Awareness, Knowledge, and Understanding of Autism Spectrum Disorders among Ohio Public School Principals

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A Survey of the Awareness, Knowledge, and Understanding of Autism Spectrum Disorders among Ohio Public School Principals

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ABSTRACT

The rise in the number of students having an Autism Spectrum Disorder (ASD) has presented challenges for school principals in public schools. Principals need to understand the nature of ASD and the unique needs of these students. The purpose of this quantitative study was to evaluate levels of awareness, knowledge, and understanding of ASD among principals in the state of Ohio and determine what may account for differences. 180 public school principals including those serving elementary, middle, and high school age children completed a validated autism awareness survey. The scores derived served as the dependent variable. An accompanying demographic survey was also completed. The participants’ years of experience, years as an educator, the type of school and any background experience in special education served as variables which were found to have no significant impact on their cognizance of ASD. Variables associated with training presented significant results. Principals reporting as having had professional development training in working with students with ASD had higher scores on the AAS $t(176) = -2.14, p = .03, 95\% \text{ CI} = [-5.81, -0.24]$. Findings demonstrated the importance of school districts providing training to their personnel who serve students with ASD as principals reporting employment in such districts were more cognizant of ASD $t(178) = -2.08, p = .04, 95\% \text{ CI} = [-5.69, -0.14]$. Findings also indicated the importance of the number of students with ASD encountered by a principal during their career as the relationship was significant $\rho = .28, p < .001$. Principals reporting a greater number of educational supports provided for students with ASD and the relationship between their awareness, knowledge and understanding of ASD was significant $\rho = .22, p = .004$. Findings will be of benefit in disseminating knowledge of the value of training for principals working with students with ASD, and the importance of greater opportunities
for working with children with ASD. This study is a contribution to leadership research as well as ASD research. Recommendations for further research include studies of effective educational supports for students with ASD and evaluation studies of types of training provided to principals.
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The words said by Mahatma Gandhi, “Live as if you were to die tomorrow. Learn as if you were to live forever,” have influenced many of my life’s journeys. There have been many people along this journey and I am eternally grateful for their influence. I begin with my father who taught me about nature and the importance of remembering history. I thank my sisters who taught me about friendship, psychology, and faith. My late mother I thank for trying to teach me to cook, but instead taught me to have a sense of humor which was needed during the statistical analysis portion of the dissertation process. I also must acknowledge my Watson teachers and staff as their dedication and work ethic was incredible and continues to be so. When I think of the Watson staff, I must personally mention Marcia, my assistant but also my friend for her daily encouragement and belief in me. Also along this journey I thank my colleague Cindy as little did either of us know the degree to which our journeys would influence the other’s journey. Now to my committee, thank you Bob and Scott and Chairperson Julie for being wonderful role models as well as readers and support team. Julie, you have been a model of faith, perseverance and commitment.

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so that they may achieve their greatest potential.
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CHAPTER 1: INTRODUCTION

The number of school-age children identified as having an Autism Spectrum Disorder (ASD) is increasing. The Centers for Disease Control and Prevention (CDC); Robledo & Ham-Kucharski, 2005) reported that one in every 150 Americans has some form of ASD. Recent research has shown that 1 in 91 children born in 2007 in the United States will be diagnosed with an ASD (Kogan et al., 2009).

Between 1995 and 2008, the number of American school children receiving special education services for ASD rose from 22,000 to over 140,000 (Fredericks, 2008). These data present a challenge to school leaders to become better prepared to serve children with ASD, both instructionally and socially. These numbers also challenge school leaders to share their practical experience professionally regarding the services and methods that best meet the needs of students with ASD. However, few avenues exist to provide educators, parents and the medical community with information that helps individuals with ASD achieve their full potential (Henry & Myles, 2007).

The principal mediates the relationships between teachers and students, and between external ideas and all of the members of the organization (Fullan, 2001). To be truly effective leaders, school principals must develop, enhance, and monitor the professional skills and knowledge of teachers and the support staff. Principals must also work with community members to create common expectations that promote the implementation of those skills and that knowledge (DiPaola, 2004). To improve service and to determine the best ways of meeting the needs of this population, it is important to determine the current level of awareness, knowledge, and understanding of ASD among school principals.
Accounts of principals involved in reform efforts had largely been absent from the research literature prior to a study of inclusive education (Salisbury, 2006). The study showed that stronger administrative support and commitment were directly correlated to higher levels of service to students with disabilities, including those with substantial needs. Students in schools with higher levels of administrative support were able to participate more fully in general education for a greater percentage of the school day (Salisbury, 2006). A school where all students are accepted, both by the building leader and the teachers, is critical for enabling students to rise to their full potential.

This chapter introduces an investigation of the status of awareness, knowledge, and understanding of ASD among school principals in Ohio. The background significance of the importance of school leadership in meeting the needs of students with ASD is first presented. Later the problem statement and the purpose of the study are presented, followed by a discussion of the theoretical framework and the research questions and hypotheses. The nature and the significance of the study are then discussed, and the chapter concludes with definitions of terms and the chapter summary.

**Background**

Knowledge of ASD is relatively new to both the medical and educational communities. Autism was not identified prior to the 20th century, and only in the 1980s, was autism included in *The Diagnostic and Statistical Manual-Third Edition* (DSM-III; American Psychiatric Association, 1980). The cause of ASD is not known. However, the literature describing ASD is extensive. There is general agreement regarding diagnostic criteria, cognitive features, and other descriptive features of ASD, and these descriptions have not changed significantly since the mid-1960s (Ritvo, 2006).
To meet the needs of the growing number of students with ASD and to take the necessary action to assist them, school principals must become aware of ASD. Awareness is a state of being conscious of a new concept and is the first stage in the process of learning about the new concept. Awareness of ASD is the first step in supporting and serving students with ASD. Principals need to learn about the nature of ASD and about the needs of children with ASD.

Knowledge refers to the familiarity gained by actual experience. Thus, experience is important for school leaders in facing the challenge of ASD. School principals, by virtue of their leadership positions, have the capacity to change practice within the school and to affect the instruction of students with ASD. The knowledge held by the principals is information that can create change, either by creating grounds for action or by making an individual (or institution) capable of different or more effective action (Drucker, 1989).

Following awareness and knowledge of ASD, effectively serving students with ASD requires understanding. Understanding is the power of comprehending something sufficiently well to have either thorough or technical acquaintance with the matter or experience in dealing with the matter. The better one understands the subject matter, the more one is able to incorporate past experiences or context into new knowledge by absorbing, doing, interacting, and reflecting (Clark, 2010). Principals should understand ASD sufficiently well to serve students with this disorder effectively. Awareness, knowledge, and skills form a continuum of behaviors and skills critical to effective school leadership. These behaviors and skills are needed during a time when school staff
members are being held accountable for serving all children, including students with ASD.

The National Association of Elementary School Principals (NAESP, 2008) noted that school principals need to “demonstrate the vision, courage, and skill to lead and advocate for effective learning communities in which all students reach their highest potential” (p. 11). The importance of the school leader’s awareness, knowledge, and understanding is further illustrated in the following statement issued by NAESP (2008) representatives:

School leaders create the conditions and structures for learning by providing resources, supports and opportunities for capacity building and continual improvement of performance of adults as well as children. They enable teachers and other staff members to participate in teams, networks and other learning communities – inside and outside the school – sometimes restructuring the school day to make time for these activities. Effective principals know that such learning groups are a necessary opportunity for teachers to read, discuss and share research, collect and analyze data on instructional effectiveness, or conduct action research to test new instructional approaches. Effective principals regularly identify resources to enable teachers to take part in local, regional, and national and international conferences and to visit other classrooms and schools to observe innovative and effective practices (p. 12).

Thus, the continuum of cognitive behaviors of awareness, knowledge and understanding of ASD are essential to the effectiveness of school principals in serving all students.
Principals may not possess adequate awareness, knowledge, and understanding of the unique needs of children with ASD to serve and meet the specific instructional needs of such children. Most often, school principals come in contact with a student who has ASD when a parent calls to request additional support and related services or when the student has been referred for a disciplinary problem (Barnhill, 2004). Parents of a child with an ASD expect a high-quality education for their child, just as parents of typically developing children do. Parents of children with ASD expect school principals to understand and know the nature and needs of their children and to provide effective programs (McLaughlin, 2009).

The No Child Left Behind Act (NCLB; Simpson, Lacava, & Graner, 2004) was enacted to ensure that all children are served, including those with a disability such as ASD. Ohio public school principals are expected to meet and exceed the standards set through the NCLB to serve all students. Public school staff members are responsible for leading the way in serving all students, including those with ASD. However, a study conducted in March, 2008 showed that parents in Ohio with children with ASD in private schools expressed more satisfaction with the services provided than did parents in district public schools (Coulter, 2008).

School principals make educational decisions on the basis of their own experiences and beliefs. Individual perceptions about a disorder affect the way the individuals develop treatment and educational strategies (Campbell, Reichle, & Van Bourgondien, 1996, p. 622). As the building leader, the school principal has considerable influence on the instructional programs, services, and strategies employed in the school. The principal’s perception of ASD is critical to the scope of services provided for and
strategies used with students with ASD. School principals’ experiences and understanding also shape the culture of the school through actions, which are guided by beliefs. School principals who model an acceptance of students with disabilities, and seek to understand and educationally serve these students, will influence staff members to do the same (Sage & Burrello, 1994).

Services, strategies and programs for educational support for ASD often require personnel with specialized training. Principals supervise these specialized personnel and the services that they provide, and possibly gain greater awareness of ASD through their supervisory responsibilities. Principals employed in school districts with specific training to support paraprofessionals often are expected to ensure that support staff members have some knowledge regarding ASD (McLaughlin, 2009).

Many misconceptions still exist about ASD (Ritvo, 2006). School principals may also possess these same misconceptions. However, principals with teaching backgrounds in special education, those with direct contact with students with ASD, and those with family members with ASD may have greater awareness of ASD. In addition, principals may have higher levels of awareness in schools where more education supports such as personal, special instructional techniques and specific services such as speech and language and occupational therapy are available for students with ASD. An accurate description of the normal levels of awareness, knowledge, and understanding of ASD among school principals may guide efforts to promote professional growth opportunities and experiences for principals serving students in kindergarten through high school graduation.
Problem Statement

The problem investigated by this study is that too few educators are qualified to work with children with ASD (Schwartz and Drager, 2008). Because of the increasing prevalence of ASD, every public school principal is likely to serve students with ASD during his or her tenure as principal. However, many principals lack sufficient awareness, knowledge, and understanding of ASD to meet the needs of these students in the public schools. Little is known about what factors are associated with awareness, knowledge, and understanding of ASD among school principals.

The identification of ASD as a distinct disorder is relatively new only dating to the middle of the 20th century. Although the cause of ASD is not known, there is a large body of information describing the features and characteristics of ASD and the resulting needs (Ritvo, 2006). There is much information about the kinds of strategies, services, supports, and programs that effectively help students with ASD succeed in school (Henry & Myles, 2007; Volkmar & Wiesner, 2009). Much research exists regarding the importance of leadership to the successful functioning of effective schools (Marzano, Walters, & McNulty, 2005) as well as regarding the connection of the leader’s beliefs and knowledge base to the culture and climate of the school (Kouzes & Posner, 2002; Strike, 2007). Studies exist measuring the knowledge of ASD among the general public, parents, and teachers (Stone, 1987; Stone & Rosenbaum, 1988) and among speech pathologists (Schwartz & Drager, 2008). However, there are currently no studies measuring the awareness of ASD among school leaders. Identifying the current level of cognizance of ASD among school principals and what accounts for differences may lead to
improvements in professional development and training experiences for principals, so that students with ASD are served more effectively.

Purpose

The purpose of this quantitative study was to determine the levels of awareness, knowledge, and understanding of ASD among school principals based on demographic variables. The study was nonexperimental in design and entailed both correlations and comparisons of means. The study was framed in terms of leadership theory, indicating the importance of engaged leadership in the functioning of all members of an organization (Bennis, 2003). A total of 180 participants were surveyed, including principals of schools for students from kindergarten through Grade 12 in the state of Ohio. The dependent variable was defined as the level of awareness, knowledge, and understanding of ASD (Stone, 1987). Levels of the dependent variables were correlated with four continuous independent variables, including years of experience as a school principal, years of experience as an educator, the number of students in the school, and the number of educational supports. Correlations were computed by means of Pearson’s product moment correlation coefficients and Spearman’s correlation coefficients. In addition, levels of the dependent variables were compared based on five nominal independent variables, including presence of family member with ASD, type of school (elementary, middle, or high school), existence of ASD-related training within the school district, educational background in special education, and professional ASD-related training. Comparisons of means were computed by means of independent samples t tests and one-way analyses of variance (ANOVA).
**Theoretical Framework**

This study was based on leadership theory, according to which effective leaders are “seed carriers” of new ideas and practices (Senge, as quoted in Freeman, 2006, p. 20). According to leadership theory, leadership is important for the outcome of any organization, and effective leadership derives from the knowledge and experience of the leader. For students with ASD to be served effectively in schools, the school principal must be a seed carrier of understanding the nature of ASD and the needs of students with ASD. To exercise effective leadership in working with students with ASD, school principals must increase their levels of awareness, knowledge, and understanding of ASD.

Beyond dedication and skill, effective leadership requires understanding and knowledge that promote a deeper moral purpose (Fullan, 2003). The development of empirical knowledge requires practical experience and evidence. To improve student performance, principals and teachers must use proven research-based practices (DiPaola & Tschannen-Moran, 2004). The principal’s knowledge is essential if teachers are to use effective research-based instructional strategies.

**Research Questions and Hypotheses**

To evaluate levels of awareness, knowledge, and understanding of ASD among school principals which will be referred to as cognizance, the following research questions are presented, together with the associated null and alternative hypotheses.

**Q1.** What is the relationship between the years of experience as a school principal and the level of autism cognizance as measured by the Autism Awareness Survey (AAS; Stone, 1987; see Appendix A)?
\( H1_0 \). The relationship between the years of experience as a school principal and the level of autism cognizance, as measured by the AAS, is not statistically significant.

\( H1_a \). The relationship between the years of experience as a school principal and the level of autism cognizance, as measured by the AAS, is statistically significant.

\( Q2 \). What is the relationship between the years of experience as an educator and the level of autism cognizance among school principals, as measured by the AAS?

\( H2_0 \). The relationship between the years of experience as an educator and the level of autism cognizance among school principals, as measured by the AAS, is not significant.

\( H2_a \). The relationship between the years of experience as an educator and the level of autism cognizance among school principals, as measured by the AAS, is significant.

\( Q3 \). What is the relationship between the number of students with ASD encountered during a principal’s educational career and the level of autism cognizance among school principals, as measured by the AAS?

\( H3_0 \). The relationship between the number of students with ASD encountered during a principal’s educational career and the level of autism cognizance among school principals, as measured by the AAS, is not significant.
$H3_a$. The relationship between the number of students with ASD encountered during a principal’s educational career, and the level of autism cognizance among school principals, as measured by the AAS, is significant.

$Q4$. What is the difference in the level of autism cognizance, as measured by the AAS, among school principals based on whether the principal is related to a child with ASD?

$H4_0$. There is not a significant difference in the level of autism cognizance, as measured by the AAS, among school principals based on whether the principal is related to a child with ASD.

$H4_a$. There is a significant difference in the level of autism cognizance, as measured by the AAS, among school principals based on whether the principal is related to a child with ASD.

$Q5$. What is the difference in the level of autism cognizance, as measured by the AAS, among school principals based on the type of school (elementary, middle, or high school)?

$H5_0$. There is not a significant difference in the level of autism cognizance, as measured by the AAS, among school principals based on the type of school (elementary, middle, or high school).

$H5_a$. There is a significant difference in the level of autism cognizance, as measured by the AAS, among school principals based on the type of school (elementary, middle, or high school).

$Q6$. What is the difference in the level of autism cognizance, as measured by the
AAS, among school principals based on whether the principal is employed in a school district with training for personnel serving students with ASD?

$H_{6a}$. There is a significant difference in the level of autism cognizance, as measured by the AAS, among school principals based on whether the principal is employed in a school district with training for personnel serving students with ASD.

$H_{6b}$. There is not a significant difference in the level of autism cognizance, as measured by the AAS, among school principals based on whether the principal is employed in a school district with training for personnel serving students with ASD.

$Q_7$. What is the difference in the level of autism cognizance, as measured by the AAS, among school principals based on whether the principal has an educational background in special education?

$H_{7a}$. There is a significant difference in the level of autism cognizance, as measured by the AAS, among school principals based on whether the principal has an educational background in special education.

$H_{7b}$. There is not a significant difference in the level of autism cognizance, as measured by the AAS, among school principals based on whether the principal has an educational background in special education.

$Q_8$. What is the difference in the level of autism cognizance, as measured by the AAS, among school principals based on whether the principal has undergone professional development and/or training in the education of students with ASD?
$H_{80}$. There is not a significant difference in the level of autism cognizance, as measured by the AAS, among school principals based on whether the principal has undergone professional development and/or training in the education of students with ASD.

$H_{8a}$. There is a significant difference in the level of autism cognizance, as measured by the AAS, among school principals based on whether the principal has undergone professional development and/or training in the education of students with ASD.

$Q_{9}$. What is the relationship between the number of educational supports provided to students with ASD in a principal’s school and the level of autism cognizance among school principals, as measured by the AAS?

$H_{90}$. There is not a significant relationship between the number of educational supports provided to students with ASD in a principal’s school and the level of autism cognizance among school principals, as measured by the AAS.

$H_{9a}$. There is a significant relationship between the number of educational supports provided to students with ASD in a principal’s school and the level of autism cognizance among school principals, as measured by the AAS.

Nature of the Study

In this quantitative study, a nonexperimental, survey-based research design was used. Participants included 180 school principals for kindergarten through Grade 12 in
the state of Ohio. Participants completed the AAS (Stone, 1987), a survey instrument
designed to evaluate levels of awareness, knowledge, and understanding of autism.

Both continuous and nominal variables were used in this study as the independent
variables. The continuous variables included years of experience as a school principal,
years of experience as an educator, the number of students encountered during the
principal’s educational career and the number of educational supports. For the continuous
variables, correlation coefficients were computed to determine the relationship between
the independent variable and autism awareness. The nominal variables included were
presence of a family member with ASD, type of school (elementary, middle, or high
school), existence of training within the school district related to ASD, educational
background in special education, and professional training in education of students with
ASD. All nominal variables except type of school were dichotomous. Independent-
sample t tests were used to compare means of two groups. One-way ANOVAs were
conducted to compare means based on type of school.

Significance of the Study

Data from this study have provided a baseline from which future review and
comparisons can be made. Evidence for factors related to awareness, knowledge, and
understanding of ASD will facilitate the development of methods of expanding these
factors among principals. It is hoped that the findings will lead to more professional
development opportunities for principals, training them to supervise personnel and to
implement evidence-based practices in their schools.
Definitions

*Autism* is a neurological disorder affecting a child’s ability to learn how to communicate, interact with others socially, and demonstrate imaginative play (Robledo & Ham-Kucharski, 2005). The disorder usually manifests itself in the first 2 years of life. According to the APA, autism is a developmental disability of unknown cause in which children show qualitative impairment in social relatedness, communication, and behavior related to play and interests (Buckendorf, 2008). The most distinguishing characteristic of autism is a lack of capacity to share attention and emotions with others (Buckendorf, 2008).

*Autism Spectrum disorder (ASD).* An ASD is one of a variety of specific conditions along a continuum of pervasive developmental disorders that affect a person’s ability to communicate and interact with others (Ritvo, 2006).

*Best practice.* A best practice is a superior method, or an innovative practice, that can be used to improve the performance of a group or organization (Henry & Smith-Myles, 2007).

*Diagnostic and Statistical Manual (DSM).* The DSM is used by mental health professionals in the United States as the standard classification system for mental disorders (APA, 2000). The DSM is a measuring tool for collecting and communicating accurate public health statistics. The DSM was first published in 1952, and the most recent update was released in 2000. The next update is expected to be published in 2012.

*Educational supports.* For this study, educational supports refer to classroom strategies that help students with ASD manage academically and socially in the classroom. Educational supports may also refer to personnel with specialized training for
addressing the needs of students with ASD. The term also refers to specific programs that target the needs of students with ASD. The term was developed for use in this study.

Elementary school. For the purposes of this study, a school was an elementary school if the participant designated the school to be so. Typically the schools designated as elementary schools housed students ranging in age from 5 to 12.

Free and appropriate education (FAPE). A FAPE is an education in which eligible children receive specially designed instruction and related services at no cost to parents and in conformity with an Individualized Education Plan (IEP).

General education classroom. For the purposes of this study, a classroom was defined as a general education classroom if all students were served who either were required to be in attendance in school or elected to take a course based on content. In a general education classroom, students do not necessarily receive any specialized instructional strategies addressing individual needs.

High-functioning autism (HFA). HFA is a form of autism in which the bearer is not mentally retarded (Aspy & Grossman, 2007). Individuals with HFA stand in contrast to most individuals with ASD, who have mental retardation and language impairment. Asperger’s syndrome is a type of HFA.

High school. For the purposes of this study, a school was a high school if the participant designated the school to be so. Typically, high schools included students in Grades 9 through 12.

Inclusive education. Inclusive education is a movement in education in which individuals seek to include a child with a disability into a classroom for instruction and
interaction with nondisabled students and for access to the regular school curriculum (McLauaglin, 2009).

*Individuals with Disabilities in Education Act (IDEA).* The IDEA was enacted in 1990 to ensure that all eligible students received the education programs to which the students were entitled (Bartlett, Weisenstein, & Etscheidt, 2002). The IDEA includes directives that schools must establish systems for finding children who are entitled to special education services. In addition, children with disabilities must be educated with nondisabled students in what is referenced in the law as the least restrictive environment. Most importantly for this research, the IDEA carries the requirement that state representatives assess their supply of trained personnel to provide special education and related services in special and regular education environments. Plans are required for ensuring an adequate supply of appropriately prepared personnel, including administrators.

*Individual Education Plan (IEP).* An IEP is a written statement of an educational plan and program based on educational data for a child with a disability. An IEP must be developed, reviewed, and revised in accordance with federal law (McLauaglin, 2009).

*Junior high school.* Principals who reported that they led junior high school buildings defined their buildings as such based on the definition used in the local school district. The grade level configurations of junior high school ranged from Grades 6 through 9, but more typically included only Grades 7 and 8 and children ranging in age from 13 to 15. For the purposes of this study, junior high school and middle school were represented by the one category of middle school.
**Middle school.** The participants of this research defined whether the building they served was a middle school based on the definition used in the local school district. Typically these buildings served students in Grades 6 to 8 and who ranged in age from 11-14.

**No Child Left Behind (NCLB).** The NCLB is the name given to a U.S. law, enacted in 2002, that requires schools to demonstrate accountability in meeting the needs of all students. Accountability is to be established through rigorous testing, providing highly qualified staff and using scientifically based instructional practices.

**School principal.** The school principal is the organizational and instructional leader of a given school.

**Special education.** Special education refers to the specialized instructional practices and services for students with disabilities (McLaughlin, 2009).

**Summary**

The number of students identified as having ASD is growing (Ritvo, 2006). School leadership is important for the implementation of effective practices for meeting the needs of this population. Although autism has been well studied, insufficient numbers of educators are well prepared to work with these students, and researchers have not investigated the levels of awareness of ASD among school principals.

This chapter introduced a quantitative study of awareness, knowledge, and understanding of students with ASD among public school principals in Ohio. The study was nonexperimental in design and included both correlations and comparisons of means. The study was framed in terms of leadership theory, indicating the importance of engaged leadership in the functioning of all members of an organization. Levels of autism
awareness, as measured by the AAS (Stone, 1987), were evaluated in terms of demographic variables. Results were computed using correlation coefficients and comparisons of means.
CHAPTER 2: LITERATURE REVIEW

This study’s literature review focused on several key areas: (a) history of autism, (b) prevalence of autism and ASD, (c) defining autism and ASD through formal definitions and types of autism, (d) the causes of ASD; (e) describing the nature of and the needs of ASD as it presents itself in children, (f) perceptions and common misconceptions of ASD, (g) the importance of school leadership in serving students with ASD, and (h) intervention and service and program options in meeting the educational and social needs of students with ASD. The history and prevalence of autism is important to understanding how ASD has evolved into a critical concern for school leaders to possess awareness, knowledge and understanding of this disability. Defining autism and the other disorders included under the umbrella of ASD serves as the basis for understanding. A brief definition is not sufficient for understanding the disorder and all of its related disorders. Several definitions will be provided. The most recent suspected causes will be briefly reviewed along with noting the common perceptions and misconceptions of ASD. Identifying the misconceptions helps separate the levels of knowledge and understanding among professionals serving persons with an ASD. The nature of ASD and the special needs as a result will be presented to support the importance of specialized interventions, strategies, services, and programs that are vital to serving and treating students with an ASD. Lastly but central to the study is the significance of school leadership.

History of Autism and ASD

Santanya’s (1905) famous observation that those who cannot remember the past are condemned to repeat it, frames the importance of the history of ASD. The literature
review reveals that some historical assumptions were made that had long term negative
effects on how children with ASD were treated. The misconception that parents were the
cause of this disorder impeded efforts to serve children educationally, as well as
medically. Some of these early theories have lingered on as common misconceptions.
This is a result that we must not repeat. Educators should focus on educational strategies
that treat the symptoms while the medical community focuses on causes and cures as well
as partnering with the educational community on effective treatment strategies.

The history of autism begins in the 20th century with the work of a physician, Leo
Kanner working at John Hopkins Hospital in the 1940’s and the dissertation research of
an Austrian pediatrician, Hans Asperger (Aspy & Grossman, 2007; Barnhill, 2004;
Buckendorf, 2008; Kennedy, 2002; Henry & Myles, 2007; Ritvo, 2006, Schwartz &
Drager, 2008). Initially, neither of these men was aware of the other’s research, and they
never met. Both used the term “autistic,” which they drew from the work of a Swiss
psychiatrist, Dr. Bleuler who is credited for coining the term in 1916 to describe
individuals who had completely withdrawn from the social world around them (Bleuler,
1916). In 1943 Kanner published a paper entitled, Autistic Disturbances of Affective
Contract” which he described children who exhibited a severe degree of social isolation,
lack of responsiveness to others and serious language impairments. In 1944 Asperger
published his paper titled “Autistic Psychopathy in Childhood” which described his
observations of children with social and communicative impairments. However, his
subjects unlike Kanner’s, were more functional in communication and showed little
developmental delay in language acquisition. Some had exceptional vocabularies. He did
describe one-sided conversations, a decreased understanding of non-literal speech, and
difficulty interpreting non-verbal communication. Asperger’s patients also did not appear to be delayed in their cognitive and adaptive behavioral development whereas the patients in Kanner’s study clearly were. Kanner’s and Asperger’s patients were alike in that they focused on an interest instead of a person, had strong attachments to objects and areas of interest, and demonstrated a degree of unawareness of other people around them (Buckendorf; Kennedy, & Ritvo).

Kanner’s work involved 11 children whom he believed had autism. These children were observed by Kanner as having deficits in language and communication, being unable to relate to other humans, preferring objects to people and demonstrating an intense desire for things to remain the same, and finding changes in routine very unsettling (Aspy & Grossman, 2007). Kanner also noted that the parents of the children in his study did not seem “warmhearted and affectionate” a casual statement that resulted in a careless presumption that lasted more than 25 years and became part of the research of Bettelheim in 1967 in which he coined the term “refrigerator mother” (Buckendorf, 2008). Subsequent research does not support the connection between distant parenting and autism.

One may ask, where were all the adults and children with autism prior to the 1940s? It is Ritvo (2006) who summarized that those with severe autism were usually called idiots, imbeciles, elective mutes, or severely retarded. Children and adults with mild forms of autism were usually labeled mildly retarded, borderline retarded, psychotic, psychopaths, seriously emotionally disturbed, or schizophrenic. Those with mild or “high functioning” autism were often misdiagnosed or just simply considered “odd ducks, social misfits, loners, hermits, learning disabled, seriously emotionally disturbed,
schizophrenic, schizoaffective, or socio-paths” (Ritvo, p. 21). Noting these historical
descriptions is important to demonstrate how far we have progressed in our awareness,
knowledge and understanding in the medical and educational fields as well as among the
general population or in some ways how far we still have to go in our awareness,
knowledge and understanding of ASD.

In 1980, Kanner’s work was formally recognized in describing autism. Prior to the 1980s, children with autism typically were diagnosed with childhood schizophrenia. Kanner’s description of Autism “was published in the Diagnostic and Statistical Manual – Third Edition, also referred to as the DSM-III” (American Psychology Association, 1980, p. 7).

Asperger’s work was unknown to English-speaking readers because it was written in German and not translated into English until 1991 by Uta Frith. Asperger’s doctoral thesis described children who exhibited unusual behaviors such as an intense interest in very specific subjects, difficulties in learning, limited attention span, lack of common sense, and poor motor coordination. The intelligence of the children varied from very low to very high, and several showed peculiar speech patterns and vocal characteristics. They also had impairments in the use of eye contact, gestures, and facial expressions. Asperger referred to these characteristics as “Autistic Psychopathy” which translates to the English as disorder (Aspy & Grossman, 2007; Kennedy, 2002, Ritvo, 2006). It is the general consensus among specialists around the world that “Dr. Asperger had simply identified very mild cases of what Kanner had described” (Ritvo, p.23).

In 1964, a psychiatrist and father of a son with ASD, Bernard Rimland wrote *Infantile Autism: The Syndrome and Its Implications for a Natural Theory of Behavior*. 
This book influenced the choices that were made in treatment methods for autism (Sicile-Kira, 2004). In addition to writing this book, he founded the Autism Society of America and in 1967 The Autism Research Institute. These organizations created a worldwide network for parents and professionals concerned with autism.

Wing (1981) used the term “Asperger’s syndrome” to describe a group of patients whose behaviors were very similar to the personalities and abilities described by Hans Asperger. Wing is a psychiatric consultant for the National Autistic Society in the United Kingdom (Exkorn, 2006). She noted the difference between Kanner’s and Asperger’s theories on the onset of the developmental delays. Kanner thought the onset to be between birth and thirty months. Whereas Asperger noted the delays to occur after age three or when children entered school. Wing felt that Asperger and Kanner were describing individuals with the same disorder and introduced the concept of an autism spectrum disorder in 1981 (Aspy & Grossman, 2007).

“It is only recently that Asperger’s syndrome has been accepted as a subtype of autism belonging on the autistic spectrum” (Kennedy, 2002, p. 24). This was recognized in the late 1990’s when the Tenth International Classification of Diseases (ICD-10) and the DSM were to be updated as a means of honoring Dr. Asperger, and providing formal diagnostic criteria for those with mild autism (Ritvo, 2006).

Prevalence of Autism

ASD’s have been found in “every corner of the world affecting all races and have no regard or preference for social class, religion education, or income level” (Ritvo, 2006, p. 26). Prevalence of autism refers to the number of individuals in a specified population who have autism at a specified time regardless of when it began or was
diagnosed (Wing & Potter, 2009). Only 2 decades ago, autism was thought to affect 1 child out of every 5000. (Wiseman, 2006). At the start of this research, the Center for Disease Control (CDC, 2007) estimated a prevalence rate of 1 in every 150 children having a form of autism. This number suggested that almost 1.5 million people in the United States, including more than 45,000 in the state of Ohio have an ASD. Government statistics suggested the rate of autism is increasing at a rate of 10 to 17% annually. Of the approximately 4 million babies born every year, 24,000 of them would eventually be identified on the autism spectrum (Skoff & Gelles, 2008). The Autism Society of America also estimated that every day, fifty families in America discovered that their child has autism (Robledo & Ham-Kucharski, 2005). No one seems to know why but no matter where in the world one looks, males were more likely to be diagnosed with autism than females, but females tend to have the severest forms of autism (Ritvo, 2006).

Further illustrating just how critical this disorder had become, The U.S. Center for Disease Control (CDC, 2010) on December 18, 2009 released their national autism prevalence report confirming what the Ohio Center for Autism and Low Incidence (OCALI) had suspected: that the prevalence of autism spectrum disorders in the United States had risen to include 1 percent of the population, which in 2006 was the equivalent of one in 110 of children 8 years of age. Prevalence in boys continued to be higher than that found among girls. The report noted that one in 70 males and one in 315 females have autism. There were also increases in the prevalence among minority populations. There was a 91 percent increase among Hispanic children and a 41 percent increase among the black non-Hispanic population. There was a 55 percent increase in White non-
Hispanic children. The study did acknowledge that while better diagnosis may account for some of the prevalence, a very real increase cannot be ruled out. Recent research continues to illustrate the rise in prevalence. Kogan et al (2009) observed that 1 in 91 children born in the United States will be diagnosed with an ASD. As a result of the increase in the prevalence of autism, it has become a topic of mass interest, and increased study.

Throughout the literature there was much debate as to what accounts for the rise in prevalence of autism. Aspy and Grossman (2007) noted many researchers believe that the increase in the prevalence of autism may not reflect an actual increase in autism. Instead they suggest alternatives that include changes in the diagnostic criteria, differences in sources of prevalence information, and increased awareness. Robledo and Ham-Kucharski (2005) referenced a National Public Radio interview of Dr. Susan Folstein of the Autism Genetics Research Cooperative and quoted her explanation for the difficulty in determining whether the prevalence rates have increased; “No accurate accounting exists of what the diagnosis rates were decades ago, so it’s hard to compare the numbers then and now” (p.4). Ritvo (2006) placed emphasis on the word guess when he shared his theory or guess for the increased diagnosis “because we are better at finding and accurately diagnosing these disorders, it just looks like an epidemic” (p. 26). He further pointed out that if he was correct, then the rise in newly diagnosed cases will level out in the next few years. Epidemiologists who have been studying the prevalence rates of autism as well have been trying to answer why the numbers of persons diagnosed with an ASD are increasing (Aspy & Grossman). At this time no one knows for certain the reasons why the increase in prevalence of children and adults being identified with an
It is clear, however, that autism is not rare, and it is increasingly one of the most commonly diagnosed developmental disorders seen in children (Aspy & Grossman; Robledo & Ham-Kucharski; Wiseman, 2006; Exkorm, 2005; Schwartz & Drager, 2008). Regardless of the underlying factors for the rising number, the numbers of students with an ASD are increasing and the demands on school leaders to address these students are also growing more critical.

Definitions of Autism, Autism Spectrum Disorders, and Types

The Diagnostic and Statistical Manual of Mental Disorders, 4th edition, DSM-IV, (APA, 1994) provided the criteria for defining autism medically. It is defined by onset of symptoms within the first three years of life and includes three general categories of behavioral impairment common to all persons who have autism: qualitative impairments in social interaction, qualitative impairments in communication and restricted repetitive and stereotyped patterns of behavior, interest, and activities (70-71). The educational diagnosis of autism came from the federal regulations of Individuals with Disabilities in Education Act, IDEA.

Federal Regulations-34 CFR 300.7(c) (1) defines autism as:

1. A developmental disability which significantly affects verbal and non-verbal communication and social interactions, generally evident before age three, that adversely affects a child’s educational performance. Other characteristics often associated with autism are engagement in repetitive activities and stereotyped movements, resistance to environmental change or change in routine and unusual responses to sensory experiences. The term does not apply if a child’s educational performance is adversely affected primarily because the child has a
serious emotional disturbance as defined in paragraph (b) (9) of Federal Regulations 34 CFR 300.7

2. A child who manifests the characteristics of “autism” after age three could be diagnosed as having “autism” if the criteria in paragraph (1) of this section are satisfied.

The state of Ohio has adopted the Federal Definition (Ohio Department of Education, 2008).

The Autism Society of America provided this definition:

Autism is a complex developmental disability that typically appears during the first three years of life. The result of a neurological disorder that affects the functioning of the brain, autism impacts the normal development of the brain in the areas of social interaction and communication skills. Children and adults with autism typically have difficulties in verbal and non-verbal communication, social interactions, and leisure or play activities.

It is important to include that according to the DSM-IV-TR (2000) autism is one of five disorders classified as a Pervasive Developmental Disorder (PDD). PDD is a category of neurological disorders characterized by “severe and pervasive impairment in several areas of development” including social interaction and communication skills. PDD refers to a family of disorders. The five disorders under this classification of PDD are: Autistic Disorder, Asperger Disorder, Childhood Disintegrative Disorder (CDD), Rett Disorder, PDD-Not Otherwise Specified (PDD-NOS). Together these disorders form the broad category of Autism Spectrum Disorders (ASD). ASD and PDD are often used to mean the same thing (Stone, 2006). Variations among the five disorders differentiate them. These differentiations include prevalence of the disorder, its severity, the time of onset for the symptoms and the rate of progression.
All disorders under the umbrella of ASD require an individual to have impairments in communication, socialization, and restricted interests and repetitive, stereotypical behaviors such as repetitive motor actions, fixations on spinning and coordinating objects in mechanical and cognitive themes. Resistance to change in routine is also commonly seen. Stone (2006) noted that in Autistic Disorder (AD) these symptoms emerge before the age of three, but can change over time and vary widely from one child to another” (p. 7). Stone further noted the greater likelihood of boys being diagnosed as having an AD to girls being diagnosed by a ratio of 4:1.

Another term, High-functioning Autism, was used to describe individuals who have cognitive and/or language development and do not meet the criteria for one of the pervasive developmental disorders described in the DSM-IV-TR (Aspy & Grossman, 2007; Stone, 2006). The DSM-IV-TR (2000) noted that most individuals diagnosed with AD have mental retardation as well as severely impaired language. The DSM-IV-TR reserves the diagnosis Asperger’s Disorder for those without language and cognitive delays. As a result, many individuals, who by all other accounts meet the criteria for Asperger’s Disorder, are diagnosed with AD due to their impaired cognitive and/or language development. This group is sometimes informally referred to as having “high-functioning autism,” or HFA (Aspy & Grossman, 2007, p. 9).

The DSM-IV-TR (2000) provided the criteria for Asperger’s Disorder which was so named to honor Hans Asperger, the Austrian physician who first described the disorder in his 1944 study (Attwood, 2006; Ritvo, 2006). Stone (2006) provided the ratio of 5:1 for boys being diagnosed to that of girls. She noted that children diagnosed with Asperger’s have average intelligence and do not have a history of delayed language
impairments, but they do have social impairments and restricted and repetitive interests. Typically this diagnosis is not made in children under age three because the symptoms are not evident until the child begins attending school. These symptoms present themselves in social interactions that are characterized by one-sided awkward conversations and a difficulty in seeing things from the perspective of another person. “This diagnosis is used only when the impairments are severe and sustained and interfere with child’s functioning at home, school, or in the community” (Stone, p. 8).

Rett’s Disorder is named for an Austrian physician, Dr. Andreas Rett who described the disorder in a journal article published in 1966 (Stone, 2006). What distinguishes this from other ASD’s is that it affects girls almost exclusively and it is the only ASD that has a known cause which is genetic. It is an abnormality of a gene on the X chromosome. This disorder is also characterized by normal development up until somewhere between six and 18 months when the child begins to lose skills in different areas of functioning such as speech, interaction and often begins to display repetitive motor movements such as hand rubbing, clasping, and wringing (Stone, 2006).

According to Exkorn (2005) and Stone (2006), the key difference between Rett’s Disorder and Childhood Disintegrative Disorder (CDD) is the length of typical development that a child experiences. The onset of CDD is not noted until after age 2 unlike the 6-18 months of Rett’s Disorder. Children with CDD lose some or all of the skills that they have developed in language, motor and social and play skills. Typically these children have severe mental retardation and unlike Rett’s Disorder the symptoms stabilize rather than continue to regress. This stabilization should occur prior to age 10. Children with CDD may also have seizures. Sometimes this disorder is called Heller’s
Syndrome giving credit to the special educator Theodore Heller who first described the condition in 1908 (Exhorn).

The final disorder under the umbrella of ASD is Pervasive Developmental Disorder Not Otherwise Specified (PDD-NOS). Stone (2006) noted that this is a “diagnosis of exclusion” (p, 9) because it is used when a child shows symptoms of PDD that do not fit the criteria specified for one of the other disorders under the spectrum. Exkorn (2005) noted that “PDD-NOS can be one of the most confusing diagnoses of all the ASD’s” (p. 26). She further noted that there is only a brief description in DSM-IV-TR (2000) about one paragraph describing PDD-NOS. Stone articulated the diagnoses as used for those children who are impaired in social interactions along with either an impairment in their language and communication skills or have a pattern of restricted or repetitive behaviors and activities, and their symptoms do not fit the criteria for other ASD’s and/or typically have milder symptoms. Currently, ASD and PDD are used synonymously (American Academy of Pediatrics, 2001)

The definitions for ASD’s are not complete without noting two concepts often seen in the literature. The term theory of mind is referenced often in the literature to describe the concept of understanding another person’s thoughts, affects, emotions, or points of view. The opposite meaning is described as mindblinded. “Mindblinded is the inability of a person to emphasize or understand that people think or feel differently” (Ekorn, 2005, p. 44). Mindblindedness is not linked to intelligence, and it is often judged as an egocentric or uncaring characteristic, thus putting a child with an ASD even further in a social deficit light. Another concept often referenced in the literature is executive function of the brain (Ritvo, 2006). According to Lichter (2001), executive function is a
set of abilities that control and regulate other abilities and behaviors such as goal directed behavior, the ability to start and stop actions, to monitor and change behavior as needed, and to plan future behavior when faced with new situations and tasks. Also a component of executive ability is the ability to think abstractly. Executive function difficulties are part of the restricted patterns aspect of the ASD definition and diagnosis.

In summary in defining ASD’s and the disorders that fall under this classification, it is important to reiterate the trilogy of symptoms that characterize the diagnosis of an ASD. The trilogy includes impaired social skills, impaired language and communication skills, and restricted interests and repetitive activities. It is also worth noting that no two children are alike, even those with an ASD because each child has a unique personality. Each child with an ASD will display a range of behaviors: some Stone (2006) noted, “look just like what we expect for his or her age and some of which are different – or unusual – compared to other children” (p. 11). There is the possibility a child can be misdiagnosed due to the subjectivity of the criteria for an ASD outlined in the DSM-IV-TR (2000), but Exkorn (2005) asserted that regardless of a “false positive diagnosis of an ASD” (p. 37), it is likely that the child has developmental delays which require the same treatments as those used for a child with an ASD.

Causes

The increase in the prevalence of autism has sparked the resurgence of determining a cause for autism. Throughout the history of autism, the suspected causes of it have varied. “From the 1940s until the late 1960s, the predominant theory was that psychological factors caused autism” (Heflin & Alaimo, 2007, p. 52). Recent research efforts suggested that there may be different causes for the different types of ASD’s.
These research efforts have not been linked to psychological factors, but rather to neurological differences, or environmental causations (Shore & Rastelli, 2008; Stone & DiGeronimo, 2006). The importance of finding a cause is linked to the belief that in finding a cause so will a cure be found. The possible causes or correlations in this review were important to the research because the mistaken theories of a cause often became the basis for misconceptions in understanding and treating ASD.

The early theories that a child was born into a family absent of affection held the parents responsible for the child’s condition, and treatments were directed toward the parents instead of toward the child. In 1967, Bruno Bettelheim used the term “Refrigerator Mother” in referring to the suspected cause of autism (Heflin & Alaimo, 2007, Robledo & Ham-Kucharski, 2005). During this time period, the dominant assumption that autism was caused by the actions of the parents and or the children’s environment. This was called the deprived environment theory. It was still believed that children with autism were born healthy, but because of psychological factors became autistic. Fortunately these theories shifted, and there is now a large volume of research determining that ASD’s are related to neurological and environmental correlations (Heflin & Alaimo; Shore & Rastelli, 2008). The neurological correlations also connect to genetic suspect causes as noted by Robledo and Ham-Kucharski (2005) “Today, scientists know that autism has nothing to do with how mothers treat their children and have traced the disorder to a genetic mutation in some of the body’s chromosomes” (p.2).

Shore and Rastelli (2008) reviewed the genetic connection that some researchers believe exists in people who develop ASD. They noted irregular segments of genetic code that create a genetic predisposition rather than a cause for developing an ASD.
Prevalence rates demonstrated that if one identical twin has autism, the other twin has a 75 percent greater likelihood of also having autism, whereas the risk of autism in typically developing siblings ranges from 2 to 8%. “Among families that contain diagnoses of autism, research shows a 10-40 percent increase in the diagnoses of other developmental disabilities, such as language delays and learning disabilities” (Shore & Rastelli, p. 34).

Brain scans and other brain research have pinpointed differences in the shape and structure of the brain of those persons afflicted with an ASD. Citing research from the Autism Tissue Program in Princeton, N.J., Shore and Rastelli (2008) noted the studies of donated brain tissue to demonstrate that the cause may be “genetic anomalies or environmental insults, or trauma” (p.35). Further research found abnormalities in the chemical messenger or neurotransmitter systems. Also, in this research noted that the weight of the brain is often heavier in children with autism and the memory centers of the brain in autistic children are larger. There are problems for the different systems of the brain in connecting because one or more system may not be working or maybe missing connections.

Somewhere between psychological and neurological possible causes was the theory that immunization vaccines were the cause. The correlation to vaccines was easily associated since about a third of children with autism start to develop language and then lose it, right around 18-32 months, the age when many vaccines are being given to children. Aspy and Grossman (2007) provided a historical summary of the studies that autism is caused by immunizations either due to the virus contained in them or the mercury from the thimerosal preservative used. They noted that recent well-designed
studies have not supported this theory as a cause of autism, especially in light of the fact that the thimerosal preservative is no longer used in immunizations. Studies of retrospective statistics for U.S. samples have led the American Academy of Pediatrics, The National Institutes of Health, The institute of Medicine, and the World Health Organization all to conclude that vaccines do not cause autism (Siegel, 2003).

The Brain-Gut connection is another area of research that considers the upper gastrointestinal, GI tract as the “second brain” according to Shore and Rastelli, 2008). This research is called neurogastroenterology. It concludes that autistic children have severe difficulty with the metabolic process of making a molecule longer by adding a carbon. This process called methylation is required for “regulating DNA synthesis and enzymes, building neurotransmitters, synchronizing neurons, and to make cellular energy” (Shore & Rastelli, p. 37). Simply stated, a person with autism cannot eliminate heavy metals such as aluminum, cadmium, lead, and mercury from their systems which leads to the symptoms seen in autism. Further research in this area may determine whether methylation is genetic, environmentally caused, or a combination of both factors. This theory may be connected to the fact some people with an ASD have food aversions and or obsessions that are difficult to explain.

The research of Baron-Cohen (Shore & Rastelli, 2008) may support the correlation to a cause and the fact that boys diagnosed with autism far surpass the number of girls being diagnosed with autism. This research shows that fetuses which produce high levels of testosterone may have a higher chance of developing autism. Children who experienced high levels of prenatal testosterone made less eye contact and had lower communication skills than those of typically developing 4 year olds. This research has
been criticized because it does not explain other symptoms common to ASD, and it stereotypes boys as better with objects and girls as better with people. Regardless, this research demonstrated the extensive efforts being made to find a correlation to a cause and the prevalence rates noted.

Another theory of research is based upon evidence that 30-70 percent of autistic children have subtle immune system abnormalities. According to Shore and Rastelli, 2008), doctors supporting the autoimmune or virus-induced theories suspected that autism may be triggered during pregnancy due to environmental factors contributing to the developing baby. Factors such as natural stress hormones from the mother or chemical exposure may disrupt normal development. Also immune system problems in the mother of a developing child may add to the possible triggers for symptoms of ASD’s. Research of this nature has typically been conducted in the form of autopsies of people with autism “revealing unusually low numbers of critical immune system components, called Purkinje cells” (Shore & Rastelli, p. 43).

Researchers have obtained the majority of their findings about the brains of persons with ASD as previously described through autopsies and examining the brain after death or through neuroimaging procedures while the person is alive such as an EEG or MRI and drawing inferences about how the brain of a person with an ASD compares to that of a person without an ASD. What is known as a result of this type of research is that there are vast variations in the neurological differences exhibited by individuals with ASD (Heflin & Alaimo, 2007). The brain functions well when the structural, chemical and functional components of the brain work in unison. Pickett (2001) summarized the importance of research for a correlation or cause that is linked to the structural, chemical
and functional aspects of the neurological system as it provides a foundation for understanding why persons with ASD might behave as they do and how their neurological systems may cause them to interact with the world differently. It is the importance of research that leads us to the next aspect of the literature review: perceptions and misconceptions.

*Perceptions and Misconceptions About ASD*

Perceptions and misconceptions surrounding ASD contribute to its misunderstanding as a condition (Franklin, 2007). The damage done by the misconception known as the refrigerator mother (Buckendorf, 2008) that autism was caused by an unloving and cold mother cannot be measured. Nor can the link to vaccinations as the cause for autism. These early perceptions, now recognized as misconceptions continue to surface in popular leisure reading and need to be eliminated through education and understanding (Volkmar & Wiesner, 2009).

“Every autistic child is different” (Robledo & Ham-Kucharski, 2005, p. 10) is true of all children – no two are exactly alike. This suggests the importance of knowing the common perceptions and misconceptions about children with ASD since no two children with ASD will react or act in the same way. Most children with an ASD are not *savants*, “a person who possesses enormous intellectual abilities or talents even as they try to manage a developmental disorder” (Robledo & Ham-Kucharski, p. 12). Actually many have below average intelligence and are not typically geniuses. This perception of below average intelligence may indeed also become a misconception. Ritvo (2006) contended that the label *idiot savant* is another outdated perception based in part by fact that supports a hopeful myth. “This label became quite fashionable as it conjures up the
fantasy of a genius locked inside a handicapped child” (Ritvo, p. 22). He clarified that the exceptional ability seen is due to the fact that some individuals with autism have a cognitive thinking ability that is relatively normal and as a result gets used a lot. He likened this to a person with polio who uses a wheelchair. The normal unaffected arm gets very strong they do not become super human, just stronger as a result of the overuse.

The assumption that students with an ASD are un-testable is another misconception that Ritvo (2006) easily dispelled with the explanation that regular IQ tests were developed for non-autistic children. IQ tests are standardized on children who have normal language-processing skills. Children with an ASD have developmental delays in language processing. “This is how word spread around that autistic kids are mentally retarded and that autism was a type of mental retardation” (Ritvo, p. 50). Children with autism may learn as quickly as other children but experience difficulty expressing what they know (Franklin, 2007). He further asserted that students with ASD can be as capable of learning as other students.

The perceptions that people with ASD are antisocial and incapable of feeling or expressing love are also common (Franklin, 2007). It is part of the ASD that communication is impaired, but a student who receives assistance in learning how to communicate is likely to be social. This also dispels the misconception that people with an ASD are incapable of feeling or expressing love. “Autistic students are capable of feeling bonds with teachers, parents, and others, but their behavioral difficulties often interfere with their abilities to express themselves accordingly” (Franklin, p. 5).

A commonly held misconception, especially among parents is that there is a cure for autism or that their child will outgrow their autism (O’Brien & Daggett, 2006; Stone
& DiGeronimo, 2006). There are many treatments that help to minimize the symptoms, but just as there is no known cause, there is currently no known cure (Exkorn, 2005). Ritvo (2006) assured that while presently there is no known cure, ASD does improves over time and credits the teachers, psychologists, occupational therapists, speech and language therapists, physical therapists and medical professionals as the hands-on care that makes a difference. These professionals working together often make the early diagnosis that leads to early intervention and treatment that improves the child’s life course with ASD. His belief further illustrates the importance of the awareness, knowledge and understanding of autism among school principals as well as the general public. “Individual perceptions about a disorder such as autism affect the methods and beliefs individuals use in the development of treatment strategies and educational planning” (Campbell, Reichle, & Van Bourgondien, 1996, p. 622). Although a cure may not currently exist and children do not outgrow their autism, treatments and interventions provided by both the educational and medical communities help to diminish the appearance of the symptoms. The foundation for the misconception that the child outgrows autism may be rooted in improvements in treatment. Other misconceptions exist in the literature. These misconceptions are connected to diagnosis and identification of ASD.

Diagnosis, and Identification

The nature of ASD, its characteristic symptoms, and behavioral signs serve as the basis of a diagnosis of ASD. The diagnosis is guided by formal diagnostic obtained from the DSM-IV-TR, (American Psychology Association, 2000, The International Classification of Diseases-Tenth Revision (ICD-10); and the World Health Organization
WHO, 1992 as noted by Charak and Stella (2002). The identification of the disorder may also be done utilizing screening tools. “There are a number of autism-specific screening tools that have been validated by research and are available for different ages” (Noland & Gabriels, 2004, p. 270). The Asperger’s Syndrome Screening Questionnaire (ASSQ: Ehlers, Gillberg & Wing, 1999) is an example of such a scale that can be used as is The Autism Diagnostic Observation Schedule ADOS (Lord, Rutter, DiLavore, & Risi, 2002). “The use of well-developed psychometrically sound assessments will greatly enhance the likelihood that accurate and valid information can be obtained” (Naglieri & Chambers, 2009, p. 88). A qualified professional makes the diagnosis by thoroughly collecting the child’s developmental history to determine onset of symptoms. Who is considered a qualified professional varies from state to state (Heflin & Alaimo, 2007). Typically a diagnosis is made by a multidisciplinary team of professionals including speech and language pathologists, occupational therapists, physical therapists, social workers as well as the child psychologist or psychiatrist, and a developmental and/or neurological pediatrician (Fergus, 2008; Heflin & Alaimo, 2007; Stone & DiGeronimo, 2006).

Ohio recognizes both a medical diagnosis as well as an educational diagnosis. (Ohio Department of Education, 2007). Regardless of which professional domain is used to make the diagnosis, Stone and DiGeronimo (2006) contended that an early diagnosis is critical to the success of interventions and preparation for school. They further noted that the diagnosis should be made by a professional who is specifically trained in the use of the DSM-IV-TR such as a child psychiatrist or psychologist, or a developmental pediatrician. One of the many misconceptions about ASD is that it can be medically diagnosed. There is no medical test to identify a child with an ASD; therefore, this is
known as a descriptive diagnosis, one based on observation (Stone & DiGeronimo). “It is mandatory to have a trained and experienced provider coordinate the results of the complex diagnostic process” (Freeman & Cronin, 2002, p. 4).

A diagnosis can be made as young as twenty-four months with the average age being three-and-a-half years (Stone & DiGeronimo, 2006). The difficulty in diagnosing an ASD arises “because of the similarities between behaviors associated with ASD and behaviors demonstrated by all people” (Heflin & Alaimo, 2007, p. 18). The authors further noted that the range of distinguishing characteristics associated with ASD varies from one person to the next. Symptoms vary from one child to the next, but it is the presence of a symptom in each of the three areas that points to the likelihood that a child has an ASD. Children, who develop typically, show a regular sequence in their communication, social relations, and motor development milestones. Whereas Ritvo (2006) noted that children and adults who have been diagnosed with some form of an ASD are not sequential. Their growth and development in these three areas is more characterized by starts and stops. It is because of this observation that Ritvo contended that time of onset does not predict the eventual life course of a child. Ritvo’s 40 years of research also serves as hope as he described Autism/Asperger Disorder as “remittent” in that the person with an ASD will naturally improve over time (Ritvo, 2006, p. 14).

Throughout the literature the importance of the idea that no two children with an ASD are alike is prevalent. Some of the characteristics are more evident, whereas others may be nearly nonexistent. It is the presence of behaviors and the intensity of these behaviors in the executive function of communication, social interactions, and motor patterns that identify an ASD.
The misconception that a medical test exists to determine whether a child has an ASD has caused confusion among the educational community. Although early diagnosis prior to a child entering school is ideal; the symptoms may not distinguish themselves or the parents may not know to seek an evaluation. Noland and Gabriels (2004) highlighted the fact that children with ASD continue to be under-identified and that schools are failing to provide comprehensive evaluations. They proposed the importance of developing and training a team to provide an internal resource for evaluating and identifying students with ASD. “These issues have heightened concerns among public school administrators and educators to take on the responsibility of screening for children with ASD in order to more efficiently provide appropriate special education and services as outlined by IDEA” (Noland & Gabriels, p. 266). This supports the importance that schools have instructional leaders who strive to understand the nature and needs of students with an ASD, are able to identify them and provide appropriate services for them. Aspy and Grossman (2007) contended that the field of the professional is less important than the expertise of the professional with the key word being expertise. This underscored the importance of school leadership possessing awareness, knowledge and understanding of ASD. It is the law to identify children with disabilities (United States Department of Education, 2002). The diagnosis of autism is complex, but can be made by professionals in the educational setting. The words team approach and expertise were found throughout the literature in regards to diagnosis. Aspy and Grossman defined as expert someone with the following traits: practical knowledge of ASD, knowledge of typical development of children; ability to conduct or oversee observation and interview the parent, child and teacher; use formal and informal evaluation procedures; works as a
team; and has knowledge of federal and state law regarding evaluation and eligibility.

The following section of this review describes how laws and legislation have evolved over time so that children with an ASD receive an education that is free and appropriate for meeting their special needs.

**The Law Addressing ASD**

As the prevalence of children with an ASD is rising, the law that ensures their right to an education is also expanding in its interpretation as well as implementation. It is important to reiterate that all of the disorders on the spectrum are similar in terms of their social and educational needs, and as a result the federal government currently does not distinguish between the types of ASD (Boutot & Tincani, 2009). A student with Asperger’s syndrome disorder or a student with Autism Disorder or one with PDD-NOS regardless of the label all may qualify for special education services that help meet their needs to succeed to their greatest capacity. Currently all of the disorders under the umbrella of ASD are subject to the same considerations under the laws that govern the treatment of students with disabilities. This has not always been the case because the history of ASD and its recognition as a disability is more recent than the initial laws that govern how students with disabilities are identified, served, and treated within our public schools.

It was 1990 that congress updated Public Law 94-142, the landmark federal law of 1975 that ensured children with disabilities receive appropriate educational services. The title was changed to Individuals with Disabilities Education Act (IDEA) and the term “autism” and its definition were added to the previous list of disability terms and definitions (Noland & Gabriels, 2004). All states including Ohio participate in this law
as a result of funding incentives that are associated with the 2004 amendments to the law (Volkmar & Wiesner, 2009). There are two main objectives of this law: “(1) to ensure that all children with disabilities had available to them a public education that recognized and responded to their unique needs, and (2) to protect the rights of children with disabilities and their parents in the educational process” (Boutot & Tincani, 2009, p. 40). IDEA mandates meeting the educational needs of children from birth until they reach age 21 through the delivery of special education services. Schools are first obligated under this law to find, evaluate and educate all students with disabilities. This aspect of the law is referred to as child find. Parents, health care professionals and school personnel all can refer a child for an evaluation to determine if a disability exists (Volkmar & Wiesner). The evaluation called a multifactored evaluation (MFE) is conducted at public expense to determine a child’s cognitive, behavioral, developmental, and physical skills and deficits. This evaluation may use a variety of assessment tools such as tests of achievement and cognitive ability, and a language assessment as well as classroom observations, parent and teacher interviews, and other checklists and rating scales. Parents provide their consent for this evaluation and participate along with teachers, psychologists, and speech and language pathologists as well as other specialists such as occupational and physical therapists in this approach as an evaluation team (Boutot & Tincani). The purpose of this evaluation is to determine whether or not a child is entitled to services and to assist the team in planning what educational services are required to meet the student’s needs. The formal plan is referred to as an Individualized Education Plan (IEP), (McLaughlin, 2009; Volkmar & Wiesner).
Another key phrase used in the law once a child has been determined to have a disability, is *free and appropriate education* (FAPE). This means that the special education services outlined in the IEP must be provided at public expense and as well are provided in accordance to each child’s specific needs (Boutot & Tincani, 2009). This is where the symptoms associated with ASD can be addressed through interventions and treatment programs most appropriate to their nature and needs. The law further stipulates that the student be educated to the greatest extent possible with same-age children without disabilities. This legal mandate is known as *least restrictive environment* (LRE) and requires that in the IEP a statement noting the extent to which a child will participate with same-age nondisabled children and in the general school curriculum be included (Boutot & Tincani; McLaughlin, 2009). A final aspect of IDEA law is the procedural safeguards that protect the rights of parents and their children with disabilities. These rights include the right to challenge or appeal any decision related to the identification, evaluation, or the placement of their child. It is then the school’s responsibility to resolve differences with a mediator or through a hearing. Schools must also maintain confidentiality of student records, and parents have the right to review any records and documents related to their child’s educational services (Boutot & Tincani; McLaughlin; Volkmar & Wiesner, 2009).

The Rehabilitation Act of 1973 includes section 504, a civil rights law which also applies to persons with disabilities (Ashley, 2007). Unlike IDEA which states that a child must have a disability that requires special education services; section 504 only requires that the child need modifications and accommodations in order to participate in learning. An IEP is not necessary, but a 504 plan listing the modifications and accommodations
that are needed is instated as part of the child’s rights to FAPE in the LRE. According to Ashley, students need a Section 504 Plan when they do not need specialized education in a special class setting but need accommodations and modifications to be successful in school. A student who qualifies under IDEA automatically qualifies under Section 504, but the reverse is not true. There are three factors to qualify for Section 504: (1) be determined to have a physical or mental impairment that substantially limits one or more major life activities, including learning and behavior; (2) have a record of having such an impairment; (3) be regarded as having such impairment. “Parents can request a Section 504 meeting to determine eligibility for accommodations and modifications by writing to the school principal” (Ashley, p. 187). As the quotation suggests, it is often the school principal who faces the challenges of ensuring that a child with an ASD receives an appropriate education.

The more recent legislation of No Child Left Behind of 2002 (NCLB, United States Department of Education) further secured the need to address autism as a recognized disability in the educational setting with unique needs and requirements for all children, including those with ASD to reach their full potential as the basic purpose of NCLB was to increase student achievement and accountability for that achievement (Henry & Smith-Myles, 2007).

Students diagnosed with ASD and their parents have laws that protect their rights to a free and appropriate education. The school principal must abide by the laws that protect students with ASD so that they are provided a FAPE in the LRE. The awareness, knowledge and understanding that school principals have of ASD is essential to their ability to help determine the most appropriate education and the best learning
environment or setting for the child’s education. The next section of this review addresses the nature of children with ASD as their very nature presents unique needs that must be met through specialized education, accommodations, and modifications.

**Nature and Needs of Children with ASD**

“You never really understand a person until you consider things from his point of view… until you climb into his skin and walk around in it” (Lee, 1960, p. 30). This quote from *To Kill a Mockingbird* serves as the frame for describing the child with an ASD because how they perceive the world around them is quite different than the perception of typically developing children. This section of the literature review examined the nature and needs of students with ASD to help the reader get into their skins and walk around in their shoes to gain a perspective of what is necessary to enable them to be successful in school. It is important to note that the nature or symptoms of ASD can severely interfere with learning (Leblanc, Richardson & Burns, 2009), and a discussion of the needs created as a result of these symptoms is crucial to building the foundation for understanding treatment interventions. “Different learning styles, difficulty communicating, impairment in social interactions, resistance to change in routines, repetitive body movements, and speech patterns are some of the characteristics of ASD that can cause stress and a variety of problems for both students and educators within the fully integrated classroom” (Leblanc et al., p. 167).

Social interaction impairment is one of the three primary symptoms comprising the descriptive nature of ASD (Aspy & Grossman, 2007; Exkorn, 2005; Ritvo, 2006; Stone & DiGeronimo, 2006; Wiseman, 2006). Children with an ASD do not show the expected development of early social interaction skills. “In fact, impaired social
interactions are the hallmark of autism and are present in all children with the diagnosis” (Stone & DiGeronimo, 2006, p. 13). The social impairments affect both the child’s interactions with other children but also adults as well. What this means in describing the nature of a child with ASD is that unlike typically developing children, children with ASD do not show an interest in other children and people, but more often in objects. At the playground the child with ASD would be more noticeably alone and detached, and likely to be engaged in repetitive odd behaviors (Exkorn).

Siegel (2003) uses the phrase “affiliative orientation” (p. 63) to describe the basic desire to be with, do with, and be like others. Children with an ASD lack this affiliative orientation. Typically developing children do not present the need to be taught to want to be with others instead of alone. They do not need to be taught to find other children interesting, they just do. “A basic lack of affiliative drive means that the child is not particularly drawn to things just because those things involve human activity and interests” (Siegel, p. 64). She further noted that children typically want to watch others and then be like them. Children with ASD poorly imitate other people if at all. This lack of affiliative orientation affects learning by imitation observation. Another result of this lack of affiliativeness is from the standpoint of psychology as Siegel cites “that the quality and contingency of care that a child receives has a lot to do with how sociable and warm a particular child is” (Siegel, p. 63). People are more innately motivated and drawn to someone who reciprocates and acknowledges them. Therefore children with ASD are not as likely to have people naturally drawn to them to offer support and assurance.

The difficulties that children with ASD experience socially create needs in learning the social codes and rules that guide behavior, making and keeping friends, and
interacting in a group. What is taken for granted that most children learn the rules of
social interaction by watching and observing, the child with an ASD must be taught how
to interact with peers, when they may not be intrinsically motivated to do so (Aspy &
to foster opportunities for students to be taught how to interact at school in a social group,
as well as the classroom. Students with an ASD can often be the target of teasing,
bullying, and understanding that they are being teased is part of learning the rules of
social interaction. Most students whose development is typical learn quickly how to
behave around certain people and what behaviors to avoid in order not to seem different
and to stay out of trouble. These skills are not taught directly, but are inferred and learned
by trial and error and are referred to as the hidden social curriculum (Myles, Trautman &
Schelvan, 2004). Due to their neurological differences, most students with ASD do not
have the ability to utilize the hidden social curriculum and may engage in behaviors that
are socially unacceptable. Even students functioning higher cognitively may be able to
store the specific rules that apply to social situations, but they may not be able to apply or
generalize these appropriately. Heflin and Alaimos further noted that as a result of
impaired social skills and understanding of the hidden curriculum, educators who do not
have an understanding of ASD may make comments that the student was just being rude,
manipulative and or willful. These perceptions can result in unnecessary discipline as
well as peer and teacher rejection. “Being disciplined for failure to identify and engage in
correct social behaviors as well as being rejected by peers can lead to students with ASD
becoming anxious and depressed further diminishing their motivation to learn and use
social skills” (Heflin & Alaimos, p.274).
Ritvo (2006) also noted another area that neurologically does not develop typically in people with an ASD that contributes to social difficulties and learning. The theory of mind is the concept that others have a mind of their own full of thoughts, and emotions such as guilt, remorse, and loneliness. Also those feelings which are naturally motivating such as the need to please get love and attention do not develop in a typical manner. The usual school reinforcement systems build themselves around these feelings therefore creating a need for interventions that reinforce in more compatible ways with the nature of ASD.

Throughout the literature autism professionals and educators stated that the student with ASD does want to interact appropriately with people and the world around them (Asphy & Grossman 2007; Attwood, 2006; Stone & DiGeronimo, 2006). It is generally because the student with ASD does not understand the situation or what is expected of them (Notbohm & Zysk, 2004). School interventions must take into consideration this symptom of ASD and the resulting needs to ensure the success of the student both functionally as well as academically. As a result of this social impairment the need for interventions that emphasize the importance of engagement and “learning-to-learn” skills is essential (Volkmar & Wiesner, 2009). Interventions and treatments that address social interaction impairment are often closely connected with those that address communication impairment symptoms of ASD.

Communication impairment may be in the form of delayed, and/or limited language or a lack of verbal speech. Communication impairment may also be found in children with sufficient verbal speech but who instead struggle to initiate and sustain conversations with others. There are indeed several aspects of communication that a
person with ASD may or may not have. Some children with ASD may have expressive communication impairments that affect the child’s ability to produce verbal speech, or the ability to initiate requests. Some children may produce repeated, echolalic speech and or speech patterns that have little or no meaning. Sometimes a child with ASD struggles to know what they want to express (Exkorn, 2005; Mirenda & Iacono, 2009; Myles & Henry, 2007; Wing, 2001).

Communication differences such as a limited ability to use and understand nonverbal communication as well as verbal communication is typical but manifests itself in each individual with an ASD differently and to a different degree (Aspy & Grossman, 2007; Sicile-Kira, 2004; Stone & DiGeronimo, 2006). Delays in language are most common, but just understanding that language is a method of communication may be lacking in children with an ASD. Tone of voice, humor, eye contact and personal space are often confusing to the child with ASD. It is the nature of persons with ASD to process and respond more appropriately to visually presented interventions. The resulting need is for interventions and treatment to include pictures and symbols to help facilitate communication both receptively and expressively. The essential professional to help design and implement interventions and treatments for communication impairment is the speech and language therapist/pathologist (SLP). The SLP provides appropriate interventions that will help the student with ASD communicate more effectively both verbally and nonverbally, as well as understand both verbal and non-verbal communication. Furthermore the SLP can guide teachers and families in how to communicate to a child with ASD and the interventions that support the child’s specific communication deficits.
Self-awareness falls under the area of personal communication as it impacts how the individual reacts to their own feelings. “Persons with ASD experience varying degrees of ability to understand their own feelings” (Henry, 2007, p. 82). They do not know how to self-regulate as they do not have a repertoire of self-calming strategies or know how to use them (Henry, Volkmar & Wiesner, 2009). The implication for interventions is to provide opportunities for the child with ASD to learn how to regulate their actions when they become angry, frustrated, or anxious (Henry).

The final symptom of the three essential features of autism is motor development characterized by repetitive and restricted patterns of behavior, interests, and activities (Aspy & Grossman, 2007; Sicile-Kira, 2004; Stone & DiGeronimo, 2006). Children with an ASD may find comfort and security in repetition of routines, patterns, and rituals as well as repetitive movements (Stone & DiGeronimo). Rocking, flapping, and fascination with objects are just a few examples. In persons with ASD who function higher cognitively this repetition is often seen as a preoccupation with a particular interest and it may be an atypical interest such as vacuum cleaners. “Some may know countless details about their unusual interests and spend much time immersed in them” (Aspy & Grossman, p. 12).

Another need of children with ASD is the need of repetition. This may present itself as an obsession for sameness and order (Aspy & Grossman, 2007; Stone & DiGeronimo, 2006). A transition or change from one activity or a location may cause distress. There is also an intense need for closure. A person with ASD may have much difficulty stopping a task before it is completed. Because of their restricted and repetitive patterns of behavior, interests, and activities; it is at first glance easy to consider the
needs and accommodations to be made by school personnel, parents, and friends alike, as schools tend to run on a schedule. This logic does not take into account the number of changes that occur throughout a day and the confusion that is created for the students with an ASD. The student with ASD needs to know what will happen next and schedules are essential to the student’s routine and love for order. The nature of ASD in terms of repetitive, restricted patterns of behaviors, interests and activities requires interventions that help the student with ASD manage their environment by providing predictability, and opportunities to pursue areas of interest.

Although not part of the formal diagnostic criteria for ASD, it was throughout the literature that sensory issues are part of the nature of ASD (Henry & Myles, 2007). In fact Volkmar and Wiesner (2009) noted that Leo Kanner in his first description of autism reported unusual sensory features. Some of the ways in which the child with ASD responds to sensory may exemplify the one of the key features of the disorder such as repetitive rubbing, spinning or stacking of an object, but it appears to be more connected with the sense of touch than the motor movement. It is not known why these sensory issues develop, and research on sensory characteristics is limited (Henry & Myles), but they present challenges for the student with ASD as well as their teachers and parents in the school environment. Abnormalities in processing incoming sensations such as sight, smell, sound, touch, taste, pain, and temperature are experienced by 70-80% of the ASD population” (Aspy & Grossman, 2007, p. 15).

Volkmar and Wiesner (2009) noted a connection to the social interaction impairment characteristic of ASD as likely to be a contributor. “Most of us learn very early in life from other people what is, and isn’t, so important to focus on” (Volkmar &
Regardless of the cause, sensory issues exist and may include sensitivity to sounds, lights, textures, temperatures, smells, and even food. Additionally connected to the social impairment nature of children with ASD is that they are not as socially motivated as typically developing peers to please and respond to praise from parents and adults. This presents challenges to teaching the child with ASD coping strategies to minimize their responses to sensory issues.

Henry and Myles (2007) connected the sensory integration process to the motor planning aspect of the ASD diagnosis as there are five steps in how the brain processes sensory and each of these presents a challenge to what we currently know about how a person with ASD processes input to the brain. These steps are as follows:

1. We become aware of the sensation
2. We pay attention to it
3. We attempt to interpret the sensation by using current information and referring to past experiences for comparison.
4. The organization occurs when our brain decides what we should do in response to the sensation.
5. We respond, the execution of the action (Henry & Myles, p. 60).

They further explained how the central nervous system functions to help the body maintain a state of balance ensuring that we can think, problem solve, and make decisions. Sensory inputs may interfere with this balance and evoke physiological reactions from other parts of the body. These reactions are what we call behavior. “Children who process sensory information effectively tend to be responsive to home routines, manage successfully on community outings, and are frequently viewed
favorably by teachers in the school setting” (Henry & Myles, p. 64). Conversely, children who have sensory processing difficulties often have difficulty learning as they are bothered by sensory that other children can ignore, cannot focus on what is important. Their central nervous system is out of balance and they do not know how to “modulate” a term Henry and Myles shared that is often used by occupational therapists. Modulation requires that the person have awareness that their system is out of balance with the environment. They recognize that their response is appropriate to the situation or that their response is not appropriate. A typically developing child learns or just seems to know techniques to recreate the needed balance.

Another sensory impairment to note is proprioception which is the sense of one’s body in space, and may be closely related to self-stimulating behaviors (Volkmar & Wiesner, 2009). This is explained by the authors using the examples of “a young child flicking a string in front of their eyes, while an older child might want to spin or body rock” (Volkmar & Wiesner, p. 494). Ritvo (2006) referred to this as vestibular sensations describing it as spinning around and staring at things that spin without getting dizzy as typical repetitive behaviors for people with ASD. They also like other visual sensory such as flashing lights and the flickering of light as wheels spin. He also noted that is not surprising to hear that a child knows exactly what time the game show Wheel of Fortune appears on TV and insists on watching it. It is the spinning wheel and flashing lights he contended to be the reason. Sensory impairment was included as part of the nature and needs of ASD as some behavioral interventions seem to work as they incorporate spinning, and swinging to help the child stimulate the balance system of the
body and serves as means of modulation. If Wheel of Fortune can be found fascinating then it can serve as a reinforcer or motivator for other types of desired behaviors.

*The Importance of School Leadership*

School principals emanate their values, and beliefs on the school culture. Understanding the importance of school leadership was essential to the purpose and objective of this research study. School principals as leaders have the ability to impact many students including those with ASD. Their beliefs about autism and how best to serve students with this disorder is critical to the treatment and practices provided to students with ASD. A core objective of school leaders is to serve students. “The principal is the person most likely to be in a position to shape the organizational condition necessary for success, such as the development of shared goals, collaborative work structures and climate, and procedures for monitoring results” (Fullan, 2001, p. 83).

McLaughlin (2009) underscores the importance of the school principal:

> Principals have always been central to high quality special education programs in schools, but never more so than in today’s climate of high standards and high stakes accountability. Today, school leaders need to have deep knowledge about special education and the students who receive these services. Until recently it was possible for a principal to delegate responsibility for special education to a special education teacher or department head. Now, principals must be involved with the education of any student because they are accountable for improving the achievement of all students (p.1).

> Public education serves all students, including those students with an ASD. Their unique nature and needs present challenges but also opportunities for principals to lead. Fullan (2003) references to moral purpose and leadership that is driven by the purpose to serve all children and to ensure that each and every child thrive and reach full potential certainly exemplifies this premise of leadership. Every child includes those with ASD.
The awareness, knowledge, and understanding that a school principal possesses about ASD is not only critical to the culture of a school but also to the capacity of the teachers, and staff of a school to meet the needs of students. “People expect their leaders to speak out on matters of values and conscience” (Kouzes & Posner, 2002, p. 46). Kouzes and Posner further noted that leaders who are not clear about what they believe are more likely to change their position with what is currently popular. With the current increase in the number of children with an ASD, it is even more important that the school principal have awareness, knowledge and understanding of ASD as well as recognizing what is needed to meet the needs of these students.

Glickman (2002) affirms the importance that the school leader be aware of the extent or lack of knowledge and how best to utilize knowledge and skills for better results for students and teachers. Attwood (1998) noted the importance of the school principal as essential to providing both practical support and emotional support as well for the teachers. The school principal is typically responsible for supporting both the special education team and all of the related service providers as well as general education teachers. “Teacher education programs provide little instruction or information about professional expectations, liability issues, and ethical decisions” (Harding, 2009, p. 94). The principal’s leadership is essential to the continued growth and understanding of those serving students with ASD.

The awareness, knowledge, and understanding among principals is built on belief systems and also interchangeably builds belief systems. Beliefs start in group and personal experiences and through reading. “Beliefs are powerful in schools because they represent the core understandings about student capacity (immutable or alterable), teacher
responsibility for learning (little or a lot), expert sources of teacher knowledge (experience, research, or intuition), and educational success (will never happen or is achievable)” (Deal, 1999, p. 27). The importance of the principal’s empirical knowledge and understanding of autism is critical to the cultural framework of the school.

Given the demands of the profession and of education curriculum in particular, and with the increasing prevalence of ASD, it is critical that professionals in the field of education increase their knowledge and understanding of ASD and that they be easily able to access the supports and resources required to meet the diverse needs of all students diagnosed with the disorder (Leblanc, Richardson, & Burns, 2009, p. 176).

The behaviors and responsibilities of school principals are guided by their beliefs and knowledge (Isaacson, 2007). Marzano, Waters & McNulty, (2005) describe “intellectual stimulation” (p. 52), as one of the 21 responsibilities that are essential to student learning. This intellectual stimulation is the extent to which the school leader ensures that teachers and staff are aware of the most current theories and practices. Therefore it is equally important that the principal have solid empirical knowledge of ASD, and the most current educational treatment approaches. In similar research, Cotton (2002) noted the importance and responsibility of the principal to reach out to the community. “Effective principals interact with parents and the community to communicate their vision for their school, get constituent input, and make certain that the resulting goals are broadly understood” (Cotton, p. 18). This responsibility is driven to a large extent by the principal’s awareness, knowledge and understanding of a need and as in the case of this research, their knowledge of ASD. The community can contribute to the principal’s understanding and knowledge of ASD as well as it can benefit from the school leader’s knowledge of school curriculum, practices, policy and personnel. The
school leader must consider the resources outside of the school as well as those within the school.

The importance that a school principal as the building leader have awareness, knowledge and understanding of ASD is never more important than when regarded in terms of the laws and legislation for students with ASD. One of the five guiding principles outlined by McLaughlin (2009) is that school principals must understand the intent and legal foundation for special education procedures and rules, not just comply with them, but to truly understand their purpose. She further provided that principals create the conditions within their schools that support effective special education practices. They should advocate that special education is neither a place nor a program. Special Education is tailor made services and supports meeting the needs of individual students so that they can progress in the general education curriculum. Harding (2009) extended the importance of the school principal’s understanding of the mandates of IDEA as well as all amendments and reauthorizations (IDEAIA, 2004). She supported the importance of school leadership as the bridge between parental concerns and classroom instruction as well as representing district, state, and federal interests. She cited the following from Michael Fullan’s (2003) *The Moral Imperative of School Leadership*:

“the principalship is the only role strategically placed to mediate the tensions of local and state forces in a way that gets problems solved” (Fullan, p. 92).

Too often a principal’s first encounter with a student with ASD is one of a disciplinary nature. “Probably nothing creates as much anxiety, frustration, and overall confusion for principals as the discipline procedures that apply to students who receive special education” (McLaughlin, 2009, p. 43). A principal who has awareness,
knowledge and understanding of ASD has the capacity to help shift behavior management from the reactive disciplinary methods to creating positive behavioral supports (McLaughlin) that are more preventive interventions. A knowledgeable principal is able to be proactive and do what is necessary to support the student’s behavioral challenges. Harding (2009) asserted that principals should participate in training in behavior modification strategies such as positive behavior support (PBS) because they improve their credibility with the staff to be skilled in working with students with ASD through these systems. A principal with a strong working knowledge of behavior modifications systems has a different role than that of disciplinarian in working collaboratively with the special education team to design and implement the student’s behavior plan. It is critical that all staff work with a very high level of consistency and understanding while addressing specific behavioral challenges.

The importance of school principals can be summarized best by the responsibilities of the site leaders. They have the ability to support and nurture effective instructional and behavioral practices through supervision and evaluation of school employees. They leverage resources in order to support successful programs, articulate the mission for continuous improvement, monitor progress and compliance issues as they adhere to law. The principal is the leader in establishing the culture where all students are educated to be successful (Harding, 2009). Harding shared how the principal by simply “providing good working conditions for personnel who are specific to the support of students with ASD and including them in school communications, providing office space as needed, and introducing and welcoming them at staff meetings creates a collaborative
culture which is an important component of administrative leadership” (Harding, p. 92-93).

The final section of this literature review will provide an overview of practices, programs, services and strategies that are typically provided and are considered effective for meeting the needs of students with ASD. McEwan (2003) noted that sometimes programs must be tailored to meet the needs of small groups of students which are often the case of students with ASD’s. It is the leader’s empirical knowledge, that which is gained through experience that supports the implementation of effective services and interventions for students. (Deal & Peterson, 1999; Reeves, 2006). The individual perceptions about a disorder such as ASD affect the methods and beliefs individuals use in educational planning (Campbell, 1996). This emphasized the importance of a school principal having a foundation in the understanding, knowledge and awareness of ASD as interventions are considered and selected in meeting the nature and needs of students with ASD.

Interventions and Services in Meeting the Educational Needs of Students with ASD

Originally this section of the literature review was to be subtitled best practices for meeting the needs of students with ASD. It was changed to define the terms best practice, evidence-based and scientifically based because these phrases occurred throughout the literature and they presented an important consideration when implementing an intervention, strategy, educational tool, practice, program, service, or treatment. Parents and teachers may hear about a program or practice and immediately begin implementing without question. Parents may investigate alternative interventions and treatments in quest of a cure or quick fix. “Schools may be asked to accommodate
these treatments in various ways” (Volkmar & Wiesner, 2009, p. 520). In fact, parents may demand a particular treatment, service, or program. It is essential that the school principal not only have an awareness, knowledge, and understanding of ASD, but understand what constitutes best practice, is evidenced based, or is scientifically based, and consider what is most appropriate as part of an educational team decision (Henry & Myles, 2007).

Simpson (2005) stated

It is clear that identifying scientifically validated methods is extremely important and timely. Indeed, a cornerstone of the No Child Left Behind Act of 2001 is an emphasis on connecting educational practices to scientifically based research. It is noteworthy that the No Child Left Behind Act uses the phrase “scientifically based research” 111 times (p. 7).

Since it was used 111 times in the NCLB Act of 2001; it is important to use NCLB’s definition. “To meet the NCLB (2001) definition of scientifically based, research must: (a). Employ systematic, empirical methods that draw an observation or experiment; (b). Involve rigorous data analyses that are adequate to test the stated hypotheses and justify the general conclusions; (c). Rely on measurements or observational methods that provide valid data across evaluations and observers, and across multiple measurements and observations; and (d). Be accepted by a peer-reviewed journal or approved by a panel of independent experts through a comparatively rigorous, objective, and scientific review” (National Institute for Literacy, 2006, p. 1).

Simpson provided this brief definition for scientifically based practices as those “that have significant and convincing efficacy and support” (p.9). IDEA of 2004 also places much emphasis on scientifically based instructional practices to improve the performance of students receiving special education services (Detrich, 2008).
Evidence-Based practice was first noted in the medical field and has recently spread to education and other fields (Detrich, 2008). Mirenda (2009) citing (Schlosser & Raghavendra, 2003, p. 263) provided this definition for evidence-based practice as “the integration of best and current research evidence with clinical/educational expertise and relevant stakeholder perspectives to facilitate decisions for assessment and intervention that are deemed effective and efficient for a given stakeholder” (Mirenda, p. 11). Simply stated, evidence-based practice is founded on scientific research but put into practice by practitioners of a particular field or discipline. “Evidence-based practices make a significant difference in the lives of young children with ASD and their families” (Becker-Cottrill & Ball, 2009, p. 9).

Best practice was defined by Henry and Myles (2007) citing (Visitask, nd) as “a superior method or innovative practice that contributes to the improved performance of an organization” (p. vii). This phrase was chosen to be used as part of the overview of interventions for educating students with ASD. Boutot and Tincani (2009) referred to education and effective treatment as the “aspirin for ASD” (Boutot & Tincari, p.24). Therefore the review of interventions that meet the nature and needs of students with ASD was necessary to this study. The interventions presented are not exhaustive, but reflect those that are common throughout the literature. They encompass treating the primary symptoms of autism and have evidence-based research that demonstrates they improve the performance of students with ASD. As a result, they are considered best practice educational interventions. Many are scientifically research based as well. Stone and DiGeronimo (2006) stated it best: “We just don’t know at this time which interventions work “best” with which symptoms of autism in which children. We do
know, however, that some have proven their effectiveness over and over again in research studies that use the scientific method of evaluation – these are the therapies and treatments you should focus on during this time of exploration so that you don’t get tangled up in treatments that take advantage of your vulnerability” (Stone & DiGeronimo, p. 137).

For the purposes of this section of the literature review, the researcher used the terms interventions and educational supports to encompass programs, educational supplements and tools, specific teaching methods, services, modification and accommodations that work to reduce the effect of specific symptoms of ASD that hinder a student’s ability to learn in a school/classroom setting. According to Bartlett, Weisenstein, and, Etscheidt (2002; American Autism Society, 2007), instructional program interventions for students with ASD typically “address communication-language skills, social skills, behavior management, vocational skills, community living skills” (Barlett et al, p. 280). These will be the focus areas for describing school interventions and services.

First, it is noted that ASD is often diagnosed prior to a child starting school, and as a result interventions can be initiated before the child enters school. In fact, Stone and DiGeronimo (2006) emphasized the importance of early diagnosis as it led to specialized early intervention services that help children with ASD in terms of cognitive development, language ability, social skills, and behavioral functioning. It was also important to note that the sooner a child is diagnosed, and that typically means prior to the start of school, the more beneficial a behavior treatment can be. “Researchers are now
convinced that the earlier children are diagnosed -- the greater the chances that they will receive the maximum benefit from treatment intervention” (Exkorn, 2005, p. 10).

By targeting the social and speech behaviors of the child, the intervention helps the child with ASD settle into public school more easily. These early interventions help to “minimize or eliminate problem behaviors, which are critical to helping children with ASD’s gain strength in cognitive and communication, play, and overall developmental skill” (Exkorn, 2005, p. 89). Early intervention means that as soon as a child is diagnosed with an ASD, an intervention plan begins. Exkorn defines intensive intervention for a child as receiving 25-40 hours of treatment services per week. Fortunately these early interventions occur prior to the child starting school, but becoming familiar with their philosophies and approaches may be beneficial to school leaders as Fullan (2001) noted that “solutions must come through the development of shared meaning” (p. 9), and it is the shared meaning that can lead to shared understanding of what journey the parent and the child with ASD have taken prior to starting school.

The literature revealed numerous early intervention programs addressing the communication, social and behavioral nature of ASD. But even more extensive was the body of information about interventions for children of school-age. Programs and educational tools address different symptoms of ASD. They may primarily address interpersonal relationships, or they may be skill based or cognitive based interventions (Simpson, 2005). Some may be physiological/biologically based such as diet and medication treatments which have not been elaborated upon because these typically are not within the expertise of educators, but of the medical profession.
The federal laws of Section 504 and IDEA overseeing the educational rights of children with disabilities requires the need for finding what works best in terms of service and intervention to meet the nature and needs of school-age children with ASD. *Related aides and services* is a phrase taken from IDEA (2004) Law and defined by Notbohm and Zysk (2004) as anything that helps the child get to school, stay at school, learn the curriculum, and participate in the extracurricular activities afforded to their typical peers and return home at the end of the school day. They noted that there are fifteen related aids and services listed in the Federal Regulations of IDEA 2004 that may help with social skills, sensory skills, sensory issues, language/communication, play skills, and leisure/recreation. Henry & Myles (2007) noted the additional related service of assistive technology. Many of these related services have specific personnel who have special qualifications to carry out the intervention or service considered as appropriate and necessary for the student.

Related service providers typically include a speech and language pathologist, an occupational therapist, and a counselor or psychologist. Their special qualifications help determine appropriate interventions and services for each child. The needs of each individual child are the primary consideration in determining which related service is necessary and which intervention(s) to implement (Stone and DiGeronimo, 2006). Typically a child’s IEP will address the related service and the personnel as part of that service but does not elaborate on specific programs or interventions unless that intervention and/or program has been proven effective for that student over time. No one program or specific intervention is right for every child and none so far have been deemed to be superior over others (Henry & Myles, 2007; Stone and DiGeronimo).
These related service providers are not always employed by the school district but rather contracted on a per student basis. The school principal should be familiar with these various related service providers and be familiar with the goals and services that they should be providing students. Principals should model behaviors demonstrating that these individuals provide a vital service to the students (Harding, 2009). The prevalent interventions in the literature employed by related service providers are overviewed next. Many of the noted interventions are evidence based and considered best practice.

The speech and language pathologist (SLP) is the key member to address the communication needs and the resulting social/behavioral needs of children with ASD. Some even help improve eating skills. Alternative forms of communication may be taught for children who cannot speak (Mirenda & Iacono, 2009). Some interventions common to the literature as those often implemented by the SLP include, Picture Exchange Communication System (PECS), Social Stories, and Visual Supports (Mirenda & Iacono; Robledo & Ham-Kucharski, 2005; Stone & DiGeronimo, 2006). Non-verbal students with ASD benefit from the use of PECS (Robledo & Ham-Kucharski, 2005). This system helps students communicate their needs and wants using pictures to express them. “PECS is a research-based strategy” (Henry & Myles, 2007, p. 76). This research has demonstrated that children may develop verbal speech as the number of pictures that they use increases. Parents as well as researchers have also noted that children with ASD have had decreases in disruptive or inappropriate behaviors when PECS is used (Henry & Myles; Stone & DiGeronimo).

The intense need for order, repetition and routine that is characteristic to the nature of persons with ASD responds well to the intervention referred to as visual
supports. These are just what the name implies a visual support that depicts what the learner can anticipate is going to happen and what is expected. Often times these supports are actually time schedules. Visual schedules address the difficulty of grasping the time concept and transitioning from one activity to the next which is not just a receptive language intervention but a social, behavior, vocational skill and life intervention (Aspy & Grossman, 2007; Robledo & Ham-Kucharski, 2005). Pictures are used paired with verbal sequencing words such as: first, next, and then. It is important to know and understand that students with ASD tend to conceptualize their ideas and experiences visually (Aspy & Grossman). The visual schedule supports this need of ASD.

Another tool utilized by SLP is the Social Story™ a name for a concept method developed by Carol Gray that teaches individuals with ASD about ways to behave in different social situations and scenarios that are difficult for students with ASD. (Aspy & Grossman, 2007; Attwood, 2006; Gray, 2000; Robledo & Ham-Kucharski, 2005). Reacting to social situations often depends on being able to read others, and react to their emotional cues. They are read in first person, positive in their nature and serve as a guide for how a child with ASD is to respond to the situation (Gray, 2000). Aspy and Grossman provided supporting research that demonstrated Social Stories™ was effective in addressing target behaviors and teaching positive social skills. They also provided the formula for writing a social story demonstrating the ease of implementing this intervention by anyone working with the child not just the SLP. Attwood cited Gray using her example to illustrate a Social Story™ specific to a child having difficulty understanding figures of speech:

Sometimes a person says, ‘I’ve changed my mind.’ This means they had one idea, but now they have a new idea. I will work on staying calm when someone
changes their mind. When someone says, ‘I’ve changed my mind.’ I can think of someone writing something down, scratching it out and writing something new (p.77).

The Social Story™ formula is very effective in helping persons with ASD understand social cues and how to respond to situations.

Assistive Technology (AT) is a related service and is defined by Henry and Myles (2007) citing the 1988 Technology-Related Assistance for Individual Act (TRAIDA) and IDEA as “any item, piece of equipment, or product system, whether acquired commercially off the shelf, modified, or customized, that is used to increase, maintain, or improve functional capabilities of individuals with disabilities” (p. 80). They further described examples of low-tech AT: Velcro™ straps, rubber mats, pictures, adaptive spoons, photographs. High-tech examples included computer assisted technology, augmentative communication devices with voice output capabilities, talking calculators, word processing software and the previously noted PECS examples of both low and high tech AT. Simpson (2005) noted that AT may be an effective intervention to address communication needs, matching skills, spelling, alertness, and task completion but there is limited published scientific research on the efficacy of AT with students with ASD. Henry and Myles (2007) noted the limited number of trained professionals available to support teachers, students and families using high-tech AT. They noted the most common reason families cite for abandoning AT is a lack of training and support. An implication for school principals is that they should be cautious of AT interventions until they have been proven to be effective for the specific student and to make training for their use a priority.
Occupational Therapy or OT is a related service and although it may sound as if it is related to job skills, it is not exclusive to job skills. For students with ASD, OT is used to help them achieve in daily living skills such as self-help, play, socialization, communication, and fine motor control (Exkorn, 2005; Stone & DiGeronimo, 2006). “OT provides support for children with ASDs who have difficulty with sensory, motor, neuromuscular, and/or visual skills” (Exkorn, p. 107). The therapist addresses fine motor skills that may be poor due to the nature of poor motor planning seen in children with ASD which indirectly supports written communication. They also use sensory integration to address behavior management through self awareness and modulation. Presently, research is limited regarding the use of sensory integration, but for many students with ASD, certain sensory-based activities just seem to work to address the their specific needs (Aspy & Grossman, 2007) Aspy and Grossman referred to the sensory diet which provides sensory-based activities addressing movement, touch, sound in a systematic and prescriptive manner. They noted the use of the weighted vest to decrease repetitive behaviors. They referenced Williams and Shellenberger’s 1996 How Does Your Engine Run? The Alert Program which uses cognitive-behavioral strategies to teach the student self-regulation skills. Children are taught to think of their bodies as a car engine: sometimes it runs high, fast, low and sometimes just right (Notbohm & Zysk, 2004).

As team members, the counselor and/or psychologist can serve the student directly through social interventions or they may function as support members of the team of educators working together to find what works for the student. Strategies such as Functional Behavioral Assessments (FBA) help identify appropriate interventions (Aspy
& Grossman, 2007; Willis, 2006). “Under the 1997 amendments to IDEA, children who exhibit challenging behavior must receive an FBA, and the results incorporated into a behavioral intervention program” (Boutot & Tincani, 2009, p. 157). The role of the counselor/psychologist or other person trained in FBA is to identify situations that produce challenging behavior. The best way to understand why a student behaves in a particular way is to examine what is going on just before or just after the behavior. Although the process sounds simple, it is complex, but essential to finding interventions that help students with ASD be successful in the school setting (Aspy & Grossman; Willis).

The school counselor and/or psychologist are also essential in social interventions such as peer buddies, circle of friends and social autopsies. Peer buddies is evidenced based as it has been effectively measured to increase appropriate social interaction. The counselor pairs the student with ASD with a typical peer and facilitates social interaction for the pair (Aspy & Grossman, 2007). Another technique seen frequently in the literature is circle of friends in which a network of peers is brought together to support a student with ASD. It is important to note, however that the research surrounding this technique does not support change in behavior of the student with ASD, and the increased acceptance level of the friends in the circle is not sustained over time (Aspy & Grossman).

Social Autopsies is a social intervention which the school counselor and/or psychologist implements. Henry and Myles (2007) pointed out that most importantly it is not a punishment, but a problem-solving strategy that helps the student with social problems understand social mistakes by working with an adult to systematically
understand the error and develop a plan for preventing the same social error again. This was originally designed to be verbal, but a visual format has been created. The success of this strategy rests with its structure, immediate feedback, positive feedback and most of all, its carry over to other aspects and areas of the student’s social life. “Every adult with whom the student with ASD has regular contact, such as parents, teachers, and therapists, should know how to do a social skills autopsy as a way of fostering student skill acquisition and generalization” (Henry & Myles, p. 131).

The teacher is not a related service, but an essential service. The teacher creates the climate, and conditions of the classroom whether it be a specialized intervention classroom or a typical classroom. Simpson (2004) citing the work of Wayne and Youngs (2003) stated that not only does intuition tell us that the achievement of students depends on the teachers they are assigned, but research supports this presumption. The teacher is the key to the interventions and services for students with ASD. They must work collaboratively with the related service providers since the ultimate goal for the student is to generalize their skills and learning across situations and settings as supported by Boutot & Tincani (2009), with this statement “One of the goals of teaching is for our children to learn skills that they can use over time and in a variety of real-world settings” (p. 168). The classroom in which a student with ASD is placed should be one that is exemplified by the following: “An effective classroom for students with ASD offers a physical structure that enhances learning opportunities and instructional approaches that facilitate language acquisition, behavior management, social skills, and targeted academic goals” (Vollrath, Cook, Robbins, Ben-Arieh, 2008, p. 93). The teacher utilizes visual supports and schedules, provides opportunities for the student to use sensory tools, makes
a personal schedule for the student, implements effective social strategies, seeks FBA assistance if needed, helps prepare the student for change through *priming* and preparing them for changes in the routine.

*Priming* according to Heflin and Alaimo (2007) may be the easiest of all interventions to implement and the effects of its use are immediately seen. It is a strategy that enhances the student’s ability to learn by allowing the student to practice the activity and become familiar with the materials and expectations ahead of time. Research indicates that priming can be effective for students with ASD because it increases predictability by allowing them to practice future tasks before they are expected to perform them.

A common intervention found in practice to support the student with ASD is the use of a paraprofessional educator. This is a person who is hired to assist the teacher in supporting the student with ASD and consequently help the student function in the classroom and school. This position may also be referred to as an instructional assistant or teacher aide. NCLB Law referred to this position as a paraeducator and even stipulates that these persons like teachers pass a rigorous state assessment to be considered highly qualified (Simpson, 2004). This intervention is an important one to both teachers and principals. “Good paraeducators are worth their weight in gold; they facilitate increased opportunities for the student with autism to learn and grow” (Notbohm & Zysk, 2004, p.168). This common intervention may sound like the solution to all that a student with ASD needs, and although NCLB stipulates they need to be highly qualified, that does not mean in reality they are prepared with the knowledge and understanding necessary to support the student with ASD (Simpson, 2004). Teachers also noted that they themselves
were not prepared for the role of supervisor to paraeducators but were often responsible for training them (Harding, 2009; Scheurermann, Boutot, Goodwin, 2003). The school principal’s role in this intervention is critical to the benefits that a paraeducator can provide. “It therefore is beneficial to all parties involved when the school administration take steps to assure that the educational assistants they hire have the skills required to meet the child’s needs” (Notbohm & Zysk, p. 169).

If the child with ASD does not qualify for special education services and their needs are not therefore guaranteed by an IEP. Their needs typically are met either formally through a Section 504 Plan outlining specific modifications and accommodations or informally through the teachers, principal, and support staff. Regardless of the law supporting, the teacher is still essential to the support and interventions in place for the child with ASD.

Whole Approach programs as service and methodology for students with ASD was reviewed as an intervention for these students. The literature frequently suggested specific approaches, and often teacher training for working with students with ASD was a result of these approaches. Specific training of teachers for working with children with ASD has been found to be based exclusively on a single theory of teaching students with ASD (Scheurermann, Weber, Boutot & Goodwin, 2003). “The problem with a single-theory approach to training, aside from the fact that no comparative studies have substantiated claims of superiority of one approach over another, is that it is detrimental to the education of children with ASD in a number of ways” (p. 200). The literature review revealed considerable criticism of single theory approaches, but a few are noted because of scientifically researched practices embedded in their philosophies that have
been found in specific strategy interventions that have proven effective on a number of children.

Applied Behavior Analysis (ABA) falls within the single or whole approach program based type of intervention. It is the most common education and intervention plan followed by parents of autistic children (Robledo & Ham-Kucharski, 2005). This treatment method was developed by Dr. Ivar Lovaas and is based on the theories of operant conditioning by B. F. Skinner (Exkorn, 2005; Siegel, 2003). The intent of ABA is to address communication and social skills of children with ASD’s by systematically changing the interfering behaviors by teaching new ways of responding to the world (Exkorn; Robledo et al; Siegel; Stone & Di Geronimo, 2006). According to Robledo et al., the reason ABA is successful is the program emphasis is one on one instruction because the therapist is able to closely monitor what is working and what is not and alter the session immediately. Conversely, it is the one on one personal contact which also makes ABA a costly approach. Training is also critical to this approach. Simpson (2005) citing a study by Alberto and Troutman, underscores the important fact that “although ABA procedures seem simple, their effective implementation requires thorough understanding of the principles involved and years of experience” (Simpson, p. 91). The implication of this point to school principals is unless the school system embraces the cost of training and personnel for one to one teaching ABA is not likely to be an easily educational intervention. An additional implication to the descriptive research study based on the empirical knowledge of Autism among Ohio public school principals is that this method is the foundation for interventions used at the Cleveland Clinic Center for Autism located in Ohio (Robledo et al). The researcher believes that an Ohio public
school principal is likely to have heard the letters ABA used in association with a child with an ASD.

*Developmental, Individual-difference, Relationship-based Model Intervention Program (DIR)*, is better known as *Floortime* because that is an essential part of the approach as the parent gets down on the floor with the child and plays with him by following his lead, and playing with the child establishing a positive interaction (Simpson, 2005; Stone & DiGeronimo, 2006). This treatment addresses the interpersonal communication symptoms of the disorder and is also an early treatment intervention helping the child with an ASD achieve the necessary developmental milestones that help foster relationships with people, self regulate, and manage sensory appropriately (Exkorn, 2006; Robledo & Ham-Kucharski, 2005; Stone et al). This treatment approach is gaining in popularity among parents, despite the lack of scientific support (Siegel, 2003). This last point is important to school principals as they work with parents who have used this method and believe in its efficacy. A school principal who is aware of this treatment intervention may be able to better understand the parent’s drive for their child to be accepted and cared for as they have spent much time engaged in play with their child.

Another interpersonal relationship based treatment approach program *Relationship Development Intervention* (RDI) is relatively new. It was introduced and developed by Gutstein to address the rigid thinking and the difficulty of understanding the thoughts and feelings of others that is associated with ASD’s (Stone & DiGeronimo, 2006). This particular intervention is noted because of its recent entry into the program arena, and parents of children who may not have responded to earlier interventions and
are now of an older school age may suggest that the school employ these techniques. Therefore, a basic awareness of this intervention may be helpful to the school principal.

A final approach prevalent throughout the literature, TEACCH (Treatment and Education of Autistic and related Communication handicapped Children), was founded on the theories of skill-based methods and structured teaching (Simpson, 2005). TEACCH is a statewide program used in North Carolina. It began in 1972 and is a classroom-based intervention (Siegel, 2003; Simpson; Stone & DiGeronimo, 2006). TEACCH is a curriculum that addresses the symptoms of ASD and strives to utilize strengths to minimize the deficits. The foundation for structured teaching is born out of the TEACCH curriculum which begins with the principle of modifying the environment to accommodate the needs of children with ASD (Simpson). Research supports the use of structured teaching approaches for students with ASD. Teachers not formally trained in TEACCH have borrowed many of the specific strategies and techniques to effectively reach and educate their students with ASD. School principals, although they may not know them as structured teaching or as part of the TEACCH curriculum, should have awareness of the structured teaching techniques such as the use of physical boundaries to separate different activity areas, visual schedules to convey the sequence of activities, and other forms of visual supports that promote success, develop organizational skills, and foster independence (Stone et al). TEACCH also takes into account that “many autistic children suffer from stimulatory overload, and works to accommodate them” (Robledo & Ham-Kucharski, 2005, p. 69). In other words, methods and or techniques to help the student handle too much stimuli are implemented as needed to accommodate their challenges.
The goal of TEACCH is to ensure that those living with an ASD not be institutionalized and that they acquire the necessary skills to be able to contribute and participate in society (Robledo & Ham-Kucharski, 2005). This goal of one of the program interventions further anchors the importance of the school leader’s role in understanding and knowledge of ASD’s. Fullan (2001) points out that a school leader who is aware of programs such as structured teaching and TEACCH can contribute to “the moral purpose of schools is to make a difference in the lives of students and that making a difference is literally to make changes that matter” (Fullan, p. 16). The ability to contribute to the quality of someone’s life is possibly the greatest difference an educator can have.

The importance of the principal is seen in the principal’s efficacy. Principals must know how much they can impact students by recognizing the supports needed for the teacher. For instance, Harding noted (2009) that teachers do not always understand when a student with a disability behaves inappropriately that they are able to teach the child with the disability to respond appropriately and follow procedures. “A principal can provide on-site training and encouragement that behavior can be taught and success can occur quite rapidly when a behavior plan is initiated and consistently followed” (Harding, p. 94). The principal should be part of interventions that help reinforce appropriate behavior. Positive behavior supports need to be in place to support student behavior but also to facilitate social competence and academic achievement (Henry & Myles, 2007). Positive supports include FBA but also include considering the environment and how it facilitates learning. There is evidence of much positive reinforcement in a school that uses and seeks interventions as positive behavioral supports. Positive reinforcement may
take longer, but the results are more long lasting as noted by Boutot and Tincani (2009). They further shared “The good news about positive reinforcement is that once it begins to work, most children are better able to maintain and generalize it than they are punishment” (Boutot & Tincari, 2009, p.168). Generalization across situations, setting, and time is the ultimate goal for most, if not all interventions and services provided to students with ASD.

Summary

The literature review began with an overview of the history of ASD as it is a relatively new disorder first observed in the 1940s by the studies of Kanner, and Asperger (Aspy & Grossman, 2007; Barnhill, 2004; Buckendorf, 2008; Kennedy, 2002; Henry & Myles, 2007; Ritvo, 2006; Schwartz & Drager, 2008). The subjects of Kanner’s work were non-verbal and cognitively impaired. His work was the accepted description of the disorder for over 40 years. The first diagnostic criteria was published in 1980 which described the subjects who were more like those found in Kanner’s work, non-verbal and cognitively impaired. Later in the 1990s diagnostic criteria was added to identify children more like the subjects in Asperger’s study who were more verbal and who had higher cognitive development. There are several disorders that comprise ASD and include: Autistic Disorder, Asperger Disorder, Childhood Disintegrative Disorder, Rett Disorder and Pervasive Developmental Disorder-Not Otherwise Specified. Regardless of which disorder, all forms under this umbrella of disorders must have what is known as the trilogy of symptoms: restricted repetitive patterns of behavior, impairments in communication and social relationships (American Psychology Association, 2000, 1980).
The chapter also examined the possible causes of ASD and its prevalence. The cause of ASD is not known and many theories exist, but equally alarming is the increase in the number of children diagnosed with an ASD. The prevalence of ASD has increased. It is seen in every country, culture, and among all socio-economic groups (CDC, 2010). Males are more likely to be diagnosed, but females have the severest forms of ASD (Ritvo, 2006). As a result of an increased prevalence of the disorder, the numbers of students with an ASD in our public schools is rising and increasing the demands on school principals to meet the special needs of these students.

As a result of the rising number of children with ASD in the public schools, this chapter included the importance of school leadership. The importance of leadership and that specifically of the school principal was an essential piece to the literature review as it served as the theoretical framework of the study, and also demonstrated the urgency that school principals have awareness, knowledge and understanding of the unique nature and needs of ASD. School principals shape the school culture (Deal, 1999; Fullan, 2001), and are central to high quality special education programs (McLauqlin, 2009). They are also critical to supporting teachers, and guiding them through liability issues, ethical decisions, and leading the professional growth of the teachers and support personnel (Harding, 2009).

The law addressing ASD was presented as having an ASD is considered a disability by federal law. The objectives of the law governing ASD is to ensure that all children have a public education available to them that responds to the unique needs of the disorder, and to protect the rights of both the parents and the child throughout the educational process (Boutot & Tincani, 2009). Section 504 of the civil rights law was
also presented as it may be applied to the accommodations and modifications that a student with an ASD may receive to be as successful as possible. The most recent No Child Left Behind Law ensured that students with ASD reach their full potential by increasing the expected achievement of every student and the accountability of doing so on school leadership (Henry & Smith-Myles, 2007).

An overview of distinguishing characteristics that frame and describe the nature of ASD and the resulting needs of the disorder was also part of this chapter. It is the needs and/or symptoms of the disorder that present challenges for school leaders and personnel. Professional development in addressing these unique needs was noted as essential for school personnel. Principals also benefit from professional development and understanding the nature of and needs of students with ASD as it helps guide their decisions in terms of discipline, interventions, and services for these students (McEwan, 2003; Harding; McLaughlin). Principals who are not clear in their understanding of a disorder such as ASD are more likely to be swayed by what is popular and/or what is easily implemented (Kouzes & Posner, 2002).

The chapter presented some misconceptions that still exist among the general population and that school principals may not be immune as they often surface in popular leisure reading (Vokmar & Wiesner, 2009). Misconceptions about cold parenting and extraordinary ability in specific areas exist (Ritvo, 2006). A perception that people with ASD are antisocial and incapable of feeling or expressing love is another common misconception (Franklin, 2007). Possibly the most common misconception is that held among parents that there is a cure for autism and/or their child will outgrow their autism (O’Brien & Daggett, 2006; Stone & DiGeronimo, 2006). These perceptions and
misconceptions have presented some roadblocks to students with ASD receiving the educational supports and services that they most need as individual perceptions about a disorder affect the methods individuals use in the development of treatment and educational planning (Campbell, Reichle & Van Bourgondien, 1996).

Noted in this chapter was Ritvo (2006) crediting the teachers, psychologists, occupational therapists, speech and language therapists, physical therapists, and medical professionals as making a difference in diagnosis, and early treatment intervention that improves a child’s life course with ASD. Principals supervise the school personnel he noted, and although there is currently no cure, there are many treatments available. The school principal is central to leveraging school resources and personnel to meet the nature of and needs of students with ASD (McLauglin, 2009).

The literature review concluded with an overview of practices, programs, services and strategies typically provided and considered effective for meeting the needs of students with ASD. They were frequently referenced throughout the body of literature as effective in meeting the needs of students with ASD. These interventions and services serve students with ASD in the key areas of socialization and behavior, communication and language, sensory, career and life skill supports. Specific personnel were found to be linked to specific practices, strategies and services.

Addressing the communication impairment characteristic of ASD, the speech and language pathologist may employ a number of strategies and treatment options including the Social Story™, and assistive technology devices such as electronic talkers. The occupational therapist may implement strategies to address fine motor skills, self-help skills, play and socialization skills, and resulting sensory needs. They also are able to
address behavior management through self awareness and modulation. The term sensory diet (Aspy & Grossman, 2007) is an important educational support of the occupational therapist. The school counselor and/or psychologist were also noted for the specific treatment programs and strategies that may be utilized to address the impairments in social relationship characteristic of ASD. Peer buddies, circle of friends, and social autopsies were a few of the programs mentioned. Techniques that teachers might be implementing in the classroom included priming, the use of an aide or paraprofessional.

Whole approaches were also described in the chapter and included, Applied Behavior Analysis (Robledo & Ham-Kucharski, 2005), and Developmental Individual Difference (Stone & DiGeronimo, 2006) both address behaviors associated with ASD. Relationship Development Intervention was developed to address the restricted patterns of thoughts and difficulty understanding the thoughts and feelings of others. A final approach TEACCH was discussed as it has been adopted as a treatment approach by an entire state and has shown much success (Siegel, 2003). It is classroom based and follows a model of structured teaching in which many of the strategies and techniques can be isolated and employed in any classroom serving a student or students with ASD.

Essentially by ending with the practices, strategies, services and programs, it was beginning with the end in mind that school principals have awareness, knowledge, and understanding of ASD so that students with the disorder receive the practices, strategies, services, and programs that meet their unique needs.
CHAPTER 3: METHODOLOGY

Because of the increasing prevalence of ASD, every public school principal is likely to serve students with ASD during his or her tenure as principal. However, many principals lack sufficient awareness, knowledge, and understanding of ASD to effectively meet the needs of these students in the public schools. The research is limited in describing what factors are associated with greater cognizance of ASD, and there are an insufficient number of educators adequately prepared to work with children with ASD (Schwartz and Drager, 2008). This study sought to determine what may account for greater awareness, knowledge, and understanding of ASD among school principals.

The purpose of this quantitative study was to determine demographic factors explaining the levels of awareness, knowledge, and understanding of ASD among school principals. The study was nonexperimental in design and entailed both correlations and comparisons of means. The study was framed in terms of leadership theory, indicating the importance of engaged leadership in the functioning of all members of an organization. A total of 180 participants were surveyed, including principals of schools for students from kindergarten through Grade 12 in the state of Ohio.

This chapter will present the research questions for the study, followed by a discussion of the research design. A presentation of the participants, the instruments, and the operational definition of variables will follow. The data collection, processing, and analysis for the study will be discussed, followed by methodological assumptions, limitations, and delimitations. The chapter will conclude with ethical assurances, and the summary.
To determine what may contribute to explaining greater awareness of ASD, the following research questions were presented, together with the null hypotheses (H₀) and alternative hypotheses (Hₐ) corresponding to each question.

Q1. What is the relationship between the years of experience as a school principal and the level of autism awareness, as measured by the Autism Awareness Survey (AAS; Stone, 1987; see Appendix A)?

H₁₀. The relationship between the years of experience as a school principal and the level of autism awareness, as measured by the AAS, is not statistically significant.

H₁ₐ. The relationship between the years of experience as a school principal and the level of autism awareness, as measured by the AAS, is statistically significant.

Q2. What is the relationship between the years of experience as an educator and the level of autism awareness among school principals, as measured by the AAS?

H₂₀. The relationship between the years of experience as an educator and the level of autism awareness among school principals, as measured by the AAS, is not significant.

H₂ₐ. The relationship between the years of experience as an educator and the level of autism awareness among school principals, as measured by the AAS, is significant.

Q3. What is the relationship between the number of students with ASD
encountered during a principal’s educational career and the level of autism awareness among school principals, as measured by the AAS?

$H3_0$. The relationship between the number of students with ASD encountered during a principal’s educational career, and the level of autism awareness among school principals, as measured by the AAS, is not significant.

$H3_a$. The relationship between the number of students with ASD encountered during a principal’s educational career, and the level of autism awareness among school principals, as measured by the AAS, is significant.

$Q4$. What is the difference in the level of autism awareness, as measured by the AAS, among school principals based on whether the principal is related to a child with ASD?

$H4_0$. There is not a significant difference in the level of autism awareness, as measured by the AAS, among school principals based on whether the principal is related to a child with ASD.

$H4_a$. There is a significant difference in the level of autism awareness, as measured by the AAS, among school principals based on whether the principal is related to a child with ASD.

$Q5$. What is the difference in the level of autism awareness, as measured by the AAS, among school principals based on the type of school (elementary, middle, or high school)?

$H5_0$. There is not a significant difference in the level of autism awareness, as measured by the AAS, among school principals based on the type of school (elementary, middle, or high school).
$H5_a$. There is a significant difference in the level of autism awareness, as measured by the AAS, among school principals based on the type of school (elementary, middle, or high school).

$Q6$. What is the difference in the level of autism awareness, as measured by the AAS among school principals based on whether the principal is employed in a school district with training for personnel serving students with ASD?

$H6_0$. There is not a significant difference in the level of autism awareness, as measured by the AAS among school principals based on whether the principal is employed in a school district with training for personnel serving students with ASD.

$H6_a$. There is a significant difference in the level of autism awareness, as measured by the AAS among school principals based on whether the principal is employed in a school district with training for personnel serving students with ASD?

$Q7$. What is the difference in the level of autism awareness, as measured by the AAS, among school principals based on whether the principal has an educational background in special education?

$H7_0$. There is not a significant difference in the level of autism awareness, as measured by the AAS, among school principals based on whether the principal has an educational background in special education.

$H7_a$. There is a significant difference in the level of autism awareness, as measured by the AAS, among school principals based on whether the principal has an educational background in special education.
Q8. What is the difference in the level of autism awareness as measured by the AAS, among school principals based on whether the principal has undergone professional development and/or training in the education of students with ASD?

H8. There is not a significant difference in the level of autism awareness, as measured by the AAS, among school principals based on whether the principal has undergone professional development and/or in the education of students with ASD.

H8a. There is a significant difference in the level of autism awareness, as measured by the AAS, among school principals based on whether the principal has undergone professional development and/or in the education of students with ASD.

Q9. What is the relationship between the number of educational supports provided to students with ASD in a principal’s school, and the level of autism awareness among school principals, as measured by the AAS?

H9. There is not a significant relationship between the number of educational supports provided to students with ASD in a principal’s school, and the level of autism awareness among school principals, as measured by the AAS.

H9a. There is a significant relationship between the number of educational supports provided to students with ASD in a principal’s school, and the level of autism awareness among school principals, as measured by the AAS.
Research Methods and Design

The research method conducted was a quantitative, nonexperimental descriptive correlational design measuring the dependent variable of awareness of ASD possessed by Ohio public school principals. This method was chosen to gather a portrait in time quantifying the current levels of awareness, knowledge, and understanding of ASD among Ohio’s kindergarten through twelfth grade public school principals. The researcher’s intent was to first describe current levels of awareness of ASD and then explain what may contribute to greater awareness of ASD among school principals. By demonstrating what contributes to greater awareness of ASD among principals, experience and training opportunities may be made available to principals to improve the education of students with ASD. According to Gall, Gall and Borg (2003), “Descriptive studies in education, while simple in design and execution, can yield important knowledge” (p. 291). The researcher further hypothesized what factors may contribute to greater awareness of ASD and sought to gain a current description of these contributing factors which Gall et al., further supported by the following “Unless researchers first generate an accurate description of an educational phenomenon as it exists, they lack a firm basis for explaining or changing it” (Gall et al, p. 290). Knowing the present status of the independent variables of this research may account for the differences in awareness, knowledge, and understanding and thereby provide insight as how best to provide professional development experiences and training for school principals in educating students with ASD. This research study focused on the current state in an effort to discover what is needed to better serve the growing population of students with ASD.
In this study, the Autism Awareness Survey (AAS; Stone, 1987; see Appendix B) was used to measure awareness of ASD, including the general descriptive features, social and emotional features, and cognitive characteristics of the disorder. Participants were randomly chosen from a list of Ohio public school principals provided by the Ohio Department of Education. The list reflected a varied geographic distribution across the state and a range of grade levels served by the participants. A total of 180 principals completed the questionnaire, representing approximately 5% of 3,535 possible public school principals in Ohio serving students in kindergarten through Grade Twelve.

A demographic questionnaire accompanied the survey (see Appendix A) which collected information about the participant and also about the educational service options provided for students with ASD in the participant’s school. Many of the participant responses to the questionnaire later served as independent variables as to what may account for differences in awareness of ASD among Ohio’s principals. These items included and were quantified; (a) years of experience held by the school principal and years prior as an educator, (b) the principal’s teaching background; (c) the number of students with ASD encountered during educational career, (d) any personal experience with a child with ASD such as being a parent or relative of a child with ASD, (e) type of school principal (elementary, middle, high school), (f) geographic area of the state, (g) any professional development and/or training that the principal had participated in regarding children with ASD, and (h) the number of educational supports typically provided to students with ASD attending the participants school. A response was also sought to determine if specific training is provided for teachers and/or paraprofessionals for working with students with ASD by the school district.
A pilot test of the procedures, instrument, and accompanying forms for completion was conducted with a convenience sample of 1 high school principal, 1 junior high school principal, 1 middle school principal, and 5 elementary principals. The pilot test participants were interviewed for obtaining insight as to which items were in need of clarification, overall appearance of the survey, incentives considered, and ease of completion. Their responses resulted in assuring the random sample group that the survey would take less than 10 minutes of their time, and the survey appearance was altered to make the Likert Scale responses just a check mark instead of a number. This ensured that respondents clearly meant what they checked as well as requiring less time by the respondent to complete.

Results were compiled using Excel and descriptive statistical analysis using SPSS 16.0 was used to present the data. Results of the survey questions were reported using measures of central tendency and variance. Mean scores were derived for each principal category corresponding to the type of building type identifier and the mean response to each of the questions surveyed by the AAS (Stone, 1987). The modal score was used to provide frequency data for each dependent variable. The range of scores was reported to determine if there was significant variance among scores.

Data describing the services provided to meet the specific needs of students with ASD was tallied and reported in accumulated totals by service description; percentages of the participant population were also reported as well as the frequency and mode of each service provided.
**Participants**

The study’s intent to describe the current status of awareness, knowledge, and understanding of ASD among kindergarten through grade twelve Ohio public school principals required either a very large sample size or as suggested by Alreck and Settle (2004) a random sample that would increase the validity and reliability of the data. They further supported that a small sample size is valid if little variance is suspected among the participants as was the presumption of this study that school principals in Ohio would be rather homogeneous in educational attainment, and other background factors. The differences would be specific to the independent variables determined by the study.

The target population of this study was public school principals in the state of Ohio serving students in kindergarten through Grade 12. A list obtained from the Ohio Department of Education April 2009 provided the sampling frame of 3,535 public schools in the state. A prior power analysis (Buchner, Erdfelder, Faul, & Lang, 2007) was performed using G*Power 3.1 to determine the number of participants needed for the study. A minimum of 159 participants was needed for the 3-way analysis of variance (ANOVA) needed to answer Research Question Q5, assuming a medium effect size of 0.25, a power of .80, and an alpha significance level of .05. To obtain the required number of participants, every sixth school was selected from the list, representing approximately 600 schools. After the initial collection of data, more participants were needed, and another random sample was selected. In addition, a convenience sample was taken in June 2009 from principals attending a summer professional conference and from a group of board members serving on the principals’ organization for Ohio.
Responses remained unrepresentative of the population of Ohio school principals in terms of school types and geographical locations. Therefore, an additional 400 surveys were mailed to principals representing the underrepresented regions and school types as of August and September 2009. After this step in the data collection, 180 responses had been completed, and all 16 State School Improvement Team Regions, representing the 88 Ohio counties, were represented (see Figure 1). Table 1 shows the distribution of respondents according to the team regions.

Figure 1. State of Ohio School Improvement Support regions.
Table 1

*Number of Participants by Region and School Type*

<table>
<thead>
<tr>
<th>School Improvement Region</th>
<th>Number from elementary schools</th>
<th>Number from middle schools</th>
<th>Number from junior high schools</th>
<th>Number from high schools</th>
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<td>3</td>
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</tr>
</tbody>
</table>
A post hoc power analysis (Buchner et al., 2007) was performed to determine the power of the study with 180 participants. For a 3-factor ANOVA, assuming a medium effect size of .25, a two-tailed test, and an alpha significance level of .05, the test achieved a power of .86. For bivariate correlations, assuming a medium effect size of .30, a two-tailed test, and an alpha significance level of .05, the tests achieved a power of .98. Further post hoc tests were performed after group sizes were determined.

**Materials/Instruments**

The Autism Awareness Survey (AAS) developed by Stone (1987) as seen in Appendix B was the instrument utilized to establish school principals’ awareness, knowledge, and understanding of ASD which is also referred to as the principal’s cognizance. The history of autism and the continued presence of misconceptions about the disorder made the Autism Survey a valuable tool to quantify the level of awareness and knowledge among Ohio school principals particularly because it was used in a similar study by Schwartz and Drager (2008) of speech and language pathologists. The survey measures the understanding among participants of how ASD is diagnosed, its general descriptors, and the social emotional characteristics that a person with ASD displays.

The development of the survey used information collected from clinical psychologists, pediatricians, school psychologists, and speech and language pathologists and compared these responses to the responses obtained from autism specialists. Stone’s Survey (1987) uses a Likert scale measure of attitude and has been modified and adapted by various groups. Most recently, it has been adopted by the Christian Sarkine Autism Treatment Center, HANDS in Autism Team (2005) as a measure of general population
awareness. For this research Stone’s Survey was used in its original form because it has been evaluated for its reliability and validity (Campbell, Reichle, & VanBourgondien, 1999).

Reliability and validity of the AAS was determined in a study by Campbell, Reichle, and VanBourgondien (1999). They determined the internal consistency using Cronbach’s Alpha correlational analyses (N=83) with an alpha coefficient of 0.66 obtained measuring the degree to which the instrument measured an individual’s beliefs about ASD. Their initial conclusions were that the AAS reliability was moderately reliable, but test-retest reliability and stability increased when related to a homogenous respondent occupation such as the current study use among school principals. The validity of the instrument was determined by analyzing responses from those occupations that directly work with children and adults with ASD. The mean scores for highly trained personnel supported the prediction that the AAS is a valid tool in measuring awareness of ASD. Their final conclusion was that the survey “may be useful in assessing an individual’s knowledge and beliefs about autism and is likely to be beneficial in a variety of research and clinical situations” (Campbell et al, p. 633). Over the years the AAS has been used to compare knowledge and beliefs of persons from different professions. It has often been used to compare the views of teachers and parents. Campbell et al further noted that informally it has been used as an indicator of training success. The survey is the intellectual property of Dr. Wendy Stone and her permission to use the survey for the purposes of this research was obtained via electronic communication (wendy.stone@Vanderbilt.Edu) at Vanderbilt University.
The survey consists of two sections. The first section consists of 21 statements measuring the understanding held by the respondents of various aspects of autism such as its characteristic features, origin, and common misconceptions about the disorder (Campbell, Reichle, & VanBourgondien, 1999). Stone (1987; Stone & Rosenbaum, 1988) grouped the survey items into three categories but did not label or group them as such in the survey. The social/emotional features included 8 statements, cognitive features of ASD were represented by 6 statements and general descriptive features had 7 items. The participants indicated the degree to which they agreed or disagreed with each statement using a scale ranging from 1 (fully agree) to 6 (fully disagree). Six of the items are intentionally worded so that they are reverse-scored to ensure integrity of the participant’s response. A principal, who is highly knowledgeable and has accurate beliefs about ASD, should have agreed with the “true” statements and disagreed with the “untrue” statements. An additional question specifically asked participants of the research to place on the continuum the degree to which they felt comfortable diagnosing or identifying a child as autistic. Higher scores on Stone’s Autism Survey (1987) “reflect more accurate beliefs about autism and a greater knowledge of the disability (Campbell, Reichle, & VanBourgondien, p. 624). It is important to note that although the survey is over 20 years old, many of the same misconceptions about autism were also found in the review of more recently published literature. Part II of the survey required respondents to mark the features required to be present for a diagnosis of Autism to be made. The researcher did not analyze this portion of the survey as it is not part of the awareness score. Many of the respondents did not complete it noting that they did not believe they were qualified to diagnose ASD.
A questionnaire developed by the researcher accompanied the survey as seen in appendix A. This questionnaire and demographic survey section followed the completion of the autism survey as advised by Rudestam (2001) to avoid respondent fatigue. This accompanying questionnaire regarding services provided to students with ASD was part of the survey to generate baseline data of what exact services are being implemented for students with ASD as well as serving as an independent variable in this study. Also important and included in the survey were the demographic items that helped to create a portrait of Ohio principals in terms of: (a) gender, (b) years of experience, (c) any personal family experience with a child with ASD, (d) experience as a teacher, and (e) any training and/or professional development in the nature and needs of children with ASD.

Operational Definitions of Variables

The independent variables quantified and described in this study include, (a) years of experience held by the school principal and years prior as an educator, (b) the principals’ teaching background; (c) the number of students with ASD encountered during the principal’s educational career, (d) any personal experience with a child with ASD such as being a parent or relative of a child with ASD, (e) type of school principal (elementary, middle, high school), (f) if the school district provides specific training for personnel serving students with ASD, (g) any professional development and/or training that the principal had participated in regarding children with ASD, and (h) the number of educational supports reported as available to students with ASD attending the participants school.
The school principal’s level of awareness, knowledge and understanding about the etiology, diagnosis, key features and characteristics is the dependent variable of this study. The study first described the present condition of the dependent variable principal cognizance of ASD as measured by the AAS and then inferred what independent variables may contribute to differences among participants in their awareness, knowledge, and understanding of ASD. The number of years of experience, number of years as an educator, number of students with ASD encountered, and the number of educational supports provided for students with ASD were the continuous variables. The nominal variables compared to the dependent variable of the AAS score included principals who had a family member with ASD, the type of school for which the principal served, principals working in districts providing specific training for working with students with ASD, principals who had background experience in special education, and principals who had professional development in working with children with ASD.

Data Collection, Processing, and Analysis

The random sample of approximately 1000 Ohio public school principals was mailed the Autism Awareness Survey (Stone, 1987), an accompanying questionnaire, and a cover letter explaining and securing informed consent to participate as seen in Appendix C. A stamped addressed return envelope for ease of responding and returning was also included. An incentive for completion was offered as noted in the student recommendations provided by Rudestam (2001) that an incentive is helpful “to encourage subjects to participate” (p. 101). This incentive was not monetary but included an electronic storage device and a bag of teaching tools for meeting the nature and needs
of students with ASD such as, visual timers, idea books, and computer software for making visual schedules.

Excel Software was used to record the participant responses. The recording of demographic data as well as the responses to the Autism Survey (Stone, 1987) provided the researcher with data to analyze for variance and central tendencies that may have accounted for differences in awareness, knowledge and understanding of ASD.

Respondents answered questions that quantified the independent variables, (a) years of experience held by the school principal and years prior as an educator, (b) the principals’ teaching background; (c) the number of students with ASD encountered during the principal’s educational career, (d) any personal experience with a child with ASD such as being a parent or relative of a child with ASD, (e) type of school principal (elementary, middle, high school), (f) if the school district provides specific training for personnel serving students with ASD, (g) any professional development and/or training that the principal had participated in regarding children with ASD, and (h) the number of educational supports reported as available to students with ASD attending the participants school. They were considered important to describe and establish a baseline range and mean score for the potential factors they represent. Inferences were made to determine which if any impacted the dependent variable of principal awareness, knowledge, and understanding, also referred to as cognizance as measured by AAS, as suggested Rudestam (2001) “lead the reader carefully through the findings, making sure that the reader knows what you consider to be the important observations” (p. 104).

Descriptive statistics were used for this study to further quantify the independent variables. The results of the research questions have been reported by using measures of
central tendency and variance. The responses of the 180 total participants were recorded and analyzed using Excel Software as well as SPSS 16.0. The breakdown of respondents by school type and geographic location were noted in Table 1. The Excel auto sum feature served to calculate the total score per respondent from The Autism Awareness Survey (Stone, 1987). Eight survey items addressed social emotional features of autism, six addressed cognitive features and seven gathered respondent knowledge of the general descriptors and features of ASD. An item analysis was conducted per type of item to derive mean scores of each respondent (see Appendix E).

Mean scores have been derived for each principal category corresponding to the type of building identifier and the mean response to each of the questions surveyed by The Autism Awareness Survey (Stone). The modal score has been used to provide frequency data for each item analysis. The range of scores has been reported to determine whether there is significant variance of scores. The findings of the research questions have been presented in narrative form. Bi-variant tables have been used to illustrate items of significance and of their relationship.

*Methodological Assumptions, Limitations, and Delimitations*

The research used an instrument, The Autism Survey (Stone, 1987) which is over 20 years old and could be considered too out dated for current use. However it was used because a study by Campbell (1996) that evaluated the reliability and validity of the instrument; noted that “the history of autism and the continued presence of misconceptions about the disorder make the Autism Survey a valuable tool with possible clinical and research uses” (p. 623). It is further acknowledged that Campbell’s research
on the tool’s reliability and validity is over ten years old, but ASD continues to be misunderstood as evidenced by the current review of the literature.

The sample size was small reflecting only 5% of the nearly 3,535 potential participant population and therefore may not have the significance to generalize across the population of all principals. The survey response rate was poor. It may reflect a shift to a trend toward higher participation if a survey is conducted electronically rather than by mail and hard copy. The response rate may have been higher with an electronic option.

The participants of this study were limited to the state of Ohio and public school principals. Public school principals were intentionally selected to avoid private schools that may serve the sole purpose of educating students with ASD where leadership would be expected to have greater than average understanding of ASD. An effort was made to gain participation from all geographic regions of the state, but some regions are represented more heavily than the general population of the region correlates.

The results of this research have potential to contribute to the understanding of ASD among school leadership that influences policy and practice affecting students with ASD. This study may guide and support professional growth experiences for principals throughout Ohio and can be easily replicated by specific regions of Ohio or by other states to determine the need for awareness, knowledge, and understanding of ASD in their schools.

*Ethical Assurances*

The research involved human participants and therefore required the approval of the Northcentral University Internal Review Board/Ethics Committee approval before
any survey was sent and any data was to be collected. This approval was granted on March 31, 2009. Surveys were sent and collected from April through December 2009. Adhering to the recommendations of Rudestam and Newton (2001) this researcher took steps to assure that ethical standards for conducting research with human participants had been planned for and followed. First and foremost, this researcher/learner had reflected on her own competence, perspective, and character and evaluated accordingly to the methods and research following detailed procedures before, during and after data collection. Self-reflection about the researcher/learner’s values and biases had been considered because these can compromise the integrity of the research design or the welfare of research participants (Gall, Gall & Borg, 2003). A request for feedback from the participants of the pilot sample was conducted through personal interview and reviewed to determine if evidence of values and bias existed in the survey questionnaire before embarking upon the full survey. The pilot sample also provided insight regarding the time required to complete the survey. It provided the researcher an opportunity to determine time required to input data and any weaknesses in the data collection and analysis strategies.

The researcher of this study understood the importance of confidentiality of participant responses. The researcher is also a principal and related to the concern that principals do not wish to be singled out for their omission of weaknesses and/or misconceptions in serving their students and staff. The coding of the questionnaire and survey were done in a manner to assure privacy of the self-report methods of the data collection. The researcher acquired informed consent of the participants as seen in
Appendix C assuring the participants that they would not be harmed by their participation in the study, and provided assurances of anonymity and data confidentiality.

Participants were selected equitably and were provided an explanation of the procedures and the purpose of the research. Their participation was encouraged by sharing how the results may benefit students, and the professional development of school principals in the invitation to participate cover letter as seen by Appendix D). There was not any direct or indirect penalty for not participating or leaving the research study. Adversely, there were not any promised monetary payments for participating. Participants were offered opportunities to be selected to receive items for meeting the needs of students with ASD such as idea books, visual timer, and a software tool for helping create visual schedules.

Another ethical consideration was the data collection instrument. The Autism Survey (Stone, 1984) is an intellectual property as well as copyrighted tool, and written permission was sought to use this instrument for the purposes proposed in this research. Permission was granted via an electronic message from Dr. Stone. Furthermore, it is important to note that the choice of instrument and procedures had no financial incentive for the researcher. The questionnaire accompanying the survey sought demographic information and will be not be shared in any way that does not adhere to the promise of anonymity and confidentiality provided to the participants and was disaggregated. It will be destroyed after a time period of five or more years.

The researcher intends to share the results of this study through publication of the dissertation as well as providing the Ohio Center for Autism and Low Incidence (OCALI) the data to support their efforts to expand professional development
opportunities for educators. The participants of this study were aware of the intent for reporting the data and publication. Participants were also offered the opportunity to receive a summary of the results of this study, because this was part of the plan to establish and maintain positive human relations with the individuals who participated as recommended by Gall, Gall & Borg (2003). Those participants who requested a summary of findings provided their email address.

The practical, moral, and political problems that this research may have solved include (a) providing Ohio organizations serving principals and also those serving students with ASD a baseline from which to increase awareness, knowledge, and understanding among school leaders in order to better serve students with ASD; (b) demonstrating need for professional development for principals to better address the needs of students with ASD; and (c) providing a baseline of services provided students with ASD in the Ohio public school setting.

Summary

The Autism Awareness Survey (Stone, 1987) was used to quantify and describe the awareness; knowledge and understanding of ASD among Ohio’s public Kindergarten through twelfth grade principals. Although the random sample was small, the results provided a snapshot picture of the current level of awareness, knowledge, and understanding of ASD among the sample of Ohio kindergarten through grade twelve principals. Additionally principals participating in the study shared further information about their background, and professional experiences that may have contributed to their levels of understanding about ASD and the educational supports typically provided to students with ASD. These findings will be reported in Chapter 4.
CHAPTER 4: FINDINGS

The purpose of this quantitative study was to determine the levels of awareness, knowledge, and understanding of ASD also referred to as cognizance among school principals based on demographic variables. The study was nonexperimental in design and entailed both correlations and comparisons of means. The study was framed in terms of leadership theory, indicating the importance of engaged leadership in the functioning of all members of an organization. A total of 180 principals of public schools for students from kindergarten through Grade 12 in the state of Ohio completed the Autism Awareness Scale (AAS; Stone, 1987; see Appendix A), a 22-item Likert-type scale with values ranging from 1 (fully agree) to 6 (fully disagree). Data were obtained between April and November 2009.

This chapter presents survey findings for the study. Frequencies, means, and standard deviations are presented. Results of the AAS are first presented as the participants’ score on the AAS measuring their level of cognizance of ASD served as the dependent variable throughout the study. Areas in which principals show strength in their cognizance of ASD will be noted. Conversely areas in which principals reflect a need for greater understanding and awareness will also be presented. It is important to the overall study to identify if principals possess some of the same misconceptions about ASD as the general population. The results related to the research questions are presented for correlations between AAS scores and the continuous variables of years of experience as a school principal, years of experience as an educator, the number of students with ASD encountered during the principal’s educational career, and the number of educational
supports provided to students with ASD. Comparisons of AAS means and the nominal variables of: presence of family member with ASD, type of school (elementary, middle, or high school), the existence of ASD-related training within the school district, an educational background in special education, and professional ASD-related training. Findings are then evaluated in light of other research in the field.

Results

Prior to reporting the findings of the research questions that guided this study, it is important to provide an overview of the findings associated with the AAS see Appendix E. The AAS consisted of 22 questions in which participants responded with their level of agreement to the statement from 1 to fully agreeing to 6 fully disagreeing. The questions were in random order but consisted of seven questions surveying respondent knowledge of the general descriptors and key features of ASD. Six questions gauged the participants understanding of the cognitive characteristics of ASD, and eight questions addressed the social emotional features of ASD. An additional question directly asked the participant to identify their level of confidence in identifying a child as having an ASD. Some of the questions required that they be reversely scored so therefore fully agreeing did not warrant the full 5 points but actually may have been scored a zero. The respondent was required to completely read the statement and could not inadvertently score high as a result of randomly marking a response. All questions were scored 0-5 indicating the greater the confidence in the direction of the true response, the greater the participants’ knowledge of ASD. A zero was given to agreement to statements which were incorrect.

Scores on the AAS were normally distributed and linear. Figure 2 displays a normal P-P plot showing a distribution of the residuals for the AAS. The mean AAS
score for all participants was 3.37 ($SD = 1.64$). Table E1 (see Appendix E) shows the mean scores for the AAS and for each of the 22 questions in the questionnaire.

Figure 2. Observed versus expected probability of Autism Awareness Survey scores.

Following are the research questions for this study, together with a discussion of the findings for each question.

Research Question Q1. Following is a restatement of Research Question Q1 and associated null and alternative hypotheses.
Q1. What is the relationship between the years of experience as a school principal and the level of autism cognizance, as measured by the AAS?

$H_{10}$. The relationship between the years of experience as a school principal and the level of autism cognizance, as measured by the AAS, is not statistically significant.

$H_{1a}$. The relationship between the years of experience as a school principal and the level of autism cognizance, as measured by the AAS, is statistically significant.

Years of experience as a school principal ranged from 1 to 32, with a mean of 9.9 years. Table 2 displays the mean and range for years of experience as a principal.

**Table 2**

*Mean Scores for Continuous Independent Variables*

<table>
<thead>
<tr>
<th>Continuous variable</th>
<th>n</th>
<th>$M$ (SD)</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Years as principal</td>
<td>180</td>
<td>9.9 (6.9)</td>
<td>1</td>
<td>32</td>
<td>Normal</td>
</tr>
<tr>
<td>Years as educator</td>
<td>180</td>
<td>23.9 (8.6)</td>
<td>8</td>
<td>47</td>
<td>Normal</td>
</tr>
<tr>
<td>Number of students with Autism Spectrum Disorder (outliers lowered)</td>
<td>178</td>
<td>4.2 (4.6)</td>
<td>0</td>
<td>25</td>
<td>Poisson</td>
</tr>
<tr>
<td>Number of educational supports</td>
<td>180</td>
<td>2.5 (1.8)</td>
<td>0</td>
<td>9</td>
<td>Poisson</td>
</tr>
</tbody>
</table>
Bivariate correlations were computed to determine the relationship between the number of years as school principal and levels of autism cognizance. The relationship was not statistically significant, \( r(178) = .05, p = .52 \). The null hypothesis \( H_{10} \) was not rejected.

*Research Question Q2.* Following is a restatement of Research Question Q2 and associated null and alternative hypotheses.

**Q2.** What is the relationship between the years of experience as an educator and the level of autism cognizance among school principals, as measured by the AAS?

**\( H_{20} \).** The relationship between the years of experience as an educator and the level of autism cognizance among school principals, as measured by the AAS, is not significant.

**\( H_{2a} \).** The relationship between the years of experience as an educator and the level of autism cognizance among school principals, as measured by the AAS, is significant.

Years of experience as an educator ranged from 8 to 47, with a mean of 23.9 total years. Table 2 displays the mean and range for years of experience as an educator.

Bivariate correlations were computed to determine the relationship between the total years experience as an educator and levels of autism cognizance among school principals. The relationship was not significant, \( r(178) = -.02, p = .83 \). The null hypothesis \( H_{20} \) was not rejected.

*Research Question Q3.* Following is a restatement of Research Question Q3 and associated null and alternative hypotheses.
**Q3.** What is the relationship between the number of students with ASD encountered during the principal’s educational career, and the level of autism cognizance among school principals, as measured by the AAS?

**H3_0.** The relationship between the number of students with ASD encountered during the principal’s educational career, and the level of autism cognizance among school principals, as measured by the AAS, is not significant.

**H3_a.** The relationship between the number of students with ASD encountered during the principal’s educational career, and the level of autism cognizance among school principals, as measured by the AAS, is significant.

The number of students with ASD encountered during the principal’s educational career ranged from 0 to 50. There were two outliers, defined as scores more than four standard deviations from the mean (Tabachnick & Fidell, 2007). One outlier had a value of 32 and one outlier had a value of 50. The outliers were lowered to the highest nonoutlier score (Tabachnick & Fidell), which was 25. The mean number of students was then computed at 4.2. Table 2 displays the mean and range for the number of students with ASD. The distribution of scores for the number of students with ASD was a nonnormal Poisson distribution, with the highest scores at the far left of the histogram and all entries whole numbers (see Figure 3). Therefore, nonparametric statistics were used to answer Research Question Q3.
Figure 3. Distribution of numbers of students with Autism Spectrum Disorder encountered during the principal’s educational career.

Spearman’s correlation coefficients were computed to determine whether there was a significant correlation between levels of autism awareness and the number of students with ASD encountered during the principal’s career. The relationship was significant, $\rho = .28$, $p < .001$. The null hypothesis $H_0$ was rejected. Table E2 (see Appendix E) shows the mean corresponding AAS score for the numbers of students with ASD from 0 to 25.
Research Question Q4. Following is a restatement of Research Question Q4 and associated null and alternative hypotheses.

Q4. What is the difference in the level of autism cognizance, as measured by the AAS, among school principals based on whether the principal is related to a child with ASD?

\( H_{40} \). There is not a significant difference in the level of autism cognizance, as measured by the AAS, among school principals based on whether the principal is related to a child with ASD.

\( H_{4a} \). There is a significant difference in the level of autism cognizance, as measured by the AAS, among school principals based on whether the principal is related to a child with ASD.

Sixteen respondents (8.9%) reported having a family member with ASD. AAS scores for this group ranged from 64 to 95. In contrast, respondents reporting no family member with ASD had scores ranging from 36 to 99. An independent samples t test was conducted to determine whether the differences in AAS scores were significant based on whether the school principal had a family member with ASD. Principals with a family member with ASD had higher mean scores (M = 76.6) than did those not having a close family member with ASD (M = 72.5), but the difference was not significant, t(178) = 1.67, p = .10, 95% CI = [-0.74, 8.89] (see Table 4).

A post hoc power analysis was performed to determine the probability that a significant result would have been found, given that the first group had only 16 respondents and the second group had 164 respondents. The power of the independent samples t test was 47.5, meaning that there was 52.5% likelihood that a significant result
was missed. A nonparametric Mann-Whitney $U$ test was then conducted to compare the two groups. The differences between the first group (mean rank = 108.1) and the second group (mean rank = 88.8) were not significant, $Z(178) = -1.42$, $p = .15$. The null hypothesis $H_{40}$ was not rejected.

Table 3

*Autism Awareness – Mean Scores by Presence of Family Member with Autism Spectrum Disorder*

<table>
<thead>
<tr>
<th>Family status</th>
<th>$N$</th>
<th>$M$ (SD)</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family member with Autism Spectrum Disorder</td>
<td>16 (8.9%)</td>
<td>76.6 (9.7)</td>
<td>64</td>
<td>95</td>
</tr>
<tr>
<td>No family member with Autism Spectrum Disorder</td>
<td>163 (91.1%)</td>
<td>72.5 (9.3)</td>
<td>36</td>
<td>99</td>
</tr>
<tr>
<td>Total</td>
<td>179 (100.0%)</td>
<td>72.8 (9.4)</td>
<td>36</td>
<td>99</td>
</tr>
</tbody>
</table>

*Research Question Q5.* Following is a restatement of Research Question Q5 and associated null and alternative hypotheses.

Q5. What is the difference in the level of autism cognizance, as measured by the AAS, among school principals based on the type of school (elementary, middle, or high school)?

$H_{50}$. There is not a significant difference in the level of autism cognizance, as measured by the AAS, among school principals based on the type of school (elementary, middle, or high school).
There is a significant difference in the level of autism cognizance, as measured by the AAS, among school principals based on the type of school (elementary, middle, or high school).

A total of 109 participants (60.6%) worked in an elementary school. A one-way analysis of variance (ANOVA) was conducted to determine whether the differences in AAS scores were significant based on the type of school. Differences were not significant, $F(2, 177) = 1.66, p = .19$, partial eta square $= 0.02$. Table 4 shows the mean scores for each school type. As differences were not significant, post hoc comparisons were not performed. The null hypothesis $H_{50}$ was not rejected.

Table 4

*Autism Awareness - Mean Scores by Type of School*

<table>
<thead>
<tr>
<th>Type of school</th>
<th>$N$</th>
<th>$M (SD)$</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elementary</td>
<td>109 (60.5%)</td>
<td>73.7 (9.8)</td>
<td>36.0</td>
<td>99.0</td>
</tr>
<tr>
<td>Middle (Junior High)</td>
<td>43 (23.9%)</td>
<td>70.6 (8.8)</td>
<td>54.0</td>
<td>86.0</td>
</tr>
<tr>
<td>High</td>
<td>28 (15.6%)</td>
<td>73.0 (7.8)</td>
<td>53.0</td>
<td>89.0</td>
</tr>
<tr>
<td>Total</td>
<td>180 (100.0%)</td>
<td>72.8 (9.4)</td>
<td>36.0</td>
<td>99.0</td>
</tr>
</tbody>
</table>

*Research Question Q6.* Following is a restatement of Research Question Q6 and associated null and alternative hypotheses.
Q6. What is the difference in the level of autism cognizance, as measured by the AAS, among school principals based on whether the principal is employed in a school district with training for personnel serving students with ASD?

H6₀. There is not a significant difference in the level of autism cognizance, as measured by the AAS, among school principals based on whether the principal is employed in a school district with training for personnel serving students with ASD.

H6ₐ. There is a significant difference in the level of autism cognizance, as measured by the AAS, among school principals based on whether the principal is employed in a school district with training for personnel serving students with ASD.

Seventy-four participants (41.1%) reported employment in a school district with training for personnel serving students with ASD. AAS scores for this group ranged from 36 to 99. In contrast, respondents reporting employment in districts with no training had scores ranging from 55 to 95. An independent samples t test was conducted to determine whether the differences in AAS scores were significant based on employment in a school district with training for personnel serving students with ASD. Participants in districts with training had higher mean scores (M = 74.6) than did participants in districts without training (M = 71.6). The differences were significant, t(178) = -2.08, p = .04, 95% CI = [-5.69, -0.14] (see Table 5). The null hypothesis H₆₀ was rejected. As results were significant, an additional power analysis was not needed.
Table 5

*Autism Awareness - Mean Scores by Training Status*

<table>
<thead>
<tr>
<th>Training status</th>
<th>N</th>
<th>M (SD)</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Training provided</td>
<td>74 (41.1%)</td>
<td>74.6 (10.5)</td>
<td>36</td>
<td>99</td>
</tr>
<tr>
<td>Training not provided</td>
<td>106 (58.9%)</td>
<td>71.6 (8.3)</td>
<td>55</td>
<td>95</td>
</tr>
<tr>
<td>Total</td>
<td>177 (100.0%)</td>
<td>72.8 (9.4)</td>
<td>36</td>
<td>99</td>
</tr>
</tbody>
</table>

*Research Question Q7.* Following is a restatement of Research Question Q7 and associated null and alternative hypotheses.

**Q7.** What is the difference in the level of autism cognizance, as measured by the AAS, among school principals based on whether the principal has an educational background in special education?

**H7**<sub>0</sub>. There is not a significant difference in the level of autism cognizance, as measured by the AAS, among school principals based on whether the principal has an educational background in special education.

**H7**<sub>a</sub>. There is a significant difference in the level of autism cognizance, as measured by the AAS, among school principals based on whether the principal has an educational background in special education.

Twenty-three participants (12.8%) reported having an educational background in special education. AAS scores for this group ranged from 54 to 99. In contrast, respondents lacking an educational background in special education had scores ranging
from 36 to 95. An independent samples t test was conducted to determine whether the differences in AAS scores were significant based on whether the school principal had an educational background in special education. Principals with an educational background in special education had higher mean scores \( M = 74.6 \) than did those without an educational background in special education \( M = 72.6 \), but the difference was not significant, \( t(177) = 0.95, p = .35 \), 95\% CI = [−2.16, 6.12] (see Table 6).

A post hoc power analysis was performed to determine the probability that a significant result would have been found, given that the first group had only 23 respondents and the second group had 156 respondents. The power of the independent samples t test was 60.5, meaning that there was 39.5\% likelihood that a significant result was missed. A nonparametric Mann-Whitney U test was then conducted to compare the two groups. The differences between the first group (mean rank = 96.2) and the second group (mean rank = 89.1) were not significant, \( Z(177) = -0.62, p = .54 \). The null hypothesis \( H_7 \) was not rejected.
Table 6

*Autism Awareness – Mean Scores by Educational Background in Special Education*

<table>
<thead>
<tr>
<th>Educational status</th>
<th>N</th>
<th>M (SD)</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Educational background in special</td>
<td>23 (12.8%)</td>
<td>74.6 (11.4)</td>
<td>54</td>
<td>99</td>
</tr>
<tr>
<td>education</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No educational background in special</td>
<td>156 (87.2%)</td>
<td>72.6 (9.1)</td>
<td>36</td>
<td>95</td>
</tr>
<tr>
<td>education</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>179 (100.0%)</td>
<td>72.8 (9.4)</td>
<td>36</td>
<td>99</td>
</tr>
</tbody>
</table>

*Research Question Q8.* Following is a restatement of Research Question Q8 and associated null and alternative hypotheses.

Q8. What is the difference in the level of autism cognizance, as measured by the AAS, among school principals based on whether the principal has undergone professional development and/or training in the education of students with ASD?

H8₀. There is not a significant difference in the level of autism cognizance, as measured by the AAS, among school principals based on whether the principal has undergone professional development and/or training in the education of students with ASD.

H8ₐ. There is a significant difference in the level of autism cognizance, as measured by the AAS, among school principals based on whether the
principal has undergone professional development and/or training in the education of students with ASD.

Seventy-four participants (41.6%) reported having undergone professional development and/or training in the education of students with ASD. AAS scores for this group ranged from 55 to 95. In contrast, respondents lacking professional development and/or training in the education of students with ASD had scores ranging from 36 to 99. An independent samples $t$ test was conducted to determine whether the differences in AAS scores were significant based on whether the school principal had professional development and/or training in the education of students with ASD. Principals with training had higher mean scores ($M = 74.6$) than did those without professional development and/or training in the education of students with ASD ($M = 71.5$). The differences were significant, $t(176) = -2.14, p = .03, 95\% \text{ CI} = [-5.81, -0.24]$ (see Table 7). The null hypothesis $H_{80}$ was rejected. As results were significant, an additional power analysis was not performed.
Table 7

*Autism Awareness – Mean Scores by Professional Training History in Autism Spectrum Disorder*

<table>
<thead>
<tr>
<th>Training history</th>
<th>N</th>
<th>M (SD)</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professional training in the education of students with ASD</td>
<td>74 (41.6%)</td>
<td>74.6 (10.5)</td>
<td>55</td>
<td>95</td>
</tr>
<tr>
<td>No professional training in the education of students with ASD</td>
<td>104 (59.4%)</td>
<td>71.5 (8.3)</td>
<td>36</td>
<td>99</td>
</tr>
<tr>
<td>Total</td>
<td>178 (100.0%)</td>
<td>72.8 (9.4)</td>
<td>36</td>
<td>99</td>
</tr>
</tbody>
</table>

*Research Question Q9.* Following is a restatement of Research Question Q9 and associated null and alternative hypotheses.

**Q9.** What is the relationship between the number of educational supports provided to students with ASD in a principal’s school and the level of autism cognizance as measured by the AAS?

**H9₀.** There is not a significant relationship between the number of educational supports provided to students with ASD in a principal’s school and the level of autism cognizance among school principals, as measured by the AAS.

**H9ₐ.** There is a significant relationship between the number of educational supports provided to students with ASD in a principal’s school and the
level of autism cognizance among school principals, as measured by the AAS.

The number of educational supports provided to students with ASD in a principal’s school ranged from 0 to 9, with a mean of 2.5 ($SD = 1.8$). Table 2 displays the mean and range for the number of educational supports. The distribution of scores for the number of educational supports was a nonnormal Poisson distribution, with the highest scores at the far left of the histogram and all entries whole numbers (see Figure 4). Therefore, nonparametric statistics were used to answer Research Question Q9. Spearman’s correlation coefficients were computed to determine whether there was a significant association between levels of autism cognizance and the number of educational supports at the principal’s school. The association was significant, $\rho = .22, p = .004$. The null hypothesis $H_{90}$ was rejected.
Evaluation of Findings

This study was an evaluation of the relationship between the school principals' cognizance of ASD or also stated as their level of awareness, knowledge and understanding of ASD as measured by Stone’s Autism Awareness Survey (1987)(AAS), and the independent variables that may account for the differences. The continuous variables included, (a) years of experience as a school principal, (b) total years as an educator, (c) number of students with ASD that the principal has encountered during their
career, and (d) the number of educational supports provided to students with ASD.

Further comparison was performed between the dependent variable of the AAS score and the following nominal variables, (a) principals who have a family member with ASD, (b) principals leading elementary, middle or high schools, (c) principals working in districts with related ASD training, (d) principals with educational background in special education, and (e) principals with professional development training in ASD. Following is an evaluation of the findings in context of other research in the area.

The cognizance or also stated as the principal’s awareness, knowledge, and understanding of ASD served as the dependent variable throughout this study. The resulting scores were normally distributed and linear. The stability of the scores in terms test-retest reliability are supported by Campbell, Reichle, and VanBourgondien’s (1999) study of the AAS (Stone, 1987) as the current study was conducted with the homogenous respondent occupation of school principal. Similar studies assessing cognizance of ASD have been conducted with homogenous occupations using the AAS. Stone (1986) compared clinical psychologists, pediatric medical specialists, school psychologists and speech and language pathologist levels of cognizance of the disorder. More recently, Schwartz and Drager (2008) specifically targeted speech and language pathologists to determine their levels of knowledge and also background training in Autism. In both studies those surveyed reported having worked with as few as one student with ASD and as many as 15 in contrast to 0 to 25 as reported by the school principals in the current study, which is interesting to note as the occupations observed in the other studies were of professions that typically diagnose and or treat persons with ASD.
The data gathered for this study required the supporting collection of AAS score results as the foundation for correlating to the research questions. In the current study the overall mean score for questions related to the general descriptors of ASD was 3.71 (See Appendix E). Principals demonstrated solid understanding that ASD is not something that a child outgrows as evidenced by a mean score of 4.68 by fully disagreeing with the statement, “Autism exists only in childhood.” In contrast to Stone’s (1986) study that found that clinical psychologists, school psychologists, and speech and language pathologists were more likely to believe that autism exists only in childhood. The more recent survey of speech and language pathologists (Schwartz & Drager, 2008) produced a similar finding with a mean score of 4.32 among speech pathologists to that of the principals in the current study demonstrating that neither of these groups possess the common misconception that children out grow autism as typically found among parents surveyed. Principals demonstrated understanding that ASD can occur in mild as well as extreme forms by the high degree of agreement with the related survey question with a mean score of 4.58. The current study and the study of speech and language pathologists demonstrated a weakness in understanding that ASD is a developmental disorder as was similarly found in Stone’s study.

Mean scores (see Appendix E) related to statements representative of the cognitive characteristics of ASD reflected the greatest need for increasing awareness and understanding among school principals as the overall mean for the 6 statements comprising the cognitive characteristics was 2.96. The majority of principals fully disagreed with the statement, “Most autistic children are also mentally retarded.” The mean score was 0.87. Principals also hold the misconception that children with ASD
often have special abilities as revealed by a mean score of 1.55 for the statement “Most autistic children have special talents or abilities.” In contrast to the speech and language pathologists of the Schwartz and Drager study (2008) for which the mean scores indicated the current understanding that most children with ASD also have cognitive impairments (Ritvo, 2006) and further noted by Ritvo that special abilities are often the result of part of the brain becoming stronger like that of the upper body strength of a person in a wheel chair and are not really special abilities. Statements that revealed strong awareness and understanding of the cognitive features of ASD and were in line with those found among the speech and language pathologists of that study included disagreement with the following statements, “Autistic children are untestable,” with a mean score of 4.18 and a mean score of 4.02 by disagreeing with “Most autistic children do not talk.”

Statements about the social emotional descriptors of ASD also demonstrated the need for increased cognizance among the principals of the current study and also among the speech and language pathologists of that study (Schwartz & Drager, 2008). However it is first to important to note that both principals and the speech and language pathologists do not possess the misconception that ASD is caused by cold, rejecting parents. The mean score of 4.78 was obtained for disagreeing with the statement, “Autistic children’s withdrawal is mostly due to cold, rejecting parents.” Because social emotional disorders typically negate a diagnosis of ASD, it is important to note those statements for which principals demonstrated lower levels of awareness of ASD. The state “Autism is an emotional disorder,” yielded a mean score of 2.95 as 26% of the principals either fully or mostly agreed with this statement. The statement “It is difficult
to distinguish between autism and childhood schizophrenia,” resulted in a mean score of 2.98. The mean score of 2.35 for the statement, “Emotional factors play a major role in the etiology of autism,” does not reflect the more current literature reflecting research that rules out emotional factors as a cause of ASD. (American Psychology Association, 2000). Principals, like the speech and language pathologists demonstrated high levels of understanding by the mean score of 4.3 by disagreeing with the statement, “Autistic children are deliberately negativistic and noncompliant.” In contrast, Stone’s study revealed that speech and language pathologists and pediatricians felt more strongly that autistic children are intentionally negativistic and noncompliant.

The mean score of 0.7 for agreement to the statement, “I feel comfortable diagnosing or identifying a child as autistic” is significant and important to the summary and conclusions to this study that principals do not feel they possess sufficient knowledge and understanding of the disorder. The speech and language pathologists of that study (Schwartz & Drager, 2008) were asked an additional but related question, “I feel that I could have benefitted from receiving additional coursework and training in the area of autism,” which resulted in 73.1% of the participants stating they felt that the training they received was adequate to prepare them to work with students with autism. In light of the findings of the AAS principals would benefit from training focused on increasing the knowledge and understanding of ASD in the areas of cognitive features of the disorder and differentiating ASD from other emotional disorders.

This study’s attempt to correlate what may contribute to greater awareness, knowledge, and understanding of ASD among Ohio public school principals was unique among the body of research. The significance of the number of students with ASD
encountered during a principal’s career as an educator and the greater the principal’s
cognizance of ASD is mirrored in Ritvo’s (2006) case studies reflecting the variances of
the disorder, but also the commonalities of it as well.

The correlation between greater cognizance of ASD and the importance of
training, and professional development for principals aligns with the theory and
proposition of Sparks (2002) that leadership without understanding and direction fails to
address the needs of its students. The other correlation resulting in rejecting the null
hypothesis was of the continuous variable of the number of educational supports provided
to children with ASD. The literature review provided a variety of educational supports
that ranged from a simple modification to an extensive program implementation to serve
students with ASD. It appears that principals who are more aware of ASD are also more
aware of the scope of possible supports that may be provided to these students.

Summary

The purpose of this study was to determine the level of cognizance, also referred
to as the awareness, knowledge, and understanding of ASD among Ohio public school
principals. The AAS (Stone, 1987) was the measurement instrument used to quantify the
dependent variable of principal cognizance of ASD. Resulting scores were normally
distributed. The research questions sought to determine what may account for greater
cognizance of ASD among principals and served as the independent variables throughout
the study.

The null hypothesis was rejected in this study for 4 of the 9 questions. The greater
the number of students with ASD encountered during an educator’s career resulted in a
significant relationship to increased understanding of ASD. It was also found that
principals employed by school district’s providing training to their personnel serving students with ASD also demonstrated higher cognizance of ASD. Principals who reported as having some form of professional development in the nature and needs of students with ASD further demonstrated greater cognizance of ASD. Awareness, knowledge, and understanding of ASD increased among principals who reported a greater number of educational supports available to students with ASD.

The results of this study demonstrated the importance of on-going training and professional development for school principals as well as other school personnel in educationally serving students with ASD in our public schools. The survey results revealed that some misconceptions still surround understanding students with ASD. Professional development and training may be guided by the results that demonstrate a need for greater understanding of the cognitive features and the social emotional characteristics that distinguish ASD. The implications, recommendations, and conclusions of this study will be presented in the following chapter.
CHAPTER 5: IMPLICATIONS, RECOMMENDATIONS, AND CONCLUSIONS

The number of students identified as having ASD in our public schools has increased, and the relative newness of the disorder has resulted in challenges and opportunities to serve these students in our public schools. School principals may not have the awareness, knowledge, and understanding of ASD expected by parents of children with ASD when challenged with disciplinary concerns or specific instructional needs. Barnhill (2004) noted the importance of this cognizance with this statement “A clear understanding of the condition is necessary to accurately interpret a student’s behavior and effectively intervene” (p. 11). School principals bring to their leadership their own experiences and beliefs that guide their decisions, and they have considerable influence on the instructional programs, services, and specific strategies that are employed in the school. The principal’s perception about ASD is critical to the scope of services and strategies provided to students with ASD as they have much influence on the staff and culture of the school (Sage & Burrello, 1994).

The purpose of this study was to determine the current levels of awareness, knowledge, and understanding of ASD among public schools principals in Ohio providing a baseline for the current norm. The study further sought to correlate what factors may contribute to greater awareness, knowledge, and understanding of ASD. Identifying factors that may contribute to greater cognizance of ASD can guide professional development and training experiences for principals with potential of impacting the educational experience of students with ASD.
The study was a quantitative nonexperimental descriptive design entailing both correlations and comparisons of means. The study was framed in terms of leadership theory, indicating the importance of engaged leadership in the functioning of all members of an organization. The randomly selected 180 participants were all Ohio public school principals serving students in grades kindergarten through grade 12. The AAS (Stone, 1987), served as the instrument to measure and determine the mean baseline of the dependent variable of cognizance of ASD among the Ohio public school principals. The independent variables correlated to the mean scores of the AAS and framing the research questions included; (a) years of experience held by the school principal, (b) total years as an educator, (c) number of students encountered during the educational career of the principal, (d) having a close relative with ASD, (e) serving as a principal of an elementary, middle/junior high school, or high school, (f) principals employed in districts that provide training to personnel working with ASD, (g) principals having a special education background, (h) principals having undergone professional development and/or training in the education of students with ASD, and (h) the number of educational supports provided to students with ASD.

The limitations of this study begin with the survey instrument as it was over 20 years old. Although research has found the AAS (Stone, 1987) to be reliable and valid (Campbell, Reichle, & VanBourgondien, 1999), some of the terminology is not as commonly used today which could have led to misunderstanding. A few participants did not accurately complete the survey omitting responses. The survey was mailed to the randomly selected participants and may not have reached the intended recipient as a few were returned by a well meaning secretary indicating the principal did not wish to
participate. The lack of a choice to respond electronically instead of via the mail may have missed those participants more comfortable with an electronic method of response which may have skewed the results toward older principals participating.

The sampling method was a limitation as the possibility of missing a significant result or the inverse of finding a significant result not representative of the general population exists. The significance of the results may not be easily generalized to the entire population as the participants, although a rather homogenous group in terms of educational attainment, and socio-economic factors, the sample size was small, only reflecting 5% of the total public school principals in the state of Ohio.

The anonymity of the survey response did not provide opportunity to clarify responses. About 20 respondents combined the services of occupational therapy and physical therapy together, possibly because they are as related services so often spoken and written together, but not actually provided to students with ASD as the respondents had indicated. It would have been helpful in these cases to ask the participants to clarify if they indeed mean for both of these services to be provided to students with ASD.

The study was conducted anonymously and participants were assured their responses would be coded. The opportunity for participants to answer untruthfully existed as in any study in which respondents self report. It is further subject to the participant’s interpretation as well as their recall of the information for which the survey is requesting to the accuracy of their response. No other ethical issues were noted while conducting this study.

In the remainder of this chapter, implications of the findings are discussed. The nine research questions and hypotheses are reviewed individually, with findings
summarized, and conclusions drawn. Implications for each result are presented. Recommendations are then presented, both for practical applications of the study and for future research conclusions. The conclusions of the study are then presented.

**Implications**

Following is a presentation of each of the nine research questions addressed in this study, together with associated hypotheses and a discussion of the implications of each question.

*Research Question Q1.* What is the relationship between the years of experience as a school principal and the level of autism cognizance, as measured by the AAS?

$H1_0$. The relationship between the years of experience as a school principal and the level of autism cognizance, as measured by the AAS, is not statistically significant.

$H1_a$. The relationship between the years of experience as a school principal and the level of autism cognizance, as measured by the AAS, is statistically significant.

Experience is valued in the business of education as monetary gains are provided for it and career security built upon it. Dundon (2002) noted the challenge that organizations face when there is turnover of both leadership and employees and this theory framed this research question that experience would make a difference. The research question sought to determine the significance between experience as a principal and the level of cognizance of ASD. The mean years of experience as a school principal was 9.9 years and the mean score on the AAS was 72.85. Experience ranged from 1 to 32 years as a school principal and the corresponding AAS scores were 85 points on the AAS.
by the 32 year veteran principal whereas 74.8 was the mean among the first year principals. Two respondents did not share their years of experience as a principal. The null hypothesis was not rejected as the relationship was not significant, \( r(178) = .05, p = .52 \). Possibly a larger sample may have produced significant results, however in light of the further results it is more likely that years of experience is not as important as the number of students with ASD encountered during that time. The findings from Research Question 1 do not support the value placed on years of experience as it relates to the engaged leadership theory framing this study.

Research Question Q2. What is the relationship between the years of experience as an educator and the level of autism cognizance among school principals, as measured by the AAS?

\( H_{20} \). The relationship between the years of experience as an educator and the level of autism cognizance among school principals, as measured by the AAS, is not significant.

\( H_{2a} \). The relationship between the years of experience as an educator and the level of autism cognizance among school principals, as measured by the AAS, is significant.

The foundation for this question was the ratio of children with ASD making it more likely that the more years as an educator the more likely to have directly instructed a student with ASD. It was further framed on the importance of longevity in the profession and its potential to impact greater wisdom and understanding of the situations within the organization. Total years as an educator ranged from 8 to 47 with a mean of
23.9 years. The relationship between years as an educator and cognizance of ASD was not significant, $r(178) = -.02, p = .83$. The null $H_2$ was not rejected.

Research Question Q3. What is the relationship between the number of students with ASD encountered during the principal’s educational career, and the level of autism cognizance among school principals, as measured by the AAS?

$H_{3,0}$. The relationship between the number of students with ASD encountered during the principal’s educational career, and the level of autism cognizance among school principals, as measured by the AAS, is not significant.

$H_{3,a}$. The relationship between the number of students with ASD encountered during the principal’s educational career, and the level of autism cognizance among school principals, as measured by the AAS, is significant.

The literature review revealed that no two children with ASD were alike except for the trilogy of distinguishing features of the disorder which are the restricted repetitive patterns of behavior, and impairments in communication and social relationships (Henry & Myles, 2007; Ritvo, 2006; Simpson, 2005). The conclusion drawn was that the more students encountered with ASD, the greater cognizance of the disorder. Table E2 (see Appendix E) presents the mean AAS score for the corresponding numbers of students encountered during the educator’s career from 0-25. The highest AAS score of 94 is reflective of a principal who has encountered 16 students during their career. The use of Spearman’s correlation coefficients determined there was a significant correlation between levels of ASD cognizance and the number of students encountered during a
principal’s career. The relationship was significant, \( p = .28, p < .001 \) thereby rejecting the null hypothesis \( H_3_0 \). Research question 3 confirms the importance that principals have opportunities to observe, experience, and encounter students with ASD. This will further support later research questions investigated.

*Research Question Q4.* What is the difference in the level of autism cognizance, as measured by the AAS, among school principals based on whether the principal is related to a child with ASD?

\( H_{4_0} \). There is not a significant difference in the level of autism cognizance, as measured by the AAS, among school principals based on whether the principal is related to a child with ASD.

\( H_{4_a} \). There is a significant difference in the level of autism cognizance, as measured by the AAS, among school principals based on whether the principal is related to a child with ASD.

It was theorized that principals with a close relative with ASD would have with certainty encountered a child with ASD, but furthermore these principals would also have been more likely to have experienced a number of different types of professionals besides educators along the way contributing to their cognizance of ASD (Ritvo, 2006; Stone & DiGeronimo, 2006). Principals reporting having a close relative with ASD accounted for 8.9% of the respondents. Their scores on the AAS ranged from 64-95. Principals reporting no family member with ASD had scores ranging from 36-99. Although those with a close relative had higher mean scores (M = 76.6) than those not having a close relative with ASD (M = 72.5), the difference was not significant, \( t(178) = 1.67, p = .10 \), 95% CI = {-0.74, 8.89} (see Table 4). Further analysis was performed to determine the
probability that a significant result would have been found, given that the first group had only 16 respondents and the second group had 164 respondents. The power of the independent samples t test was 47.5, meaning that there was a 52.5% likelihood that a significant result was missed. A nonparametric Mann-Whitney U test was then conducted to compare the two groups. The difference between the first group (mean rank = 108.1) and the second group (mean rank = 88.8) were not significant, Z(178) = -1.42, p = .15. The null hypothesis H40 was not rejected. The conclusion is that having a close relative with ASD is not a predictor of greater cognizance of the disorder.

**Research Question Q5.** What is the difference in the level of autism cognizance, as measured by the AAS, among school principals based on the type of school (elementary, middle, or high school)?

**H50.** There is not a significant difference in the level of autism cognizance, as measured by the AAS, among school principals based on the type of school (elementary, middle, or high school).

**H5a.** There is a significant difference in the level of autism cognizance, as measured by the AAS, among school principals based on the type of school (elementary, middle, or high school).

This research question was framed in the theory that elementary principals would have greater cognizance of ASD because of the age group of students they serve. The diagnosis of the child having ASD would have more recently have occurred and the professionals involved in that diagnosis as well as educational service plan working more directly with the principal than in later school years (Henry & Myles, 2007; Volkmar & Wiesner, 2009). Although the majority of participants were elementary principals
the mean scores between elementary and high school principals which comprised 15.6% of the respondents, were very close \( M = 73.7 \) for principals of elementary schools and \( M = 73.0 \) for principals of high schools.(see Table 4). A one-way analysis of variance (ANOVA) was conducted to determine whether the differences in AAS scores was significant based on the type of school the principal led. Differences were not significant, \( F(2, 177) = 1.66, p = .19 \), partial eta square = 0.02. Post hoc comparisons were not performed since differences were not significant. The null hypothesis \( H_5 \) was not rejected.

*Research Question Q6.* What is the difference in the level of autism cognizance, as measured by the AAS, among school principals based on whether the principal is employed in a school district with training for personnel serving students with ASD?

*H6*. There is not a significant difference in the level of autism cognizance, as measured by the AAS, among school principals based on whether the principal is employed in a school district with training for personnel serving students with ASD.

*H6a*. There is a significant difference in the level of autism cognizance, as measured by the AAS, among school principals based on whether the principal is employed in a school district with training for personnel serving students with ASD.

The literature review was rich in educational supports which encompassed strategies, interventions, and services specially designed to address the disabling features of ASD. Many of these supports required specialized training as well as specialized personnel to employ them. This research question sought to determine if principal
employed districts providing training for personnel serving students with ASD would demonstrate greater awareness, knowledge, and understanding of ASD. The supervisory nature of the position and the theory of engaged leadership framing this question (Bennis, 2003). This question was measured by the nominal variable as respondents simply stated yes or no to the inquiry if the school district for which they were employed provided training for their personnel serving students with ASD. Seventy-four (41.1%) reported employment in such districts. AAS scores for this group ranged from 36-99. In contrast, respondents reporting employment in districts with no training had scores ranging from 55-95. An independent $t$ test was conducted to determine whether differences in AAS scores were significant based on employment in a school district with training for personnel serving students with ASD. The mean scores of the participants in districts with training were higher ($M = 74.6$) than those of the participants in districts not providing training ($M = 71.6$). The differences were significant, $t(178) = -2.08$, $p = .04$, 95% CI = [-5.69, 0.14] (see Table 5). An additional power analysis was not needed as the null hypothesis $H_{6O}$ was rejected. Findings of Research question 6 confirm the importance of engaged leadership, as well as the importance of training. Training of teachers and aides was the second most requested service of Autism regional centers as reported in a survey conducted by the Autism Society of California. Only narrowly behind requests for social skill therapy (Autism Society of California Survey, 2009)

*Research Question Q7*. What is the difference in the level of autism cognizance, as measured by the AAS, among school principals based on whether the principal has an educational background in special education?
There is not a significant difference in the level of autism cognizance, as measured by the AAS, among school principals based on whether the principal has an educational background in special education.

There is a significant difference in the level of autism cognizance, as measured by the AAS, among school principals based on whether the principal has an educational background in special education.

The theory behind this construct was simply rooted in the belief that principals with an educational background teaching special education would be more likely to have worked with a student with ASD and/or have training in working with students with ASD establishing a comparison group if the results were significant. Twenty-three participants (12.8%) reported having an educational background in special education. The AAS scores for this group ranged from 54 to 99. In contrast, respondents lacking an educational background in special education had scores ranging from 36 to 95. An independent samples t test was conducted to determine whether the differences in AAS scores were significant based on whether the school principal had an educational background in special education. Principals with an educational background in special education had higher mean scores ($M = 74.6$) than did those without educational background in special education ($M = 72.6$), but the difference was not significant, $t(177) = 0.95$, $p = .35$, 95% CI = [-2.16, 6.12] (see Table 6). A post hoc power analysis was performed to determine the probability that a significant result would have been found, given that the first group had only 23 respondents and the second group had 156 respondents. The power of the independent samples $t$ test was 60.5, meaning that there was a 39.5% likelihood that a significant result was missed. A nonparametric Mann-
Whitney U test was then conducted to compare the two groups. The differences between the first group and the second group were not significant, \( Z(177) = -0.62, p = .54 \). The null hypothesis \( H_{70} \) was not rejected. Although the result was not significant to the research question, it did provide a foundation that principals without an educational background in special education possess the same capacity to understand the needs of the students served by special education.

Research Question \( Q8 \). What is the difference in the level of autism cognizance, as measured by the AAS, among school principals based on whether the principal has undergone professional development and/or training in the education of students with ASD?

\( H_{80} \). There is not a significant difference in the level of autism cognizance, as measured by the AAS, among school principals based on whether the principal has undergone professional development and/or training in the education of students with ASD.

\( H_{8a} \). There is a significant difference in the level of autism cognizance, as measured by the AAS, among school principals based on whether the principal has undergone professional development and/or training in the education of students with ASD.

Principals are essential to providing support and learning opportunities that teachers and staff need to improve instruction and services that increase student achievement and potential (National Association of Elementary School Principals, 2004). Principals should further lead by example and identify professional development and training that enables them to promote student achievement and potential (Reeves, 2006).
This research question focused on the nominal variable of determining if the principal has undergone professional development and/or training in the education of students with ASD. Seventy-four participants (41.6%) reported having undergone professional development and/or training in the education of students with ASD. AAS scores for this group ranged from 55 to 95. In contrast, participants lacking professional development and/or training in the education of students with ASD had scores ranging from 36 to 99. An independent \( t \) test was conducted to determine whether the differences in AAS scores were significant based on whether the school principal had professional development and/or training in the education of students with ASD. Principals with training had higher mean scores (\( M = 74.6 \)) than did those without professional development and/or training in the education of students with ASD (\( M = 71.5 \)). The differences were significant, \( t(176) = -2.14, p = .03, 95\% \text{ CI} = [-5.81, 0.24] \) (see Table 7). The null hypothesis \( H_8 \) was rejected. There is a trend of significance, an additional power analysis was not performed. The results of this question confirm the importance of engaged leadership and that principals not only model lifelong learning, but lead the entire staff in learning (Fullan, 2001). A recommendation for further research stems from an observation made by the researcher that the 2 respondents who noted having training in TEACCH (Treatment and Education of Autistic and related Communication Handicapped Children) (Volkmar& Wiesner, 2009), scored the highest on the AAS. Further research is recommended on what specific training and professional development yields the greatest gain in cognizance of ASD among principals as done in a study of beginning teachers by Leblanc, Richardson, and Burns (2009). Especially so in light of their finding that teachers reported workload and stress levels increased when working with students with
ASD and when provided with low levels of leadership support. Further confirming the need for engaged leadership is noted by the following from their report, “there is an urgent need for professional working with students with ASD to have a full understanding of the exceptionality and its many complexities” (p.176). In the study by Drager and Schwartz (2008) measuring training and knowledge in Autism among speech-language pathologists they noted that in their study “the majority of the respondents reported that they could have benefitted from additional training in the area of autism” (p. 66). Their conclusion and recommendation that it may be necessary to consider methods for providing this training further supported the importance of training for principals in understanding ASD.

*Research Question Q9.* What is the relationship between the number of educational supports provided to students with ASD in a principal’s school and the level of autism cognizance as measured by the AAS?

*H90.* There is not a significant relationship between the number of educational supports provided to students with ASD in a principal’s school and the level of autism cognizance among school principals, as measured by the AAS.

*H9a.* There is a significant relationship between the number of educational supports provided to students with ASD in a principal’s school and the level of autism cognizance among school principals, as measured by the AAS.

The chapter 2 Literature Review provided many examples of strategies, services, and programs collectively referred to by the researcher as educational supports. The
continuous variable of the number of educational supports provided to students with ASD was included as it was theorized that a principal able to articulate various educational supports would possess greater awareness, knowledge, and understanding of ASD. This construct required the respondent to specify by name the educational supports typically provided to students. Educational supports address the disabling features of ASD and the principal who is able to name those supports may be more cognizant of the subsequent needs.

The number of educational supports provided to students with ASD in a principal’s school ranged from 0 to 9, with a mean of 2.5 \( (SD = 1.8) \). Table 2 displays the mean and range for the number of educational supports. The distribution of scores for the number of educational supports was a nonnormal Poisson distribution, with the highest scores at the far left of the histogram and all entries whole numbers (see Figure 4). Therefore, nonparametric statistics were used to answer this research question. Spearman’s correlation coefficients were computed to determine whether there was a significant association between the levels of autism cognizance and the number of educational supports at the principal’s school. The association was significant, \( p = .22, p = .004 \). The null hypothesis \( H_0 \) was rejected.

The most commonly reported educational supports were: a paraprofessional aide, speech and language services, and occupational therapy. The researcher further observed that principals with AAS scores of 90 or above mentioned educational supports specific to serving students with ASD. Many of these supports were referenced in chapter 2 as evidenced-based effective strategies, services, and/or programs. Among these specifics were: TEACCH, visual schedules, applied behavior analysis, PECS, and Social
Stories™. The results of this research question confirm the importance of the school leaders' greater understanding of what students with ASD need. School principals leverage the resources and guide classroom practices (Marzano, Waters, & McNulty, 2005; NAESP, 2004).

Recommendations

The resulting challenges and opportunities public school principals face because of the growing number of children with ASD attending public schools makes the findings of this study worthwhile to communicate to several organizations. The Ohio Center for Autism and Low Incidence (OCALI) serves both educators and families in identification, service, and support. Further it provides professional development and training for educators primarily through the Ohio School Improvement Team Regions. The primary focus of this professional development is fostering a greater understanding of ASD and the subsequent needs and supports needed to help students with ASD be understood and thrive to their greatest potential. The findings of the present study provide a baseline for OCALI to evaluate the effectiveness of their existing trainings and professional development offerings.

Although other studies have sought to determine the baseline cognizance of ASD among pediatricians, teachers, school psychologists (Stone, 1986), and speech and language pathologists (Schwartz & Drager, 2008), this study is unique in its focus on school principals and specifically those working in Ohio. An agency like OCALI could replicate the study with a larger population of Ohio’s principals increasing the ability to generalize the results. The ability to generalize the results would lend well to focusing the professional development and training OCALI provides. OCALI also has great potential
for acquiring funding targeted at professional development and training in serving children with ASD.

Other organizations which may find this study’s findings relevant are the Ohio Association of Elementary School Administrators (OAESA), and the Ohio Association of Secondary School Administrators. These organizations all have access to members who are principals and serve students with ASD. The potential to impact educational leadership with opportunities to learn about ASD and how to better serve students with ASD exists through their electronic communication, conferences, and associated professional journals. Even though no cure currently exists for ASD, there are many educational supports that can be provided to students with ASD to help them cope both, socially and emotionally as well as academically. The literature review produced a large number of these supports whereas the research findings noted that principals reported the use of very few of these supports. Using these organizations to present and write about effective educational supports not only would increase the awareness, knowledge, and understanding of ASD among Ohio’s principals, but it may increase the use of more evidenced-based educational supports for students with ASD.

Reporting these findings to universities may also contribute to the preparation of both school principals as well as teachers in educating students with ASD. Becker-Cottrill and Ball (2009) noted that many postsecondary institutions do not have faculty members with the knowledge base to teach an entire course on ASD and many universities and colleges offer no coursework in autism to educators. The findings of this study that principals with a background in special education did not necessarily possess greater knowledge of ASD than principals having no special education training
demonstrates the importance of colleges and universities preparing teachers and future school leaders for educating students with ASD.

Professional development and training for teachers and staff are often low on the priority of public school funding. Yet the findings of this study demonstrated that districts that provided training for their staff working with students with ASD, also had principals more cognizant of ASD. It would be important that the study’s findings be used to further support district level training of personnel serving students with ASD.

In light of the findings, further research is needed. It would be desirable to conduct a similar study with a larger sample to further generalize the results to the population. Nonparametric statistics had to be used to determine some of the results and perhaps more significant finding may have been found. These independent variables included, the principal having a close relative with ASD, the principal having an educational background in special education, and the number of students with ASD encountered during an educational career.

This last continuous variable of number of students with ASD encountered during an educational career which resulted in a trend of significance is one of interesting implication. Although it is easy to report the findings to the previously mentioned organizations and associations, the concept of providing principals with more students with ASD to encounter as a means of increasing their cognizance of the disorder is an interesting opportunity. Students with ASD are a group that would likely benefit from extended school year services. Summer programs for students with ASD could provide not only a training ground for implementing and demonstrating strategies, services and
programs, but also an opportunity for educators to increase their encounters with students with ASD.

Opportunities for further research exist and are needed. First are the opportunities to replicate this study among principals in other regions, states, and countries. The findings can also be used as baseline data for comparing professional development and training effects. Qualitative studies evaluating the effectiveness of professional development and training such as the Canadian study conducted on inclusion teachers in that country (Leblanc, Richardson, & Burns, 2009) could be conducted only with school principals as the focus. Additional qualitative and mixed method studies could evaluate the effectiveness of district level training provided to personnel serving students with ASD, and other types of professional development and training provided to specialists serving students with ASD. Case studies could be conducted with principals undergoing year-long team approach trainings such as those provided by OCALI. Further evaluation studies could be conducted on the effectiveness of specific educational strategies, services, and programs and which contribute to greater awareness, knowledge, and understanding of ASD.

Conclusions

The theme of professional development and training surrounded the significant correlations this study found in the survey of awareness, knowledge, and understanding among Ohio public school principals. Principals serving in school districts that provided staff serving students with ASD training were more cognizant of ASD. Principals who reported having undergone professional development and/or training in educating
students with ASD also demonstrated greater awareness, knowledge, and understanding of ASD.

Significant findings were also noted for the continuous variable of number of educational supports provided to students with ASD as the greater the number of educational supports, the greater the principal’s cognizance of ASD. The number of students with ASD encountered during a principal’s educational career also positively impacted the principal’s cognizance of ASD.

In light of these findings further research is needed which evaluates the effectiveness of professional development and training would be of benefit to not only public education, but higher education as well as professional organizations that serve principals and serve students with ASD. Further evaluation of what strategies, services, and programs are effective would also contribute to the body of research on educating students with ASD. The link between greater awareness, knowledge, and understanding among school principals and the number of students encountered during a principal’s career opens new avenues for research but also opportunities to serve these students more effectively. The opportunity to provide extended school year services to students with ASD and at the same time provide principals with a training ground to observe, and encounter many students with ASD is an experience worth considering for further research and evaluation.

Findings from this study support the importance of professional development, and training of educators in the nature and needs of students with ASD. Many organizations, and agencies which serve principals, and/or serve students with ASD may find this research beneficial in their pursuit of funding, and other resources for the delivery of
professional development and/or training initiatives that help meet the needs of students with ASD. It has been an honor and a privilege to produce this quantitative study describing the awareness, knowledge, and understanding of ASD among Ohio public school principals.
References


Ohio Department of Education. Number of schools in Ohio. Retrieved March 4, 2008 from http://webapp2.ode.state.oh.us/data/ohio_school_counts.asp


Appendix A Principal Questionnaire

Please complete the following questions about yourself and your career experiences.
Thank you.
How many years (total) have you been a school principal? _______________
How many years have you been principal at your current school? __________
Your gender? Please circle M or F
Prior to becoming a principal, please share your teaching experiences – grades served, subjects taught, and specializations
______________________________________________________________________
______________________________________________________________________
______________________________________________________________________

Do you have a family member with ASD? _________
If so, their relationship to you? ________________
Number of children in your school currently identified as having ASD? _______________
Number of children you estimate that during your principal career that have attended your school including those currently identified and noted in the previous question? ________________ (Total number of students with ASD)

Describe any and all professional development and specific training that you have had in educating students with ASD?
______________________________________________________________________
______________________________________________________________________
______________________________________________________________________

What strategies, services, and/or programs are typically provided at your school for students with ASD?
______________________________________________________________________
______________________________________________________________________

Is there a treatment center for autism located near to your school? _________
If so, please share name and location ______________________________________

Thank you for completing this questionnaire. Please return the autism awareness survey along with this questionnaire in the stamped envelope provided.
Donna Bishop
Principal Watson School, Perry Local – Massillon
Doctoral Candidate
Northcentral University
Appendix B Autism Survey Part I & Part II

Permission has been obtained electronically via an email, but formal written permission has not been officially obtained. The researcher intends to write a letter requesting permission to use. An overview of the proposed research study will be provided, including a description of the proposed participants, and the proposed audience for dissemination of the results. The researcher has provided the survey for this part of the research process as it is critical for how the process and results will be evaluated.

Autism Survey
©Stone, 1984

Part I

Directions: For each of the following statements, choose the number that best reflects how much you AGREE with the statement. Write the appropriate number on the line following each statement. Use the following scale:

1  2  3  4  5  6
Fully Mostly Somewhat Somewhat Mostly Fully
Agree  Agree  Agree  Disagree  Disagree  Disagree

1. Autism is an emotional disorder. __________
2. Autism exists only in childhood. __________
3. Even with the early intervention, the prognosis for independent community functioning of autistic individuals is poor. __________
4. Autistic children are “untestable”. __________
5. Autism can occur in mild as well as extreme forms. __________
6. Autistic children are more intelligent than scores from appropriate test indicate. __________
7. It is difficult to distinguish between autism and childhood schizophrenia. __________
8. Autism is a communication disorder. __________
9. Autistic children do not show social attachments, even to parents. __________
10. Autistic children usually grow up to be schizophrenic adults. 

11. Most autistic children are also mentally retarded. 

12. Most autistic children do not talk. 

13. Autistic children are deliberately negativistic and noncompliant. 

14. It is important that autistic children receive Special Education services at school. 

15. Autism occurs more commonly among higher socioeconomic and educational levels. 

16. Autism is a developmental disorder. 

17. Autistic children’s withdrawal is mostly due to cold, rejecting parents. 

18. Most autistic children have special talents or abilities. 

19. Emotional factors play a major role in the etiology of autism. 

20. With proper treatment, most autistic children eventually “outgrow” autism. 

21. I feel comfortable diagnosing or identifying a child as autistic. 

22. Autistic children do not show affectionate behavior. 

Permission has been obtained for the use of this survey from Dr. Wendy Stone.

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Phone (615) 936-0267, Fax (615) 322-8236
www.TRIADatVanderbilt.com
Part II of The Autism Awareness Survey (Copyright Stone 1984)
Directions: For the following questions, check all items that apply:

23. Which of the following behaviors or characteristics **must be present** for a diagnosis of autism:
   ____ Language delays
   ____ Hallucinations
   ____ Sudden, unexplained mood changes
   ____ Lack of eye contact
   ____ Mutism
   ____ Need for sameness; resistance to change in routine
   ____ Peculiar speech characteristics
   ____ Inappropriate laughing or giggling
   ____ Attention deficits
   ____ Unusual sensory responses
   ____ Lack of social responsiveness
   ____ Thought disorder
   ____ Rigid or stereotyped play activities
   ____ Aggressive behavior
   ____ Onset of symptoms before thirty (30) months
   ____ Unusual mannerisms such as finger flicking
   ____ Hyperactivity
   ____ Allergies

24. Which of the following behaviors or characteristics are helpful (though not necessary) in making a diagnosis of autism:
   ____ Language delays
   ____ Hallucinations
   ____ Sudden, unexplained mood changes
   ____ Lack of eye contact
   ____ Mutism
   ____ Need for sameness; resistance to change in routine
   ____ Peculiar speech characteristics
   ____ Inappropriate laughing or giggling
   ____ Attention deficits
   ____ Unusual sensory responses
   ____ Lack of social responsiveness
   ____ Thought disorder
   ____ Rigid or stereotyped play activities
   ____ Aggressive behavior
   ____ Onset of symptoms before thirty (30) months
   ____ Unusual mannerisms such as finger flicking
   ____ Hyperactivity
   ____ Allergies
Appendix C Informed Consent

This research study is a non-experimental descriptive design collecting data to examine the level of awareness and understanding about autism spectrum disorders that is currently held by K-12 principals of Ohio public schools. The study will also survey the services and instructional strategies provided to meet the specific needs of students with autism spectrum disorders. This research study is being conducted by an elementary school principal as part of the requirements of a dissertation for obtaining a doctorate degree in education from Northcentral University.

Confidentiality of responses connected to a specific principal and/or school will be safeguarded by the researcher and there are no foreseeable risks associated with this research. There are no costs or payment to participate in this research study. The benefit to the school principal is his/her contribution to the educational research on meeting the needs of students with autism spectrum disorders. If you have any questions and/or concerns, please feel free to contact me, Donna Bishop, 330-499-5949) or my university advisor Dr. Julie Davis, Northcentral email).

You have been provided with a list of bulleted understandings regarding your participation.

I agree to participate in this research study and I understand that:

1. The time to complete the survey and questionnaire is about 30-45 minutes
2. My participation is entirely voluntary. I may discontinue my participation at any time without penalty.
3. Your responses will not be reported in any manner that will directly connect you and your school. Confidentiality and anonymity of each school principal and their school will be safeguarded.

4. All surveys and questionnaires will be destroyed within 5 years of the completion of this research study.

5. You may contact the researcher at any time for clarifications, or questions.

6. I will contact the research at my earliest convenience if I am not planning to participate in this research study so that she may randomly select another school principal to complete the survey and questionnaire.

Your signature indicates that you have read and understand the information provided above and that you willingly agree to participate at this time in the above described research study.

Donna Bishop
7570 Angel Dr. NW
North Canton, Ohio 44720

Signed: _______________________________ Date: ______________________
Researcher

Signed: _______________________________ Date: ______________________
School Principal

Return signed copy and keep one copy for your records
Appendix D Invitation to participate

Letter of Invitation to Participate in a Research Project

Dear School Principal:

I am a student at Northcentral University working on my doctorate degree in organizational leadership. I am an elementary principal of an Ohio public elementary school as well. I am conducting a quantitative descriptive research study collecting baseline data on the level of awareness and understanding of autism spectrum disorders held by K-12 Ohio public school principals. In addition, the research design will gather information regarding the types of services and instructional strategies typically afforded to students with autism spectrum disorders.

You have been randomly selected from the pool of over 3500 possible K-12 school principals in the state of Ohio to participate. Participation will only require a brief amount of your time. You will be asked to complete the Autism Awareness Survey and a demographic questionnaire. Together, these questionnaire surveys should require less than 30 minutes of your time to complete. The benefits of your participation may help Ohio principals to serve their students with autism spectrum disorders.

All of your responses shall be kept confidential and will not in any way cause harm to your school and/or school district or to you personally. As the researcher I will enter data by coding by type of school, and the region of the state. Your name or specific school will not be connected to responses or any other information to help to ensure your anonymity. Although there are no foreseeable risks to you as the participant, you are able to decline from participation at any point in this research study. I asked that you do notify
me in a timely way so that I may randomly obtain another principal to complete the survey and the questionnaire.

Enclosed, please find the Informed Consent Form. You are to sign one copy and return to me in the addressed, stamped envelope. If you should wish a copy of the results of this study, please indicate your interest on the Informed Consent Enclosure.

Thank you for your assistance.

Donna Bishop
330-497-1693
Appendix E

Mean Scores, Autism Awareness Survey

Table E1

Autism Awareness Survey: Mean Scores, Individual Questions

<table>
<thead>
<tr>
<th>#</th>
<th>Question type</th>
<th>Survey question</th>
<th>$M$ (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>GD$^a$</td>
<td>Autism is an emotional disorder</td>
<td>3.09 (1.65)</td>
</tr>
<tr>
<td>2</td>
<td>GD$^a$</td>
<td>Autism exists only in childhood</td>
<td>4.69 (0.64)</td>
</tr>
<tr>
<td>3</td>
<td>Cognitive</td>
<td>Prognosis poor for independent functioning</td>
<td>3.60 (1.18)</td>
</tr>
<tr>
<td>4</td>
<td>Cognitive</td>
<td>Autistic children are “untestable”</td>
<td>4.19 (1.01)</td>
</tr>
<tr>
<td>5</td>
<td>GD$^a$</td>
<td>Autism can occur in mild as well as extreme forms</td>
<td>4.58 (1.16)</td>
</tr>
<tr>
<td>6</td>
<td>Cognitive</td>
<td>More intelligent than appropriate tests show</td>
<td>3.31 (1.17)</td>
</tr>
<tr>
<td>7</td>
<td>Soc/Emot$^b$</td>
<td>It is difficult to distinguish between autism and childhood schizophrenia</td>
<td>3.20 (1.32)</td>
</tr>
<tr>
<td>8</td>
<td>GD$^a$</td>
<td>Autism is a communication disorder</td>
<td>3.11 (1.39)</td>
</tr>
<tr>
<td>9</td>
<td>Soc/Emot$^b$</td>
<td>No attachments even parents</td>
<td>3.13 (1.43)</td>
</tr>
<tr>
<td>10</td>
<td>Soc/Emot$^b$</td>
<td>Grow up to be schizophrenic adults</td>
<td>4.15 (1.06)</td>
</tr>
<tr>
<td>11</td>
<td>Cognitive</td>
<td>Most autistic children are also mentally retarded</td>
<td>0.87 (1.42)</td>
</tr>
<tr>
<td>12</td>
<td>Soc/Emot$^b$</td>
<td>Most autistic children do not talk</td>
<td>4.05 (1.07)</td>
</tr>
<tr>
<td></td>
<td>Category</td>
<td>Description</td>
<td>Score (SD)</td>
</tr>
<tr>
<td>---</td>
<td>----------</td>
<td>-----------------------------------------------------------------------------</td>
<td>------------</td>
</tr>
<tr>
<td>13</td>
<td>Soc/Emot</td>
<td>Autistic children are deliberately negativistic and noncompliant</td>
<td>4.33 (0.93)</td>
</tr>
<tr>
<td>14</td>
<td>Cognitive</td>
<td>Special education services important</td>
<td>4.06 (1.21)</td>
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<tr>
<td>15</td>
<td>GD</td>
<td>More common among higher socioeconomic levels</td>
<td>3.64 (1.31)</td>
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<tr>
<td>16</td>
<td>GD</td>
<td>Autism is a developmental disorder</td>
<td>2.82 (1.52)</td>
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<tr>
<td>17</td>
<td>Soc/Emot</td>
<td>Autistic children’s withdrawal is mostly due to cold, rejecting parents</td>
<td>4.79 (0.57)</td>
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<tr>
<td>18</td>
<td>Cognitive</td>
<td>Most autistic children have special talents or abilities</td>
<td>1.59 (1.22)</td>
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<tr>
<td>19</td>
<td>Soc/Emot</td>
<td>Emotional factors play a major role in the etiology of autism</td>
<td>2.45 (1.29)</td>
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<tr>
<td>20</td>
<td>GD</td>
<td>Proper treatment outgrow AD</td>
<td>3.88 (1.18)</td>
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<tr>
<td>21</td>
<td></td>
<td>I feel comfortable diagnosing or identifying a child as autistic</td>
<td>0.71 (1.18)</td>
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<tr>
<td>22</td>
<td>Soc/Emot</td>
<td>Do not show affectionate behavior</td>
<td>3.83 (1.16)</td>
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<tr>
<td></td>
<td>All</td>
<td></td>
<td>3.37 (1.64)</td>
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*General development. Social and emotional.*
Table E2

*Number of Students with ASD Encountered during the Principal’s Educational Career*

<table>
<thead>
<tr>
<th>Number of students</th>
<th>Mean score, Autism Awareness Survey</th>
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<td>3</td>
<td>59</td>
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<tr>
<td>4</td>
<td>62</td>
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<td>5</td>
<td>54</td>
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<td>58</td>
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<td>76</td>
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<td>8</td>
<td>61</td>
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<td>72</td>
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<td>62</td>
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<td>83</td>
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<tr>
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<td>81</td>
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<td>68</td>
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