In Search of Common Ground: Exploring Clinical and Educational Approaches to Autism Spectrum Disorders

by

Dawn Meissner Wheeler

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Bob Peters
Robert Peters, Ph.D.

Donald Stephenson
Don Stephenson, Ph.D.

Weissenburger
Jacalyn Weissenburger, Ph.D.

The Graduate School

University of Wisconsin-Stout

May, 2008

The Graduate School
University of Wisconsin-Stout
Menomonie, WI

Author: **Meissner Wheeler, Dawn**

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ABSTRACT

Autism Spectrum Disorders (ASDs) are currently receiving a great deal of attention in medical, clinical, educational and social environments due to rising incidence/prevalence, the importance of early identification and intervention, the continued search for definitive causal factors, the growing wealth of information pertaining to autism, and the need to distinguish valid and reliable expertise. Despite the swell of attention, ASDs are also a source of controversy, principally in identification and diagnosis. Two separate and distinct settings typically evaluate and diagnose autism: clinics and schools. A distance exists between these two environments, one that creates room for potential debate, disagreement, and distress. The two settings serve different purposes, use different diagnostic criteria, and may define autism differently (all while using a similar vocabulary), thus creating confusion and uncertainty as an unwanted byproduct. This research explores the similarities and differences between these settings, in an effort to proactively pursue a more collaborative model: one which uses a common language to define, describe, diagnose and treat children diagnosed with ASDs.

The Graduate School

University of Wisconsin Stout

Menomonie, WI

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Chapter I: Introduction

Autism Spectrum Disorder (ASD) is currently a hot topic in medical, educational, and even social environments. Autism is seemingly everywhere: a mini-series on Dateline NBC, the local evening news story, a concern voiced at parent-teacher conferences, a rumor about someone else's toddler, etc. In other words, autism has become a shared experience with which people now can relate; "I know what you mean, my nephew has autism, too." Likewise, it is not uncommon to hear the disorder referred to as an adjective, or descriptive reference to a child; "he is looking sort of Asperger-ish," or "isn't that [behavior] a red flag for one of the Pervasive Developmental Disorders (PDDs)?" Yet, despite all the conversation and combined experience, a growing need is developing to adopt a common language pertaining to autism. Olley (1999) stated:

> The scholarly literature on autism has grown remarkably during the past two decades, and the result has been a much better understanding of the nature of the disorder. A corresponding explosion of literature has occurred regarding the treatment of autism, although this information is a mix of science, anecdotes, and unproven theories. The result is a seemingly 'open market' on autism advice. On one hand, scientific journals, the Internet, and popular media have made information on autism more available than ever. On the other hand, consumers are left with little guidance in separating valid information from the 'fringe therapies' that seem to abound. (p. 595)

While the topic of autism seems commonplace and generally well-understood, ASDs continue to remain somewhat of an uncertainty, clouded with controversy and debate.

What accounts for the rising attention to ASDs? How have autism and its related disorders come to pervade our society? According to Bashe and Kirby (2001), "One thing we do know is the rate of diagnosis of autism, Asperger's Syndrome, and 'pervasive developmental disorder-not-otherwise-specified,' a catchall term for diagnosis that don't meet exact criteria, has increased dramatically over the past decade" (OASIS, p. 12). The prevalence, or all known cases of autism at a specific moment in time, is not definitive (due to changes in autism defining criteria, diagnosis subjectivity, differential diagnosis, etc.), but is arguably swelling. The incidence or the amount of newly diagnosed cases of autism in a specified period of time is generally believed to be rising. One source estimates the incidence of autism in the United States to be "3,000 per year, 250 per month, 57 per week, 8 per day . . ." (http://www.wrongdiagnosis.com/a/autism/prevalence.htm).

Yet, the numbers alone do not fully account for society's rising attention to autism. Another important aspect of our awareness is early identification and intervention to promote more positive lifelong outcomes. Ramey and Ramey (1998) summarized what held true in the 1990s, "Generally, interventions that begin earlier in development and continue longer afford greater benefits to the participants than do those that begin later and do not last as long," as demonstrated in cases when the largest effects of early intervention on children's early cognitive and social development occur when enrolled in intervention during infancy or soon after (p. 109). In other words, the earlier autism is detected, the earlier the intervention can begin, which translates into increased opportunities to positively impact a child's development.

One might argue that ASDs are *common*, at least in terms of frequency, universality, and familiarity. After all, autism occurs regularly in all people, virtually everywhere, everyday (TEACCH, 1999). Yet, despite this illusion of commonness, autism is surrounded by controversies that serve to limit our ability to communicate about autism in common terms.

The very definition of autism is often the source of debate. Many clinicians use the term "Autism Spectrum Disorders" (ASDs), a subcategory of Pervasive Developmental Disorders (PDDs), to describe a continuum or range of severity in three related disorders, including autism (or Autistic Disorder, AD), Asperger's Syndrome (AS), and PDD-NOS (Pervasive Developmental Disorder – Not Otherwise Specified) (Schieve et. al., 2006). Some experts agree the link between these three disorders (AS, autism, and PDD-NOS) is largely justifiable based on continuum of "autistic" symptoms and evidence of hereditary susceptibility to ASDs (Bashe & Kirby, 2001, p. 18). Likewise, there is little evidence to suggest differential diagnosis of subtypes has meaningful implications for treatment planning (Harris & Glasberg, 1996). However, the very existence of differential diagnosis implies there are distinct and significant differences between the three disorders (AS, autism, and PDD-NOS), notable enough to be distinguished in the Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association, 2000). In a slightly different categorizing approach, ASD is stated to be essentially synonymous with the larger classification PDD, thereby including Rett's Disorder and Child Disintegrative Disorder (Janzen, 2003, p. 6). This variability in basic terminology confounds the understanding of and communication about ASDs, PDDs and autism.

Autism Spectrum Disorders (ASDs) are typically diagnosed/labeled in one of two settings: schools or clinics. The distance between these two settings is best described not in miles, but instead by differences in their systems of identification. The most regarded resources for clinical diagnoses are the Diagnostic and Statistical Manual of Mental Disorder, Fourth Edition (DSM-IV) and the International Classification of Diseases, Tenth Edition (ICD-10). The DSM-IV and ICD-10 diagnostic features for autism are virtually the same; with preference and popularity given to the DSM-IV. DSM-IV autism criterion specifies that individuals exhibit six or more impairments in three specific areas, as summarized by Dahle (2003), ". . . at least two behaviors demonstrating qualitative impairments in communication, one behavior demonstrating qualitative impairment in socialization, and one behavior demonstrating repetitive and restrictive behavior," as well as two additional behaviors from any of the three mentioned areas (to total the necessary six). In addition, individuals must display a delay in at least one of the following: social interaction, social language/communication, and symbolic/imaginative play (p. 239). Consider the variability within this one system of identification, as Dahle cleverly notes, "Another individual with autism may exhibit six completely different characteristics of the diagnosis. It is certainly easy to understand why individuals with autism are so different" (p. 239). Alternatively, it is easy to understand why clinicians might diagnosis differently, even when using the same system of identification.

Educational professional may consult the DSM-IV; however, school systems do not diagnose school-age children using the DSM-IV. Instead, school personnel must determine if a child is eligible for special education services under one of thirteen federal disability categories outlined in the Individuals with Disabilities Education Act, 1997. According to IDEA (1997):

> Autism means a developmental disability significantly affecting verbal and nonverbal communication and social interaction, 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 stereotypical movements, resistance to environmental change or change in daily routines, 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 an emotional disturbance. (sec. 300.7)

Given this broad definition, each state is then responsible to interpret federal IDEA guidelines and determines their own state's eligibility criteria. Fitton and Ford (1998) explain:

> While most districts agree that children who meet the diagnostic criteria for autism under the DSM-IV automatically meet criteria under their local standards, some children may merit the classification of autism based on their school district criteria and yet not meet DSM-IV criteria. These children will receive an educational diagnosis of autism to be eligible for services through the public school system. (n. p.)

Shriver, Allen, and Mathews (2000) write, “Comments taken directly from the federal regulations indicate that the federal definition was neither intended to require the presence of all the characteristics listed not to be an exhaustive list of characteristics (as in the DSM-IV)” (p. 539). But for those who must navigate both systems (e.g., a child with the medical diagnosis and/or educational label of autism), it is difficult to understand why a diagnosis in one setting does not necessarily hold true in the alternative setting.

By definition, each setting is then challenged to make its own determination of autism, to conduct its own assessments and determine its own conclusions based on the respective governing guidelines. Autism assessments are various, and they commonly take the form of checklists, surveys, observations, interviews, etc. Each setting determines which assessments are necessary to make a determination, and likely does so (at least in part) based on the diagnostic system. Choosing an assessment tool seems to be a matter of personal preference in many regards. However, choosing an assessment or battery is deserving of careful consideration, particularly since many assessments are used in both settings, though may ultimately communicate different outcomes. Children with autism are typically not inherently ideal subjects for assessment regardless of setting. As Schwartz (2001) remarked:

> Traditional assessment strategies that rely on the use of standardized measures administered in clinical settings do not provide an accurate picture of the strengths and needs of a child with autism. If one thinks of the process of collecting assessment information as painting a portrait of a child, then children with autism and related disorders should be viewed from every angle to ensure a realistic and multidimensional picture. (p. 223)

The challenge is not only in choosing the best assessments, but also in being aware of the limitations of assessment.

Clinicians and educational specialists surely approach autism from different angles. This space between settings creates a certain level of uncertainty. For example, how does clinical assessment information pertain to the educational setting and vice versa? Dahle (2003) illustrates the prospective mess this division creates:

> Clinicians may be confused about special education, and special educators may not understand the clinical system. Both sets of professionals may make recommendations about each other's services that cannot be honored. For example, a clinician may recommend specific inappropriate special education services or, if the teacher doesn't understand the system, she or he may erroneously tell the family their clinician is wrong. A more cooperative partnership would limit those misunderstandings and help the parents feel that there is a more collaborative spirit among the professionals working with their child or young adult. (p. 246)

Unfortunately, there is currently no medical test to determine if a person has an ASD. However, clinicians use a list of indicators from which to diagnose (DSM-IV and IDEA). Diagnosis is a challenging feat on its own; and, in the case of autism, has multiplied dramatically. Both clinical and educational practitioners may feel uncertain when facing a diagnostic decision. This uncertainty can create stress on parents, especially if they suspect something is wrong with their child and receive no answer, half-answers, and/or conflicting answers. Goin and Myers (2004) state;

> Parents need accurate information about their children's difficulties so that they can learn how to best care for and manage them, as well as a relationship with a sensitive and knowledgeable team of providers that responds to their concerns. Earlier detection may mitigate long-term familial stress over the uncertainty of what is affecting their child. With a diagnosis, parents can become educated about

> autistic disorders, make informed decisions on best-care practices for their children, and move in an appropriately therapeutic direction. (p. 6)

No provider wants to be responsible for sending a parent in the wrong direction, and no provider wants to further confuse a family. A provider's intention is largely to *provide* help. Yet, the problem of autism appears to multiply; the difficulties of diagnosis, accompanied by the pressure to diagnosis, the reality of advantageous early intervention, the cost of stalling, etc. These issues act as roadblocks in our pursuit of "an appropriately therapeutic direction," and inadvertently create a disservice to those we hope to help.

Statement of the Problem

The intention of this paper is to investigate similarities and differences between educational and clinical settings that diagnose ASDs. There are many controversies concerning autism (as documented above and not exclusively) that wholly exceed the limitations of this paper. However, on a smaller scale and of particular interest to this research is to explore the distance between disciplines. Autism is typically diagnosed in one of two settings: clinical and/or educational. However, between these two environments, there are significant differences in terms of protocol and procedure. In fact, what it means to be autistic in a clinical sense does not necessarily translate into an autism label for special education services in the public school system (and vice versa). Disagreement between the two settings is not entirely uncommon, as the guidelines for each differ. As Allen (2001) states:

> Classifications and/or diagnostic perspectives derive from different disciplines and serve many different purposes: educational, medical, and research, for example. Access to educational services should not be based on diagnostic labels

> inasmuch as a same diagnosis does not imply identical educational/vocational needs. (p. 76)

There are inherent differences between these environments and therefore different perspectives of and responses to autism. Dahle (2003) adds;

> The special educator and clinician are not bound by the same guidelines in diagnosing an individual with autism. Therefore, it is imperative that all professionals involved understand the 'language' of each other's system. This increases the probability that the student will receive the most appropriate educational and psychiatric services. (p. 244)

In other words, it appears there is a need to find a way to effectively and efficiently communicate across disciplines with a common language and understanding. Dahle further suggests, "Ideally, the psychiatric and educational systems would merge into a unitary diagnostic system, but this is unlikely to occur since these systems do not operate in tandem" (p. 246). Each discipline operates as its own entity, governed by its own rules and resources.

The intention of this paper is to provide some groundwork in this direction. By exploring the differences in assessment practices and diagnostic criteria between clinical and educational settings, professionals could collaborate to optimize our ability to assist children with autism to our utmost potential and intention.

Purpose of Study

The purpose of this study is to review, compare and contrast assessment practices and diagnostic systems; those used by clinicians and those used by school professionals. The intention of this review is to gain practical and literal knowledge about the similarities and differences between the two differing diagnostic systems. This study will focus on describing different systems (specifically the clinical and educational models) and their unique approaches to ASD diagnoses, as well as treatment recommendations. As such, the following are the research questions:

1. What systems of identification are used when diagnosing autism in the schools or in clinics? Are there differences in the use of these identification systems by professional setting?
2. What professionals are included when diagnosing autism in the schools or in clinical settings? Are there differences in the professionals utilized by professional setting?
3. What assessments are employed when diagnosing autism in the schools or in clinical settings? Are there differences in the assessments administered by professional setting?
4. What diagnoses are made when assessing for autism in the schools or in clinical settings? Are there differences in the diagnostic categories by professional setting?
5. What recommendations are made when assessing for autism in the schools or in clinical settings? Are there differences in the recommendations by professional setting?
6. Do the diagnostic reports refer to the other professional setting when identifying, diagnosing, and making recommendations for intervention services? If so, are there differences in these references by professional setting?

Significance of Study

The significance of this study relates to the importance of understanding the implications of early identification of an individual with Autism Spectrum Disorder. Given the research on early detection, it is essential that educators (within public schools) and clinicians (from outside agencies) understand both the evaluation process and the implications. Controversies and ambiguities amongst professionals and nonprofessionals disrupt the early identification and intervention process, when a collaborative approach, including all environments, would likely remain more proactive and successful.

Assumptions

By systematically comparing and contrasting educational reports versus clinical reports, I will be able to report the similarities and differences between a clinical and school-based setting in terms of diagnostic definitions, assessment methods and tools, and treatment recommendations.

Definition of Terms

Asperger's Disorder/Asperger Syndrome. According to the Diagnostic and Statistical Manual of Mental Disorders- Fourth Edition – Text Revision (DSM-IV-TR) Asperger Syndrome is a neurological disorder characterized by impairments in social interaction, communication, imagination, and restricted or repetitive behaviors (American Psychological Association, 2000). According to Bashe and Kirby (2005), "Asperger Syndrome differs from other pervasive developmental disorders in that those children who have it usually hit major developmental milestone on time or even early" (p. 11).

Autistic Disorder (or Autism). According to the National Institute of Child Health and Human Development (NICHD) (May 2005), autism is a complex neurobiological disorder and developmental disability, with primary symptomatic difficulties in the following areas: communication (verbal and nonverbal), language, social interactions/empathy, and inflexible repetitive behaviors.

Autism Spectrum Disorders. For purposes of this study and in attempt to be consistent with the research, the terms *autism*, *Asperger's Syndrome* and *Pervasive Developmental Disorder- Not Otherwise Specified* are considered related disorders, within the general category of Autism Spectrum Disorders (ASDs).

Clinical settings. For purposes of this particular study, clinical settings refer to outside agencies which include personnel who evaluate and diagnose ASDs. Clinical settings can be considered synonymous with medical, therapeutic, etc. whereas the evaluation process is conducted by professionals outside of the school district.

Diagnosis. The art and act of identifying a condition from its signs and symptoms. For purposes of this study, a diagnosis can be considered synonymous with labeling.

Diagnostician. Professional person responsible for diagnosis and/or labeling.

Educational settings. For purposes of this study, educational settings refer to environments employing public school personnel under the direction of federal special education laws.

Pervasive Developmental Disorder (PDD). The Diagnostic and Statistical Manual-Fourth Edition-Text Revision (DSM-IV-TR) describes PDDs as severe and continual conditions beginning in early childhood, impacting several areas of development, including: "reciprocal social interaction skills, communication skills, or the presence of stereotyped behavior, interests, and activities" (APA, 2000, p. 69).

Pervasive Developmental Disorder – Not Otherwise Specified (PDD-NOS). The DSM-IV-TR describes PDD-NOS as “a severe and pervasive impairment in the development of reciprocal social interaction associated with impairment in either verbal or nonverbal communication skills or with the presence of stereotyped behavior, interests, and activities . . . ” (APA, 2000, p. 84).

Professional. A formally trained person in a profession, thought to possess a large body of knowledge from specialized training or extensive education.

Methodology

While Chapter I provides the basis for this study, the rising attention to and significance of Autism Spectrum Disorders (ASDs) in present-day society, the remaining chapters will discuss potential problems with our ability to successfully handle ASDs. The literature review will discuss key problems and areas of interest in terms of diagnosis/labeling of autism.

Chapter II: Literature Review

This chapter will review the literature on Autism Spectrum Disorders. The initial portion of this chapter will focus on the rising attention to ASDs, specifically information about prevalence and incidence and the importance of early intervention. The latter part of this chapter will address areas of greatest interest to this research: the etiology and defining characteristics of autism, the systems of identification: clinical diagnosis and educational label, diagnostic responsibilities, and assessment and implications.

The fact that autism is a hot topic is not necessarily surprising given the impact this developmental disorder has on today's society. Iovannone (2003) wrote:

> Multiple factors have contributed to the current contentiousness, including an increased prevalence of ASD [Autism Spectrum Disorders], growth in litigation concerning appropriate interventions, a massive amount of literature regarding treatments, and a lack of guidance in determining which treatments are appropriate for individual children. (p. 150)

Autism has not only found a home in the media, but the topic also seems to frequent courtrooms as professionals struggle to identify the best treatments. Universities are also responding to the rising demand, and in effect offering new ASD courses for prospective undergraduate and graduate students. Yet, regardless of this wave of growing knowledge, Allen (2001) stated, "Despite extensive research and clinical interest in autism, there is still a lack of agreement as to its diagnostic boundaries and its relationships with other disorders manifest [*sic*] in early childhood" (p. 68). Information about autism is plentiful, as is evident upon exploration of most library and bookstore inventories. A simple web search, scholastic (e.g., Medline) or not (e.g., Google), results in several hits. As

Iovannone (2003) stated; “Although the last decade has seen an expansion in our knowledge of effective instructional practices for students with ASD, controversy exists among researchers, program developers, educators, parents, attorneys, advocates, and the media regarding the appropriateness of specific strategies” (p. 150). In other words, autism has become common, as virtually everyone has heard of the disorder. Can professional expertise in diagnosing autism (and subsequently planning and implementing effective interventions) keeping up with the speed of word-of-mouth?

Prevalence and Incidence

According to a recent survey study by the Center for Disease Control (CDC) via the National Health Interview Survey (NHIS) and the National Survey of Children’s Health (NSCH) (2006):

> [T]he prevalence of parent-reported diagnosis of autism was 5.7 per 1,000 children in NHIS and 5.5 per 1,000 children in NSCH . . . . These estimates suggest that, as of 2003--2004, autism had been diagnosed in at least 300,000 U.S. children aged 4--17 years. (Schieve, Rice, Boyle, Visser & Blumberg, p. 481)

Most recently, CDC’s Autism and Developmental Disabilities Monitoring (ADDM) Network, a surveillance project devoted to determining the best estimates of prevalence of Autism Spectrum Disorders (ASDs) in United States communities, released their summary results in February of 2007. According to their CDC Media Relations press release, the prevalence of ASDs is currently “approximately one in 150 children” (http://www.cdc.gov/od/oc/media/pressrel/2007/r070208.htm). The Autism Society of America (ASA) claims the rate of incidence of autism is increasing 10 to 17 percent per year in the US (http://www.autism-society.org/site/PageServer?pagename=FactsStats).

Many question the actual basis behind such claims of increasing prevalence and incidence of autism. Williams, Mellis, and Peat (2005) wrote:

> Evidence for an increase in the incidence of autism is based on estimates from different regions and estimates from the same region over time. There are potential sources of bias for both of these types of evidences that undermine the validity of comparisons, making firm conclusions elusive. Factors that may influence reported rate estimates include increasing awareness among parents, professionals and the general public, as well as sample size and power to detect time trends. (p. 31)

In other words, several different studies have estimated autism rate based on several inherently different samples. These samples are different in terms of size, composition, reporting methods, etc. Likewise, reported cases of autism are likely impacted by the fact that more people know about autism today. Other potential problems with epidemiological studies on autism include changes in diagnostic criteria (the original narrow criterion for diagnosis has widened in recent years) and the subjective nature of diagnosis (not a definitive medical examination, and therefore subject to diagnostician interpretation) (Wing & Potter, www.nas.org.uk/nas/jsp/polopoly.jsp?d=364&a=2618). Rutter (2005) responds to such criticisms, by stating:

> Administrative data show massive increases over time in the rate of diagnosed ASD, and it is clear that, in large part, this is due to the combination of better ascertainment and a broadening of the diagnostic concept, but a true rise over time in the incidence of ASD cannot be entirely ruled out. (p. 13)

Perhaps the bottom line is, as Safran and Safran (2001) predicted autism "may well become the fastest-growing disability group of the early 21st century" (p. 386). Autism has likely attained this noteworthy status in more recent years; and, while some might spend their time debating the validity of such claims, the numbers might best speak for themselves.

Early Identification and Intervention

Regardless of the numbers, with their accuracies or inaccuracies, no one seems to dispute the importance of early intervention. Filipek et al. (2000) wrote;

> Identifying children with autism and initiating intensive, early intervention during the preschool years result in improved outcomes for most young children with autism. Early diagnosis of autism and early intervention facilitates earlier educational planning, provisions for family supports and education, management of family stress and anguish, and delivery of appropriate medical care and treatment. (p. 469)

The M.I.N.D. Institute (2002) agreed, "Treatment successes for some children diagnosed early and treated intensively have increased attention toward making the diagnosis of autism as early as possible" (p. 6). The challenge is largely to become better at accurately identifying ASDs as soon as possible.

Early detection can translate into earlier access (and consequently more exposure) to effective intervention, decreasing family frustration and stress (and potentially increasing family acceptance or receptiveness to diagnosis), and maximizing the efficiency and effectiveness of tax dollars. Pinto-Martin et al. (2005) illustrated the monetary implications of early intervention:

> Studies have shown that intervention prior to kindergarten has huge academic, social, and economic benefits, including savings to society of $30,000 to $100,000 per child. Although substantial, the money saved is not the only measure of value--especially to the 1-in-25 households with a disabled preschool-aged student. Late identification of children with developmental delays and disabilities forces states, schools, and taxpayers to pay for expensive special education programs for problems that could have been resolved, or at least treated more effectively and at a cheaper cost, during the preschool years. (p. 1928)

The pressure is paramount, as Robert L. Beck, the President of the Autism Society of America, stated, "'Parents, physicians, and researchers all agree that early diagnosis permits early intervention which produces lifelong benefits to individuals and to society. However, too many children with autism are not diagnosed until they reach school age'" (Brown University, 2004, p. 3). Early intervention appears to be critical for individuals with ASDs; therefore, "it is important that educators, families, and physicians have a comprehensive understanding of this complex exceptionality" (Myles & Simpson, 2002, p. 132). Whether the motivation to face autism is driven by logic, emotion, and/or money, the reasons for this "hot-topic" are plentiful and therefore undoubtedly touch every corner of our diverse society.

The remainder of this chapter will discuss present barriers to early detection, intervention and communication about ASDs. The following sections will describe the problematic obstacles brought about by separate or differing definitions, systems of identification, diagnostic responsibilities, assessments, and treatment recommendations.

Etiology and Defining Characteristics

Of all the controversies that surround the topic of autism (best treatments/interventions, linked causes, pharmacology, etc.), the difficulty in arriving at a common definition is most primary and supersedes all other debate. According to Bryson (2003), "Autism has traditionally been viewed as a severe but rare disorder for which little can be done" (p. 507). Autism was initially presumed to be a direct result of cold parenting; "As a matter of fact, the community of that time held the view that the withdrawal of the autistic child could be understood as a child's reaction to the aloofness and rigidity of his/her mother (in particular)" (Ruberman, 2002, p. 262). This hypothesis has long since been abandoned, as the etiology of autism continues to be a major focus of scientific research. According to Feinberg (2000), "At present, there are four areas of causation that are receiving attention in the scientific community. These include genetic predisposition; neurochemical explanation; vaccine explanation; environmental toxin and nutritional theories" (p. 131). However, "The one thing that almost all researchers in the field agree on is that genetic predisposition plays a crucial role in laying neurological foundations of autism in most cases" (Silberman, 2001, p. 179). In a Newsweek article, Cowley (2000) offered encouragement in light of causal uncertainties:

> [T]he pace of discovery is accelerating. Scientists are gaining tantalizing insights into the autistic mind, with its odd capacity for genius as well as detachment. And though the suspected causes range from genetic mutations to viruses and toxic chemicals, we now know it's a brain-based developmental disorder . . . (p. 48)

In other words, beliefs about causation and autism have changed over time, e.g., from blaming poor parenting (nurture) to discovering potential innate brain and genetic differences (nature).

In popular culture, people commonly refer to ASDs as; "mind-blindness," "the geek syndrome," "social dyslexia," and "social blindness." Whatever truths and/or falsehoods these labels may possess; all fail to properly define the breadth and depth of autism. Many professionals have attempted to define ASDs, yet all fall short of creating and encompassing a universal definition. According to the National Institute of Child Health and Human Development (NICHD) (May 2005), autism is a complex neurobiological disorder and developmental disability with primary symptomatic difficulties in the following areas: communication (verbal and nonverbal), language, social interactions/empathy, and inflexible repetitive behaviors. NICHD stated the following:

> Because different people with autism can have very different features or symptoms, health care providers think of autism as a 'spectrum' disorder – a group of disorders with a range of similar features. Based on their specific strengths and weaknesses, people with autism spectrum disorders (ASDs) may have mild symptoms or more serious symptoms, but they all have an ASD. (p. 2)

The ASD category reportedly includes autistic disorder (autism), Asperger Syndrome (AS), and Pervasive Development Disorder - Not Otherwise Specified (PDD-NOS). A slightly different definition has been proposed by Kutscher (2002) of the Departments of Pediatrics and Neurology at the New York Medical College. Kutscher defines Autism Spectrum Disorders as communication disorders characterized by non-spoken communication problems. Kutscher's paper documented a solid and commendable attempt to simplify (or, as Kutscher refers to it, oversimplify) and summarize the diagnostic criteria of ASD. In an annotated outline format, Kutscher suggested the ASD category includes the following diagnoses: autistic disorder, Asperger's Syndrome, PDD-NOS, and *sometimes* other spectrum extensions, such as semantic pragmatic communication disorder, nonverbal learning disabilities, high functioning autism, hyperlexia, etc. Kutscher's paper culminated with the following thought:

> The classification of the Autistic Spectrum Disorders is in a state of flux. The problems can overlap, cause each other, occur simultaneously in different combinations and severities, change over time, and don't even have one 'official' group attempting the classification of the whole spectrum. (n. p.)

In other words, Autism Spectrum Disorders are not easily, nor consistently, defined. The problem in defining autism (and its related forms, categories, etc.), may be, as Shriver, Allen, and Mathews (2000) stated (in reference to IDEA definition of autism), "This definition, and every other definition, of autism is a description of symptoms" (p. 539). Symptoms are defined as signs indicative of something else, that something else being autism, which is defined by symptoms (and thus begins the vicious cycle).

The definition controversy extends to differential diagnosis amongst the autism "types." So, not only is there disagreement about the definitions in general (e.g., what is autism?), there is also disagreement about the application of differential definitions (i.e., which form of autism is it? Is it an ASD or not?). Allen (2001) illustrated one example:

> Many parents and professionals use the terms PDD and PDD-NOS interchangeably to refer to children who have autistic behaviors but do not fit

> their conceptions of autism. They seem unaware that PDD is a generic umbrella term that refers to the entire autistic spectrum, whereas PDD-NOS is but one of the subtypes of PDD. Many children carry the PDD-NOS diagnosis which, by definition, states that they are 'not autistic,' i.e., do not have Autistic Disorder (AD). Parents and educators are understandably confused by a clinical diagnosis that implies that a child who exhibits autistic behaviors but seems otherwise intelligent is 'definitely not autistic but may have PDD or PDD-NOS.' (p. 76)

As a result, if one were to ask several different people about a particular case of autism (or PDD, ASD, AS, etc.), he or she is likely get several different answers. In fact, imagine the implications this controversy has when people attempt to communicate about ASDs, whether these conversations are between parents or practitioners.

In further attempt to be consistent with the research, the terms *autism* and *Asperger's Syndrome* and *Pervasive Developmental Disorder- Not Otherwise Specified* are considered related disorders, or Autism Spectrum Disorders (ASDs). For research intentions and convenience sake, all will be collectively referred to as "ASDs" or "autism" interchangeably throughout the remainder of this paper. Whether or not one is a form of the other is not specified in the present paper. Instead, this paper will follow the notion of the National Autistic Society (2008):

> It is much more important for clinicians to diagnose the presence of an autistic spectrum disorder than to worry about the sub-group. Research workers may decide to study only pure cases, but clinicians should be concerned with the needs of the individual they are seeing.
>
> (http://www.nas.org.uk/nas/jsp/polopoly.jsp?d=1419&a=2224)

Therefore, rather than discuss differential diagnosis, this paper intends to look at these separate diagnoses as a whole, particularly since diagnostic recommendations appear to be better prescribed based on symptoms, which in many ways precedes the issue of differential diagnosis.

In spite of limitations to the definitions, there is also the fact that ASD symptoms are truly unique to the individual; as Steuernagel (2005) wrote, "Every individual is unique, and every impairment affects an individual in a unique way. Autism is particularly challenging in this regard" (p. 140). Like other disorders, the specific characteristics and behaviors vary by the individual diagnosed with autism. Selfe (2002) concurred:

> Children with autism resemble one another in terms of essential criteria that are very broad in terms of their problems of social comprehension, difficulties with language and stereotyped and ritualized behaviors. It is equally frequently stated that autistic children do not resemble one another, and very rarely does any child meet all criteria for autism. (p. 338)

It is, therefore, difficult to arrive at the same diagnosis for very different presentations and manifestations of the same disorder. Further, as Steuernagel (2005) wrote:

> Autism is a spectrum disorder; individuals display widely different deficiencies, all of which may themselves change during an individual's lifetime, and a definition readily applicable to one group of disabilities may well have the unintended consequence of marginalizing those whose conditions do not easily fit within the definition. (p. 140)

As has been stated, our initial problem with defining autism just became more complicated as we consider the individualistic nature of this disorder and the fact that very few if any individuals remain developmentally static over time and given experience. As Klinger (2000) wrote, "It is difficult to formulate a list of necessary and sufficient diagnostic criteria that is valid across the lifespan" (480). Unless time stops altogether and all extraneous factors controlled, it is impossible.

Systems of Identification

In an article entitled, "The Clinical and Educational Systems: Differences and Similarities," Karen Bowen Dahle (2003) tackled one major issue of discussion in the present paper. Dahle's article began with a narrative, a hypothetical situation involving parents of a child with suspect ASD diagnosis. The parents are presented with disjointed and contradicting information from two settings, a clinic and a school. The two environments appear to operate independent of one another in terms of assessment, diagnosis (labeling), and placement (treatment). In effect, an already difficult situation becomes more difficult as parents try to sort through the information. The parents undoubtedly question the expertise of the specialists involved and even consider pursuing outside legal advice. This well executed hypothetical situation communicates a real issue, one especially important in present paper. As Dahle explains, this situation is the "result of the confusion between the clinical and educational diagnosis of autism and related disorders as a result of two diagnostic systems" (p. 238). The distance between the two separate systems of identification creates a disadvantage for those who are forced to navigate both waters, particularly since the currents can be conflicting.

The diagnosis of mental disorders and determination of special education eligibility is not an exact science; and, therefore, brings about debate. Autism is, by all definitions, a disorder of symptoms. Therefore, what one might label an ASD, another person might call something else entirely, a likelihood that increases somewhat when you consider slightly different diagnostic criteria/guidelines. The Diagnostic and Statistical Manual of Mental Disorder, Fourth Edition – Text Revision (DSM-IV-TR) offers the most regarded resource for clinical diagnosis, while schools look to the legal special education criteria (IDEA). Each setting (clinical and educational) has its own set of guiding principles, which are summarized in the following two sections, subtitled the "clinical diagnosis" and the "educational label."

Clinical Diagnosis

As outlined by DSM-IV-TR, autism is identified by the presence of several characteristics, including impairment in social interactions, communication irregularities, as well as evidence of repetitive behaviors, interests, or activities (American Psychiatric Association [APA], 2000). Autism is one of five Pervasive Development Disorders (PDD) that includes Autism (autistic disorder), Asperger's Syndrome (AS), Rett's Disorder, Child Disintegrative Disorder, and PDD- Not Otherwise Specified (PDD-NOS). The DSM-IV describes PDDs as severe and continual conditions beginning in early childhood, impacting several areas of development, including: "reciprocal social interaction skills, communication skills, or the presence of stereotyped behavior, interests, and activities" (APA, 2000). Diagnosis is made when a specified number of specific criteria for each specific disorder are met.

The term Autism Spectrum Disorders is not necessarily a DSM-IV-TR term; however, a review of the literature consistently refers to a "spectrum" of disorders that typically excludes two especially rare subgroups of the five PDDS: Rett's Disorder and Childhood Disintegrative Disorders. According to Kutscher (2002), "In common practice, the diseases of Rett's Disorder and Childhood Disintegrative Disorder are considered medical disorders and are not usually considered part of the 'Autism Spectrum Disorders'" (n. p.). The National Institute of Child Health and Human Development (NICHD) also use the term Autism Spectrum Disorders to describe Autistic Disorder, Asperger's Disorder and Pervasive Developmental Disorder- Not Otherwise Specified. The term "autism" is often used in the literature to refer to all ASDs. Again, in attempt to be consistent with this research, "autism" and "ASDs" will be used interchangeably to refer to this spectrum. Rett's Disorder and Childhood Disintegrative Disorder are not discussed further, due to each disorder's unique features, a difference that cleanly distinguishes these disorders from the other three PDDs.

DSM-IV-TR diagnostic criteria for Autistic Disorder, Asperger's Disorder and Pervasive Developmental Disorder – Not Otherwise Specified can be found in Appendix A in Figures 1A through 3A, respectively. Three similar features appear in all these DSM-IV categories: (1) impairment in social interaction; (2) impairment in communication; and (3) restricted, repetitive and stereotyped patterns of behavior, interests, and activities. The differences between these subgroups illustrate the spectrum-like nature of each diagnosis: ranging from low to high levels of delay, development, presentation, etc. The spectrum is ultimately the only feature that keeps these disorders separate, by way of language, specific symptomatology, age of onset, and/or extent of delay.

Educational Label

According to Individuals with Disabilities Education Act (IDEA, 1997), "autism means a developmental disability significantly affecting a child's interaction and verbal and nonverbal communication, generally evident before age 3, that adversely affects learning and educational performance" (34 CFR 300.8, Section 300.8). School districts across the country adhere to their state's interpretation of federal guidelines dictated in Individuals with Disabilities Education Improvement Act (IDEIA, 2004). The interpretation and application of federal law may differ slightly from state to state; however, all states must remain in compliance with federal IDEA 1997 and IDEIA 2004 law (collectively referred to as IDEA hereafter). Newschaffer et. al. (2006) stated the following:

> IDEA does provide a standard definition for each disability category, but individual states develop their own criteria. The IDEA definition for autism is general enough to encompass all ASDs, but state eligibility criteria and the way in which they are implemented can limit, for example, the extent to which higher-functioning children on the autism spectrum receive autism special education classifications. (p. 280)

Therefore, in an effort to simplify and avoid copious comparisons (amongst 50 states) the federal definition alone will be cited and discussed here (See Appendix B: Figure 1B).

The primary focus of a special education evaluation for autism is to determine whether or not the child's deficits negatively impact educational performance. If the answer to this question is "yes," then a placement in a special education program is considered (though not necessarily granted); however, if the answer is "no," it is likely that the child will not be labeled or serviced. The label is assigned primarily to communicate the need for services, not to communicate a child's condition. This is not to say that the latter is not important, more to say that labels serve to determine eligibility and programming. Feinberg and Vacca (2000) explained, school personnel "are contending with the need to define direction, determine how resources are to be used, define training needs, and ensure implementation of appropriate services" (p. 130). Likewise, educational eligibility is based on goodness-of-fit. In other words, which category does a child best qualify for? There are 13 options to consider for special education eligibility, including but not limited to cognitive disability, emotional behavioral disability, learning disability, other health impairment, etc.

Given these two systems of identification (i.e., clinical and educational), which are complementary in many respects but different nonetheless, it is easy to see that both are separately subject to their own interpretation. For example, define the word *unusual*; or quantify *repetitive*; or describe significant *differences*. These words appear in both the clinical and educational systems of identification; yet no two people will likely identify these terms exactly the same way. There is no clear, 100 percent universal operational definition for the symptoms of autism regardless of which system of identification one uses. As with any diagnosis that lacks a clear scientific basis (i.e., the identification of an autism gene or proof positive of mercury causation), it is very difficult to make definitive decisions. According to Fitton and Ford (1998), public schools approach autism diagnosis from different angles:

> Assessments are typically carried out to assign a diagnostic label or to determine placement eligibility. Domains such as communication, cognitive ability, social skills, and motor development are often of interest to the school psychologist. The ultimate goal of assessment, however, is to provide opportunities for helpful educational planning. (p. 2-3)

Not to say, of course, that clinical diagnosis has an entirely different aim, as both clinicians and school psychologists are helping professionals. Both settings also provide an element of education, an education aimed at a healthy and productive future. Federal special education law requires that schools provide a free and appropriate education in the least restrictive environment, which means schools must meet the unique needs of each individual student. There is no law that binds clinical staff, nor are there federal monies that consistently fund their services.

When the clinical and educational systems are compared and contrasted, a common thread with two slightly different designs emerge. See Appendix C: Similarities and Differences in Classification Systems, as reported by Dahle (2003), which collectively summarizes both systems.

As similar as these two systems appear, the distance between them creates unsteady ground; as in Dahle's hypothetical description of parents confronted with contradictory diagnoses; e.g., your child has autism under this system but not under this system. In such cases, "A parent can become confused and angry when the clinical and educational diagnoses do not agree and there is no collaboration during the testing and placement process" (p. 246). As described in the initial portion of this chapter, defining ASDs is not an easily agreed-upon task; add the fact that different professionals approach diagnosis from slightly different angles and the room for interpretation swells. What is autism? Who has autism? Who decides?

Diagnostic Responsibility

Imagine the role of the diagnostician, the person responsible for answering these aforementioned questions. Given the cloudy definition and systems of identification, one might wonder who can adequately navigate this system and to claim expertise with confidence. These facts do very little to empower individual diagnosticians to make definitive decisions. The price of uncertainty in the face of diagnosis is painful, as Selfe (2002) wrote:

> The competence of any practitioner is called into question if the response to the question 'Is he autistic?' is 'I'm really not sure' or 'He's too young to be really certain' or 'I need more evidence and need to see him in a variety of settings.' The pressure to diagnose is creating its own momentum. (p. 336)

Despite the diagnostician's knowledge of how imperative early detection and intervention are, diagnosis carries serious implications. Filipek et al. (2000) wrote, "The diagnosis of autism often is not made until 2 to 3 years after symptoms are recognized, primarily because of concerns about labeling or incorrectly diagnosing the child" (469). Although it may be helpful to receive diagnosis, it may also be devastating . . . particularly if the diagnosis is wrong. Koenig and Scahill (2001) warned, "Given the serious implications of such diagnoses, it is wise to suggest the diagnosis in a provisional way and seek consultation from a professional experienced in the diagnosis of PDDs" (p. 165). According to Filipek et al. (2000), "Although educators, parents, and other health care professionals identify signs and symptoms characteristic of autism, a clinician experienced in the diagnosis and treatment of autism is usually necessary for accurate and appropriate diagnosis" (p. 5). A diagnostician's shoes are seemingly too big to fill: be quick in your determination of diagnosis and always 100 percent correct; when uncertain, refer to someone else.

Still, who has the expertise, when neither the clinical model nor the educational system is easy to maneuver? Weston and Weinberger (2005) illustrated the difficulties of clinical diagnoses:

> To make a reliable DSM-IV diagnosis, one must make hundreds of highly specific, often arbitrary decisions (one for each criterion for each disorder). This can only be done by systematically inquiring about every sign and symptom in specific ways required to decide whether the patient meets what are usually arbitrary cut-offs for 'case-ness' (e.g., whether the patient has binged and purged twice per week on average rather than once per week. (p. 1269)

These guidelines by design are limited in their capacity to direct the diagnostician. Filipek and colleagues further concluded that diagnostic decisions are based mainly on assessment and clinical judgment, with as-needed assistance from clinical and/or educational references (DSM-IV-TR and IDEA). Weston and Weinberger (2005) defined clinical judgment, or "interpretive understanding," as requiring informed expertise and personal reflection ". . . that we stay abreast of the available data while remaining vigilant to both the emotional and cognitive biases to which human minds, including clinical minds, are prone" (p. 1269). Diagnosis may be more accurately defined in the following statement: "Rather than counting criteria assessed independently of one another, the clinician's task is to judge the goodness of fit between the prototype taken as a whole, or as a gestalt, and the patient's symptom picture" (Weston & Weinberger, 2005, p. 1261). Clinical judgment is obviously not an exact science, but more of an approximation based on diagnostician's knowledge of the specific diagnoses and person-specific knowledge.

Consider how this paradox affects the diagnostician, the person responsible for definitively deciding who gets which diagnosis, who qualifies for what program, who fits and who does not, etc. In a series of interviews, Nissenbaum, Tollefson, and Reese (2002) examined professionals' and parents' perceptions when giving/receiving a diagnosis of autism:

> Parents recalled that psychologists typically provided the diagnosis of autism, although a variety of other professionals, including speech pathologists, physical therapists, occupational therapists, pediatricians, and nurses were represented at the interpretative meeting. Professionals from both sites [medical center and preschool] reported that the psychologist on the team usually shared the diagnosis. (n. p.)

Shriver, Allen, and Mathews (1999) agreed the school psychologist serves a similar role in schools:

> The school psychologist looks for agreement across assessment methods and procedures regarding prevalence and intensity of behavior characteristics that comprise special education verification for autism. Based upon the objective data gathered across the multiple methods and procedures used, clinical judgment regarding the appropriateness of verification and/or diagnosis is made by the school psychologist. The more agreement there is across assessment methods and

> procedures, the more confidence the school psychologist may have in his/her clinical judgment. (p. 555)

The psychologist commonly appears to be the face and voice of diagnoses, yet these statements also imply this decision is based on a collaborative effort, multiple sources of data, and assessments (including those not necessarily completed by the psychologist).

The literature frequently suggests that diagnosticians are not only trained specifically in autism, but also approach diagnosis/labeling as a team of professionals, all with applicable expertise. As stated by Ho, Miller, and Armstrong (1994):

> Children with developmental disorders can present with complex diagnostic problems that require the participation of a number of professional disciplines. Provision of this service in an organized program has the advantage of promoting collaborative consultation and developing a prioritized set of recommendations to assist the child, family, and community professionals. (p. 144)

A team of professionals contributing to the diagnosis is preferred over a sole professional making a diagnosis. In some ways, the IEP (Individualized Education Plan) team is set up for this team-approach diagnosis already, with several members collectively determining special education placement. According to the Individuals with Disabilities Education Act (IDEA) 2004, Section 1414(d)(1)(B), the term 'IEP team' means a group of individuals composed of the child when appropriate, the child's parent(s), not less than one regular education teacher, not less than one special education teacher, a local education agency (LEA) representative, other specialists per discretion of parents and/or school, and "an individual who can interpret the instructional implications of evaluation results." Likewise, many clinics have set up "Autism Clinics," whereby a team of professionals (many times including a pediatrician, neuropsychologist, and/or speech language therapist) pool their efforts together to reach consensus. To illustrate the usefulness of different disciplines offering their own set of expertise, Koenig and Scahill (2001) wrote the following:

> Given the wide variability of typical development, a consultation with a developmental pediatrician may be helpful. These physicians have specialized training in normal physical and psychosocial development, rather than a focus on physical pathology, so their awareness of unusual psychosocial responses in young children is particularly acute. A child psychiatrist may be helpful in ruling out other psychiatric conditions in which there is significant overlap of symptoms. In some cases, a referral to a clinical geneticist is warranted to rule out genetic syndromes with developmental consequences, such as fragile X syndrome. (p. 165)

A professional team-approach is the best practice approach, as was stated by Goin and Myers (2004), "Parents need accurate information about their children's difficulties so that they can learn how to best care for and manage them, as well as a relationship with a sensitive and knowledgeable team of providers that responds to their concerns" (p. 6). To take this one step further, it seems ideal that this team would include both the school and the clinic. With an educational/clinical team, there would be a wealth of knowledge and perspective at the same exact table, at the same exact time. This would potentially shorten the distance between the two settings, clear up any misconceptions, and ultimately provide a more productive environment for the child with autism and his/her family. Dahle (2003) wrote, "Ideally, the psychiatric and educational systems would merge into a unitary diagnostic system, but this is unlikely to occur since these systems do not operate in tandem" (p. 246). Can our systems eventually operate in tandem? In the absence of this development, Dahle suggests proactive collaboration among professionals may help alleviate this problem.

The team approach could expand to include members from schools and clinics. There is some evidence to suggest that both environments see the value of the other. In fact, Nissenbaum et al. (2002) wrote, "Many professionals interviewed from the school setting, including the psychologist, indicated that giving the diagnosis of autism was not their responsibility but that of a medical professional" (n. p.). Noland and Gabriels (2004) added, "Parents should also be informed that they may seek a differential clinical diagnosis with an out-of-district medical or mental health autism specialist, if they so choose, to further determine what specific type of ASD their child may have" (p. 269). Likewise, clinical staff often recommends treatment/intervention assistance not based in their clinic, but instead in the child's school. Each setting seems to recognize its own limits.

Assessments and Implications

The significance of diagnosis exists in light of the fact that there are no universally used assessment tools for diagnosis. In fact, neither diagnostic model (DSM-IV-TR nor IDEA) dictates, or even recommends, a set battery of assessments for the diagnosis. Instead, each professional is given a set criterion of symptoms and little guidance from either model how to properly identify each symptom. Each professional ultimately makes his/her own decision about what assessments are appropriate (or this is predetermined by test availability/user access) and what level of intensity warrants the presence or absence of a "symptom." This careful selection of assessment methods reveals a sort of diagnostic art, which undoubtedly ranges according to person-specific skill, knowledge, experience, diligence, and professionalism.

Despite the absence of assessment direction from either major autism diagnostic references (DSM-IV and IDEA), a review of the literature reveals several recommendations for best practices when assessing for autism. These recommendations for assessment appear to apply to either professional setting- educational and clinical; therefore, the following discussion is believed to reflect best practice assessment for both environments across disciplines. First and foremost, assessments should include diagnosticians possessing strong knowledge of ASDs. In the absence of this knowledge, the diagnostician may not know what symptoms to look for. The opposite is true as well; if you only have a hammer (only know about autism), everything will likely look like a nail (look like autism). Therefore, it is important to balance knowledge and perspectives when attempting to diagnose.

Shriver, Allen, and Mathews (1999) listed several domains of ASD assessment interest: social competence, communication, behavioral variability, environmental influence, motor skills, play skills, academic skills, independent living skills, and behavior. Knowledge of ASDs alone is not enough information, but it provides a solid foundation to build from. Autism diagnosis is all about signs and symptoms.

Along with knowledge, assessment should include multiple sources of information. An ASD evaluation generally includes some or all of the following: parent interviews, teacher/daycare provider interviews, reviews of past records/evaluations/medical history (with special attention to documenting early developmental indicators of ASD, and/or ruling out alternative physical factors contributing to child's presentation and/or consideration of medical diagnoses), multiple observations in various settings, speech language assessments, standardized intelligence tests, evaluations of sensory, motor and developmental skills, and standardized behavior rating scales completed by raters whom know the student well (Janzen, 2003). Noland and Gabriels (2004) concurred; "Appropriate evaluations are defined as those conducted by qualified professionals and should involve reviewing the child's existing evaluation data, gathering information for the child's caregivers, teachers, and specialized service providers, and conducting current classroom-based assessments and observations" (p. 267).

A large part of the assessment is gathering information to either rule-out or support a diagnosis. Schwartz, Boulware, McBride, and Sandall (2001) wrote, "The purpose of assessment activities varies, but generally assessment is the process of gathering information to assist in answering a question or making a decision" (p. 222). One source alone cannot adequately answer this kind of question, nor would one voice suffice to make the decision.

Ideal assessment also should include multiple methods of obtaining information. According to Shriver, Allen, and Mathews (1999), there are three principle assessment methods in conducting autism evaluations: observations, verbal report/interviews and direct interactions. Not one assessment tool (i.e., observations) is likely to provide all the evidence necessary for diagnosis, but rather a combination of tools and a variety of sources provides the ideal assessment (p. 545). Assessment tools range from the informal to the formal, from homemade to copyright, from free to costly.

There are several official protocols to help assist with all three methods of autism evaluation. Examples of observation protocols include: portions of the Autism Screening Instrument for Educational Planning (ASIEP), the Childhood Autism Rating Scale (CARS), and the Autism Diagnostic Observation Schedule (ADOS). Examples of verbal report/interview protocols include: the Autism Diagnostic Interview-Revised (ADI-R), the Gilliam Autism Rating Scale (GARS), and the Autism Behavior Checklist (ABC). Further, examples of direct interaction protocols include: portions of the Autism Screening Instrument for Educational Planning (ASIEP) and the Psychoeducational Profile- Revised (PEP-R). There really is a great deal of room for choice in assessments, for these examples are not exhaustive. Therefore, there is great variability in assessment methods, not only between schools and clinics, but also between schools and schools or clinics and clinics.

Educational personnel may or may not use the same assessments as professionals employed by a clinic. School District A may or may not use the same assessments at School District B. Clinic C may or may not use the same assessment at Clinic D. Given the variability and the possibility of practice effect or other extraneous factors, it is no wonder diagnosis is often conflicting. The purpose of this discussion is not to evaluate several popular assessments, but rather to illustrate the need for a common plan of assessment, or, at the very least, a clear communication between settings of what assessments each setting utilizes. Then, rather than repeat an assessment, invalidate an assessment, give a partial assessment (therefore prohibited another to finish that assessment), make the family wait longer for a definitive diagnosis/label. Again, the distance between definitions, settings, systems, assessments seems counter-productive and counter-intuitive.

Distance and ambiguity allow a great deal of room for interpretation and variety. As Kling and Renner (2000) wrote, "Historically, the diagnosis of autism has been based on clinical observations and intuitions rather than through the use of standardized diagnostic protocols" (p. 479). There are obvious problems with relying on strategies as vague and subjective as intuition or personal perception of behavior. What one person identifies as severely atypical, another might view as mildly delayed. The same is true of behavior scales and interviews; as Selfe (2002) explained, ". . . assessment tools are almost always behavioral checklists used with parents – the responses are subjective and open to interpretation and bias. There is no medical test for autism – no objective, definitive test" (p. 336). Autism diagnosis seems to be more synonymous with a diagnostician's opinion, rather than absolute fact. Weston and Weinberger (2005) explained; "Truth does not reveal itself without interpretation. The choice of what hypotheses to pursue, using what methods, is inherently a clinical decision, however informed (as it should be informed) by the available quantitative evidence" (p. 1269). Therefore, it is vital that all three features of assessment are a documented part of the assessment: multiple sources with multiple methods of information and knowledgeable clinical judgment. The outcome may not be absolute fact, but should be the best approximation of fact.

Yet, diagnosis is not the end-all outcome. Schwartz, Boulware, McBride, and Sandall (2001) offered this reminder, "The importance of assessment extends well beyond diagnosis. Thorough assessments act as road maps for intervention. The members of the intervention team (including families) work together to identify where they want to go and the best way to get there" (p. 222). The implications that follow the assessment vary greatly as well. Schools are only obligated to create a treatment plan or Individualized Education Plan (IEP) in the event that the child is found eligible for special education services (though this is not frequently thought to be best practice). A clinic provides recommendations regardless of diagnosis. The recommendations and treatment/intervention planning at schools is typically meant to occur at school. Schools must be very careful when mentioning/recommending any outside therapies, or may be found financially responsible for that therapy. Clinics may offer several therapy suggestions, which may or may not be covered by the family's health insurance. Janzen (2003) recommended caution when seeking professional expertise, "A teacher is not qualified to discuss the specific causes of autism, related medical problems, or medications. A physician is not qualified to suggest educational programs or strategies" (p. 58). It is important to ask each professional the right questions. A clinic may refer parents to the school and/or make several recommendations for intervention at the school, despite the fact that the school and the clinic are entirely different environments with separate systems of identification.

There is no argument that both settings, educational and clinical, serve their purposes. However, as we continue to confront the rising cases of ASDs, as we struggle to plan and act early for children in need of intervention, and as we work toward better lifetime outcomes for those with disabilities, it seems collaboration is needed. There is undoubtedly more to learn about autism with new discoveries to uncover. Yet, it seems improvements can be made upon the information we already have, with efforts focused on establishing commons or universals; specifically definitive language, system of identification, diagnostic approach and assessment practices. Simpson (2005) wrote the following:

> This process will be complicated and at times tedious, it will be encumbered and affected by political and legislative actions, and it will likely never result in total consensus. Yet, the need to identify effective methods is so important that the field will not be able to move forward without significant progress in this area. (p. 147)

It seems that children would be in a better place, given a better chance, if schools and clinics teamed together to reach a common goal.

Chapter III: Methodology

Research Design

This study was a qualitative review of a limited sample of diagnostic evaluations, and, as such, results are not generalizable to all settings. Research questions provide the outline for data collection while both visual inspection and statistics are incorporated to analyze data. Chi-square analysis was employed to provide statistical evidence of the differences between the two diagnostic settings: clinics and schools.

Given the rising attention to Autism Spectrum Disorders and the potential barriers surrounding ASDs, there is a need to develop a more effective and efficient communication across disciplines. By exploring the similarities and differences in practices between clinical and educational settings, this research could help assist others in identifying a common language to define, describe and diagnose autism. This chapter will describe the study methodology, instrumentation, data collection and analysis, as well as the criterion by which reports will be reviewed.

Procedures and Settings

In obtaining reports written about the same individual child for consideration of both the medical and educational diagnosis/label of autism, information will be derived for comparative purposes. A review of existing reports ensures a reflection of actual professional practice, rather than to survey professionals about their method, beliefs, intentions, ideal vs. actual professional practice, etc. The same review criterion will be used for both clinical and educational reports in a concrete and unbiased fashion. The reviewed information will comprise the reported similarities and differences between clinical and educational reports in Chapters IV and V. The remainder of this chapter will discuss the pragmatic approach to subject description and selection, instrumentation, data collection and analysis, as well as any limitations. The majority of this chapter will be committed to developing a clear review criterion, a description of the item and the reason it was selected for inclusion.

The demographics of the chosen community are relatively reflective of the general population. Together with surrounding communities, the Midwestern city is home to approximately 28,000 people, with an average household income of $60,000. The school district serves approximately 4,000 students and employs nearly 450 teachers/personnel. Medical services provide roughly 40 percent of this Midwestern city's industrial employment, due to the large local medical practice clinic/hospital, of which includes clinical evaluations of Autism Spectrum Disorders.

Due to the fact that autism is considered a low-incidence disability, a randomized sample of students currently receiving special education services for autism did not likely suffice. Therefore, all students currently receiving special education services for autism as either a primary or secondary disability will be included (n = 39). The exception will be students in which both clinical and educational reports were not already made available in their cumulative education file. Of the 39 student files reviewed, 5 were found to include no clinical reports and were consequently excluded from this study. As a result, a total number of 34 student files were reviewed.

Subject Selection and Description

Under the supervision of a collaborating school administrator, a list of students currently receiving special education services under the label autism will be generated from a small Midwestern unified school district.

Instrumentation

The reports will be reviewed given a set review criterion, see Appendix D for additional information on review criteria. The items included on this review criterion include the following, given explanations:

1. Setting and System of Identification

What setting did the report originate from? Did the setting explicitly indicate the system of identification and/or criterion for diagnosis? Are the DSM-IV and/or IDEA referenced specifically? Identifying what system was used, whether the system was indicated, and whether or not the alternative system was mentioned will be addressed through reviewing each child's diagnostic reports.

2. The Diagnostician(s) (Professional Titles Only)

Research suggests best practice in diagnosis includes a team of professionals. Similarities and differences between diagnosticians in a school vs. a clinic will be reviewed through carefully noting each professional (by occupation title) included in the evaluation. While IDEA 2004 requires an IEP team participate in the evaluation, of greatest interest are those members that completed and reported assessment results to aide in diagnosis/labeling. Therefore, only the IEP team members who performed assessments will be noted as diagnosticians here. Clinics are not bound by the same legal obligations or guidelines as schools. In the interest of broadening the concept of team for clinical settings, "team" will also include additional professionals mentioned in the report (collaborating clinicians, additional and/or past referrals related to ASD diagnosis, etc.).

3. Types/specific assessments

Of interest here is variety. What assessments and assessment methods are typically used by schools/clinics? Are they the same/different? The implications of which could be that one setting (i.e., the school) refer to the other setting's assessment (i.e., the clinic) in making their own determinations, or that one environment uses the assessment of the other as evidence.

4. Diagnosis

Of primary interest is diagnosis, but also whether one setting's diagnosis differs from the other setting's diagnosis. In other words, are the families of children with suspected ASD receiving contradicting information from these two settings?

5. Recommendations/Intervention Planning

Recommendations will likely differ depending on the environment, given environmental roles; however, of interest here are diagnostic boundaries. Does the clinic recommend an intervention at the school? Does the school indicate clinical therapy is necessary?

6. Mention of Alternative Setting

One secondary question will persist throughout each review criterion 1-5: does either setting refer to the alternative setting? In other words, in terms of systems of identification, diagnosticians, assessments, diagnosis, and recommendations, does the clinic/school mention the school/clinic?

Data Collection

A list of students evaluated for autism was compiled by an unnamed person from the school district's clerical staff who was paid a predetermined hourly wage by the researcher to complete this task. This clerical staff member retrieved each students' file and will copy from the file any clinical and educational (IEP) reports for each student, careful to keep each students' reports together so a comparative review was based on reports written about the same student. The educational reports copied included all special education initial evaluations and reevaluations, whereby any additional assessment was completed and/or referenced (e.g., new evaluation data from a clinic). Likewise, all clinic reports available in the cumulative file was included, with special attention to those referencing ASD symptomology. Each student file including more than one educational and/or clinical report was addressed similarly. In interest of demonstrating the team-like nature of both settings, each group of setting-specific reports (e.g., all clinic reports for one given individual) were reviewed as one all-inclusive report, indicative of the practices of the entire setting holistically.

From these copies, the clerical staff member blacked out all identifying information regarding the student (i.e., name, birth date, medical history number, etc.). These copies were provided to the researcher, devoid of any identifying information, who reviewed each report using the review criterion worksheet (see Appendix D). For results and discussion purposes, each group of reports on a given individual was assigned a number, assigned by way of order of review. Afterwards, the reports were shredded, to ensure the confidentiality of each student/patient.

Data Analysis

This researcher is a trained school psychologist in the diagnosis of ASDs and the interpretation of various assessment devices, tools, inventories, and observational techniques. Therefore, given the developed review criterion, this researcher examined each report, noting specific features of each report. The results of this analysis was reported by review criteria with special attention to similarities and differences.

Limitations

The main limitation of this study is the limited sample. Since one small Midwestern Wisconsin school district was chosen (and contained children who likely had limited access to a large variety of clinics), the findings are not likely to be generalizable to all educational and clinical settings. Likewise, the sample was also limited by definition in the selection of the sample. In selecting students only evaluated for special education services for autism in a school setting, other students (who may have a clinical diagnosis of ASD) were excluded; for example, those students who qualified for services under another impairment area in special education. A student may be identified as learning disabled, cognitively disabled, speech language, or virtually any of the remaining disability areas, based on comorbid diagnoses (orthopedic impairment, visual impairment, hearing impairment, other-health-impairment, etc.). Additionally, access to information was limited to the current composition of the student's cumulative record. Given this fact, access was limited to only those reports that existed in the students' files at the time of the review process. Lastly, the study may have been limited by the review criterion, which was developed and based on the review of literature cited here in this particular study.

Chapter IV: Results

The purpose of this study was to explore the similarities and differences in diagnostic reports between two different diagnostic settings: clinics and schools. Both visual inspection and statistical analysis of clinical and educational diagnostic report results are summarized under the following criterion research questions:

Research Question 1: What systems of identification are used when diagnosing autism in the schools or in clinics? Are there differences in the use of these identification systems by professional setting?

Visual inspection. Of the 34 clinical reports, 20 referenced the DSM specifically, as illustrated in Appendix F, Figure 1F. A specific mention of the DSM included those reports which directly mentioned ("DSM") or clearly referred to language used in a version of the DSM (e.g., "Axis I"). None of the 14 remaining clinical reports (those that did not mention the DSM specifically) explicitly stated the system of identification used to determine diagnosis. Of the 34 clinical reports, 24 referenced IDEA specifically. A specific mention of IDEA included any clear reference to the legal special education stipulations as mentioned in IDEA (e.g., IEP). Of the 34 educational reports, 34 referenced IDEA specifically and 1 referenced DSM specifically.

Both settings referred to their own system of identification when referring to diagnosis. Likewise, both settings referred to the alternative setting's system of identification making report recommendations. One notable difference is clinical reports often referred to IDEA (most often IEPs) in patient background history. Educational reports frequently referenced medical diagnosis; however, it was not explicitly clear that the diagnosis originated from the DSM.

Statistical analysis. A chi-square analysis was completed to address this research question, to assist in determining whether significant differences exist in the system of identification referenced by professional setting. Appendix G, Tables G1 and Table G2 provide the chi-square analysis results for each system of identification. The computed chi-square statistic for the clinical system of identification referenced by professional setting ($\chi 2 = 24.871$) exceeds the critical value for 0.05 probability level (3.841). The computed chi-square statistic for the educational system of identification referenced by professional setting ($\chi 2 = 11.724$) also exceeds the critical value for 0.05 probability level (3.841). Report references to the clinical and the educational systems of identification are associated with differences in professional setting.

Research Question 2: What professionals are included when diagnosing autism in the schools or in clinical settings? Are there differences in the professionals utilized by professional setting?

Clinical and educational diagnostic teams can be found in Appendix H, Figures 1H and 2H respectively, depicted in a pie chart by professional titles only. It is important to note that only IEP team members who conducted an assessment to aid in the identification of autism were included as diagnostic team members. Also, all clinical professionals referenced in the clinical reports were included as a member of the clinical diagnostic team. In 34 educational reports, 32 included special education teachers, 31 included speech language therapists, 30 included school psychologists, 17 included occupational therapists, 12 included physical therapists, 7 included school social workers, and 3 included autism specialists. In the 34 clinical reports, 24 included pediatricians, 23 included speech language pathologists, 22 included clinical psychologists, 14 included neuropsychologists, 13 included pediatric neurologists, 12 included occupational therapists, 6 included child psychiatrists, 4 included audiologists, 3 included educational specialists, 3 included orthopedic physicians, 1 included a physical therapist, 1 included a social worker, and 1 included an endocrinologist.

There are similarities and differences in the professionals utilized by each professional setting. One notable similarity is the presence of corresponding professional areas: speech language, psychologists, occupational therapists, physical therapists, and social workers. Another similarity is the average number of team members per report: clinical teams on average consisted of 3.7 members and educational teams on average consisted of 4.8 members. The most apparent difference is the absence of certain members on teams. There were no clinical professionals on the educational teams. Likewise, there were no special educators on the clinical teams. Appendix H, Figure 3H, illustrates the specific professionals included in the special educator category, including teachers of early childhood special education, learning disabilities, cognitive disabilities, emotional behavioral disabilities, and specially designed physical education. Each special education specialty area appears equally represented, ranging from 15 to 25 percent of the overall category.

Research Question 3: What assessments are employed when diagnosing autism in the schools or in clinical settings? Are there differences in the assessments administered by professional setting?

Clinical and educational assessments can be found in Appendix I, Table I1, depicted by category of assessment. These categories of assessment were determined and assigned during the data collection and organization portion of this research. This distinction likely should have been made in the methodology portion of this study; however occurred in hindsight in an effort to make the data more organized, meaningful and reportable.

The test categories are largely based on Buros Institute of Mental Measurements (*Buros Institute of Mental Measurements: Test Reviews Online*), with the exception of the self-created category: "ASD specific" assessments. This category included all assessments that specifically mention ASD in title and/or description. Additionally, Buros Institute of Mental Measurements categories of achievement, reading and math are combined and referred to comprehensively as "achievement" assessments. Tests not found in the Buros Institute of Mental Measurements Database were located instead in the Educational Testing Service (ETS) Test Link Database, and were then categorized based on cross-referencing ETS test descriptions and Buros Institute of Mental Measurements category descriptions (*Educational Testing Service (ETS) Test Link: SydneyPLUS Knowledge Portal*).

Visual inspection. In 34 educational reports, there were a total of 43 achievement assessments, 37 ASD specific assessments, 63 behavior assessments, 56 developmental assessments, 82 language assessments, 49 intelligence assessments, 1 neuropsychological assessments, 9 personality assessments, 31 sensory motor assessments, and 30 speech and hearing assessments. In 34 clinical reports, there were a total of 16 achievement assessments, 15 ASD specific assessments, 37 behavior assessments, 29 developmental assessments, 22 language assessments, 31 intelligence assessments, 28 neuropsychological assessments, 3 personality assessments, 16 sensory motor assessments, and 20 speech and hearing assessments. Appendix J, Figure 1J, provides a visual representation of the total number of assessments per category by professional setting.

In all but one assessment area (neuropsychological), educational reports included more total assessments in each assessment category compared to clinical reports. The top five assessment categories for both settings include four similar categories: behavior, developmental, intelligence and language. Assessments of personality were relatively infrequent for both environments (ranked tenth for clinics and ninth for schools). Educational reports reported less neuropsychological assessment than clinical reports (ranked fourth for clinics and tenth for schools).

In a slightly different approach, the number of reports (*n* = 34) including each category of assessment were also calculated. Of the 34 educational reports, 22 reports included achievement assessments, 25 reports included ASD specific assessments, 23 reports included behavior assessments, 25 reports included developmental assessments, 26 reports included language assessments, 23 reports included intelligence assessments, 1 report included neuropsychological assessments, 6 reports included personality assessments, 20 reports included sensory motor assessments, and 19 reports included speech and hearing assessments. Of the 34 clinical reports, 14 reports included achievement assessments, 10 reports included ASD specific assessments, 17 reports included behavior assessments, 18 reports included developmental assessments, 13 reports included language assessments, 21 reports included intelligence assessments, 10 reports included a neuropsychological assessments, 3 reports included personality assessments, 13 reports included sensory motor assessments, and 15 reports included speech and hearing assessments. Appendix J, Figure 2J, provides a visual representation of the number of reports including each assessment category by professional setting.

Educational reports included more assessments overall, as well as more frequently assessed each category of assessment within each report, with the prevailing exception of the neuropsychological assessment category. In addition, the assessment categories: behavior, developmental and intelligence were three of the most frequently included in both the clinical and educational diagnostic reports. Language and ASD specific assessments were also included in educational reports most often (tied with developmental and intelligence assessment categories in schools, but ranked seventh and eighth respectively for clinics).

Statistical analysis. A chi-square analysis was also completed to address this research question, to assist in determining whether significant differences exist in the category of assessments included per diagnostic report by professional setting. Appendix K, Tables K1 through K10, provide the chi-square analysis results for each assessment area.

The computed chi-square statistic for the use of achievement assessment in diagnostic reports by professional settings ($\chi 2 = 4.048$) exceeds the critical value for 0.05 probability level (3.841). The use of achievement assessments in diagnostic reports differs based on professional setting.

The computed chi-square statistic for the use of ASD specific assessment in diagnostic reports by professional settings ($\chi 2 = 13.247$) exceeds the critical value for 0.05 probability level (3.841). The use of ASD specific assessments in diagnostic reports differs based on professional setting.

The computed chi-square statistic for the use of behavior assessment in diagnostic reports by professional settings ($\chi2 = 2.186$) does not exceed the critical value for 0.05 probability level (3.841). The use of behavior assessment in diagnostic reports is independent of changes in professional setting.

The computed chi-square statistic for the use of developmental assessment in diagnostic reports by professional settings ($\chi2 = 3.01$) does not exceed the critical value for 0.05 probability level (3.841). The use of developmental assessments does not differ based on professional setting.

The computed chi-square statistic for the use of language assessment in diagnostic reports by professional settings ($\chi2 = 10.161$) exceeds the critical value for 0.05 probability level (3.841). The use of language assessments differs based on professional setting.

The computed chi-square statistic for the use of intelligence assessment in diagnostic reports by professional settings ($\chi2 = 0.258$) does not exceed the critical value for 0.05 probability level (3.841). The use of intelligence assessments does not differ based on professional setting.

The computed chi-square statistic for the use of neuropsychological assessment in diagnostic reports by professional settings ($\chi2 = 8.785$) exceeds the critical value for 0.05 probability level (3.841). The use of neuropsychological tests differs based on professional setting.

The computed chi-square statistic for the use of personality assessment in diagnostic reports by professional settings ($\chi2 = 1.153$) does not exceed the critical value for 0.05 probability level (3.841). The use of personality assessments does not differ based on professional setting.

The computed chi-square statistic for the use of sensory motor assessment in diagnostic reports by professional settings ($\chi2 = 2.885$) does not exceed the critical value for 0.05 probability level (3.841). The use of sensory motor assessments does not differ based on professional setting.

The computed chi-square statistic for the use of speech and hearing assessment in diagnostic reports by professional settings ($\chi2 = 0.941$) does not exceed the critical value for 0.05 probability level (3.841). The use of speech and hearing assessments does not differ based on professional setting.

Research Question 4: What diagnoses are made when assessing for autism in the schools or in clinical settings? Are there differences in the diagnostic categories by professional setting?

Visual inspection. Clinical and educational diagnoses can be found in Appendix L, Figure 1L. Figure 1L summarizes each setting diagnoses in a bar graph, whether diagnosis confirms the presence of ASD, and agreement with alternative setting. Of the 34 student files reviewed, 23 revealed both setting were in agreement as to the diagnosis/label of an ASD. Of the 34 student files reviewed, 11 were not in agreement. Of the 11 cases of disagreement, 11 educational reports endorsed ASD when the clinical report did not.

In all cases of disagreement, the school endorsed the label of autism while the clinic did not. This is not to say that the clinic did not diagnose the student with another disorder, but instead the student was not diagnosed with any form of ASD. In fact, in all

34 clinical reports, only one student had no clinical diagnoses at all. This means that in the 11 cases of disagreement, 11 of these students were diagnosed with some other disorder or disability by the clinic.

Another notable difference in diagnoses is the variety of clinical diagnoses: autism, Asperger's Syndrome, PDD, and PDD-NOS; while schools are limited to the educational label of autism only.

Statistical analysis. A chi-square analysis was also completed to address this research question, to assist in determining whether significant differences exist in the diagnosis of ASDs by professional setting. Appendix M, Table M1, provides the chi-square analysis results.

The computed chi-square statistic for the diagnosis of the diagnosis of ASD by professional setting ($\chi 2 = 14.571$) exceeds the critical value for 0.05 probability level (3.841). ASD diagnosis is, therefore, associated with changes in professional setting.

Research Question 5: What recommendations are made when assessing for autism in the schools or in clinical settings? Are there differences in the recommendations by professional setting?

Of interest in regard to recommendations are diagnostic boundaries. Of the 34 clinical reports, 31 included internal recommendations (or recommendations made for within the clinical setting). Internal clinical recommendations included: referrals to other clinical departments or clinical setting, follow-up appointments, and orders for additional assessment. Of the 34 clinical reports, 23 included external-specific (recommendations for the educational setting, such as special education referrals, teaching strategies, suggested teacher trainings, etc.). Of the 34 educational reports, 34 included internal recommendations (or for within the educational setting). Internal educational recommendations included: educational support services, educational modifications and accommodations, etc. Of the 34 educational reports, 2 included external-specific recommendations (recommendations for the clinical setting, such as clinical consideration for various medical diagnoses or medications). In both such cases, educational diagnostic reports recommended parents mention the possibility of an Attention Deficit and/or Hyperactivity Disorder (ADD/ADHD) diagnosis to medical professionals, as well as explore potential benefits of behavioral counseling and/or medication management. Appendix N, Figure 1N provides a visual bar graph of internal versus external-specific recommendations by professional setting.

Research Question 6: Do the diagnostic reports refer to the other professional setting when identifying, diagnosing, and making recommendations for intervention services? If so, are there differences in these references by professional setting?

Visual inspection. Of the 34 student files reviewed, 31 clinical reports mentioned the educational setting: 24 mentioned the educational system of identification (IDEA, IEP, special education referral), 12 mentioned educational diagnosticians, 15 mentioned educational assessment, 14 mentioned educational labels, and 1 mentioned an educational recommendation (made by school to clinic). Likewise, of the 34 student files reviewed, 34 educational reports mentioned the clinical setting: 1 mentioned clinical system of identification (DSM, Axis I), 18 mentioned clinical diagnosticians, 32 mentioned clinical assessments, 33 mentioned clinical diagnoses, and 11 mentioned clinical recommendations (made by clinic to school). Appendix O, Figure 1O provides for an illustration of the educational and clinical references to the alternative setting (clinics mentioning schools, schools mentioning clinics) in diagnostic reports. References to the alternative setting were categorized based on five areas of interest: systems of identification, diagnosticians, assessments, diagnosis and recommendations.

Both clinical and educational report reviews revealed several mentions of the alternative environment (including system of identification, diagnosticians, assessment, diagnosis, and recommendations) in the background history of the report. In clinical reports, this section was frequently referred to as background summary, social history, referral concern, history of present illness, and current status. In educational reports, this section was frequently referred to as relevant medical information, previous evaluations, information provided by parents and student history. Clinical reports mentioned the educational system of identification more than the educational reports mentioned the clinical system of identification. However, in all other areas (diagnosticians, assessment, diagnosis, and recommendations), educational reports mentioned the clinical setting more frequently than the clinic referenced the educational setting.

Statistical analysis. A chi-square analysis was also completed to address this research question, to assist in determining whether significant differences exist in references by professional setting. Appendix P, Table P1 through Table P5, provide the chi-square analysis results for each area of reference.

The computed chi-square statistic for references to the alternative setting's system of identification in diagnostic reports by professional setting ($\chi2 = 33.462$) exceeds the critical value for 0.05 probability level (3.841). References to the alternative setting's system of identification differs based on professional setting.

The computed chi-square statistic for references to the alternative setting's diagnosticians in diagnostic reports by professional settings ($\chi2 = 2.147$) does not exceed the critical value for 0.05 probability level (3.841). References to the alternative setting's diagnosticians in diagnostic reports do not differ based on professional setting.

The computed chi-square statistic for references to the alternative setting's assessment in diagnostic reports by professional setting ($\chi2 = 19.911$) exceeds the critical value for 0.05 probability level (3.841). References to the alternative setting's assessment differs based on professional setting.

The computed chi-square statistic for references to the alternative setting's diagnosis in diagnostic reports by professional setting ($\chi2 = 28.781$) exceeds the critical value for 0.05 probability level (3.841). References to the alternative setting's diagnosis differs based on professional setting.

The computed chi-square statistic for references to the alternative setting's recommendations in diagnostic reports by professional setting ($\chi2 = 10.119$) exceeds the critical value for 0.05 probability level (3.841). References to the alternative setting's recommendations differs based on professional setting.

Chapter V: Discussion

According to the literature, clinical and educational settings have different systems of identification for those suspected of having Autism Spectrum Disorders (ASDs). The presence of separate systems in the identification of the same disorder can create confusion for those involved in the care and treatment of individuals with autism (Dahle, 2003). To explore this dilemma further, the current study examined similarities and differences between these settings, as evidenced by diagnostic reports originating from each setting for a common individual. This chapter will discuss the results of the current study. The chapter begins by discussing the limitations of the study, followed by the implications of the results, organized again by specific research question. Next, the chapter highlights recommendations for additional research and professional practice. The chapter concludes with a summary of the study.

Limitations

The primary limitation of the current study is the limited sample, in terms of sample size, selection and composition. The sample size was relatively small ($n = 34$), as dictated by the demographics of the small Midwestern Wisconsin school district. The sample was also limited by method of selection. Only those students who qualified for special education services under the (primary or secondary) disability label of autism were included. Therefore, the study excluded those students who were evaluated and did not qualify for special education under IDEA's autism criterion. The study also excluded those students who may have qualified under a different disability criteria area (e.g., students who may have been labeled learning disabled, yet still possess the medical ASD diagnosis). Lastly, the study is limited in terms of composition. The student files reviewed were subject to the limits of their current contents. This undoubtedly excluded any additional clinic and/or educational reports that may not have found their way into the file yet. The findings of this study are therefore not likely demonstrative of all educational and clinical settings.

Implications

The current study presents previous research on the similarities and differences between clinical and educational systems of ASD identification (Dahle, 2003). This study adds to Dahle's previous research findings in exploring other dimensions of difference and similarity between clinical and educational settings, as evidenced by reports generated from each environment. Study findings and related implications are addressed in the following sections according to their respective research question.

Research Question 1: What systems of identification are used when diagnosing autism in the schools or in clinics? Are there differences in the use of these identification systems by professional setting?

Of primary interest is whether the system of identification was clearly indicated by each setting. Of secondary interest is whether the alternative setting's governing system was specifically mentioned. The DSM was referenced in 58.8 percent (*n* = 20) of clinical reports, while IDEA was referenced in 70.6 percent (*n* = 24) of clinical reports. Alternatively, IDEA was referenced in 100 percent (*n* = 34) of educational reports, while the DSM was referenced in only 3 percent (*n* = 1) of all educational reports. Visual inspection suggests schools refer to the educational system more often than clinics, while clinics refer to the clinical system of identification more often than schools. Statistical analysis confirms the reference to both clinical and educational systems of identification is associated with, or differs due to changes in diagnostic settings. This finding is not surprising given the assumption that each environment would likely refer to its own system of identification more often than the alternative setting.

Interestingly, the alternative setting's system of identification (IDEA) was cited more often than the clinical setting's own system of identification (DSM) in clinical reports. However, it is notable that IDEA was never specifically used to clinically diagnose a child with autism; instead, IDEA was referred to in either the background history or most often in the recommendations portion of the clinical report (e.g., referral for IEP). An educational report referenced the clinical system of identification (DSM) on one occasion only. In this particular case, the student qualified for special education services but did not have a medical diagnosis of ASD. The mention of the DSM was, therefore, used to illustrate the differences between medical and educational diagnosis of autism.

The more prevalent citing of IDEA both in clinical and educational reports likely reflects the impact of a legal system of identification and services versus a medical manual and model (e.g., DSM is a professional manual, IDEA is law). Likewise, schools are in many ways a public service, whereby special education services are free to those students who qualify and demonstrate a need. Clinical services may be costly and family medical insurance coverage may vary. Therefore, educational recommendations may be perceived as less imposing and/or demanding for families. Likewise, professionals may regard free services with entitlement, believing it a disservice to not inform a family of gratis services.

Research Question 2: What professionals are included when diagnosing autism in the schools or in clinical settings? Are there differences in the professionals utilized by professional setting?

Each team of professionals, regardless of setting, consisted of a variety of team members. Visual inspection of this data suggests notable similarities in professionals on both settings diagnostic teams: speech language therapists, psychologists, occupational therapists, physical therapists and social workers. Speech language professionals and psychologists are two of the most frequent members of diagnostic teams in both settings. The average number of diagnostic team members per report was relatively similar, within 1.1 (clinical teams: 3.7, educational teams: 4.8).

Another notable similarity is both settings referred to the other setting consistently (please see research question 6 below), yet never included the alternative setting professionals as team members. While pediatricians, neuropsychologists, and neurologists comprised 40 percent of team membership in clinical reports, none of these professionals were included in educational diagnostic teams. Likewise, while special educators comprised 24 percent of team membership in educational reports, special educators were never included in clinical diagnostic teams. Clinical teams also had nearly twice as much variety in terms of prospective team members (13 different clinical team members versus 7 different educational team members).

Research Question 3: What assessments are employed when diagnosing autism in the schools or in clinical settings? Are there differences in the assessments administered by professional setting?

Except for the assessment category of neuropsychological, schools completed more total assessments within each assessment category when compared to clinics. For example, in 34 educational reports, there were a total of 84 language assessments versus 22 language assessments in the 34 clinical reports. Schools also utilized each assessment category (except neuropsychological) more often per educational report compared to the clinic reports. For example, 26 of the 34 educational reports included language assessments, while 13 of the 34 clinical reports included language assessments. As mentioned, the only assessment area in which clinics used more total assessments per category (overall tally of assessments given, regardless of amount per report) as well as more often per diagnostic report (tally for each report utilizing assessment category) was neuropsychological assessments.

Statistical analyses of the assessments utilized in clinical and educational diagnostic reports indicate significant differences between professional settings. The use of achievement, ASD specific, language and neuropsychological assessments in diagnostic reports is associated with changes in diagnostic setting. In other words, the assessment tool differs based on diagnostic setting. By visual inspection, schools incorporate more achievement, ASD specific and language assessment, while clinics incorporate more neuropsychological assessments. Alternatively, the use of behavior, developmental, intelligence, personality, sensory motor, and speech and hearing assessments is independent of changes in diagnostic setting. That is, these assessment areas are equally distributed across settings.

Assessment may vary based on the variety of diagnostic team members. For example, neuropsychologists comprise 11 percent of clinical diagnostic team membership. Neuropsychologists were not found to be diagnostic participants of any (0 percent) of educational diagnostic team membership. One assumption may be that neuropsychological testing is more common when the team of diagnosticians includes a neuropsychologist. Likewise, achievement assessment may be more prevalent in schools given special educators comprise 24 percent of the educational diagnostic team. An explanation for language assessment differences is less evident, given speech language therapists are frequently members of both clinical (24 percent) and educational (18 percent) diagnostic teams. However, since speech and language are related areas, hence the professional title: speech language therapists, I suspect combining these two areas into one assessment category would provide more meaningful results.

Research Question 4: What diagnoses are made when assessing for autism in the schools or in clinical settings? Are there differences in the diagnostic categories by professional setting?

Due to sample selection methods, all educational reports included only those students who qualified for (and were therefore labeled as) autism. Of the 34 files reviewed, 22 clinical reports also diagnosed a form of ASD. Therefore, there was 64.7 percent agreement between school and clinic in terms of diagnosis. It is also important to note in 8 of the 11 cases whereby the school labeled autism when the clinic had not, the clinical report made note of this difference and supported school's decision to provide special education services under this label. In the remaining 3 cases where there was no clinical diagnosis of ASD, no mention was made of the educational label.

Statistical analysis indicates the diagnosis of ASD is associated with changes in professional setting; and, therefore, differs based on diagnostic setting. This statistical finding serves this research well and helps validate the significance of this study. ASD diagnosis differs based on diagnostic setting. Stated in another way, this potentially means the determination of whether or not a child has autism depends on where the question of diagnosis is posed. This situation suggests diagnosis is at least in part a product of setting.

Research Question 5: What recommendations are made when assessing for autism in the schools or in clinical settings? Are there differences in the recommendations by professional setting?

Ninety one point two percent of clinical reports recommended internal recommendations, while 67.6 percent recommended external-specific recommendations (for the school). All educational reports (100 percent) recommended internal recommendations, while 6 percent made external-specific recommendations (to the clinic). Both environments made more internal recommendations versus external recommendations. Clinical reports made external-specific recommendations more often than educational reports made external-specific recommendations.

Aside from the suggestion made earlier regarding entitlement to free services, there are other potential reasons educational recommendations are made more often than clinical recommendations. Schools need to be careful about external recommendations to prevent obligating their district to be financially responsible for outside services. Educational settings are monitored and ruled by public laws, whereas clinical settings are less public, more private and seemingly specialized. A possible implication of this public versus private condition is that clinics are more comfortable with the educational system.

Again, public education is something of an entitlement, while clinical services are perhaps more of a privilege.

Research Question 6: Do the diagnostic reports refer to the other professional setting when identifying, diagnosing, and making recommendations for intervention services? If so, are there differences in these references by professional setting?

Upon visual inspection, clinics refer to schools most often in terms of system of identification and least frequently in terms of recommendations. It is important to note that in all 34 educational reports, only 2 made any recommendations to a clinic. Schools refer to clinics most often in terms of diagnosis and assessment, and least frequently in terms of system of identification. Again, it is important to note that in 34 clinical reports only 58.8 percent, just over half, mentioned the DSM specifically. In other words, the clinical setting itself does not consistently refer to its own system of identification. Therefore, it may be less surprising that schools neglect to mention the DSM.

Statistical evidence indicates that report references to the alternative setting's system of identification, assessment, diagnosis, and recommendations are associated with changes in diagnostic setting, and therefore differs based on diagnostic setting. Visual inspection suggests educational reports refer more often to clinical assessment, diagnosis and recommendations, while clinical reports refer more often to system of identification. Schools refer to clinics more often overall than clinics refer to schools; the only exception being the system of identification. As discussed previously, this difference is likely related to the nature of IDEA (law), the accessibility of educational services (free), and comfort level with which schools are addressed (public service).

Recommendations

Recommendations for further research include replication of the current study, with key changes to avoid the current limitations. A replication study would benefit from increased sample size, better selection techniques, as well as a more diverse composition of students. Such changes could help increase the likelihood that research results are more representative of the general population. Likewise, the study would reveal richer, more complete, results if unlimited access were obtainable, beyond the contents of school cumulative records, but also access to clinical records, personal communication with students, parents, and/or clinical staff. However, unlimited access would have to be carefully weighed against maintaining a certain level of confidentiality.

Another area of research interest related to this study is to gain the perspective, or to explore self-reports from various professional educational and clinical staff, parents, and students. Examples of questions might include: would a pediatrician be willing to participate in an educational setting evaluation? Would a teacher be willing to participate in a clinical setting evaluation? Would this participation be valued by the alternative setting? What recommendations do experienced parents and/or students have for navigating both clinical and educational systems? The people who have the most pertinent answers to these questions are undoubtedly the people who have direct experience with the content of these questions.

Summary

The ultimate goal of this study was to evaluate the similarities and differences of the diagnostic systems for ASD. The result of the study could provide evidence for a need for a common ground, common language, common diagnosis, etc. Both the school and clinical environment undoubtedly serve their own purposes and originate from separate disciplines. However, a more collaborative approach could potentially benefit both, as well as the consumers/clientele served by both clinics and schools.

In reviewing reports written about the same individual yet written in two different settings, or those governed by different systems of identification, this research made a move in a productive direction. By exploring the similarities and differences between settings, a better understanding of each setting develops. By developing an improved understanding, professionals are in a better position to avoid misunderstandings. As Dahle (2003) writes, “A more cooperative partnership could limit those misunderstandings and help the parents feel that there is a more collaborative spirit among the professionals working with their child or young adult” (p. 246).

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Appendix A: DSM-IV diagnostic criteria

A. A total of six (or more) items from (1), (2), and (3), with at least two from (1), and one each from (2) and (3):
  1. qualitative impairment in social interaction, as manifested by at least two of the following:
     a. marked impairment in the use of multiple nonverbal behaviors such as eye-to-eye gaze, facial expression, body postures, and gestures to regulate social interaction
     b. failure to develop peer relationships appropriate to developmental level
     c. a lack of spontaneous seeking to share enjoyment, interests, or achievements with other people (e.g., by a lack of showing, bringing, or pointing out objects of interest)
     d. lack of social or emotional reciprocity
  2. qualitative impairments in communication as manifested by at least one of the following:
     a. delay in, or total lack of, the development of spoken language (not accompanied by an attempt to compensate through alternative modes of communication such as gesture or mime)
     b. in individuals with adequate speech, marked impairment in the ability to initiate or sustain a conversation with others
     c. stereotyped and repetitive use of language or idiosyncratic language
     d. lack of varied, spontaneous make-believe play or social imitative play appropriate to developmental level
  3. restricted repetitive and stereotyped patterns of behavior, interests, and activities, as manifested by at least one of the following:
     a. encompassing preoccupation with one or more stereotyped and restricted patterns of interest that is abnormal either in intensity or focus
     b. apparently inflexible adherence to specific, nonfunctional routines or rituals
     c. stereotyped and repetitive motor manners (e.g., hand or finger flapping or twisting, or complex whole-body movements)
     d. persistent preoccupation with parts of objects

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

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

Figure 1A. Diagnostic criteria for Autistic Disorder.

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

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

C. The disturbance causes clinically significant impairment in social, occupational, or other important areas of functioning.

D. There is no clinically significant general delay in language (e.g., single words used by age 2 years, communicative phrases used by age 3 years).

E. There is no clinically significant delay in cognitive development or in the development of age-appropriate self-help skills, adaptive behavior (other than in social interaction), and curiosity about the environment in childhood.

F. Criteria are not met for another specific Pervasive Developmental Disorder or Schizophrenia.

Figure 2A. Diagnostic criteria for Asperger's Disorder.

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This category should be used when there is a severe and pervasive impairment in the development of reciprocal social interaction associated with impairment in either verbal or nonverbal communication skills or with the presence of stereotyped behavior, interests, and activities, but the criteria are not met for a specific Pervasive Developmental Disorder, Schizophrenia, Schizotypal Personality Disorder, or Avoidant Personality Disorder. For example, this category includes "atypical autism" - presentations that do not meet the criteria for Autistic Disorder because of late age at onset, atypical symptomatology, or subthreshold symptomatology, or all of these.

Figure 3A. Diagnostic criteria for Pervasive Developmental Disorder – Not Otherwise Specified.

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Appendix B: IDEA definition of autism

Autism means a developmental disability significantly affecting verbal and nonverbal communication and social interaction, generally evident before age 3, which 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 daily routines, and unusual responses to sensory experiences. The term does not apply if the child's educational performance is adversely affected primarily because the child has emotional disturbance, as defined by IDEA criterion.

A child who manifests the characteristics of "autism" after age 3 could be diagnosed as having "autism" if the criteria in the preceding paragraph are met.

Figure 1B. IDEA definition of autism.

Note. From Individuals with Disabilities Education Act (IDEA), 34 CFR 300.8, Section 300.8 (c) (1).

Appendix C: Similarities and differences in classification systems

Similarities and Differences in Classification Systems

DSM-IV-TR	IDEA
• Qualitative impairments in communication, social interaction, and repetitive and restricted movements.	• Significantly affects verbal and nonverbal communication and social interaction behaviors. Engagement in repetitive and stereotyped movements.
• Requires that symptoms be evident before 3 years of age.	• Generally evident before 3 years of age. A child who manifests the characteristics of autism after age 3 could be diagnosed as having autism if all other criteria are met.
• Does not require behaviors to adversely affect educational performance. There may be abnormalities in the development of cognitive skills. Verbal skills typically weaker than nonverbal skills. Sometimes special skills are present.	• Requires behaviors to adversely affect educational performance.
• Resistance to environmental change one of the "menu" items under repetitive and restrictive behaviors.	• Resistance to environmental change can be demonstrated as an additional characteristic.
• Odd responses to sensory experiences discussed as an associated feature of autism with hyperactivity, short attention span, impulsivity, aggressiveness, self-injurious behaviors, and temper tantrums in young children.	• Unusual responses to sensory experiences can be demonstrated.
• "Menu" of behaviors listed characteristic of the disorder.	• Does not include a list of behaviors characteristic of the disorder. Behaviors are identified as part of the evaluation procedure.
• Requires that abnormal functioning in social interaction, language as used in social communication, or symbolic or imaginative play be demonstrated prior to 3 years of age.	• Does not require that abnormal functioning in social interaction, language as used in social communication, or symbolic or imaginative play be demonstrated prior to 3 years of age.
• Requires that Rett's disorder or childhood disintegrative disorder be ruled out.	• Requires that children who have an emotional disturbance be ruled out.
• Pervasive developmental disorders are diagnosed separately.	• All pervasive developmental disorders are eligible for autism category if eligibility criteria are met.
• Specific evaluations are not required but are recommended based on "best practice" guidelines from various disciplines.	• Specific evaluations are required.
• Individual or team decision on diagnosis. Licensure required in most cases.	• Team decision on eligibility. Licensure not mandated for eligibility.
• Uses a multiaxial system.	• Multiple eligibility considerations are discussed to come to a final decision.
• Used nationally; criteria do not vary from state to state.	• Criteria may vary from state to state; as long as they maintain the integrity of the federal guidelines, states can expand on the definition.

Note. *DSM-IV-TR* – *Diagnostic and Statistical Manual of Mental Disorders–Fourth Edition–Text Revision* (American Psychiatric Association, 2000); IDEA – Individuals with Disabilities Education Act.

Figure 1C. Similarities and differences in classification systems.

Note. From "The Clinical and Educational Systems: Differences and Similarities" by K. B. Dahle, Winter 2003, *Focus on Autism and Other Developmental Disabilities*, *18(4)*, p. 244. Copyright 2003 by the Hammill Institute on Disabilities. Reprinted with permission.

Appendix D: Review criterion

Setting: (circle) SCHOOL CLINIC

System of Identification: IDEA DSM OTHER Explicitly stated: (circle) YES NO

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Diagnosticians: ....

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Assessments: ....

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Diagnoses/Labels:

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Recommendations: (circle) INTERNAL EXTERNAL

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Mention of alternative environment? (circle) YES NO

(circle) SYSTEM DIAGNOSTICIAN ASSESSMENTS

DIAGNOSES/LABELS RECOMMENDATIONS

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University of Wisconsin
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Appendix F: Report reference to system of identification by professional setting

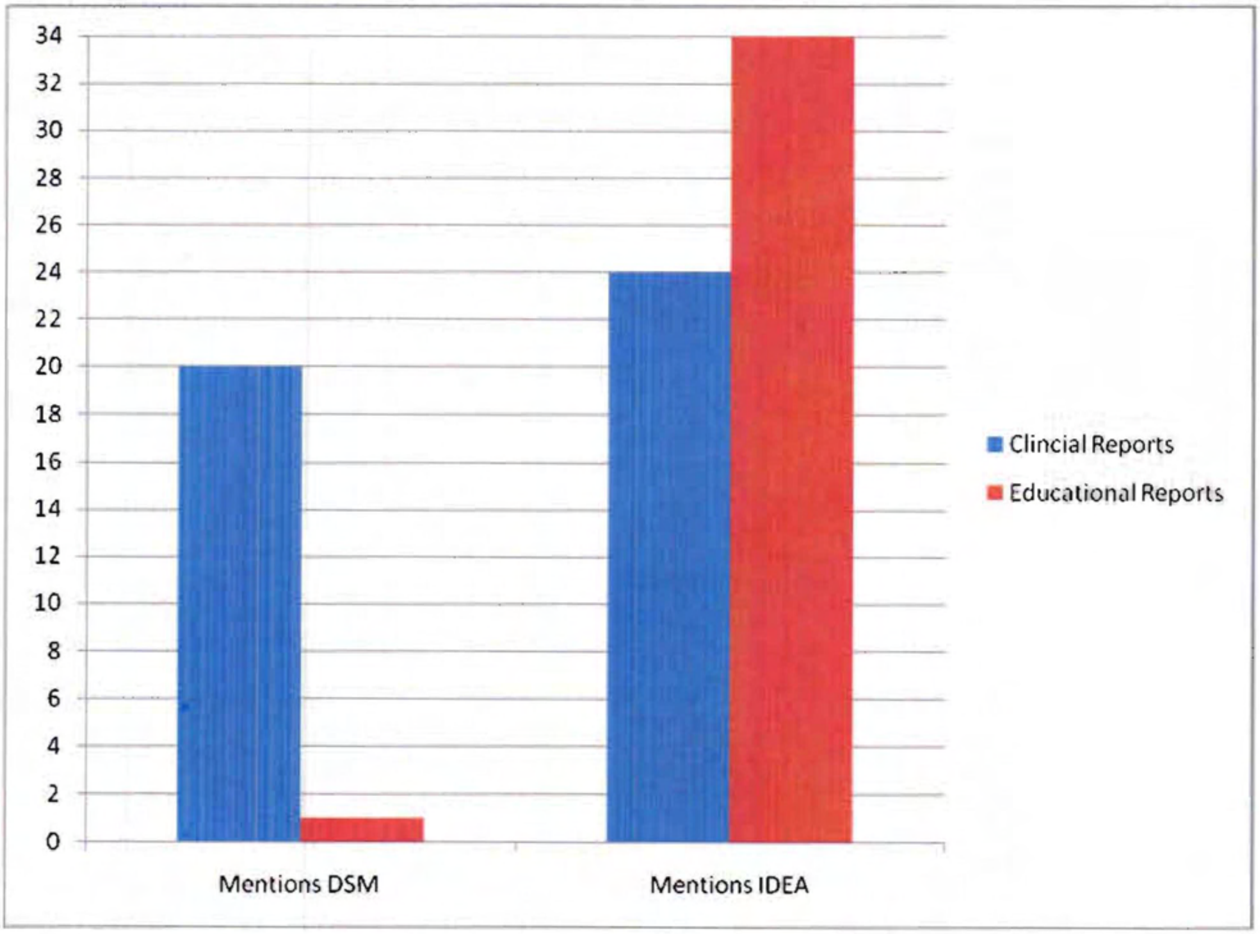

Figure 1F. Report reference to system of identification by professional setting.

Appendix G: Chi-square calculations for system of identification by professional setting

Table G1

Clinical system of identification referenced by professional setting

	Clinic	School	Total
Mentions DSM	20	1	21
Does not mention DSM	14	33	47
Total	34	34	68

$\chi2 = 24.871$, df = 1, $p < .05$

Table G2

Educational system of identification referenced by professional setting

	Clinic	School	Total
Mentions IDEA	24	34	58
Does not mention IDEA	10	0	10
Total	34	34	68

$\chi2 = 11.724$, df = 1, $p < .05$

Appendix H: Team members

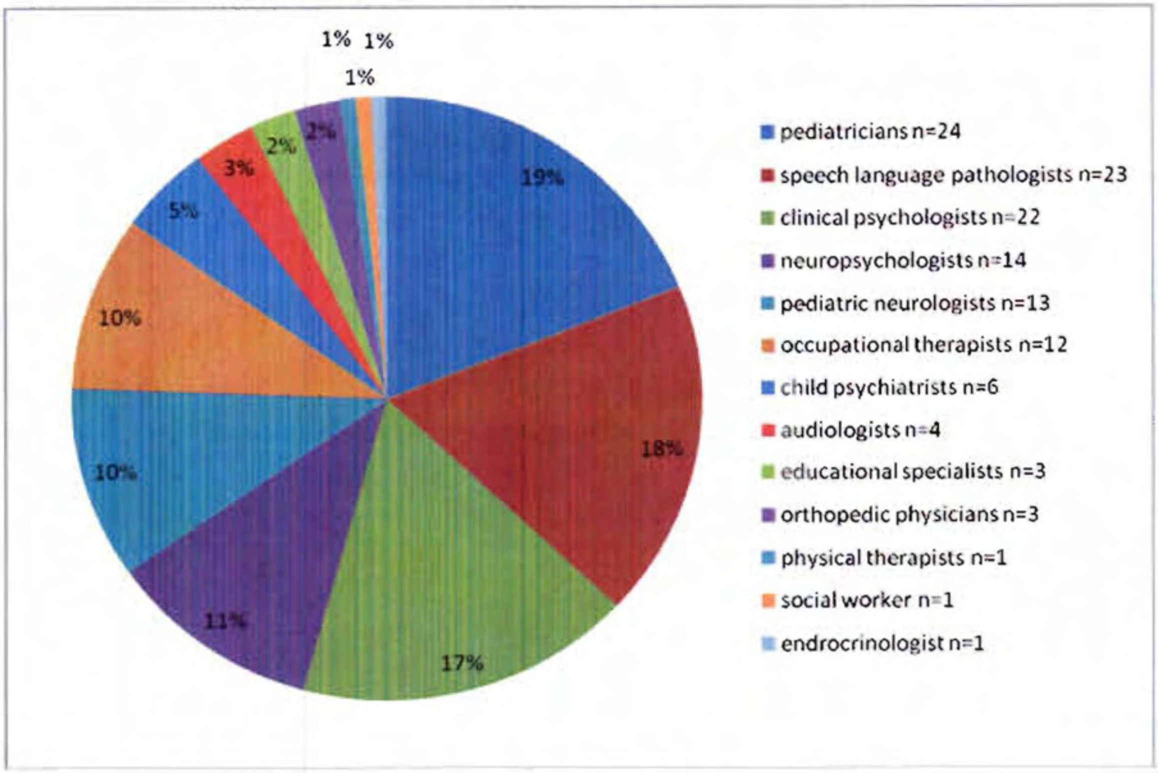

Figure 1H. Clinical report team members.

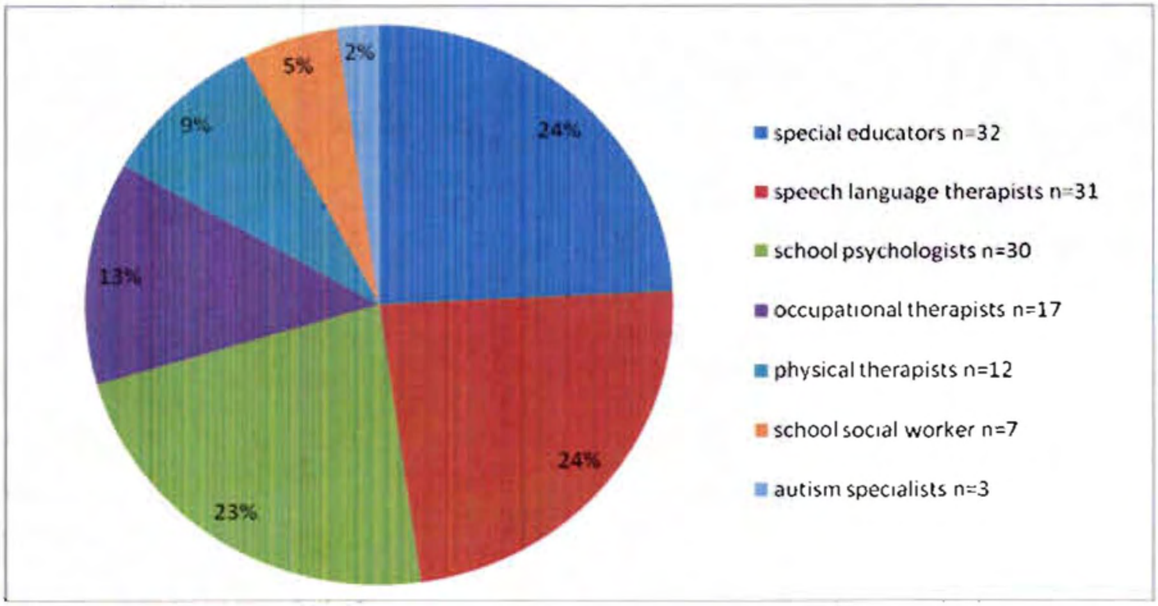

Figure 2H. Educational report team members.

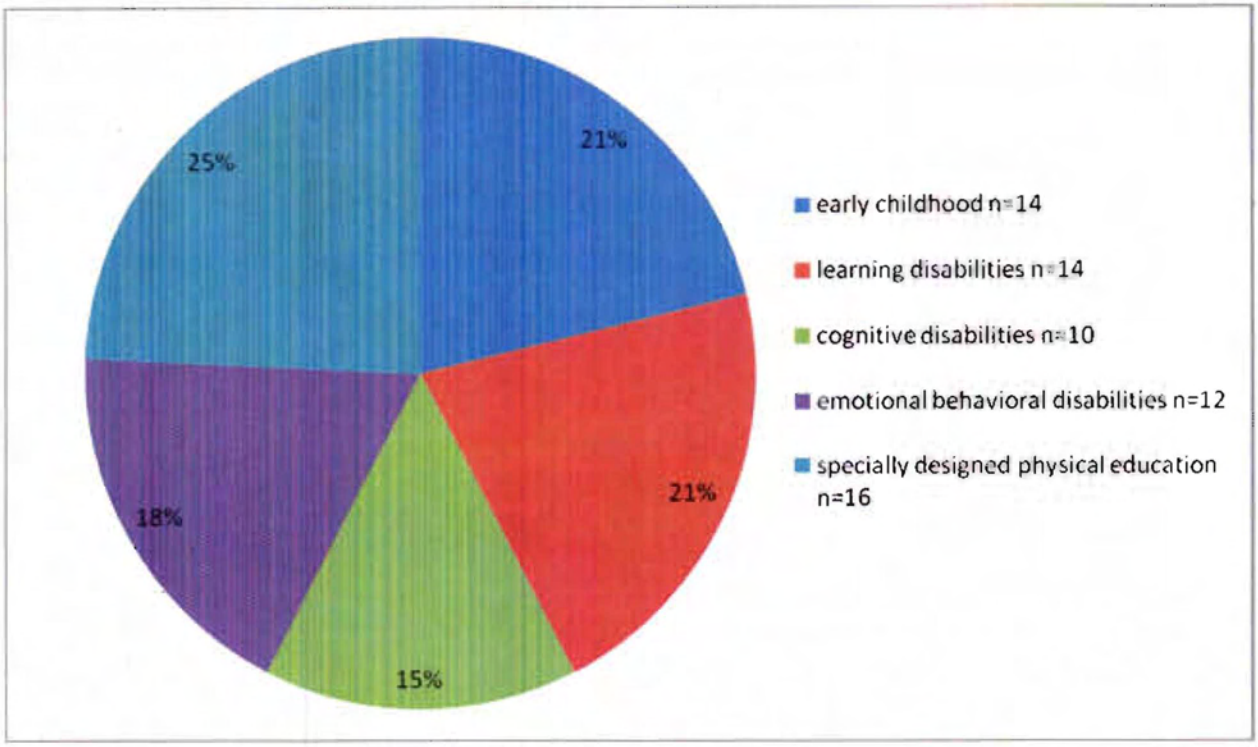

Figure 3H. Special educator team members.

Appendix I: Categories of assessment

Table I1

Categories of assessment

Achievement	ASD-Specific	Behavior
Basic Reading Inventory Dynamic Indicators of Basic Early Learning Skills Kaufman Test of Educational Achievement KeyMath STAR Reading Assessment Standardized Reading Inventory Test of Early Math Ability Test of Early Reading Ability Wechsler Individual Achievement Test Wide Range Achievement Test Woodcock Johnson Tests of Achievement Basic Reading Inventory	Autism Diagnostic Interview Autism Diagnostic Observation Schedule Autism Behavior Checklist Autism Spectrum Screening Questionnaire Asperger's Syndrome Diagnostic Scale Assessment of Social and Communication Skills for Children with Autism Childhood Autism Rating Scale Checklist of Communicative Functions and Means for ASDs Gilliam's Autism Rating Scale Social Communication Questionnaire, formally Autism Screening Questionnaire WH- Question Comprehension Test for Students with ASDs Autism Diagnostic Interview	Achenbach Child Behavior Checklist Adaptive Behavior Assessment System AD/HD Comprehensive Teacher's Rating Scales AD/HD Rating Scales AD/HD Symptom Checklist Attention Deficit Disorders Evaluation Scale Behavior Assessment System for Children Behavior Disorders Identification Scales Behavioral and Emotional Rating Scales Behavior Rating Profile Behavior Rating Scale Burk's Behavior Rating Scale Conner's Rating Scales Differential Test of Conduct & Emotional Problems Early Childhood Behavior Scales Functional Assessment & Intervention System Preschool Behavior Checklist Scales of Independent Behavior Tests of Variables of Attention Vineland Adaptive Behavior Scales

Note. From *Buros Institute of Mental Measurements: Test Reviews Online* and **Educational Testing Service (ETS) Test Link: SydneyPLUS Knowledge Portal.*

Table I1

Categories of assessment

Developmental	Language	Intelligence
Ages & Stages Questionnaire Battelle Developmental Inventory Bayley Scales of Infant Development Bracken Basic Concepts Scale Brigance Diagnostic Inventory of Early Development Brigance Early Preschool Screen Child Development Inventory Communication and Symbolic Behavior Scales Denver II Developmental Assessment of Young Children Learning Accomplishment Profile Merrill-Palmer Scales of Development Peabody Developmental Motor Scales School Function Assessment Symbolic Play Scale Transdisciplinary Play-Based Assessment Wisconsin Behavior Rating Scale	Comprehensive Assessment of Spoken Language Expressive One Word Picture Vocabulary Test Language Processing Test Language Sampling Analysis Oral & Written Language Scales Peabody Picture Vocabulary Test Preschool Language Scale Rossetti Infant Toddler Language Scale* Test of Early Written Language Test of Early Language Development Test of Language Competence Test of Language Development Test of Semantic Skills* Test of Written Language Token Test for Children WORD test of Expressive Vocabulary & Semantics	Boehm Test of Basic Concepts Cattell Infant Intelligence Scale Kaufman Brief Intelligence Test Leiter International Performance Scale Stanford Binet Intelligence Scales Test of Nonverbal Intelligence Test of Problem Solving Wechsler Abbreviated Scale of Intelligence Wechsler Adult Intelligence Scale Wechsler Preschool and Primary Scale of Intelligence Woodcock Johnson Test of Cognitive Abilities Wide Range Assessment of Memory & Learning

Note. From *Buros Institute of Mental Measurements: Test Reviews Online* and **Educational Testing Service (ETS) Test Link: SydneyPLUS Knowledge Portal.*

Table I1

Categories of assessment

Neuropsychological	Personality	Sensory Motor	Speech and Hearing
California Verbal Learning Test	Children's Depression Inventory	Beery-Buktenica Developmental Test of Visual-Motor Integration	Communication Activities of Daily Living
Child Memory Scales	Culture-Free Self-Esteem Inventory	Bender Motor Gestalt Test	Clinical Evaluation of Language Functioning
Comprehensive Trail Making Test	House-Tree-Person	Bruininks-Oseretsky Test of Motor Proficiencies	Comprehensive Test of Phonological Processing
Delis-Kaplan Executive Function System	Joseph Preschool and Primary Self-Concept Screening	Developmental Test of Visual Perception	Goldman-Fristoe Test of Articulation
Rey Complex Figure Test	Politte Self-Concept Q-sort	Erhardt Hand Functional Assessment	Phonic Articulation Test
Short Category Test	Personality Inventory for Children	Grooved Pegboard Test	Receptive Expressive Emergent Language Scale
Wisconsin Card Sort Test	Personality Inventory for Youth	Motor-Free Visual Perception Test	Structured Photographic Articulation Test
		Sensory Integration Inventory	Test of Auditory Perceptual Skills
		Sensory Profile	Test of Auditory Reasoning and Processing Skills
		Test of Gross Motor Development	Test of Auditory Comprehension
		Test of Visual-Perceptual Skills	Test of Pragmatic Language

Note. From *Buros Institute of Mental Measurements: Test Reviews Online* and **Educational Testing Service (ETS) Test Link: SydneyPLUS Knowledge Portal.*

Appendix J: Categories of assessment by professional setting

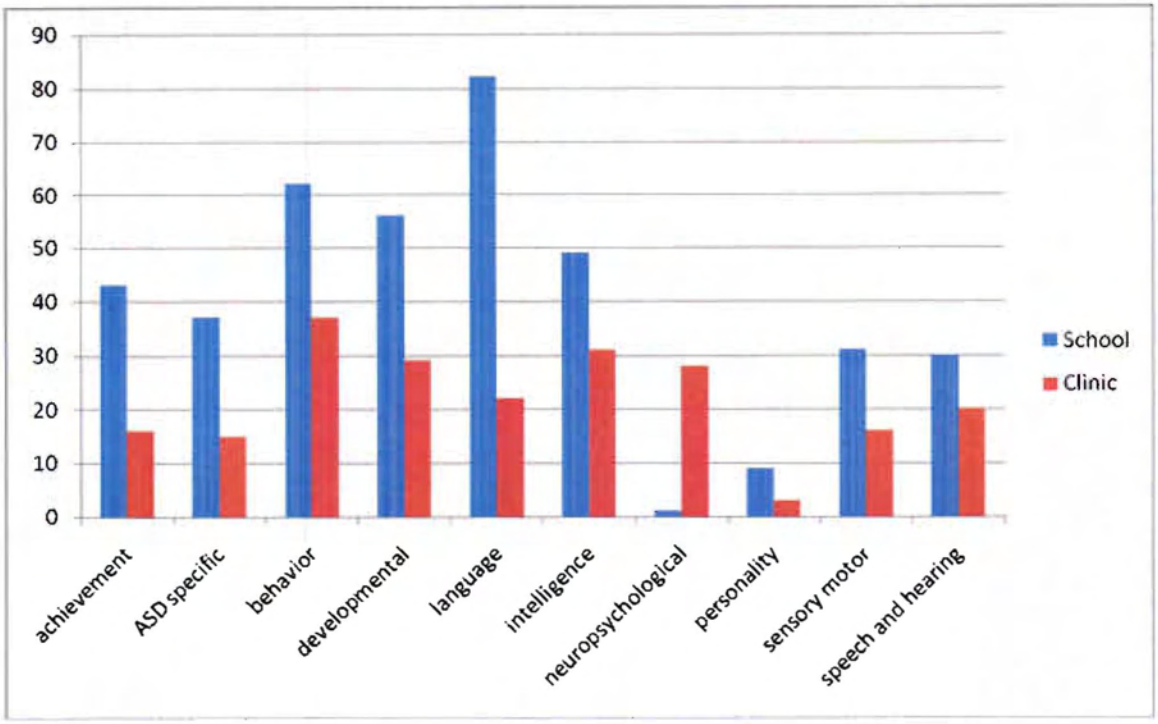

Figure 1J. Total number of assessments per category by professional setting.

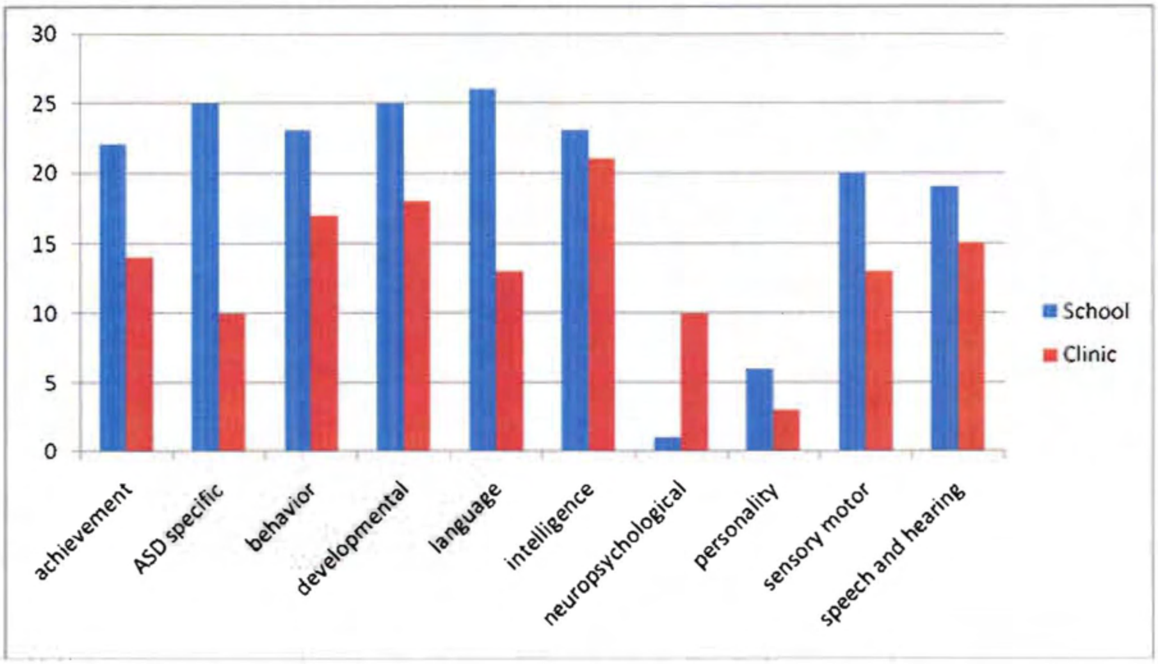

Figure 2J. Number of reports including assessment category by professional setting.

Appendix K: Chi-square calculations for categories of assessment by professional setting

Table K1

Achievement assessments by professional setting

	Clinic	School	Total
Achievement testing	14	22	36
No achievement testing	20	12	32
Total	34	34	68

$\chi 2 = 4.048$, df = 1, $p < .05$

Table K2

ASD specific assessments by professional setting

	Clinic	School	Total
ASD-specific testing	10	25	35
No ASD-specific testing	24	9	33
Total	34	34	68

$\chi 2 = 13.247$, df = 1, $p < .05$

Table K3

Behavior assessments by professional setting

	Clinic	School	Total
Behavior testing	17	23	40
No behavior testing	17	11	28
Total	34	34	68

$\chi 2 = 2.186$, df = 1, $p > .05$

Table K4

Developmental assessments by professional setting

	Clinic	School	Total
Developmental testing	18	25	43
No developmental testing	16	9	25
Total	34	34	68

$\chi 2 = 3.01$, df = 1, $p > .05$

Table K5

Language assessments by professional setting

	Clinic	School	Total
Language testing	13	26	39
No language testing	21	8	29
Total	34	34	68

$\chi 2 = 10.161$, df = 1, $p < .05$

Table K6

Intelligence assessments by professional setting

	Clinic	School	Total
Intelligence testing	21	23	44
No intelligence testing	13	11	24
Total	34	34	68

$\chi 2 = 0.258$, df = 1, $p > .05$

Table K7

Neuropsychological assessments by professional setting

	Clinic	School	Total
Neuropsychological testing	10	1	11
No neuropsychological testing	24	33	57
Total	34	34	68

$\chi 2 = 8.785$, df = 1, $p < .05$

Table K8

Personality assessments by professional setting

	Clinic	School	Total
Personality testing	3	6	9
No personality testing	31	28	59
Total	34	34	68

$\chi 2 = 1.153$, df = 1, $p > .05$

Table K9

Sensory motor assessments by professional setting.

	Clinic	School	Total
Sensory motor testing	13	20	33
No sensory motor testing	21	14	35
Total	34	34	68

$\chi 2 = 2.885$, df = 1, $p > .05$

Table K10

Speech and hearing assessments by professional setting.

	Clinic	School	Total
Speech and hearing testing	15	19	34
No speech and hearing testing	19	15	34
Total	34	34	68

$\chi 2 = 0.941$, df = 1, $p > .05$

Appendix L: Diagnosis of ASD by professional setting

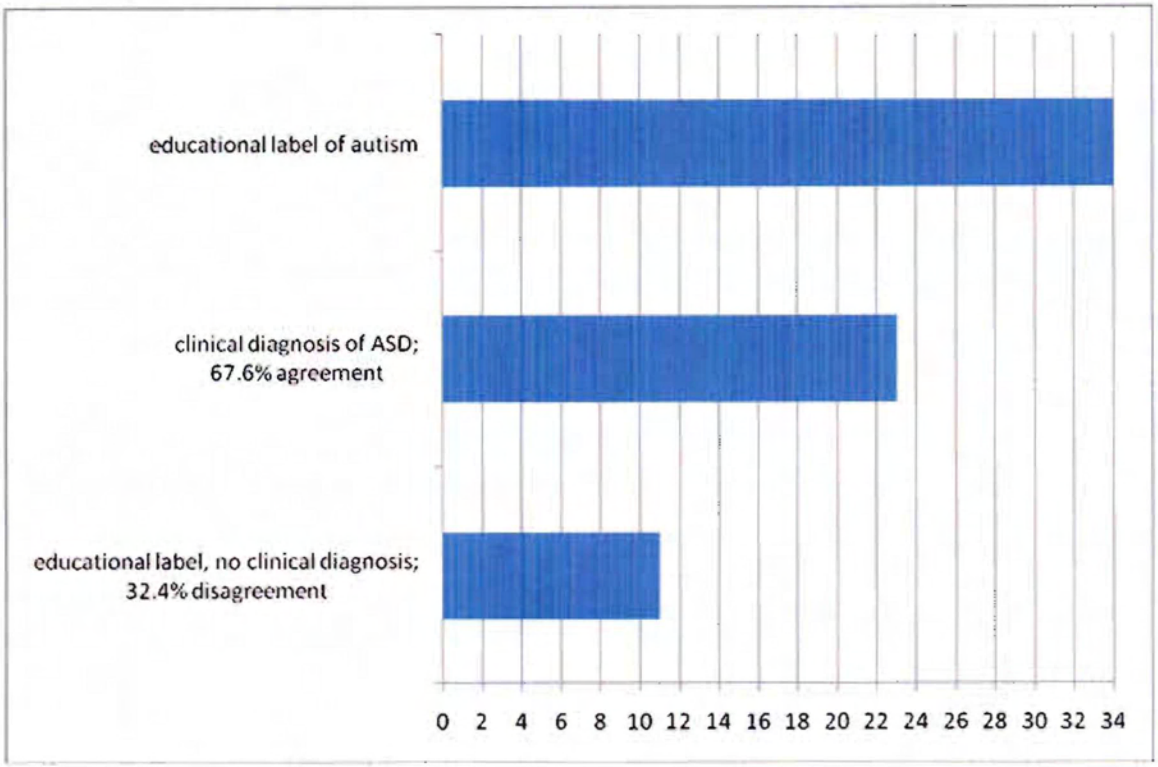

Figure 1L. Diagnosis of ASD by professional setting.

Appendix M: Chi-square calculations for diagnosis of ASD by professional setting

Table M1

Diagnosis of ASD by professional setting.

	Clinic	School	Total
Diagnosis of ASD	22	34	56
No diagnosis of ASD	12	0	12
Total	34	34	68

$\chi 2 = 14.571$, df = 1, $p < .05$

Appendix N: Recommendations by professional setting

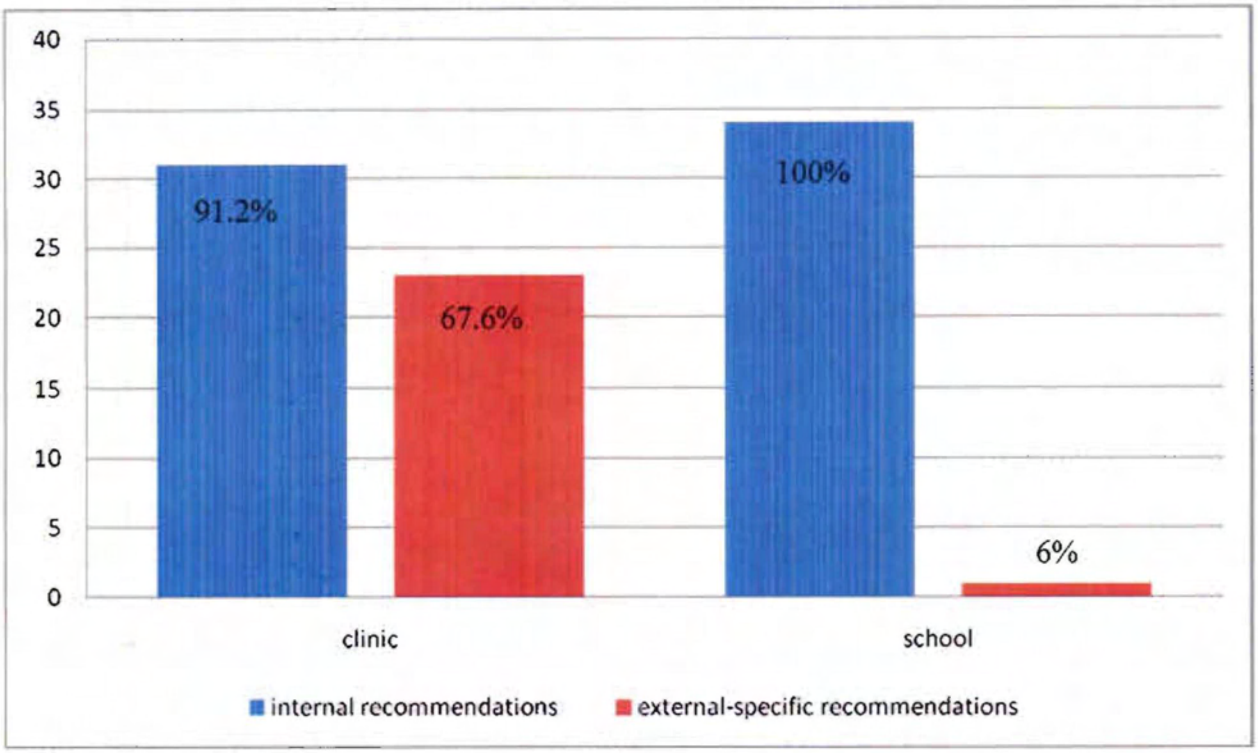

Figure 1N. Recommendations by professional setting.

Appendix O: Reference to alternative setting by professional setting

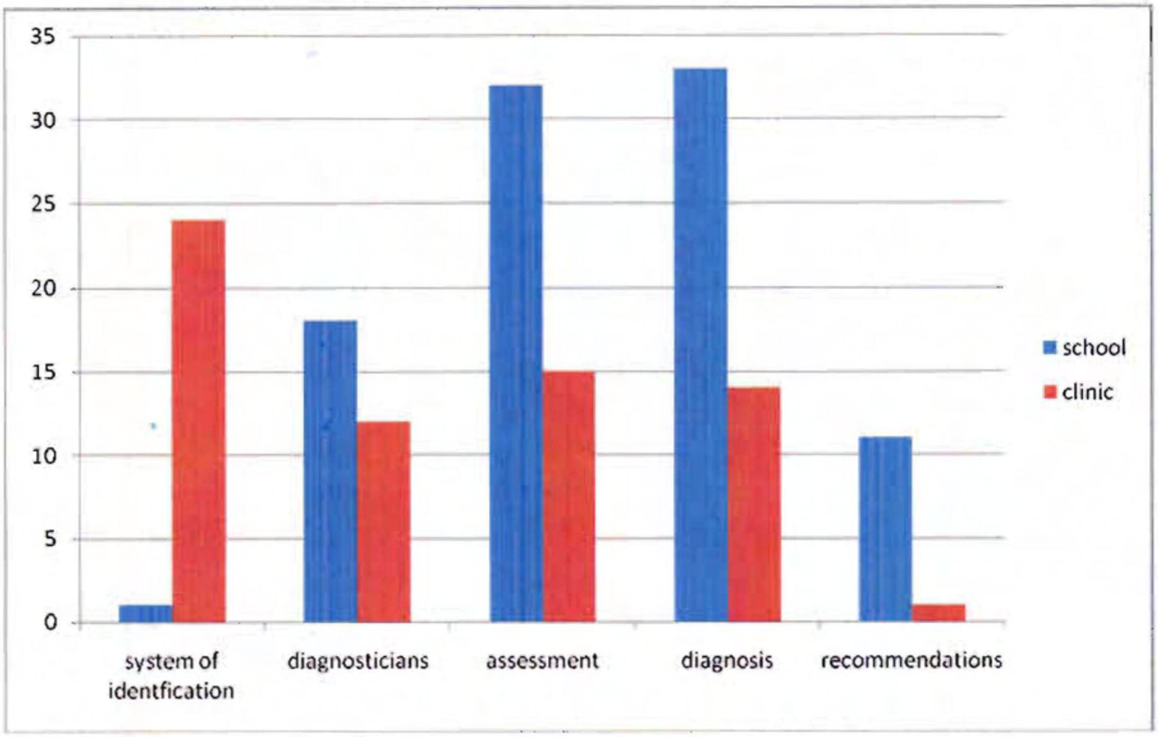

Figure 1O. Reference to alternative setting by professional setting.

Appendix P: Chi-square calculations for reference to alternative setting

Table P1

Reference to alternative setting's system of identification by professional setting

	Clinic	School	Total
Reference to system of identification	24	1	25
No reference	10	33	43
Total	34	34	68

$\chi 2 = 33.462$, df = 1, $p < .05$

Table P2

Reference to alternative setting's diagnosticians by professional setting

	Clinic	School	Total
Reference to diagnosticians	12	18	30
No reference	22	16	38
Total	34	34	68

$\chi 2 = 2.147$, df = 1, $p > .05$

Table P3

Reference to alternative setting's assessment by professional setting

	Clinic	School	Total
Reference to assessments	15	32	47
No reference	19	2	21
Total	34	34	68

$\chi 2 = 19.911$, df = 1, $p < .05$

Table P4

Reference to alternative setting's diagnosis by professional setting

	Clinic	School	Total
Reference to diagnosis	14	33	47
No reference	20	1	21
Total	34	34	68

$\chi2 = 28.781$, df = 1, $p < .05$

Table P5

Reference to alternative setting's recommendations by professional setting

	Clinic	School	Total
Reference to recommendations	1	11	12
No reference	33	23	56
Total	34	34	68

$\chi2 = 10.119$, df = 1, $p < .05$