>
<td>2. Ethnicity/Race</td>
<td>2</td>
<td>1.0</td>
</tr>
<tr>
<td>3. Professional training</td>
<td>3</td>
<td>1.4</td>
</tr>
<tr>
<td>4. Years teaching</td>
<td>5</td>
<td>2.4</td>
</tr>
<tr>
<td>5. State employed</td>
<td>4</td>
<td>1.9</td>
</tr>
<tr>
<td>6. Type of school district</td>
<td>1</td>
<td>0.5</td>
</tr>
<tr>
<td>7. Type of school</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>8. Grades serviced</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>9. Training in ASDs</td>
<td>2</td>
<td>1.0</td>
</tr>
<tr>
<td>10. How training was received</td>
<td>2</td>
<td>0.1</td>
</tr>
<tr>
<td>11. Elective course</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>12. Importance of training in ASDs</td>
<td>2</td>
<td>1.0</td>
</tr>
<tr>
<td>13. – 36. Intervention strategies familiar with/used</td>
<td>13</td>
<td>6.2</td>
</tr>
<tr>
<td>37. Other interventions used</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>38. Training in selecting interventions (Y/N)</td>
<td>13</td>
<td>6.2</td>
</tr>
<tr>
<td>39. Types of intervention training received</td>
<td>17</td>
<td>8.1</td>
</tr>
<tr>
<td>40. Preparedness to teach students with ASDs</td>
<td>30</td>
<td>14.4</td>
</tr>
<tr>
<td>41. Special education courses</td>
<td>26</td>
<td>12.4</td>
</tr>
<tr>
<td>42. Professional development in ASDs</td>
<td>25</td>
<td>12.0</td>
</tr>
<tr>
<td>43. Administrator support</td>
<td>25</td>
<td>12.0</td>
</tr>
<tr>
<td>44. Collaboration with others</td>
<td>27</td>
<td>12.9</td>
</tr>
<tr>
<td>45. Facilitators to teaching students with ASDs</td>
<td>24</td>
<td>11.5</td>
</tr>
<tr>
<td>46. Barriers to teaching students with ASDs</td>
<td>24</td>
<td>11.5</td>
</tr>
<tr>
<td>47. Severity of ASD</td>
<td>28</td>
<td>13.4</td>
</tr>
<tr>
<td>48. Importance of parental support</td>
<td>26</td>
<td>12.4</td>
</tr>
<tr>
<td>49. Importance of support staff</td>
<td>30</td>
<td>14.4</td>
</tr>
<tr>
<td>50. General thoughts including students with ASDs</td>
<td>27</td>
<td>12.9</td>
</tr>
</tbody>
</table>
Demographic Data

Summarized in Table 7 are the demographic data of the participants who completed the survey. The modal participant was female (89.4%), Caucasian (87.9%), and held a master’s degree (56.3%). When asked to indicate how many years they have worked as a general education teacher, most respondents indicated that they had been working 15 or more years in the field (44.6%). The modal setting in which participants were employed was an elementary school (56.0%) in a Southern (33.7%), rural school district (63.0%). Additionally, all grade levels (preschool through twelfth grade) were represented in this survey, with the highest number of participants indicating they worked with students in tenth grade (21.5%).

Questions 1, 2, and 3: General knowledge and training in identifying the different types of ASDs and the major/associated characteristics

Participants were asked to share if they had knowledge about or had received specific training regarding ASDs. As illustrated in Figure 1, 29.0% ($n = 60$) of participants indicated that they had knowledge about or had received training in understanding the different types of ASDs. Regarding knowledge and training in understanding the characteristics of ASDs, 44.9% ($n = 93$) of those surveyed noted they had knowledge/training in the major characteristics of ASDs, while fewer participants (31.9%, $n = 66$) reportedly had knowledge/training in the associated characteristics of ASDs. Moreover, 43.0% ($n = 89$) of the teachers responded that they had not received training in ASDs or their major/associated characteristics (note: the percentages do not add up to 100 because participants were able to check more than one response).

Question 4: How did general education teachers receive their training about special education and students with ASDs?
Table 7

*Summary of Demographic Data*

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>22</td>
<td>10.6</td>
</tr>
<tr>
<td>Female</td>
<td>186</td>
<td>89.4</td>
</tr>
<tr>
<td><strong>Ethnicity/Race</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>African American</td>
<td>7</td>
<td>3.4</td>
</tr>
<tr>
<td>Hispanic</td>
<td>8</td>
<td>3.9</td>
</tr>
<tr>
<td>Asian</td>
<td>1</td>
<td>0.5</td>
</tr>
<tr>
<td>Native American</td>
<td>2</td>
<td>1.0</td>
</tr>
<tr>
<td>Caucasian</td>
<td>182</td>
<td>87.9</td>
</tr>
<tr>
<td>Multi</td>
<td>5</td>
<td>2.4</td>
</tr>
<tr>
<td>Other</td>
<td>2</td>
<td>1.0</td>
</tr>
<tr>
<td><strong>Highest Level of Professional Training</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BA/BS</td>
<td>87</td>
<td>42.2</td>
</tr>
<tr>
<td>MA/MS</td>
<td>116</td>
<td>56.3</td>
</tr>
<tr>
<td>PhD/EdD</td>
<td>3</td>
<td>1.5</td>
</tr>
<tr>
<td><strong>Years as a General Education Teacher</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 – 4</td>
<td>28</td>
<td>13.7</td>
</tr>
<tr>
<td>5 – 9</td>
<td>43</td>
<td>21.1</td>
</tr>
<tr>
<td>10 – 14</td>
<td>42</td>
<td>20.6</td>
</tr>
<tr>
<td>15 or more</td>
<td>91</td>
<td>44.6</td>
</tr>
<tr>
<td><strong>Region Employed</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Midwest</td>
<td>48</td>
<td>23.4</td>
</tr>
<tr>
<td>Northeast</td>
<td>43</td>
<td>21.0</td>
</tr>
<tr>
<td>South</td>
<td>69</td>
<td>33.7</td>
</tr>
<tr>
<td>West</td>
<td>45</td>
<td>22.0</td>
</tr>
<tr>
<td><strong>District Type</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td>131</td>
<td>63.0</td>
</tr>
<tr>
<td>Urban</td>
<td>22</td>
<td>10.6</td>
</tr>
<tr>
<td>Suburban</td>
<td>27</td>
<td>13.0</td>
</tr>
<tr>
<td>Mixed</td>
<td>21</td>
<td>10.1</td>
</tr>
<tr>
<td>District with multiple locations</td>
<td>7</td>
<td>3.4</td>
</tr>
</tbody>
</table>

(continued)
Table 7 (continued)

<table>
<thead>
<tr>
<th>Variable</th>
<th>$n$</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>School Type</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elementary</td>
<td>117</td>
<td>56.0</td>
</tr>
<tr>
<td>Middle</td>
<td>61</td>
<td>29.2</td>
</tr>
<tr>
<td>High School</td>
<td>50</td>
<td>23.9</td>
</tr>
<tr>
<td>Other</td>
<td>3</td>
<td>1.4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Grade Levels Serviced</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>PK</td>
<td>3</td>
<td>1.4</td>
</tr>
<tr>
<td>K</td>
<td>30</td>
<td>14.4</td>
</tr>
<tr>
<td>1</td>
<td>32</td>
<td>15.3</td>
</tr>
<tr>
<td>2</td>
<td>24</td>
<td>11.5</td>
</tr>
<tr>
<td>3</td>
<td>30</td>
<td>14.4</td>
</tr>
<tr>
<td>4</td>
<td>18</td>
<td>8.6</td>
</tr>
<tr>
<td>5</td>
<td>35</td>
<td>16.7</td>
</tr>
<tr>
<td>6</td>
<td>31</td>
<td>14.8</td>
</tr>
<tr>
<td>7</td>
<td>31</td>
<td>14.8</td>
</tr>
<tr>
<td>8</td>
<td>35</td>
<td>16.7</td>
</tr>
<tr>
<td>9</td>
<td>40</td>
<td>19.1</td>
</tr>
<tr>
<td>10</td>
<td>45</td>
<td>21.5</td>
</tr>
<tr>
<td>11</td>
<td>42</td>
<td>20.1</td>
</tr>
<tr>
<td>12</td>
<td>41</td>
<td>19.6</td>
</tr>
</tbody>
</table>

*Note.* Percentages may not add up to 100 for certain items because participants were able to indicate more than one response.
Figure 1. Teachers’ knowledge and training in identifying ASDs.
General educators indicated they received training in special education and ASDs across a variety of venues (see Figure 2). Most frequently (27.5%; \( n = 57 \)), teachers received in-service training through their school district. A smaller percentage of teachers (23.2%; \( n = 48 \)) indicated that they had engaged in other types of training related to ASDs (see Table 8 for examples). All other types of training were endorsed less than 10%.

In addition, if participants indicated that they had received training through an elective course, they were asked to identify the type of graduate course that they took. A small number of participants responded to this question (5.3%, \( n = 11 \)), and they identified courses related to special education, autism spectrum disorders, social cognition, teaching, and behavior/learning courses.

**Question 5: Does the level of knowledge general education teachers have regarding students with ASDs vary by demographic differences?**

Initially, for the purpose of completing analyses for this research question, general educators’ years of experience were collapsed into four categories: (a) 0–4, (b) 5–9, (c) 10–14, and (d) 15 or more. Level of training was categorized into bachelor’s (B.A./B.S.) and master’s (M.A./M.S.) degrees. Teachers holding doctoral (Ph.D./Ed.D.) degrees were excluded due to a very small cell number (\( n = 3 \)). There were three categories for the type of school, including elementary, middle, or high school. Participants who checked more than one type of school or answered that they worked in an “Other” type of school were also excluded from this analysis.

To determine if variance existed between general educators’ knowledge regarding ASDs and their demographic information (i.e., level of training, years of experience, and type of school where they work), three chi-square analyses were completed. Due to the repeated chi-square analyses, the Sidak correction (1967, 1968) was used to reduce the probability of making a Type
Figure 2. Types of teacher training experiences in ASDs. Percentages for this research question do not sum to 100 because teachers could check more than one response choice.
Table 8

*Other Types of Training Identified by Teachers*

<table>
<thead>
<tr>
<th>Training Type</th>
<th>Example Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undergraduate coursework</td>
<td>“Undergraduate Education Course”</td>
</tr>
<tr>
<td></td>
<td>“Undergraduate Psychology minor”</td>
</tr>
<tr>
<td>Independent research/reading</td>
<td>“Self-initiated investigation.”</td>
</tr>
<tr>
<td></td>
<td>“Parent brought in a book that I read.”</td>
</tr>
<tr>
<td>Online information/resources</td>
<td>“Reading online articles.”</td>
</tr>
<tr>
<td></td>
<td>“Webinar.”</td>
</tr>
<tr>
<td>Working with other school colleagues and/or personal teaching experiences</td>
<td>“Talking with experts in my school.”</td>
</tr>
<tr>
<td></td>
<td>“Reading and school psychologist.”</td>
</tr>
<tr>
<td>Member of family with ASD</td>
<td>“Lived with an autistic sibling.”</td>
</tr>
<tr>
<td></td>
<td>“Self taught by doing lots of reading and having a child with ASD.”</td>
</tr>
<tr>
<td>Other certifications/experiences</td>
<td>“I have a degree in psychology and I teach about Autism.”</td>
</tr>
<tr>
<td></td>
<td>“Work in a children's psychiatric hospital setting.”</td>
</tr>
<tr>
<td></td>
<td>“Prior Sped certification.”</td>
</tr>
<tr>
<td>Not applicable/no training</td>
<td>“Not applicable.”</td>
</tr>
<tr>
<td></td>
<td>“No training.”</td>
</tr>
</tbody>
</table>
l error. As a result, the level of significance was adjusted from .05 to .00563. The adjusted significance level was used for all subsequent chi-square analyses discussed in this chapter. Results from chi-square analyses did not reveal significant comparisons for this research question. Please refer to Appendix I for the non-significant analyses tables.

**Question 6: How important is training in ASDs to general education teachers?**

Respondents also shared their perspectives regarding the importance of receiving training related to ASDs, ranging from “not at all important” to “extremely important” (see Figure 3). Most frequently, participants indicated that training in ASDs was either “extremely important” (33.5%, n = 70) or “very important” (51.2%, n = 107). No participants reported that training was “not at all important.”

**Questions 7 and 8: Which evidence-based ASD interventions are general education teachers familiar with and/or have used in their classrooms?**

Illustrated in Table 9 are data regarding teachers’ familiarity with and use of the 24 evidence-based ASD interventions identified by the NPDC. The most frequently endorsed familiar interventions were differential reinforcement (48.5%), computer-aided instruction (45.4%), prompting (44.9%), social skills groups (44.4%), functional behavioral assessment (43.4%), and visual supports (43.4%). The least familiar interventions included pivotal response training (30.6%), interruption/redirection (30.1%), time delay (27.6%), video modeling (27.6%), and structured work systems (19.9%). The interventions that teachers reported using most frequently were differential reinforcement (48.5%), prompting (43.4%), reinforcement (42.3%), antecedent-based interventions (36.7%), visual supports (32.7%), and task analysis (32.7%). Least frequently identified interventions in use included speech generating devices (12.2%),
Figure 3. Teachers’ perceived importance in receiving ASD training.
Table 9

*Evidence-based ASD Interventions General Education Teachers are Familiar with and/or Use in their Classrooms*

<table>
<thead>
<tr>
<th>Technique</th>
<th>Familiar Frequency</th>
<th>Have used Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rank(^a)</td>
<td>(n)</td>
</tr>
<tr>
<td>Differential Reinforcement</td>
<td>1</td>
<td>95</td>
</tr>
<tr>
<td>Computer-Aided Instruction</td>
<td>2</td>
<td>89</td>
</tr>
<tr>
<td>Prompting</td>
<td>3</td>
<td>88</td>
</tr>
<tr>
<td>Social Skills Groups</td>
<td>4</td>
<td>87</td>
</tr>
<tr>
<td>Functional Behavioral Assessment</td>
<td>5</td>
<td>85</td>
</tr>
<tr>
<td>Visual Supports</td>
<td>5</td>
<td>85</td>
</tr>
<tr>
<td>Task Analysis</td>
<td>7</td>
<td>83</td>
</tr>
<tr>
<td>Antecedent-Based Interventions</td>
<td>8</td>
<td>81</td>
</tr>
<tr>
<td>Extinction</td>
<td>9</td>
<td>78</td>
</tr>
<tr>
<td>Picture-Exchange Communication System</td>
<td>9</td>
<td>78</td>
</tr>
<tr>
<td>Reinforcement</td>
<td>11</td>
<td>77</td>
</tr>
<tr>
<td>Social Narratives</td>
<td>12</td>
<td>73</td>
</tr>
<tr>
<td>Naturalistic Intervention</td>
<td>13</td>
<td>72</td>
</tr>
<tr>
<td>Peer-Mediated Instruction and Intervention</td>
<td>14</td>
<td>71</td>
</tr>
<tr>
<td>Self-Management</td>
<td>14</td>
<td>71</td>
</tr>
<tr>
<td>Speech Generating Devices</td>
<td>14</td>
<td>71</td>
</tr>
<tr>
<td>Discrete Trial Training</td>
<td>17</td>
<td>69</td>
</tr>
<tr>
<td>Functional Communication Training</td>
<td>18</td>
<td>68</td>
</tr>
<tr>
<td>Parent-Implemented Intervention</td>
<td>19</td>
<td>63</td>
</tr>
<tr>
<td>Pivotal Response Training</td>
<td>20</td>
<td>60</td>
</tr>
<tr>
<td>Response Interruption/Redirection</td>
<td>21</td>
<td>59</td>
</tr>
<tr>
<td>Time Delay</td>
<td>22</td>
<td>54</td>
</tr>
<tr>
<td>Video Modeling</td>
<td>22</td>
<td>54</td>
</tr>
<tr>
<td>Structured Work Systems</td>
<td>24</td>
<td>39</td>
</tr>
</tbody>
</table>

*Note.* Percentages do not add up to 100 because participants were able to indicate more than one response on this question. \(^a\) Rank based on familiarity.
discrete trial training (11.7%), pivotal response training (9.7%), video modeling (4.6%), and structured work systems (4.1%).

Participants were also asked to identify additional types of interventions they utilized that were not specifically listed under the 24 evidence-based interventions. Seventeen participants (8.1%) provided responses to this question. Four teachers (1.9%) responded that they did not use additional interventions with students with ASDs. Selected examples of participants’ comments regarding other interventions used in their classrooms are listed in Table 10.

**Question 9: Have general education teachers received training in selecting and providing interventions to students with ASDs?**

When asked about their intervention training experiences, the majority of respondents (90.3%, n = 179) indicated that they had not received training in providing interventions to students with ASDs in their classrooms. The small number of teachers who reportedly completed training, indicated that they received in-service training through their school district (n = 11), half-day workshop (n = 4), one- to three-day conference (n = 3), mandated and/or elective graduate course (n = 4), and other training activities (n = 17; e.g., webinars, training through their special education department, and consultation with colleagues). No respondents indicated that they had received training through additional graduate experiences.

**Question 10: Does general education teacher use of evidence-based interventions for students with ASDs vary by demographic characteristics?**

Three chi-square analyses were conducted to determine whether teachers’ use of evidence-based interventions varied by demographic characteristics (i.e., level of training, years of experience, and type of school where they work). For the purposes of completing these chi-squares, the top six most frequently used interventions were totaled across each participant (there
Table 10

Other Types of Interventions Used by Teachers

<table>
<thead>
<tr>
<th>Selected Examples of Responses/Other Interventions Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>“I have researched and implemented small steps in sensory therapy.”</td>
</tr>
<tr>
<td>“A lot of the strategies I have used with my ASD students involves simply getting to know them, their likes, dislikes, and triggers and responding appropriately in various ways. It could be as simple as having specific food available for students who only eat a restricted diet due to sensory needs (keeping a box of cereal around for breakfast and snack) or allowing a student to have a specific place on the carpet. Without extensive formal training in ASD, my intervention strategies have come from getting to know my kids and figuring out what works.”</td>
</tr>
<tr>
<td>“Using short concrete statements without ambiguity.”</td>
</tr>
<tr>
<td>“Our school sometimes employs the use of a coach/aid who assists the child throughout the day in all classes.”</td>
</tr>
<tr>
<td>“We have no interventions for this at this time.”</td>
</tr>
</tbody>
</table>
were six top interventions because two interventions were the fifth most frequently used type). The intervention totals were summed for each participant, ranging from 0 to 6 (depending on how many interventions were reportedly used by each teacher). If teachers used 4 or more interventions, they were placed into the “more interventions used” category, and if they used 0 to 3 of the top interventions, they were placed in the “fewer interventions used” category. The demographic variable groupings were the same as previously mentioned (see descriptions under Question 5 discussion for more information).

According to the results of these analyses, one significant comparison was identified (see Table 11). Specifically, general education teachers who held a master’s degree were more likely to use the top six interventions. The results of the non-significant chi-square analyses for this research question are included in Appendix I.

**Question 11: How well trained/prepared do general education teachers believe they are to work with students with ASDs?**

Educators were asked to rate their perceived preparedness for working with students with ASDs in their classrooms from “not at all prepared,” “a little prepared,” “somewhat prepared,” or “very prepared.” As pictured in Figure 4, most frequently, teachers endorsed being “somewhat prepared” (41.9%, n = 75). Least often (5.0%; n = 9) teachers reported that they were “very prepared” to work with this population of students.

**Question 12: What percentage of general education teachers have completed specific courses in special education?**

Teachers were also asked to report if they have completed specific courses in special education. Similar numbers of respondents noted that they had not taken any special education
Table 11

*Chi-square Analyses Comparing Teachers’ Use of ASD Interventions by Training Level*

<table>
<thead>
<tr>
<th>Use of Top 6 Interventions</th>
<th>Training Level</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>BA/BS</td>
<td>MA/MS</td>
<td>Total</td>
<td>(\chi^2)</td>
<td>df</td>
<td>(p)</td>
</tr>
<tr>
<td>More Interventions Used</td>
<td>18</td>
<td>46</td>
<td>64</td>
<td>9.524</td>
<td>1</td>
<td>0.002*</td>
</tr>
<tr>
<td>Fewer Interventions Used</td>
<td>66</td>
<td>62</td>
<td>128</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note. \(*p < .00563 \) needed for significance after calculation of the Sidak correction.*
Figure 4. Teachers’ reported level of preparedness in teaching students with ASDs.
courses (51.4%, \( n = 94 \)) or that they had completed specific special education courses (48.6%, \( n = 89 \)).

**Question 13: What percentage of general education teachers participate in professional development activities to enhance their knowledge of students with ASDs?**

When asked to share information about the frequency with which respondents participate in professional development activities to increase their knowledge of students with ASDs, the majority reported they do not engage in professional development activities related to this topic (70.1%, \( n = 129 \)). Of those who reported engaging in professional development activities related to ASDs, 25.5% reported participating in these activities one time per year (\( n = 47 \)). Seven teachers (3.8%) engaged in professional development two to three times per year. One teacher reportedly attended ASD-related professional development activities more than three times per year.

**Question 14: How much support do general education teachers perceive from administrators (e.g., school principal) to teach students with ASDs?**

Teachers also identified their perceived level of support from administrators when teaching students with ASDs (see Figure 5). Similar rates of endorsement (20–25%) were noted for “insufficient,” neutral, and “somewhat sufficient” support.

**Question 15: What percentage of general education teachers collaborate with other school staff (such as special education teachers, classroom aides, school psychologists) when teaching students with ASDs?**

Respondents supplied information regarding the frequency with which they collaborate with their colleagues in schools regarding students with ASDs (see Figure 6). “Often” was the
Figure 5. Teachers’ perceived level of support from school administrators.

Figure 6. Frequency in which teachers collaborate with other school staff.
most frequently endorsed answer (44.0%, n = 80). Only 10% (10.4%; n = 19) of teachers reportedly “never” collaborate with their colleagues when educating students with ASDs.

**Question 16: What types of facilitators and barriers do general education teachers identify when teaching students with ASDs?**

Summarized in Table 12 are participants’ views on different facilitators and barriers to teaching students with ASDs in general education settings. Responses to each question (i.e., facilitators and barriers) were ranked in order from most frequently endorsed to least frequently endorsed by teachers. The most frequently identified facilitators were (a) “Teaches other students to interact with a variety of other individuals” (66.5%) and (b) “Prior experience working with/teaching students with ASDs” (65.9%). The least frequently endorsed facilitators were (a) “Normalizes individual differences between students” (35.1%), and (b) “Helps to increase diversity in the classroom” (38.9%).

Teachers were also asked to indicate different types of barriers that might impact their teaching students with ASDs. The most frequently identified barrier was “Lack of necessary time and/or knowledge working with students with ASDs” (64.9%), and the second most frequently identified barrier was “Lack of experience (or limited experience) with ASDs” (54.6%). Moreover, the least frequently endorsed barriers were (a) “Including students with ASDs lowers state test scores” (13.5%) and (b) “The behaviors associated with ASDs exceed/are outside of my comfort zone” (15.1%).

**Question 17: To what degree do general education teachers report that the severity of the ASD affects their perspectives of the students?**

Teachers were asked about their perspectives regarding whether the severity of the ASD affects their relationships with these students. As illustrated in Figure 7, the majority of
Table 12

Facilitators and Barriers to Teaching Students with ASDs

<table>
<thead>
<tr>
<th>Variable (Facilitators or Barriers)</th>
<th>Rank</th>
<th>n</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Facilitators (11.5%)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teaches other students to interact with a variety of individuals</td>
<td>1</td>
<td>123</td>
<td>66.5</td>
</tr>
<tr>
<td>Prior experience</td>
<td>2</td>
<td>122</td>
<td>65.9</td>
</tr>
<tr>
<td>Allows for personal/professional growth</td>
<td>3</td>
<td>104</td>
<td>56.2</td>
</tr>
<tr>
<td>Personal experience</td>
<td>4</td>
<td>94</td>
<td>50.8</td>
</tr>
<tr>
<td>Enhances nonacademic skills of all students</td>
<td>5</td>
<td>87</td>
<td>47.0</td>
</tr>
<tr>
<td>Helps increase classroom diversity</td>
<td>6</td>
<td>72</td>
<td>38.9</td>
</tr>
<tr>
<td>Normalizes individual differences between students</td>
<td>7</td>
<td>65</td>
<td>35.1</td>
</tr>
</tbody>
</table>

| **Barriers (11.5%)**                                                                              |      |     |            |
| Lack necessary time and knowledge                                                                | 1    | 120 | 64.9       |
| Lack of/limited experience with ASDs                                                               | 2    | 101 | 54.6       |
| Necessary increase in time to plan curriculum for students                                        | 3    | 83  | 44.9       |
| Lack teaching support                                                                             | 4    | 65  | 35.1       |
| Budgetary/resource concerns                                                                      | 5    | 63  | 34.1       |
| Negative impact on the classroom/education of classmates                                         | 5    | 63  | 34.1       |
| Lack administrative support                                                                       | 7    | 46  | 24.9       |
| ASD behaviors are out of comfort zone                                                             | 8    | 28  | 15.1       |
| Including students with ASDs lowers state test scores                                             | 9    | 25  | 13.5       |

*Note. Percentages do not add up to 100 because participants were able to indicate more than one response*
Figure 7. Degree to which teachers report the severity of the ASD affects their perspectives of these students.
respondents (77.4%, n = 140) answered “not at all” or “to a small degree.” Less than 5% (4.3%; n = 9) of teachers indicated that the severity of the ASD affects them “to a considerable degree” or “to a great degree.”

**Question 18: How important is parental support to general education teachers when working with students with ASDs?**

When asked to identify the importance of parental support when working with students with ASDs, the majority of educators reported that parental involvement is “extremely important” (67.8%, n = 124; see Figure 8). Conversely, two individuals indicated that parental support was “a little important” when working with students with ASDs.

**Question 19: How important are the roles of support staff (such as classroom aides and monitors) to teachers when educating students with ASDs?**

In addition, teachers identified their perceptions regarding the importance of classroom support staff (e.g., classroom aides and monitors) in the education of students with ASDs. The majority of participants (63.7%, n = 114) indicated that support staff members were “extremely important” in teaching students with ASDs (see Figure 9). Few individuals (4.0%, n = 7) reported that support staff members were “a little important” or “somewhat important.”

**Question 20: In general, what are general educators’ thoughts regarding the inclusion of students with ASDs in inclusive/mainstream settings?**

When answering this survey question, most respondents endorsed either “somewhat positive” or “very positive” views regarding the inclusion of students with ASDs in the classroom (61.6%, n = 112; see Figure 10). Similar percentages of teachers reported neutral views regarding the inclusion of students with ASDs (30.2%, n = 55). “Somewhat negative” or “very negative” views regarding the inclusion of students were indicated by 15 teachers (8.2%).
Figure 8. Teachers’ beliefs regarding the importance of parental support in educating students with ASDs.

Figure 9. Teacher’s perceptions regarding the importance of support staff when working with students with ASDs.
Figure 10. General teacher perspectives regarding the inclusion of students with ASDs in their classrooms.
Question 21: Do general education teacher views on different factors that enhance the success of students with ASDs vary by demographic characteristics?

To determine if relationships existed between teachers’ views on factors that facilitate teaching students with ASDs and demographic information (i.e., level of training, years of experience, and type of school where they work), three chi-square analyses were calculated. To complete these analyses, the top five most frequently identified facilitators were summed for each participant, ranging from 0 to 5 (depending on how many facilitators were identified by each teacher). If teachers identified 3 or more facilitators, they were placed into the “more facilitators identified” category, and if they used 0 to 2 of the top facilitators, they were added to the “fewer facilitators identified” category. The demographic variable groupings were the same as the previous chi-square analyses for Questions 5 and 10. Based on these chi-square analyses, there were no significant relationships between teachers’ views on facilitators teaching ASDs and demographic variables. Results of these non-significant chi-square analyses are also provided in Appendix I.

Feedback and Additional Comments from Survey Participants

Respondents were given the opportunity to share additional comments related to the topic at the conclusion of the survey. Forty-nine teachers (23.4%) provided additional feedback regarding the inclusion of students with ASDs in their classrooms. Provided in Table 13 are selected examples of participants’ open-ended comments, which were categorized using the constant comparison method (Glaser & Strauss, 1967). This approach to qualitative data involves a continual process of comparing information within and across categories to create clear distinctions between the categories (Gall et al., 2007). Based on teachers’ additional comments and feedback, several themes/categories emerged, including: (a) support of including
### Examples of Feedback/Comments from Survey Respondents

<table>
<thead>
<tr>
<th>Category/Theme</th>
<th>n</th>
<th>Examples of Feedback/Comments</th>
</tr>
</thead>
</table>
| Support for Inclusion of Students with ASDs | 8  | “Thank you for doing this survey. I hope you get the information you are looking for. I have always enjoyed the students I have with ASD. They add a new perspective to my classroom and help to make our classroom community worthwhile.”  
“The success of ASD students in the classroom is fundamental for the success of all students. With the right setting - teacher, para, administration relationship ASD students can be successful. It prepares all students for real-life experiences.”  
“I feel that every situation is different and that each child with ASD should be given an educational experience that is the most beneficial for them and the others in their classroom.”  
“I have always felt that students with ASD make me a better educator because I have to try new teaching strategies that result in benefits for ALL students.” |

<table>
<thead>
<tr>
<th>Category/Theme</th>
<th>n</th>
<th>Examples of Feedback/Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limited or No Experience teaching students with ASDs</td>
<td>4</td>
<td>“Being very small and very rural, I have had limited experience with autistic students - however, because we are small and rural, the two students we've had with Asperger's spent quite a bit of time with me - as in several hours every day. It was on-the-job learning, but very positive in the end.”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“In my 40 years of teaching, I have not had child diagnosed with ASD in my classroom. I did observe an autistic classroom when I was in college 40 years ago.”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“I have never had one of these students in class.”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“I have not had any students with ASD's in my classroom. I feel that as an extremely small school (68 kids k-12) we would receive the necessary training and support if we have a student with an ASD.”</td>
</tr>
<tr>
<td>Need for Additional Training, Classroom and/or Administrative Support</td>
<td>17</td>
<td>“I think students with ASDs should be in the regular education classroom. However, there should be support in all areas to be successful.”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“At times, I have seen children with ASD function well in a mainstream classroom. However, at times I have seen students become aggressive and hurt others. It is difficult to redirect students without the proper support. Due to the lack of support, teachers struggle with mainstreaming.”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“We need more and better training.”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“There are too many time constraints and lack of support for teaching special needs children unfortunately.”</td>
</tr>
<tr>
<td>Category/Theme</td>
<td>n</td>
<td>Examples of Feedback/Comments</td>
</tr>
<tr>
<td>---------------</td>
<td>----</td>
<td>------------------------------</td>
</tr>
<tr>
<td>Severity of ASD</td>
<td>14</td>
<td>“Depending on the severity of the ASD, it can negatively impact the pacing and frustration level of the class. For the most part, student with ASD can function normally in a classroom using accommodations. However, severe cases without the proper classroom support can negatively affect the learning of the other students in the class because of how much individual attention he/she requires from the teacher.”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“From what I know of ASD the degree of severity can vary greatly. I am not able to make a blanket statement since each case/child would present a completely different situation. The one child I have taught was not inclusion and could not have achieved in a regular classroom.”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“I taught a child with autism but he was not severe. He had some quirks, but he was able to work in the classroom with assistance. Therefore, I had a positive experience with him. We have another autistic child that has severe behavior issues and he is a danger to the other children and to the staff members. I do NOT believe that this child should be mainstreamed into the classroom at all. He spits, kicks, pulls hair, yells at the children, and hits. He runs away from the teachers constantly.”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“I have a difficult time managing my middle school class when a severely disabled child is present with no support staff. It feels like that child takes most of my effort and attention, to the detriment of the learning of other students in the class. I'm not sure the severely ASD child actually benefits from the classroom social interactions. Students less affected by ASD do seem to benefit and are easier to integrate into my class.”</td>
</tr>
<tr>
<td>Category/Theme</td>
<td>n</td>
<td>Examples of Feedback/Comments</td>
</tr>
<tr>
<td>----------------------------------------</td>
<td>---</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| Impacts Other Students’ Education/Safety | 3 | “I think inclusion is fine when the student does not interfere with the learning of all the other students. When their behaviors are so great that the others cannot learn then they should have another place to go.”  
“I support inclusion of students with ASDs except when there is a chance of causing injury to others. Students, any student, not just those with ASD, should not be in the classroom when that child is in danger of causing injury to others or when there is extreme classroom disruptions throughout the day. No one is benefiting from this.”  
“While I completely support the inclusion of ASD students, I do feel that when the learning of the other students in the classroom is inhibited, these students should be removed. At a point when general learning can not take place, I feel like that setting is no longer the LRE.” |
<p>| Comments on Survey Question # 50       | 3 | “Question 50 is a loaded question. Many students labeled ASD are successful in the classroom setting. However, when a severely affected student is placed in an academically rigorous course, it can and does cause a negative impact on the education of other students in the classroom including other students in that same classroom who carry a label as well. The answer 'somewhat negative' is because a number of labeled students have been misplaced. The pattern I've noted over the years is the typical student in the high school setting recognizes misplacement quickly, then drops the course; the labeled student does not. To make matters worse, there are other adults encouraging the student to stay in a class that is not going to benefit the student and is negatively impacting other students. We need to do a better job of placing ALL students (labeled or not) in classes that are a good match for them.” |</p>
<table>
<thead>
<tr>
<th>Category/Theme</th>
<th>n</th>
<th>Examples of Feedback/Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comments on Survey Question # 50 (continued)</td>
<td>3</td>
<td>“#50-This really depends on the individual student. There are many students who cause disruptions impairing the ability to teach and the learning of the other students. As a classroom teacher, I depend on the ability of the paraprofessional to assist these students. The paraprofessionals are not always competent to handle the issues of every child with ASD. Proper, professional, competent support is essential.”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“My answer to Q. 50 reflects my belief that without proper teaching training and support, mainstreaming can be very difficult and even detrimental to the learning experience of the whole class. With appropriate training and support, mainstreaming is more successful for all students. In my experience, it all comes down to money. If districts believe they can get teachers to mainstream ASD students without additional training or support, they will place them as needed according to class openings. Once placed, it becomes extremely difficult for the teacher to get extra support or training. Districts will stonewall parents and staff to avoid the extra costs. I have seen several families having to retain legal services to receive appropriate services. Unfortunately, I have also seen my peers refuse to follow IEP's or deal appropriately with ASD students. They feel put upon having to include these students in their classrooms. Teacher training is CRITICAL to ensure success for all.”</td>
</tr>
</tbody>
</table>

*Note. Selected comment examples were provided for each category/theme (3-4 examples each). Some comments were not included due to identifying information included in the response and/or typographical/grammatical errors.*
students with ASDs; (b) limited experience teaching students with ASDs; (c) need for additional training, classroom and/or administrative support; (d) the severity of the ASD; (e) impact of students with ASDs on the education/safety of peers; and (f) comments related to survey Question # 50 (i.e., “In general, what are your thoughts regarding the inclusion of students with ASDs in mainstream settings?”).
Chapter 5: Discussion

Overview

Children with disabilities, including those with ASDs, are required by federal law to be educated in their least restrictive learning environment, which may involve inclusion classrooms. Because children with ASDs typically present with difficulties in social and communication skills, general educators may experience different obstacles when teaching this population of students. Classroom teachers’ views regarding the broad practice of inclusion have been thoroughly investigated in the research literature (Chmiliar, 2009). In general, teachers express positive opinions regarding the inclusion of students with disabilities (Scruggs & Mastropieri, 1996), but some research suggests that teachers may experience more reluctance to educating students with severe disabilities (Cook, 2001).

The goal of this study was to expand upon previous research concerning the perceptions and opinions of general education teachers regarding students with ASDs in general education classrooms. In particular, this study investigated general education teachers’ level of knowledge and understanding of ASDs, their level of understanding and use of the available evidence-based interventions for ASDs in their classrooms, their perspectives of included students with ASDs, as well as their opinions regarding different factors that affect the success and difficulties of students with ASDs in general education settings.

Provided in this chapter is a discussion of the results of this study. The discussion begins with a summary of the respondent characteristics and how this demographic information compares to national characteristics of US public school teachers. Next, a review of the major findings is included (i.e., teachers’ knowledge and training related to ASDs, teachers’ use and familiarity of interventions for ASDs, and factors influencing teachers’ work with students with
ASDs). Implications for education (both training and practice) are discussed next. Limitations of the present study and considerations for future research in this area are then explained. This chapter concludes with a summary of the entire research investigation, and key points are examined.

**Respondent Characteristics**

When research is completed, it is important to establish the extent to which the results can be generalized to the greater population. In order to determine the generalizability of results for the current study, a comparison was made between general education teacher characteristics in this investigation and the demographics of US public school teachers, according to national statistics (National Center for Education Statistics; NCES, 2013). In addition, it is important to consider the type of sampling method used when discussing generalizability of research results. As mentioned in Chapter 3, a random sampling procedure was used to select participants from each state (including Washington, DC) to ensure equal geographic representation.

The modal participant for this study was a Caucasian female who held a master’s degree and had been working 15 or more years in the field of education. The modal setting in which general educators were employed was an elementary school in a Southern, rural school district. In addition, all grade levels (i.e., preschool through twelfth grade) were included in this study. The highest number of teachers in this study reported to work with students in tenth grade.

When comparing demographic information in the current study to results from the NCES (2013) regarding demographic information for US public school teachers, many similarities were noted. Nationally, the majority of teachers were non-Hispanic Caucasian (82%) and female (76%; NCES, 2013). Regarding years of experience, US public school teachers had been teaching on average for 14 years, and 48% of teachers held a master’s degree, according to the
NCES (2013). Additionally, Feistritzer (2011) surveyed a national sample of teachers and found that 31% were employed in urban school districts, and 23% worked in rural areas of the country. Approximately half of teachers (48%) taught preschool through grade four (Feistritzer, 2011). Similar percentages of teachers worked with students in grades five through eight (26%) and grades nine through twelve (27%), according to Feistritzer (2011).

Overall, the statistics regarding demographic information (gender, ethnicity, education, years of experience, etc.) from this study compared to previous studies investigating the demographics of US public school teachers (e.g., Feistritzer, 2011; NCES, 2013) were similar. Two potential differences that were noted were district type (e.g., urban, rural) and school type (i.e., grade levels serviced). These demographic differences should be considered when interpreting the results of this study and generalizing the information to the larger population of teachers. It is also important to consider that each state has different requirements and regulations for teacher certification. More specifically, certain states require teachers to obtain their master’s degree for permanent certification (e.g., New York; New York State Education Department, 2014). In addition, due to the limited response rate (i.e., 11.16%) of the current study, the results can only be generalized to those participants who responded to the survey.

**Teacher Knowledge and Training Related to ASDs**

An extensive survey investigating general education teacher perspectives on the inclusion of students with ASDs was conducted. More specifically, this study investigated general education teachers’ knowledge and training experiences related to teaching students with ASDs. Notably, 43% of teachers in the current study responded that they had not received any training in ASDs or their major/associated characteristics. This percentage is similar to Saddler’s (2012) study where approximately one-half of teachers (in New York State only) who were surveyed
had not received training related to teaching students with ASDs. In the current investigation, less than one-third (29%) of teachers indicated that they had received training in understanding the different types of ASDs. Moreover, about 45% of respondents noted they have knowledge/training concerning the major characteristics of ASDs. Fewer participants (31.9%) reported to have knowledge/training of the associated characteristics of ASDs. As noted in Chapter 4, these percentages do not add up to 100 because participants were able to check more than one response to that survey question.

Regarding preparedness for teaching students with ASDs, less than half (41.9%) of educators in the current study endorsed being “somewhat prepared” to teach students with ASDs, while only 5% of teachers reported they were “very prepared” to work with this population of students. Some participants shared additional comments regarding their lack of training related to students with ASDs. For example, one teacher said, “[i]n my 40 years of teaching, I have not had [a] child diagnosed with ASD in my classroom. I did observe an autistic classroom when I was in college 40 years ago.” Another teacher shared the following statement: “I have never had one of these students in class.” Prior investigations have found similar results, suggesting that teachers often lack training related to teaching students with disabilities (e.g., Kind & Edmunds, Leblanc et al., 2009).

General educators in this study indicated they received training in special education and ASDs across several types of settings. Most frequently (27.5%), teachers received in-service training through their school district; similarly, 23.2% reported that they had engaged in other types of training related to ASDs. Teachers rarely (about 5%) received training through an elective course related to special education, autism spectrum disorders, social cognition, teaching, and behavior/learning courses. Participants were also asked to share information
regarding whether they had completed specific courses in special education. Similar numbers of respondents noted that they had not taken any special education courses (51.4%), or had completed specific special education courses (48.6%).

When asked to share information about the frequency with which they participate in professional development activities to increase their knowledge of students with ASDs, the majority (over 70%) of respondents indicated they do not participate in professional development activities related to this topic. Of those respondents who reported engaging in professional development activities related to ASDs, 25.5% reported participating in these activities one time per year. These results are consistent with previous studies that suggested teachers do not receive an adequate amount of training related to including students with disabilities in their classrooms (e.g., Hargrove, 2010; King & Edmunds, 2001; Martin et al., 2003).

Respondents also shared their perspectives regarding the importance of receiving training related to ASDs, ranging from “not at all important” to “extremely important.” The majority of participants in this study (over 80%) indicated that training in ASDs was either “extremely important” or “very important.” Examples of comments that teachers shared included the following: “We need more and better training,” “There are too many time constraints and lack of support for teaching special needs children unfortunately,” and “I think students with ASDs should be in the regular education classroom. However, there should be support in all areas to be successful.” These findings regarding teacher training reflect the results from previous studies that indicated increased training and professional development opportunities are important for successful inclusion of students with disabilities (e.g., Hargrove, 2010; King & Edmunds, 2001; Leblanc et al., 2009; Martin et al., 2003; Messemer, 2010; Shemesh, 2009; Van Reusen et al; 2001).
Interventions for ASDs: Teacher Use and Familiarity

Teachers were also asked to report their familiarity with and use of the 24 evidence-based ASD interventions identified by the NPDC. The most frequently endorsed familiar interventions were differential reinforcement, computer-aided instruction, prompting, social skills groups, functional behavioral assessment, and visual supports. The least familiar interventions included pivotal response training, interruption/redirection, time delay, video modeling, and structured work systems.

The interventions that teachers reported using most frequently were differential reinforcement, prompting, reinforcement, antecedent-based interventions, visual supports, and task analysis. As discussed in Chapter 4, a significant relationship was found between general education teachers who held a master’s degree and the likelihood that they use the top six identified evidence-based interventions. The least frequently identified interventions that teachers use included speech generating devices, discrete trial training, pivotal response training, video modeling, and structured work systems. These results are similar to Saddler’s (2012) study, which suggested that only six of the 24 evidence-based practices (i.e., social narratives, differential reinforcement, visual supports, functional behavioral assessment, prompting, and reinforcement) were being used by more than half of the participants who responded to the survey used in that investigation (i.e., New York State teachers).

The current study also examined whether general education teachers have received training in selecting and providing interventions to students with ASDs. The majority of respondents (over 90%) indicated that they had not received training in providing interventions to students with ASDs in their classrooms. The small number of teachers who reportedly completed training indicated that they received it through a variety of venues (e.g., in-service
training through their school district, workshops, conferences, mandated and/or elective graduate course, and other training activities [webinars, training through their special education department, and consultation with colleagues]). When comparing the current investigation to Saddler’s (2012) work, more participants in the current study reported they were not aware of the best practices available to teach students with ASDs (90% versus 50%). Differences between the current research and Saddler’s (2012) study may be due to a variety of factors, including differences in the two samples of teachers. More specifically, the current study included a national sample of general education teachers representing all grade levels and states, while Saddler’s (2012) investigation included a sample of elementary school teachers from New York State who had students with ASDs in their classrooms.

Factors Influencing Teachers’ Perspectives of Students with ASDs

In the current study, general education teachers were asked to share information about their views and opinions regarding the inclusion of students with ASDs in their classrooms. The majority of teachers who participated in this investigation reported neutral, “somewhat positive,” or “positive” views regarding the inclusion of students with ASDs. Only 15 teachers reported to have “somewhat negative” or “negative” views on mainstreaming students with ASDs in their classrooms, suggesting that most teachers hold favorable views regarding the inclusion of students with ASDs. These findings are comparable to previous studies indicating that teachers generally have positive views regarding the inclusion of students with disabilities in general education settings (e.g., Chmiliar, 2009; Finke, et al., 2009; Scruggs & Mastropieri, 1996).

Severity of the ASD. According to previous research (e.g., Cook, 2001), the severity of a student’s disability can impact educators’ views toward inclusion. Teachers in the current study were also asked to describe the extent to which the severity of the ASD impacted their
perceptions of the students. The majority (77.4%) of teachers in this study reported that their perceptions are not affected by the severity of the ASD, which is inconsistent with Cook’s (2001) investigation regarding the severity of the disability impacting teacher perspectives on inclusion.

There are several hypotheses regarding the difference between the results of this study and prior research. First, it is presumed that general educators with more years of experience may feel more comfortable teaching all types of students (those with and without disabilities). As discussed previously, the majority of participants in this study reported having several years of teaching experience. It is possible that teachers who have more years of experience may be more comfortable working with students with ASDs who are considered more severe. Second, it is thought that media exposure of ASDs in general may play a role in teachers’ perspectives of the severity of ASDs. Because ASDs are discussed frequently in the media, teachers may believe that they have more of an understanding of these students (regardless of their severity). Third, the prevalence of ASDs continues to rise, and one in 68 children have ASDs (CDC, 2014). As a result, the general public may have more knowledge of ASDs due to its increasing prevalence rates. It is thought that some teachers may not believe the severity of the disorder impacts their perspectives due to their common knowledge of ASDs and the frequency with which students are identified as having ASDs.

**Perceived support from administrators.** Teachers were also asked about the importance of different supports in the inclusion of students with ASDs. Based on information from previous studies (e.g., Messemer, 2010), teachers described themselves as more competent to teach in inclusion settings if they had support from their administrators. In the current study, participants described the degree to which they felt supported by their administrators when teaching students with ASDs. Approximately 25% of teachers indicated they had insufficient
support from their school administrators when teaching this population of students in general education classrooms.

**Collaboration and work with colleagues.** Another valuable resource for general educators is their colleagues (e.g., special education teachers, aides, guidance counselors, and/or school psychologists; DeSimone & Parmar, 2006). In fact, Segall and Campbell (2012) found that school psychologists and special education teachers have a higher level of experience, training, and knowledge regarding students with ASDs compared to general educators. Given this information, general educations would likely benefit from frequent collaboration and consultation with these professionals when determining effective strategies for teaching students with ASDs. General educators in this investigation described the frequency with which they collaborate with other school staff (such as special education teachers, classroom aides, school psychologists) when educating students with ASDs in their classrooms. Only 19 teachers (approximately 10%) reported that they do not collaborate with other professionals/staff when working with students with ASDs, suggesting that collaboration is common in the inclusion of this population of students.

**Parental and staff support.** When asked about the importance of parental support in the inclusion of students with ASDs, the majority of teachers indicated that parental support is “extremely important.” Similarly, teachers were asked to identify the importance of support staff in the education of students with ASDs in general settings, and most of them indicated that support staff are “extremely important” as well. It is clear that having support from other key individuals is crucial to teachers working with students with ASDs. Similar results were found in Emam and Farrell’s (2009) investigation, which suggested that teachers often seek assistance from teaching assistants to manage tensions related to including students with ASDs.
Facilitators and barriers to including students with ASDs. According to previous research studies, certain factors can affect the success of including students with disabilities in general education settings. More specifically, Messemer (2010) found that teachers expressed more preparedness to work in inclusion settings if they had adequate time to plan. Lack of proper training was also identified as a challenge for teachers working with students with disabilities (e.g., Shemesh, 2010; Van Reusen et al., 2001).

Based on previous research findings, participants in the current study were asked to identify various facilitators and barriers when teaching students with ASDs. General educators in this study most frequently identified the following facilitators for including students with ASDs: (a) other students in the classroom have opportunities to interact with a variety of individuals, and (b) years of experience. Teachers were also asked to indicate different types of barriers that impact their teaching of students with ASDs. Lack of necessary time, knowledge, and experience working with students with ASDs were the most frequently identified barriers to the inclusion of students with ASDs, which was consistent with previous research studies (e.g., Finke et al., 2009; Hargrove, 2010; King & Edmunds, 2001; Leblanc et al., 2009).

Implications for Education: Training and Practice

The results of the current study suggested specific implications for the field of education in regard to both training and practice. Particularly, the implications for this study indicated that teachers should (a) be provided with frequent opportunities for training (during their preparation/education, as well as when they are practicing teachers), (b) engage in continual professional development opportunities to increase their knowledge about ASDs and the evidence-based interventions available to treat them, and (c) access support from other professionals in their district such as special educators, school psychologists, social workers, and
directors of special education, as well as have support from other important stakeholders (i.e., parents, principals/administrators, paraprofessionals, other general educators).

**Teacher training and professional development on ASDs and interventions.** Over half of the teachers who participated in the survey indicated that they had not taken courses in special education or ASDs. In addition, a very high number of respondents indicated that they had not received training in providing interventions to students with ASDs in their classrooms. Furthermore, participants in the current investigation indicated that training in ASDs was either “extremely important” or “very important,” despite their lack of training.

This information is similar to previous research investigations, which suggested teachers do not have sufficient time or training to support the needs of children with disabilities in inclusion classrooms (e.g., Barnes, 2008; Hargrove, 2010; Macmillan & Meyer, 2006; Scruggs & Mastropieri, 1996). In fact, the most negative attitudes expressed by teachers were from those who had the least amount of special education training (Van Reusen et al., 2001). Even when teachers are provided with small amounts of training and professional development regarding ASDs, it can significantly reduce their anxiety and increase their knowledge of ASDs and intervention strategies (Leblanc et al., 2009).

In order to effectively teach and meet the needs of students with ASDs, general educators need to be provided with specific training and professional development opportunities related to special education and ASDs specifically. This education and training could be completed through various methods. For example, general education teachers could receive the training through their educational degree programs or through continuing professional development as practicing educators by attending workshops, consulting with experts, attending presentations from local autism societies, and so forth. Importantly, the results of this study suggested that
teachers with a master’s degree were more likely to use the top six evidence-based interventions that have been identified; however, most teachers (regardless of their level of degree) have not received training in providing interventions to students with ASDs in their classrooms.

**Support from other professionals and key individuals.** In previous studies, as well as the current study, teachers have noted the importance of collaboration and support from others professionals (DiSimone & Parmar, 2006). Another major implication for educational practice gleaned from this study is in regard to teachers’ support from other individuals, such as administrators, parents, support staff, and other colleagues. It is beneficial for teachers to have support from school administrators in order to effectively educate all of their students, including those with disabilities and ASDs. Results from this study suggested that many teachers do not believe they are supported by administrators when teaching students with ASDs. More specifically, less than 15% of teachers who participated in this study indicated they received “sufficient support” from their administration. To help address this issue, it may be important for administrators to have opportunities for training and professional development related to ASDs. This may increase collaboration between teachers and administrations related to teaching students with ASDs and promoting their success in the classroom.

Further, participants in the current study suggested the importance of parental support in the education of students with ASDs (the majority of teachers noted parental support was “extremely important”). As such, teachers and parents need opportunities for frequent communication and collaboration to best meet the needs of students, including those with ASDs, in general education classrooms. This collaboration could occur through a number of venues: parent/teacher phone contact, electronic communication, face-to-face meetings, as well as
meeting with other team members in the school (e.g., school psychologists, therapists, school principals).

**Limitations and Future Research**

The current study provided information regarding general education teachers’ knowledge and perspectives regarding students with ASDs in their classrooms. When discussing research results for any investigation, it is imperative to address the major limitations of the study. There were specific limitations identified for the current study, which are explained in the sections below. By investigating the limitations of the current study, ideas and suggestions for future research in this area were also determined.

**Survey research limitations.** As discussed in Chapter 2, there are numerous advantages and disadvantages to conducting survey research. Nonresponse error may occur as a result of participants who do not respond to the survey being different than those who do respond in a way that is important to the study (Dillman et al., 2009). Other major limitations of survey research include sampling procedure errors, biases in the responding sample, and participants accidentally or purposefully leaving items blank (Groves, 1989; Mangione, 1995). In the current study, certain respondents left items blank (either accidentally or intentionally). In order to address these limitations in future studies, shorter surveys could be utilized that focus on more specific content. It may also be useful for future studies to assess the characteristics of those participants who did not respond to certain questions and examine potential reasons for their response pattern.

In the current study, all US states and grade levels (i.e., preschool through twelve) were represented in the responding sample. Also, as mentioned earlier in this chapter, the statistics regarding demographic information (gender, ethnicity, education, years of experience, etc.) from
this study were similar to previous studies investigating the demographics of US public school teachers (e.g., Feistritzer, 2011; NCES, 2013). Although a random sampling method was utilized to initially gather participants’ email addresses, it is possible that the sample was not fully representative of the population of general education teachers due to differences in district type (e.g., urban, rural) and school type (i.e., grade levels serviced), as explained earlier in this chapter. In terms of generalizing the results of this study as a whole, it is important to consider the inherent limitations that are associated with survey research, as well as the particular limitations that are identified with the current study in particular. Future studies could employ different methods of data collection, such as shorter/more specific surveys, focus groups, and accessing a specific target population of teachers who specifically work with students with ASDs.

**Small sample size and low response rate.** Another major limitation of the current research study was the small sample size of participants who responded \( n = 209 \) and the overall low participant response rate (11.16%). According to Gall and colleagues (2007), the statistical power of a study is directly impacted by sample size. In addition, Mangione (1995) suggested researchers completing survey research must sustain a high response rate of approximately 75% because individuals filling out surveys may respond in a biased manner (despite using random sampling procedures/techniques). It is also noted in the literature that internet-based survey research in particular can result in low response rates (e.g., Cook et al., 2000). As previously discussed, the overall response rate of the current study remained low, despite multiple e-mailings at different times in the year school year (i.e., summer and fall months), as well as the gift card drawing incentive (participants had the opportunity to win one of two $50 Visa gift cards if they completed the survey and entered the optional drawing). Given the low response
rate of the current study, it may be best understood as an exploratory study of general education teachers’ perspectives and knowledge regarding students with ASDs. When considering future research in this area, it is also important to consider the phenomenon of survey fatigue (Porter et al., 2004). More specifically, individuals who have already completed one or two surveys may decide that they have adequately contributed as survey participants and may not desire to complete additional surveys (Dillman et al., 2009; Groves & Magilavy, 1981). As mentioned, future studies should consider using alternative methods of data collection, such as shorter surveys, focus groups, and participants who may be more motivated to respond (i.e., those who work with students with ASDs).

Further, when comparing the response rates for different types of surveys (i.e., postal mail, internet-based, or mixed-mode), Greenlaw and Brown-Welty (2009) indicated that mixed-mode survey techniques (i.e., a combination of internet-based and paper-based methods) had the highest response rate: 60.3%. To address this limitation in future research in this area, it may be useful to send the survey though the mail rather than using an electronic communication or use a mixed-mode approach in order to increase the participant response rate. If electronic methods are used, Bethlehem and Biffingandi (2012) also suggested that customized email reminders might increase the response rate by reminding participants to complete the survey. Future researchers studying this topic could utilize personalized email reminders as a strategy to increase response rates. On a different note, it may also be helpful for future researchers to combat low response rates by contacting school district administrators (e.g., superintendents, principals) for their support and assistance in identifying teachers who work directly with students with ASDs in inclusion settings.
Grade levels served, experiences teaching students with ASDs, and years of teaching experience. It is noteworthy that the types of interventions teachers have familiarity with and use in their classrooms may vary depending on the grade levels they serve, whether they have experiences working with students with ASDs, as well as their years of teaching experience. In particular, teachers working with younger students in elementary and middle schools may be utilizing different types of interventions (e.g., functional behavioral assessment, PECS) compared to students in high school who may be more independent in the classroom and require less direct, targeted interventions.

Also, it was assumed in this study that general education teachers had at least some prior experience working with students with ASDs, especially due to its increasing prevalence rates. Based on the survey data collected, some teachers reported having no prior experience working with this population of students. As a result, future investigations should clearly distinguish between teachers with and without prior experiences teaching students with ASDs.

Additionally, the most common participant in this study reported having more than 15 years of experience. Early career teachers may report different experiences with their training and knowledge of students with ASDs and evidence-based interventions, especially if new requirements related to special education and ASDs were included in their teacher preparation programs. Future studies should investigate differences between the grade levels of students served, as well as years of experience, and the types of interventions teachers have knowledge about and use in their classrooms.

Teachers’ perspectives of facilitators and barriers to teaching students with ASDs. In the current study, teachers were asked to identify certain factors that enhance the education of students with ASDs, as well as obstacles they may encounter in their classrooms. The survey
questions in this study that addressed the facilitators and barriers to teaching students with ASDs did not include an opportunity for participants to share open-ended responses. Future studies should consider giving teachers the opportunity to share additional comments regarding facilitators and barriers to teaching students with ASDs to ensure their responses are not limited.

**Other school professionals who implement interventions to students with ASDs and provide support to teachers.** General education teachers in this study were asked about their familiarity with and use of various interventions for students with ASDs. Some participants reported being familiar with certain interventions, but they did not report using them in their classrooms. For example, almost half of the teachers in this study (44.4%) reported having familiarity with the Social Skills Groups intervention, but only 18.4% of teachers reported using Social Skills Groups. Future research in this area should include the consideration of other school professionals who may be providing these interventions. More specifically, school psychologists or social workers may offer group counseling to students with ASDs that focuses on increasing social skills.

As mentioned previously, many participants in this study reported they did not feel supported to teach students with ASDs. Given this finding, it may be important for future studies in this area to address which supports would be helpful for general education teachers. Particularly, future research should determine the types of specific assistance that other professionals (e.g., school psychologists, special education teachers, administrators) could provide to teachers to help them feel supported (e.g., more collaboration, a resource library).

**Individual state teaching certification requirements and courses.** As noted in the beginning of this chapter, teaching requirements for certification in each state are different (e.g., certain states, such as New York, require a master’s degree). Future research studies should
examine each state’s teaching certification and training requirements. Researchers should also consider the issue of whether coursework in special education is required (e.g., the exceptional child). By considering this information, researchers could determine whether relationships exist between teachers’ knowledge and perceived preparedness to teach students with ASDs and the types of educational experiences they have (per their state requirements).

**New interventions identified by the NPDC.** An additional consideration for future research is to include updated evidence-based interventions and groupings that have been identified by the NPDC. Since this study was proposed in 2013, the NDPC has incorporated changes to the 24 evidence-based interventions previously identified by expanding certain categories in 2014. For instance, Computer-Aided Instruction and Speech Generating Devices were expanded to a new category called Technology-Aided Instruction and Intervention (Wong et al., 2014). In addition, recent research has supported additional types of interventions, which have been added to the NPDC’s list of evidence-based treatments for ASDs, including (a) Cognitive Behavior Intervention, (b) Exercise, (c) Modeling, (d) Scripting, and (e) Structured Play Group. Structured Work Systems were removed from the list due to more rigorous criteria for effectiveness that resulted in limited to no effectiveness for this intervention (Wong et al., 2014).

**Diagnostic and Statistical Manual of Mental Disorders – Fifth Edition (DSM-5).**

Another limitation of the current study is related to the introduction of the Diagnostic and Statistical Manual of Mental Disorders – Fifth Edition (DSM-5; APA, 2013). When this research project was initially proposed in April 2013, the conceptualization and definition of autism spectrum disorders/pervasive developmental disorders was taken from the then current DSM-IV-TR (APA, 2000). When the DSM-5 was released in May 2013, it included new
information and a new classification system/understanding of autism spectrum disorders. According to the APA (2013a), autism spectrum disorder is a new DSM-5 category that includes four previously distinct disorders: autistic disorder (autism), Asperger’s disorder, childhood disintegrative disorder, and pervasive developmental disorder not otherwise specified. These disorders are now considered a single condition with different levels of symptom severity in two core domains: (a) deficits in social communication and social interaction; and (b) restricted repetitive behaviors, interests, and activities (RRBs; APA, 2013a). The results of the current study should be interpreted with an understanding that the terms and definitions for autism spectrum disorders were taken from a now outdated version of the DSM (although it was current at the time the study was proposed).

Future research studies concerning this topic should incorporate the new DSM-5 ASD criteria rather than the older DSM-IV-TR criteria. Additionally, it may be important for researchers to explain the changes to future general educators, especially due to the elimination of Asperger’s disorder as a separate autism spectrum disorder category.

Summary

Because federal regulations require that children with disabilities be taught in their least restrictive learning environment, students with ASDs are frequently included within general education classrooms (Chmiliar, 2009; Friedlander, 2009; Williams et al., 2011). Given the characteristic impairments that students with ASDs display (i.e., difficulties with social interaction/communication and restrictive attitudes/interests), general education teachers and students without disabilities in general education classrooms may experience tension and challenges as a result of their inclusion (Horrocks et al., 2008; Robertson et al., 2003).
The results of the current research study provided initial/preliminary information regarding general education teachers’ level of knowledge and understanding of ASDs, their level of understanding and use of the available interventions for ASDs in their classrooms, their perspectives of included students with ASDs, as well as their opinions regarding different factors that affect the success and difficulties of students with ASDs in general education settings. Although classroom teachers’ views regarding the broad practice of inclusion have been thoroughly investigated (Chmiliar, 2009), fewer studies have examined general educators’ views regarding the inclusion of students with ASDs specifically. This research study expanded upon previous investigations examining the perceptions and relationships of general education teachers with students with ASDs in general education classrooms, and it examined this information at a national level, which has not previously been done (according to this researcher’s knowledge).

The results of the current study revealed that most teachers viewed the practice of inclusion (including students with ASDs) in a positive manner, which is consistent with previous studies (e.g., Chmiliar, 2009; Robertson et al., 2003). In the current study, almost half of teachers responded that they had not received any training in ASDs or their major/associated characteristics; however, the overwhelming majority of teachers indicated that training in ASDs was either “extremely important” or “very important.”

The current study also examined general educators’ familiarity with and use of the 24 evidence-based ASD interventions identified by the NPDC (2013), as well as whether teachers have received training in selecting and providing interventions to students with ASDs. Importantly, the majority of respondents indicated that they had not received training in providing interventions to students with ASDs in their classrooms. Interestingly, a significant
relationship was found in that teachers with a master’s degree were more likely to use the top six identified evidence-based interventions for ASDs. This study also investigated the different factors that influence teachers’ perspectives of students with ASDs, including severity of the ASD, perceived support from school administrators, collaboration and work with colleagues, parental support, and other classroom facilitators and barriers to teaching students with ASDs.

With respect to implications for educational practice, teachers need to be given ample opportunities for professional development and training through their educational programs and school districts. Previous research has indicated that when teachers are given training, even in small amounts, it can substantially increase their comfort levels and decrease their anxiety related to teaching students with ASDs (Leblanc et al., 2009). Another implication for educational practice determined from this study is in regard to teachers’ support from other individuals (e.g., administrators, parents, support staff, colleagues, school psychologists). More specifically, regular collaboration with others and support from parents, administrators, and other school staff can provide support to teachers and promote the educational success of all students, including those with ASDs.
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APPENDIX A: GENERAL EDUCATION TEACHER SURVEY
(Adapted to comply with APA format)

General Education Teachers’ Knowledge, Training, and Perspectives of Students with ASDs Questionnaire

Instructions: Please complete the following questions to the best of your ability.

I. Demographic Information:

1. **What is your gender?**
   - □ Male □ Female

2. **Please select the term that best describes your ethnicity/race.**
   - □ African American □ Hispanic □ Asian □ Native American □ Caucasian □ Multi □ Other (Please specify) ____________

3. **What is your highest level of professional training?**
   - □ BA/BS □ MA/MS □ PhD/EdD

4. **How many years have you been a general education teacher? ______

5. **Please indicate the state in which you are currently employed. ______

6. **Please indicate the type of school district in which you are currently employed.**
   - □ Rural □ Urban □ Suburban □ Mixed □ District with multiple locations

7. **Please indicate the type of school in which you work (check all that apply).**
   - □ Elementary □ Middle □ High school □ Other

8. **Please indicate the grades that you service (check all that apply).**
   - □ Pre-K □ K □ 1 □ 2 □ 3 □ 4 □ 5
   - □ 6 □ 7 □ 8 □ 9 □ 10 □ 11 □ 12
II. Knowledge and training regarding students with Autism Spectrum Disorders (ASDs):

9. Please indicate whether you have knowledge about or have received training in the following (check all that apply):

□ Understanding the different types of ASDs: Autistic Disorder (AD), Asperger’s Syndrome (AS), and Pervasive Developmental Disorder – Not Otherwise Specified (PDDNOS)

□ The major characteristics of ASDs (e.g., social and communication difficulties, and restricted behaviors/interests)

□ The associated characteristics of ASDs (e.g., intellectual disability, behavioral difficulties, seizure disorders)

□ I have not received training in ASDs or their major/associated characteristics (please skip to question 12)

10. Please indicate how you received your specific training (check all that apply).

□ In-service training through your district
□ 1/2 day workshop/conference
□ 1-3 day workshop/conference
□ Mandated graduate course
□ Elective graduate course
□ Additional graduate field experiences
□ Other (please specify) ______________

11. If you indicated that your training was through an elective course, please identify the specific course(s) that you completed:

________________________________________________________________________
________________________________________________________________________

12. Please identify how important you think it is for general education teachers to receive training about ASDs:

□ 1 Not at all important
□ 2 A little important
□ 3 Somewhat important
□ 4 Very important
□ 5 Extremely important
### III. Interventions for ASDs and their use in the classroom:

Please indicate which of the following ASD intervention strategies you are familiar with, as well as those you currently use or have used in the past (please check all that apply).

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Familiar</th>
<th>Have used</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>13. Antecedent-Based Interventions</strong> (strategies used to modify environmental conditions that result in the individual’s interfering behaviors)</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td><strong>14. Computer-Aided Instruction</strong> (the use of computers to teach academic skills and enhance communication and language development)</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td><strong>15. Differential Reinforcement</strong> (reinforcement is given for desired behaviors and undesired behaviors are ignored)</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td><strong>16. Discrete Trial Training</strong> (a one-to-one, systematic instructional method for teaching skills using small repeated steps)</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td><strong>17. Extinction</strong> (reduces or eliminates an unwanted behavior by removing what maintains the unwanted behavior)</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td><strong>18. Functional Behavioral Assessment</strong> (strategies used to determine the underlying reason for behaviors, and an intervention plan is developed from the assessment of behavior)</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td><strong>19. Functional Communication Training</strong> (decreasing unwanted behavior or subtle communication with more appropriate and effective communication behaviors)</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td><strong>20. Naturalistic Intervention</strong> (involves environmental arrangement, interaction techniques, and behavioral strategies to promote appropriate behaviors that are naturally reinforcing)</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td><strong>21. Parent-Implemented Intervention</strong> (involves parents using individualized intervention strategies to promote positive learning and skill development)</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td><strong>22. Peer-Mediated Instruction and Intervention</strong> (typically developing peers are taught strategies to interact with and assist children with ASDs in developing social skills and social opportunities within natural settings)</td>
<td>□</td>
<td>□</td>
</tr>
</tbody>
</table>
23. **Picture-Exchange Communication System** (teaching young children to communicate in social contexts by giving a picture of a desired item to another individual in exchange for the item)

24. **Pivotal Response Training** (teaches communication skills, language, play, and social behaviors using motivation, responding to multiple cues, self-management, and self-initiations)

25. **Prompting** (involves any assistance that is given to children to help them use a specific skill, usually by an adult or peer)

26. **Reinforcement** (identifies the relationship between a child’s behavior and a consequence occurring after the behavior; the goal is to help children learn new skills and maintain them over time)

27. **Response Interruption/Redirection** (practices used to decrease behaviors that are repetitive, stereotypical, and/or self-injurious and are typically sensory-maintained)

28. **Self-Management** (interventions that help children with ASDs regulate their own behaviors and act appropriately in various settings and situations by recognizing the difference between appropriate and inappropriate and rewarding themselves for appropriate behavior)

29. **Social Narratives** (interventions that help children adjust to changes in routine and adapt their behaviors by explaining social situations in detail, emphasizing relevant cues, and giving examples of appropriate responses)

30. **Social Skills Groups** (strategies used to help children with ASDs appropriately interact with typically developing peers often involving small group instruction, role-playing, and feedback)

31. **Speech Generating Devices** (portable electronic devices that create either synthetic or digital speech sounds using graphic symbols and alphabet keys)

32. **Structured Work Systems** (an instructional strategy developed by Division TEACCH)
[Treatment and Education of Autistic and related Communication handicapped CHildren] that utilizes visual supports where students independently practice previously mastered skills)

33. **Task Analysis** (breaking a skill into smaller, more manageable pieces in order to teach the skill and is often combined with other intervention strategies such as reinforcement and video modeling)

34. **Time Delay** (a method used in combination with prompting procedures that involves fading the use of prompts during instructional time)

35. **Video Modeling** (involves video recording and display technology to supply a visual model of the targeted behavior or skill)

36. **Visual Supports** (pictures, written words, and/or objects presented visually that help children with ASDs navigate throughout their day)

37. Please identify any other intervention strategies that you have used that are not listed in questions 13 through 36 (e.g., facilitated communication, auditory integration training, optometric training, and/or sensory integration therapy).

________________________________________________________________________

________________________________________________________________________

38. Have you received specific training in selecting and providing interventions for students with ASDs? (if you answered no, please skip to question 40)

□ Yes
□ No

39. Which of the following types of training have you received for providing interventions for students with ASDs? (please check all that apply)

□ In-service training through your district
□ 1/2 day workshop/conference
□ 1-3 day workshop/conference
□ Mandated graduate course
□ Elective graduate course
□ Additional graduate field experiences
□ Other (please specify) ______________
IV. Teacher preparedness, experience, and perspectives regarding teaching students with ASDs:

40. How well trained/prepared do you believe you are to teach students with ASDs?
   □ 1 Not at all prepared
   □ 2 A little prepared
   □ 3 Somewhat prepared
   □ 4 Very prepared
   □ 5 Extremely prepared

41. Have you received specific courses in special education?
   □ Yes
   □ No

42. How often do you participate in professional development activities to enhance your knowledge of students with ASDs?
   □ I do not participate in professional development related to ASDs
   □ 1 time per year
   □ 2-3 times per year
   □ More than 3 times per year

43. How much support do you think that you have from building administrators (e.g., school principal) to teach students with ASDs in your classroom?
   □ 1 Insufficient support
   □ 2 Somewhat insufficient support
   □ 3 Neither insufficient or sufficient support
   □ 4 Somewhat sufficient support
   □ 5 Sufficient support

44. How often do you collaborate with other school professionals (e.g., special education teachers, classroom aides, school psychologists) when you work with students with ASDs?
   □ Never
   □ Sometimes
   □ Often
   □ Always
45. In your teaching experience, please identify which of the following items facilitate the teaching of included students with ASDs (please check all that apply).

- □ Personal experience (e.g., you, friends, and/or family members have children with ASDs)
- □ Prior experience working with/teaching students with ASDs
- □ Helps to increase diversity in the classroom
- □ Teaches other students to interact with a variety of other individuals
- □ Enhances the nonacademic (e.g., social) skills of all students in the classroom
- □ Normalizes individual differences between students
- □ Allows for personal/professional growth in teaching students with disabilities

46. In your teaching experience, please identify which of the following items are barriers when teaching included students with ASDs (please check all that apply).

- □ Negative impact of students with ASDs on the education of classmates
- □ Necessary increase in time to plan curriculum for students
- □ Budgetary/resource concerns
- □ Lack necessary time and/or knowledge working with students with ASDs
- □ Lack of teaching support
- □ Lack of administrative support
- □ Lack of experience (or have limited experience) with ASDs
- □ The behaviors associated with ASDs exceed/are outside of my comfort zone
- □ Including students with ASDs lowers state test scores

47. Does the severity of the ASD affect your relationships and/or attitudes regarding these students?

- □ 1 Not at all
- □ 2 To a small degree
- □ 3 To a moderate degree
- □ 4 To a considerable degree
- □ 5 To a great degree

48. How important is parental support in educating students with ASDs in general education settings?

- □ 1 Not at all important
- □ 2 A little important
- □ 3 Somewhat important
- □ 4 Very important
- □ 5 Extremely important
49. How important are the roles of support staff (e.g., classroom aides, monitors) in educating students with ASDs in general education settings?

□ 1 Not at all important
□ 2 A little important
□ 3 Somewhat important
□ 4 Very important
□ 5 Extremely important

50. In general, what are your thoughts regarding the inclusion of students with ASDs in mainstream settings?

□ Very negative
□ Somewhat negative
□ Neither negative nor positive
□ Somewhat positive
□ Very positive

51. Please indicate any other additional comments you would like to share:

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Thank you for your participation and time!!
APPENDIX B: SUBMISSION OF RESPONSES

The survey is now completed. If you would like to submit your responses, please click the “Continue” button. Once you have submitted your responses, you will be provided with the opportunity to enter the gift card drawing (which is not connected in any way to your responses) and directions for how to enter. Thank you for your valuable time and participation in this study. It is greatly appreciated!
APPENDIX C: GENERAL EDUCATION TEACHER ELECTRONIC COVER LETTER

Subject Line:

Information needed from General Education Teachers

Email:

Dear General Education Teacher:

You have been selected to participate in a study investigating general education teachers’ knowledge, training, and perspectives regarding students with Autism Spectrum Disorders (ASDs) who are included in general education classrooms. Your name was randomly selected from staff/teacher listings on your district/school’s official website.

The official title of this project is: Children with Autism Spectrum Disorders and Evidence-Based Interventions: General Education Teachers’ Knowledge, Training, and Perspectives

In order to participate in the survey, please click on the following link:

https://www.psychdata.com/s.asp?SID=155141

You will be asked to provide responses to survey questions relating to the inclusion of students with ASDs in general education settings, as well as your knowledge, views, and experiences working with this population of students.

The survey will take about 10–20 minutes of your time to complete. After you have completed the survey, you will be given the opportunity to be entered into a drawing to win a $50 prepaid Visa gift card. If you choose to participate in the drawing, you will be redirected to a separate website to enter your information. Two winners will be randomly selected from those teachers who wish to participate after all of the data have been collected. Please note that your participation in the gift card drawing is in no way connected to your survey responses.

Thank you in advance for your consideration and time in participating in this survey. Your answers will help provide knowledge about the education of students with ASDs, specifically when these students are included in mainstream settings.

If you have any questions about this study or your participation in the survey, please feel free to contact the researcher, Jeannette Ellis, at jellis@albany.edu or the dissertation chairperson, Dr. Deborah Kundert at dkundert@albany.edu.
Dear General Education Teacher:

Thank you for your consideration in participating in this research study. This study is being carried out by Jeannette Ellis, a doctoral candidate in the School Psychology program at the University at Albany, State University of New York.

**Goals of the Current Study**

As the rates of children being identified with Autism Spectrum Disorders (ASDs) continually rise, schools are also increasingly expected to educate these children in their least restrictive learning environments. Often times, this is the general education classroom. As a general education teacher, you may be working with students with ASDs and are expected to effectively teach them and promote their academic and social achievement. Given the characteristic difficulties inherent to students with ASDs (i.e., communication, social skills, and restricted behaviors/interests), these students may present complex challenges to teachers and their classroom peers.

The broad goal of this study is to obtain information about general education teachers’ knowledge and training regarding the characteristics of children with ASDs, as well as the available interventions used with these students. In addition, this study seeks to identify the perspectives of general education teachers regarding included students with ASDs, and general educators’ views on different factors that affect the performance of students with ASDs in general education settings, as well as the overall climate of the classroom.

By choosing to participate, you will be asked to respond to a number of questions in order to supply demographic and other relevant information (e.g., training experiences, views on inclusion of students with ASDs in the general education classroom). The total time required to complete the survey is approximately 10–20 minutes.

Your participation in this project is voluntary. Even after you agree to participate in the research or respond to the informed consent, you may decide to leave the study at any time without penalty. I will retain and analyze the information you have provided up until the point you have left the study unless you request that your data be excluded from any analysis and/or destroyed. In addition, you may choose not to respond to certain questions, if you do not wish. There are no known risks or discomforts associated with completing this survey. A benefit of completing this survey is that you are helping to add to the knowledge base for effectively teaching students with ASDs.

**Confidentiality**

Please note that your responses to questions on this survey are strictly anonymous. All of the information used to identify you (including your computer’s IP address), as well as your name and contact information (should you choose to participate in the gift card drawing), is not associated with your responses regarding students with ASDs in general education classrooms.
An additional method used to protect your anonymity is that all responses will be reported in a group format only. Further, the only individuals who will be involved in the data collection and inspection are my dissertation chair, Dr. Deborah Kundert, and myself. The data collected in this survey will be contained on a secure website for two years, as well as password-protected files on the researcher’s personal computer, after which time it will be deleted.

All information obtained in this study is strictly anonymous unless disclosure is required by law. In addition, the University at Albany Institutional Review Board, University, or government officials responsible for monitoring this study may inspect these records.

This project has been approved by the University at Albany Institutional Review Board. Approval of this project only signifies that the procedures adequately protect the rights and welfare of the participants. Please note that absolute anonymity cannot be guaranteed due to the limited protections of internet access. Please be sure to close your browser when finished so no one will be able to see what you have been doing. Also, closing your browser when you are finished with the survey and deleting your internet browsing history/cookies are other helpful suggestions to help protect your privacy when using the internet, especially in public settings.

Questions?

If you have questions concerning your rights as a research participant or if you wish to report any concerns about the study, please contact the University at Albany’s Office of Regulatory Research Compliance at (518) 442-9050, toll free at (800) 365-9139, or via email at hsconcerns@albany.edu.

Finally, if you have questions about this study and would like to contact the primary researcher, Jeannette Ellis, or the dissertation chairperson, Dr. Deborah Kundert, please refer to the contact information below:

Jeannette Ellis, M.S., C.A.S.
Doctoral Candidate
School Psychology
(607) 725-2599
jellis@albany.edu

Deborah K. Kundert, Ph.D.
Dissertation Chairperson
School Psychology
(518) 442-5052
dkundert@albany.edu
Gift Card Drawing

After submitting your responses, you will be given the opportunity to enter to win a Visa gift card in the amount of $50. Two winners will be chosen randomly and contacted after all data have been collected.

Informed Consent

I have read, or been informed of, the information about this study. By clicking the “Continue” button below, I hereby consent to participate in the study.
APPENDIX E: GIFT CARD DRAWING

Gift Card Drawing

If you would like to participate in the drawing for a $50 gift card, please click on the following link:

https://www.psychdata.com/s.asp?SID=155145

You will be asked to provide your name and email address only. The information that you shared on the survey is not connected in any way to your contact information. Two gift card winners will be selected at random and contacted after all data have been gathered. If you have any questions about the gift card drawing, please feel free to contact me or my dissertation chairperson.

Jeannette Ellis, M.S., C.A.S.
Doctoral Candidate
School Psychology
(607) 725-2599
jellis@albany.edu

Deborah K. Kundert, Ph.D.
Dissertation Chairperson
School Psychology
(518) 442-5052
dkundert@albany.edu
APPENDIX F: ELECTRONIC FOLLOW-UP MESSAGE

Subject Line:
Thank you for your participation

Email:
Dear General Education Teacher,

One week ago, you were sent an email with a web link to participate in a study regarding your experience working with students with Autism Spectrum Disorders (ASDs). If you have already competed the survey and submitted your responses, please accept our sincere thanks and appreciation.

If you have not yet completed the survey, please do so as soon as possible. It is important that your responses be included to accurately reflect the current practices of general education teachers. In addition, you will be given the opportunity to enter a drawing for a $50 prepaid Visa gift card, which is in no way connected to your survey responses.

In order to participate in the survey, please click on the following link:

https://www.psychdata.com/s.asp?SID=155141

Thank you again for your time and participation!

Sincerely,

Jeannette Ellis, M.S., C.A.S. 
Doctoral Candidate
School Psychology

Deborah K. Kundert, Ph.D.
Dissertation Chair
School Psychology
APPENDIX G: PREVIEW QUESTIONS

Subject Line:
Dissertation Pilot Study

Email:

Dear General Education Teacher,

Thank you for agreeing to participate in the pilot study for my doctoral dissertation. If you would like to complete the survey, please click on the following link:

https://www.psychdata.com/s.asp?SID=151563

In addition, below are some questions that you will be asked regarding your experience completing the survey. Your responses will assist me in making revisions and improvements to the survey. Please respond to the questions at the end of the survey when you are prompted to do so.

1. How long did it take you to complete the survey?
2. Did you understand all of the terms used?
3. Were any of the questions difficult to understand? If so, please indicate which ones.
4. Was the formatting of any questions confusing? If so, please indicate which ones.
5. Were there questions missing that you thought would be important? If so, please describe.
6. What is your opinion regarding the web-based presentation of the survey? Please indicate if there are any ways it could be improved.

Thank you again for your invaluable time and help. It is greatly appreciated!

Sincerely,

Jeannette Ellis, M.S., C.A.S.                    Deborah K. Kundert, Ph.D.
Doctoral Candidate                            Dissertation Chair
School Psychology                             School Psychology
APPENDIX H: DATA ANALYSES

I. Teachers' Knowledge and Training Regarding Students with ASDs

<table>
<thead>
<tr>
<th>Research Question</th>
<th>Corresponding Survey Question(s)</th>
<th>Data Analyses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. What percentage of general education teachers have knowledge about or have received training in identifying the different types of ASDs (e.g., AD, AS, and PDD-NOS)?</td>
<td>9. Please indicate whether or not you have knowledge about or have received training in the following (check all that apply): (a) Understanding the different types of ASDs: Autistic Disorder (AD), Asperger’s Syndrome (AS), and Pervasive Developmental Disorder – Not Otherwise Specified (PDDNOS) (b) The major characteristics of ASDs (e.g., social and communication difficulties, and restricted behaviors/interests) (c) The associated characteristics of ASDs (e.g., intellectual disability, behavioral difficulties, seizure disorders) (d) I have not received training in ASDs or their major/associated characteristics (please skip to question 12)</td>
<td>Percentages</td>
</tr>
<tr>
<td>2. What percentage of general education teachers have knowledge about or have received training regarding the major characteristics of students with ASDs (e.g., social and communication difficulties, and restricted behaviors/interests)?</td>
<td>9. Please indicate whether or not you have knowledge about or have received training in the following (check all that apply): (a) Understanding the different types of ASDs: Autistic Disorder (AD), Asperger’s Syndrome (AS), and Pervasive Developmental Disorder – Not Otherwise Specified (PDDNOS) (b) The major characteristics of ASDs (e.g., social and communication difficulties, and restricted behaviors/interests) (c) The associated characteristics of ASDs (e.g., intellectual disability, behavioral difficulties, seizure disorders) (d) I have not received training in ASDs or their major/associated characteristics (please skip to question 12)</td>
<td>Percentages</td>
</tr>
</tbody>
</table>

(continued)
### I. Teachers’ Knowledge and Training Regarding Students with ASDs (continued)

<table>
<thead>
<tr>
<th>Research Question</th>
<th>Corresponding Survey Question(s)</th>
<th>Data Analyses</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. What percentage of general education teachers have knowledge about or have received training regarding the associated characteristics of students with ASDs (e.g., intellectual disability, behavioral difficulties, seizure disorders)?</td>
<td>9. Please indicate whether or not you have knowledge about or have received training in the following (check all that apply): &lt;br&gt; (a) Understanding the different types of ASDs: Autistic Disorder (AD), Asperger’s Syndrome (AS), and Pervasive Developmental Disorder – Not Otherwise Specified (PDDNOS) &lt;br&gt; (b) The major characteristics of ASDs (e.g., social and communication difficulties, and restricted behaviors/interests) &lt;br&gt; (c) The associated characteristics of ASDs (e.g., intellectual disability, behavioral difficulties, seizure disorders) &lt;br&gt; (d) I have not received training in ASDs or their major/associated characteristics (please skip to question 12)</td>
<td>Percentages</td>
</tr>
<tr>
<td>4. How did general education teachers receive their training about special education and students with ASDs?</td>
<td>10. Please indicate how you received your specific training (check all that apply). &lt;br&gt; 11. If you indicated that your training was through an elective course, please identify the specific course(s) that you completed.</td>
<td>Percentages, Frequencies</td>
</tr>
<tr>
<td>5. Does the level of knowledge general education teachers have regarding students with ASDs vary by demographic differences (i.e., level of training, experience, type of school)?</td>
<td>9. Please indicate whether or not you have knowledge about or have received training in the following (check all that apply): &lt;br&gt; (a) Understanding the different types of ASDs: Autistic Disorder (AD), Asperger’s Syndrome (AS), and Pervasive Developmental Disorder – Not Otherwise Specified (PDDNOS) &lt;br&gt; (b) The major characteristics of ASDs (e.g., social and communication difficulties, and restricted behaviors/interests) &lt;br&gt; (c) The associated characteristics of ASDs (e.g., intellectual disability, behavioral difficulties, seizure disorders) &lt;br&gt; (d) I have not received training in ASDs or their major/associated characteristics (please skip to question 12)</td>
<td>Chi-Square Analysis with Sidak correction for number of comparisons made</td>
</tr>
<tr>
<td>6. How important is training in ASDs to general education teachers?</td>
<td>12. Please identify how important you think it is for general education teachers to receive training about ASDs.</td>
<td>Percentages</td>
</tr>
</tbody>
</table>
II. Teachers’ Familiarity with and use of ASD Interventions in their Classrooms

<table>
<thead>
<tr>
<th>Research Question</th>
<th>Corresponding Survey Question(s)</th>
<th>Data Analyses</th>
</tr>
</thead>
<tbody>
<tr>
<td>7. With which evidence-based ASD interventions are general education teachers familiar?</td>
<td>13. – 36. Please indicate which of the following ASD intervention strategies you are familiar with, as well as those you currently use or have used in the past (please check all that apply).</td>
<td>Percentages</td>
</tr>
<tr>
<td>8. Which evidence-based ASD interventions do general education teachers use in their classrooms (currently or in the past)?</td>
<td>13. – 36. Please indicate which of the following ASD intervention strategies you are familiar with, as well as those you currently use or have used in the past (please check all that apply). 37. Please identify any other intervention strategies that you have tried that are not listed in questions 13 through 36 (e.g., facilitated communication, auditory integration training, optometric training, and/or sensory integration therapy).</td>
<td>Percentages</td>
</tr>
<tr>
<td>9. Have general education teachers received training in selecting and providing interventions to students with ASDs?</td>
<td>38. Have you received specific training in selecting and providing interventions for students with ASDs? (if you answered no, please skip to question 40). 39. Which of the following types of training have you received for providing interventions for students with ASDs? (please check all that apply).</td>
<td>Percentages</td>
</tr>
<tr>
<td>10. Does general education teacher knowledge of evidence-based interventions for students with ASDs vary by demographic differences (i.e., level of training, experience, type of school)?</td>
<td>13. – 36. Please indicate which of the following ASD intervention strategies you are familiar with, as well as those you currently use or have used in the past (please check all that apply). 37. Please identify any other intervention strategies that you have used that are not listed in questions 13 through 36 (e.g., facilitated communication, auditory integration training, optometric training, and/or sensory integration therapy). 38. Have you received specific training in selecting and providing interventions for students with ASDs? (if you answered no, please skip to question 40). 39. Which of the following types of training have you received for providing interventions for students with ASDs? (please check all that apply).</td>
<td>Chi-Square Analysis with Sidak correction for number of comparisons made</td>
</tr>
</tbody>
</table>
### III. Teacher Preparedness, Experience, and Perspectives Regarding Teaching Students with ASDs

<table>
<thead>
<tr>
<th>Research Question</th>
<th>Corresponding Survey Question(s)</th>
<th>Data Analyses</th>
</tr>
</thead>
<tbody>
<tr>
<td>11. How well trained/prepared do general education teachers believe they are to work with students with ASDs?</td>
<td>40. How well trained/prepared do you believe you are to teach students with ASDs?</td>
<td>Percentages</td>
</tr>
<tr>
<td>12. What percentage of general education teachers have completed specific courses in special education?</td>
<td>41. Have you received specific courses in special education?</td>
<td>Percentages</td>
</tr>
<tr>
<td>13. What percentage of general education teachers participate in professional development activities to enhance their knowledge of students with ASDs?</td>
<td>42. How often do you participate in professional development activities to enhance your knowledge of students with ASDs?</td>
<td>Percentages</td>
</tr>
<tr>
<td>14. How much support do general education teachers perceive from administrators (e.g., school principal) to teach students with ASDs?</td>
<td>43. How much support do you think that you have from building administrators (e.g., school principal) to teach students with ASDs in your classroom?</td>
<td>Percentages</td>
</tr>
<tr>
<td>15. What percentage of general education teachers collaborate with other school staff (such as special education teachers, classroom aides, school psychologists) when teaching students with ASDs?</td>
<td>44. How often do you collaborate with other school professionals (e.g., special education teachers, classroom aides, school psychologists) when you work with students with ASDs?</td>
<td>Percentages</td>
</tr>
<tr>
<td>16. What types of facilitators and barriers do general education teachers identify when teaching students with ASDs?</td>
<td>45. In your teaching experience, please identify which of the following items facilitate the teaching of included students with ASDs (please check all that apply).</td>
<td>Percentages</td>
</tr>
<tr>
<td></td>
<td>46. In your teaching experience, please identify which of the following items are barriers when teaching included students with ASDs (please check all that apply).</td>
<td></td>
</tr>
</tbody>
</table>

(continued)
### III. Teacher Preparedness, Experience, and Perspectives Regarding Teaching Students with ASDs (continued)

<table>
<thead>
<tr>
<th>Research Question</th>
<th>Corresponding Survey Question(s)</th>
<th>Data Analyses</th>
</tr>
</thead>
<tbody>
<tr>
<td>17. To what degree do general education teachers report that the severity of the ASD affects their perspectives of the students?</td>
<td>47. Does the severity of the ASD affect your relationships and/or attitudes regarding these students?</td>
<td>Percentages</td>
</tr>
<tr>
<td>18. How important is parental support to general education teachers when working with students with ASDs?</td>
<td>48. How important is parental support in educating students with ASDs in general education settings?</td>
<td>Percentages</td>
</tr>
<tr>
<td>19. How important are the roles of support staff (such as classroom aides and monitors) to teachers when educating students with ASDs?</td>
<td>49. How important are the roles of support staff (e.g., classroom aides, monitors) in educating students with ASDs in general education settings?</td>
<td>Percentages</td>
</tr>
<tr>
<td>20. In general, what are general educators’ thoughts regarding the inclusion of students with ASDs in inclusive/mainstream settings?</td>
<td>50. In general, what are your thoughts regarding the inclusion of students with ASDs in mainstream settings?</td>
<td>Percentages</td>
</tr>
<tr>
<td>21. Do general education teacher views on different factors that enhance the success of students with ASDs vary by demographic differences (i.e., level of training, experience, type of school)?</td>
<td>45. In your teaching experience, please identify which of the following items facilitate the teaching of included students with ASDs (please check all that apply).</td>
<td>Chi-Square Analysis with Sidak correction for number of comparisons made</td>
</tr>
<tr>
<td>Demographic Variables:</td>
<td>46. In your teaching experience, please identify which of the following items are barriers when teaching included students with ASDs (please check all that apply).</td>
<td></td>
</tr>
<tr>
<td>• Level of Training</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Years of Experience</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Type of School</td>
<td></td>
<td></td>
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</tbody>
</table>
APPENDIX I: NON-SIGNIFICANT CHI-SQUARE ANALYSES

I. Chi-square Analyses Comparing Teachers’ Knowledge of ASDs by Training Level, Years of Experience, and School Type

<table>
<thead>
<tr>
<th>Teachers’ Knowledge of ASDs</th>
<th>Training Level</th>
<th>Total</th>
<th>$\chi^2$</th>
<th>df</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have knowledge</td>
<td>BA/BS</td>
<td></td>
<td>1.218</td>
<td>1</td>
<td>.270</td>
</tr>
<tr>
<td>Do not have knowledge</td>
<td>MA/MS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Teachers’ Knowledge of ASDs</th>
<th>Years of Experience</th>
<th>Total</th>
<th>$\chi^2$</th>
<th>df</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have knowledge</td>
<td>0-4</td>
<td></td>
<td>1.1330</td>
<td>3</td>
<td>.769</td>
</tr>
<tr>
<td>Do not have knowledge</td>
<td>5-9</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>10-14</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>&gt;15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Teachers’ Knowledge of ASDs</th>
<th>School Type</th>
<th>Total</th>
<th>$\chi^2$</th>
<th>df</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have knowledge</td>
<td>Elementary</td>
<td></td>
<td>.079</td>
<td>2</td>
<td>.961</td>
</tr>
<tr>
<td>Do not have knowledge</td>
<td>Middle</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>High School</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td></td>
<td></td>
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### II. Chi-square Analyses Comparing Teachers’ Use of ASD Interventions by Years of Experience and School Type

<table>
<thead>
<tr>
<th>Use of Top 6 Interventions</th>
<th>Years of Experience</th>
<th>χ²</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0-4</td>
<td>5-9</td>
<td>10-14</td>
<td>&gt;15</td>
</tr>
<tr>
<td>More Interventions Used</td>
<td>7</td>
<td>13</td>
<td>15</td>
<td>31</td>
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<tr>
<td>Fewer Interventions Used</td>
<td>21</td>
<td>29</td>
<td>21</td>
<td>58</td>
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<table>
<thead>
<tr>
<th>Use of Top 6 Interventions</th>
<th>Elementary</th>
<th>Middle</th>
<th>High School</th>
<th>Total</th>
<th>χ²</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>More Interventions Used</td>
<td>33</td>
<td>13</td>
<td>13</td>
<td>59</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Fewer Interventions Used</td>
<td>62</td>
<td>26</td>
<td>26</td>
<td>114</td>
<td>.038</td>
<td>2</td>
<td>.981</td>
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### III. Chi-square Analyses Comparing Classroom Facilitators by Training Level, Years of Experience, and School Type

<table>
<thead>
<tr>
<th>Identification of Top 5 Facilitators</th>
<th>BA/BS</th>
<th>MA/MS</th>
<th>Total</th>
<th>$\chi^2$</th>
<th>df</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>More Facilitators Identified</td>
<td>42</td>
<td>67</td>
<td>109</td>
<td>1.802</td>
<td>1</td>
<td>.179</td>
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<td>Fewer Facilitators Identified</td>
<td>35</td>
<td>37</td>
<td>72</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Identification of Top 5 Facilitators</th>
<th>0-4</th>
<th>5-9</th>
<th>10-14</th>
<th>&gt;15</th>
<th>Total</th>
<th>$\chi^2$</th>
<th>df</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>More Facilitators Identified</td>
<td>13</td>
<td>25</td>
<td>19</td>
<td>54</td>
<td>111</td>
<td>1.887</td>
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<td>Fewer Facilitators Identified</td>
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<td>15</td>
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<td>73</td>
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</table>

<table>
<thead>
<tr>
<th>Identification of Top 5 Facilitators</th>
<th>Elementary</th>
<th>Middle</th>
<th>High School</th>
<th>Total</th>
<th>$\chi^2$</th>
<th>df</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>More Facilitators Identified</td>
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<td>19</td>
<td>99</td>
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<td>2</td>
<td>.291</td>
</tr>
<tr>
<td>Fewer Facilitators Identified</td>
<td>31</td>
<td>14</td>
<td>19</td>
<td>64</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>