Asperger’s Syndrome:
Definition, Differentiation, Diagnostic Criteria,
Co-Morbid Conditions and Assessment Tools
A Research Paper
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By:
Kathleen Bischel Beddow
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Preface

My interest in the Pervasive Developmental Disorder called Asperger’s Syndrome began in the summer of 1994 when I discovered the definition for Asperger’s in the DSM-IV. I knew immediately that this was the condition that my son has and the diagnostic criteria explained the challenges he had been experiencing and the struggles these challenges caused him and his family. He was twelve years old.

At the time, many medical professionals were not aware of Asperger’s, and the condition was not well understood even by those who had become aware of the diagnosis. The only assessment used was the criteria in the DSM-IV, and there were few interventions or treatment plans available. When I began researching Asperger’s, it was possible for me to read all the available resources on the Internet, a feat no longer possible. Information on Asperger’s has exploded in volume not only on the Internet and in magazine articles, but in professional journals as well.

While we do know much more about Asperger’s now than when it first became a separate diagnosis in the DSM-IV, we still do not know most of the critical information needed to truly understand it and all its complexities. We do not know the cause, and without that knowledge, it is impossible to find a cure. Knowing when intervention might halt or reverse the development of the brain disorder is still unknown. We know the characteristics of the disorder, but we still do not understand how the symptoms and behaviors may manifest uniquely in different individuals. There is no standard, uniformly administered assessment tool, and that results in a wide spread of diagnostic criteria. And because we do not have definitive diagnostic tools for this neurological disorder, it is very difficult to compile statistics.
What we do know is that the number of children and adolescents diagnosed with Asperger’s has been rising in an alarmingly fast rate. We know that there are many thousands of adults who are living with undiagnosed Asperger’s. And we do know that while many people with Asperger’s manage to live successful lives, there are many, many more that do not.

It is not only the afflicted individual who is impacted by Asperger’s. Parents, siblings, extended family, neighbors, friends, teachers and community systems all become involved to some extent when a loved one or a student or a friend struggles with the disorder. We develop programs, we prescribe medications, and we create special classrooms for the children and adolescents and it is still not enough. As they age the chance that their situation may worsen is great for we abandon or ignore the adults, as we have little to offer them.

My hope is that with this paper and the presentation that grew out of this research, therapists and mental health providers will have a greater awareness of the disorder and the complexities involved with accurate diagnosis, and skilled intervention and treatment. With more understanding may come additional advocacy that may make a difference in how those with Asperger’s are treated in the future.
Abstract

Asperger’s Syndrome is a neurological disorder that falls under the categories of Autism and Pervasive Developmental Disorders. Assessment and treatment of Asperger’s is difficult because of the lack of a definitive assessment tool and understanding of the etiology of the disorder. Several factors contribute to the challenges of diagnosis and treatment; the absence of a definitive assessment instrument, the prevalence of co-morbid conditions that cloud symptoms, the pervasive nature of the disorder that is responsible for the myriad ways the impairments may present, the lack of consensus among mental health professionals of what symptoms actually define Asperger’s Syndrome, and its unique and complex impairments. The number of individuals diagnosed is growing, and further research is needed to discover the etiology and understand the disorder.
Introduction

The term Asperger’s Syndrome or Asperger Syndrome (AS) has become well known since the inclusion of Asperger’s as a separate diagnosis in the 1993/94 edition of the DSM-IV. The confluence of several factors contributed to the growth in recognition:

(1) The Decade of the Brain project from 1990 through 1999 provided research money that encouraged the exploration of the human brain and its diseases. The project was sponsored by the Library of Congress and the National Institute of Mental Health and declared in 1990 by Presidential Proclamation 6158 to enhance public awareness of the benefits to be derived from brain research (Library of Congress, 2000),

(2) The explosion of the use of computers and the Internet during that same decade made it possible for millions of people to learn about brain disorders and pathological conditions previously unknown to them, and

(3) The inclusion of Asperger’s in the 1993/1994 DSM-IV as a separate diagnosis under the previously known category of Autism raised awareness that in many cases children, adolescents and adults had been undiagnosed or misdiagnosed with other conditions that were actually the Autistic Disorder named Asperger’s.

The criteria in the DSM-IV were specific but wide-ranging and from the beginning of its inclusion, there have been questions about how AS fits in the Autistic criteria. The controversy over the separation of Asperger’s from Classic Autism or Autistic Disorder (AD) and from the lesser-known High Functioning Autism (HFA) is an ongoing discussion among researchers,
medical professionals, mental health providers, educators, parents, and individuals diagnosed with an Autistic Spectrum disorder.

In order to provide a background of some of the factors that contribute to the failure to resolve the issue, the writer will provide information in this paper on the history of the original identification of Autism and Asperger’s Syndrome, the current understanding of the differences between the disorders, criteria and assessment tools used to differentiate between them, prevalence rates, and common co-morbid conditions. In addition, a brief listing of current intervention and treatments used and a conclusion with suggestions for future considerations is included.

To understand Asperger’s Syndrome it is necessary to know what the terms used to describe Asperger’s mean and how Asperger’s is distinguished from two other terms sometimes used interchangeably: Classic Autism and High Functioning Autism. Autism, Asperger’s and High Functioning Autism are labels used to describe separate disorders that are also considered to be part of a larger Autistic Spectrum. Although High Functioning Autism is not defined separately in the DSM-IV-TR as is Classic Autism and Asperger’s Syndrome, it is thought by many professionals to be either a sub-type of the Autistic disorders or to be the same as Asperger’s with slightly more deficits. AD, AS and HFA are considered to be on the Autistic Spectrum and are also classified as Pervasive Developmental Disorders (PDD). Pervasive Developmental Disorder is also a general term used to describe a group of complex developmental brain disorders. The other Pervasive Developmental Disorders not considered in this paper are Rett’s Disorder, Childhood Disintegrative Disorder and Pervasive Developmental Disorder Not Otherwise Specified (PDD-NOS) (American Psychiatric Association, 2000).

The difficulty comes in trying to separate out the three disorders of AD, AS and
HFA absolutely, as they are thought to be separate in some ways, and yet have so many similarities that many researchers and mental health professionals think of them as possibly the same disorder with different levels of severity. The word “Autism” is used to define a separate diagnosis from Asperger’s and also as a term for a larger set of neurological conditions that includes Classic Autism, Asperger’s Syndrome and High Functioning Autism. Autism, Asperger’s and High Functioning Autism are all referred to as Autism Spectrum Disorders (ASD) (Autism Speaks, 2010).

The Autistic Spectrum refers to the range of abilities and impairments that can appear in different combinations and in varying degrees of severity. AD, AS, and HFA are placed on this spectrum based on a variety of criteria that define abilities and impairments. Individuals with the same diagnosis can share certain patterns of behavior while exhibiting a wide range of skills and abilities. The spectrum ranges from the lower functioning Classic Autism (AD) at one end to the highest functioning Asperger’s (AS) at the upper end of the spectrum, with High-Functioning (HFA) appearing somewhere below AS. Within the spectrum the variance in abilities and impairments mean that not all individuals with Classic Autism, High Functioning Autism or Asperger’s Syndrome are clustered in static positions on the spectrum. In addition to use of the word “spectrum” to expand understanding of the autistic conditions, the word “syndrome” for Asperger’s and Autism means that these disorders are defined by a collection of characteristics.

AD, AS, HFA and the Autistic Spectrum are under the larger umbrella known as the Pervasive Developmental Disorders (PDD). PDD begins in infancy or early childhood, has a steady course without remission or relapse, and has impairments that result from maturation-related changes in various systems of the brain (World Health Organization, 2010). Pervasive Developmental Disorders are characterized by severe and pervasive impairment in three main
areas of development: reciprocal social interaction skills; communication skills; or stereotyped behavior, interests, and activities (American Psychiatric Association, 2000). These three areas of impaired development present in the Autistic Disorders are defined as the triad of impairments (Wing, 1981). The expression of the triad’s impairments varies greatly depending on the particular disorder and the degree of impairment. The impairments may also present in distinct ways depending on the developmental stage or intellectual ability of the individual. These neurological impairments are present throughout life and while they may vary in degree or intensity, they do not appear and disappear like the delusions of schizophrenia or the mood swings of bi-polar disorder. Unlike other neurological disorders that affect the way the brain functions and that may appear as one or more episodes, Autism, as a Pervasive Developmental Disorder, is a condition that does not go away (Autism Society, 2010, Kennedy, 2002).

History

When questions arise concerning the recent increase in numbers of autism cases and how that increase may be caused by current factors, it becomes important to recognize that autism is not a new disorder caused by 21st century vaccines, environmental causes or toxins. Autism may have always existed in human beings but was not identified until the middle of the 1900’s. Stories about fictional and non-fictional characters such as Brother Juniper, the Wild Boy of Aveyron and Sherlock Holmes (Wing, 2002) tell us that there were individuals who exhibited traits of Asperger’s and Autism prior to and without the formal diagnosis.

The history of the formal identification and diagnosis of Autism began with the work of an Austrian psychiatrist, Leo Kanner (1894-1981), who immigrated to the United States in 1924. The publication of his work in 1943 “Autistic Differences of Affective Contact”, described a group of patients who from an early age appeared aloof or indifferent to other people, resisted
change, and engaged in repetitive activities. As these children grew, Kanner observed an absence of imaginative or make-believe play, a fascination with objects rather than people, a lack of language and the intention of communication.

The first paper written about children with the patterns of behavior later described by Hans Asperger was published in 1926 in a German journal by a Russian woman psychiatrist, G.E. Ssucharewa and translated into English by Sula Wolff in 1996. Ssucharewa used the term “schizoid personality disorder of childhood” to describe the condition we know as Autism (Wing, 1981).

Less than a year after Kanner’s 1943 publication on Classic Autism, Asperger published a paper detailing his work with boys who had normal intelligence but lacked the ability to integrate themselves socially. These boys had poor nonverbal communication skills, failed to demonstrate empathy with their peers and were physically clumsy because of difficulty with coordination. Their speech was pedantic and formal, their all-absorbing interest in a single topic dominated their conversations, and they experienced social isolation. He defined these behaviors as “autistic psychopathy” meaning autism (self) and psychopathy (personality disease).

Asperger’s observation of these children resulted in his 1944 paper “Autistic Psychopathy in Childhood”. Asperger believed that these “little professors” as he called them, would be capable of exceptional achievement and original thought later in life (Frith, 1991).

Asperger and Kanner were unaware of each other’s work at the time they wrote their seminal papers but both used the same term, “autistic” originally used by Eugen Bleuler in 1911. Bleuler used “autistic” to describe the extreme withdrawal from the outside world into the self in patients he saw and diagnosed this “autism” as the basic disturbance in schizophrenia (Frith, 1991). In the decade between 1951 and 1962 a German physician, Gerhard Bosch, worked as a
psychiatrist at Frankfurt University and published a monograph detailing five case histories of individuals with Pervasive Developmental Disorders. This work was translated into English eight years later in 1970 and was one of the first to establish German research on autism.

An English psychiatrist, Dr. Lorna Wing, attached the name of Asperger’s Syndrome to the condition of children in her case studies in her 1981 publication “Asperger’s Syndrome: a Clinical Account” (Wing, 1981). In 1991 Asperger’s work was translated into English by Uta Frith (Frith, 1991) and sets of diagnostic criteria were outlined by Gillberg and Gillberg (1989) and by Szatmari, Bremner and Nagy (1989) in the same year (Attwood, 1998). Subsequently the high functioning autistic condition named Asperger’s Syndrome was defined in the International Classification of Diseases (ICD-10) in 1992, and was included as a separate diagnosis in the Diagnostic and Statistical Manual of Mental Disorders in the 1993/1994 edition.

*Diagnosis and Assessment of Asperger’s*

There are no definitive biologic tests for identifying Asperger’s (Phetrasuwan, Miles and Mesibov, 2009). Observation by parents, caregivers, and teachers is most often the first indication that an individual is experiencing problematic differences that need intervention. The entrance into the diagnostic process for an individual generally begins with an assessment by a pediatrician or family physician. There is a growing effort by the Centers for Disease Control (CDC, 2010) to encourage family doctors and pediatricians to do a routine assessment of all children for Autistic Spectrum Disorders (Phetrasuwan et al, 2009). Steps to confirming Asperger’s begin by combining family history, medical history, academic concerns, behavior and social interactions, psychiatric indications and the observations of imaginative play in a child. Adolescents often are assessed for Asperger’s as a result of emotional, school or social behaviors that raise concern. Often these behaviors present as ADHD, bi-polar, depression, anger or
anxiety and the condition of Asperger’s is not discovered until detailed assessments are completed.

Assessment tools currently used to assess children, adolescents and adults for the presence of Autism, HFA and Asperger’s include the use of parent, teacher and family member observation checklists, rating scales, semi-structured interviews, structured interviews, questionnaires, tests and formal diagnostic criteria. Also used are intelligence tests, specific tests used to determine educational or intervention needs such as adaptive behavior, communication, play development, vocabulary or coping behaviors, tests of non-verbal intelligence, behavior scales, family aspects including stress index and parenting satisfaction, family adaptability and cohesion.

Since the inclusion of the disorder in the DSM-IV, 1993/1994, increasing numbers of children have been diagnosed with Asperger’s in the past 15 years. With the rise in numbers has also come the awareness that many individuals who are now adolescents and adults are living with undiagnosed Asperger’s. Adult individuals or their partners and family members are beginning to realize that they may have undiagnosed Asperger’s. They seek confirmation that their life-long difficulties in communication, especially their reciprocal social interaction skills, and their stereotyped behavior, interests, and activities are explained by the condition of Asperger’s. Many struggle with co-morbid conditions that have developed due to the undiagnosed Asperger’s or that have masked the condition of Asperger’s. Diagnosing underlying conditions such as depression or anxiety is essential as co-morbid conditions make the diagnosis of Asperger’s more difficult to determine. Additional assessment tools that rule out ADHD, depression, anxiety and other conditions that may either co-exist or mask Asperger’s are used to aid in the confirmation of Asperger’s.
Despite the fact that recent statistics from the National Autistic Society indicate that the numbers of individuals with Asperger’s Syndrome is greater than the individuals with Autism, there are no standardized diagnostic instruments specifically designed for AS (Howlin, 2000). Several assessment tools have been developed to diagnose Asperger’s, but frequently these tools are also used to identify Autism or High Functioning Autism and are not specific for the criteria for Asperger’s. Several of the instruments do measure pre-verbal Classic Autism but there are few reliable instruments that can distinguish specifically between Asperger’s and High Functioning Autism. The lack of differentiation in the instruments used for diagnosis is one result of the dearth of understanding and agreement about whether or not the two sub-types of Autism are actually different or are the same disorder with different ranges of impairments.

Diagnosis is also made more difficult because of the confusion from the lack of clear distinction between Autism and Asperger’s in the DSM-IV and the ICD-10. There is continued debate about whether High Functioning Autism is the same condition as Asperger’s, or is another sub-type of Autism with similarities to Asperger’s. How High Functioning Autism is categorized depends on which clinician is defining HFA. Asperger’s presents additional challenges because individuals with Asperger’s frequently are very high functioning in the areas of language and depending on age, have made adaptations that can be misleading as to the diagnosis. Most often assessments for autism are used and if the individual is high-functioning and meets the DSM-IV-TR criteria for Asperger’s a diagnosis of Asperger’s is made although no definitive instrument confirmed the diagnosis.

Other difficulties in the use of assessment instruments and diagnostic tools are that many of the existing tools are costly, time-consuming to use, or are administered by professionals with inadequate training or supervision. There is also failure to apply best practice guidelines because
of the non-standardized instruments, and many parents are unable to sort out and provide the information needed to assist in the assessment (Williams, Atkins, and Soles, 2009). As much of the information needed for an accurate diagnosis comes from early observation of the child’s language development, behaviors, social interaction and type of play, diagnosis is challenging without a definitive instrument. Many of the instruments in use are intended for screening or as an aid in clinical diagnosis but not for diagnosis itself.

Because of disagreements among clinicians over the unclear criteria in the DSM surrounding language development and other criteria, a variety of assessment tools are needed to assist in the diagnosis of Asperger’s and Autism. The following assessment tools are currently the most frequent used to evaluate Asperger’s Syndrome:

1. Adult Asperger Assessment [AAA], Baron-Cohen, Wheelwright, Robinson & Woodbury-Smith, 2005. This assessment tool links two screening instruments, the Autism Spectrum Quotient (AQ) and the Empathy Quotient (EQ) and uses a more stringent set of diagnostic criteria than DSM-IV. It requires training.

2. Asperger’s Syndrome Diagnostic Interview [ASDI], Gillberg et al., 2001. This interview is based on the Asperger’s Syndrome Scale Questionnaire (ASSQ) and is used as an aid in clinical assessment and not as a diagnostic tool. The Asperger’s Syndrome Diagnostic Interview does not differentiate between Asperger’s and High Functioning Autism (Howlin, 2000). The ASDI can be used for children and adults and is specifically designed for clinical work in identifying AS and HFA. The ASDI has evolved through research and clinical experience over a period of many years (Wing and Gould, 2006).

Asperger is a semi-structured, investigator-based interview for caregivers of children and adults for whom autism or pervasive developmental disorders are possible diagnoses. Two studies (Lord, Rutter, LeCouter, 1994; Lord, Storoschuk, Rutter, Pickles, 1993) were conducted to assess the psychometric properties of the ADI-R. Reliability was tested among 10 autistic (mean age 48.9 months) and 10 mentally handicapped or language-impaired children (mean age 50.1 months), and validity was tested among an additional 15 autistic and 15 non-autistic children. Results indicated the ADI-R was a reliable and valid instrument for diagnosing autism in preschool children. Inter-rater reliability and internal consistency were good and inter-class correlations were very high. The ADI-R is considered by some professionals in the field as a measure of high diagnostic accuracy. It takes several hours to administer and score. The ADI-R is recognized as one of the better-standardized instruments currently available for establishing a diagnosis of autism. An update on the scoring procedure is planned in order to reflect the DSM-IV-TR criteria (California Departments of Education and Developmental Services, 1997). The Autism Diagnostic Interview-Revised is useful for adults who meet the criteria for abnormalities in reciprocal communication (Howlin, 2000). The ADI-R complements the ADOS and has excellent reliability and validity (Williams et al, 2009). Training courses are in place to teach professionals how to administer and evaluate the results in a consistent manner (Wing and Potter, 2002).

4. Autism Diagnostic Observation Schedule-Generic [ADOS-G]; Lord et al., 1999 (Williams et al, 2009). The ADOS is an important clinical tool with a strong research base. The ADOS uses systematic methods of observation and assessment. The ADOS is considered the “gold standard” for assessing and diagnosing autism and pervasive...
developmental disorder. It can be used with all ages, verbal or non-verbal and can be administered within 35 to 40 minutes.

5. The Diagnostic Interview of Social and Communication Disorders [DISCO], Wing and Potter, 2002. The DISCO is a diagnostic interview that covers all autistic spectrum disorders. It is longer to administer than other instruments such as the AAA or the ASDI, but provides more information about skills, disabilities and needs of the individual concerned (Wing, Gould, 2006). The DISCO gathers information on history and behavior patterns. Training courses are in place to teach professionals how to administer and evaluate the results in a consistent manner (Wing and Potter, 2002).


7. International Classification of Diseases [ICD-10]. The DSM-IV-TR and the ICD-10 both distinguish the condition of Asperger’s Syndrome using specific criteria.

8. Wechsler Intelligence Scales. (WPPSI-R and WISCIII). This intelligence test can be used for children and adults with High Functioning Autism and Asperger’s Syndrome. The Wechsler is in conjunction with other assessments, including observation, neuropsychological, behavioral, and cognitive used to determine the functioning level of individuals (Minshew, Turner and Goldstein, 2005).

Autism, Asperger’s and High Functioning Autism are on a spectrum due to the similarities of the criteria for each, but because they are developmental disorders they also have many differences. Behaviors in developmental disorders manifest differently depending on a numbers of variables present in each individual, and their borders merge making it challenging,
if not impossible, to separate absolutely from each other. Establishing precise criteria for any syndrome defined solely on behavior symptoms is difficult or impossible (Wing, 2005).

Additionally, various professionals look at the symptoms differently. VanBergeijk and Shtayermman (2005) explain the range of professional viewpoints this way: “Occupational therapists often conceptualize Asperger’s as “Sensory Integration Dysfunction” given the focus of this profession on how a child moves in his or her world. Children who have sensory integration dysfunction are characterized as having gravitational insecurity, poor proprioceptive sense, and either under or over sensitivity to olfactory, tactile, auditory and/or visual stimuli. They have difficulty learning and dealing with peers.

Psychiatrists may use the term “Schizoid Personality Disorder” to refer to individuals who have AS. Under the Schizoid Personality Disorder label, these persons have social isolation, bizarre preoccupations, and odd speech. They are perceived as strange, eccentric, cold, or aloof. Neuro-psychologists use the term Non-Verbal Learning Disability (NLD). Persons with NLD have “significant deficits in social perceptions, social judgment, and social interaction skills, marked deficits in nonverbal problem solving and outstanding relative deficiencies in mechanical arithmetic compared to proficiencies in reading and spelling. Speech pathologists use the term Semantic Pragmatic Disorder (SPD). Individuals with SPD exhibit similar social interaction deficits as an individual with Asperger’s Syndrome” (VanBergeijk and Shtayermman, 2005).

Because of these challenges, no one single testing instrument, no matter how reliable or thoroughly researched, can be used in isolation to determine diagnosis. Currently, the only way to confirm a definitive diagnosis is by using the DSM-IV-TR criteria for Asperger’s.
Co-morbid conditions

It is highly likely that an individual with AS will also have a co-morbid mental health diagnosis. In a study done by Ghaziuddin, Weimer-Mikhail, and Ghaziuddin (1998), 65% of 35 AS patients had an additional psychiatric diagnosis (VanBergeijk and Shtayermman, 2005). Tourette’s Syndrome, ADHD, anxiety, depression and obsessive compulsive disorder are among the more common psychiatric conditions found to co-exist with AS. Tourette’s Syndrome (TS) in the general population is 1 per 169 people (Ringman & Jankovich, 2001) and the prevalence of Tourette’s in the Asperger population is four times higher. Klin and Volkmar (1997) found in their study of 99 individuals with AS that 28% of their sample exhibited ADHD (VanBergeijk and Shtayermman, 2005). Ghaziuddin et al’s report in 1998 found that twenty-five percent of the children had a diagnosis of depression, and fifty-three percent of the adolescents and adults were diagnosed as depressed (VanBergeijk and Shtayermman, 2005).

Psychiatrists are becoming aware that the high functioning autistic disorder of Asperger’s can underlie psychiatric conditions. The behaviors and characteristics of Obsessive-Compulsive Disorder, Schizoid-affective disorder, Schizophrenia, bi-polar, ADHD, anxiety, depression and other personality disorders can mask the underlying AS. This is true for individuals with Asperger’s regardless of age. The characteristics of Oppositional Defiant Disorder in a child, adolescent or adult may have been caused by the compulsive rituals relied on for calming by the underlying undiagnosed Asperger’s condition. The behaviors seen in AS can also appear similar to the criteria used for other conditions such as ADHD, bi-polar or depression. Asperger’s can look like ADHD at 7 years old, as ADHD and AS share similar features as well as being diagnosed in early childhood. AS can look like bi-polar disorder at 11 years old, and may be masked by depression at any age (Kennedy, 2002.).
Environmental stressors such as social isolation, higher levels of frustration associated with social interactions and unpredictability of the social environment for individuals with AS may exacerbate their susceptibility to mood and anxiety disorders. Depression is frequently a result of failed social attempts or confusion over the myriad and ever-changing social rules. Ghaziuddin et al. (1998) found that adolescents and adults were more likely to be diagnosed with depression than any other co-morbid disorder (VanBergeijk and Shtayermman, 2005). Before Asperger’s had a name, many people who were referred to psychiatric hospitals and clinics were misdiagnosed as having one or more of a variety of psychiatric disorders (Wing, 2005). Frequently those misdiagnosed were said to have schizoid and schizo-typal personality disorder (Wing, 2005).

Other co-morbid conditions that are present may take precedence over diagnosing Asperger's. Associated conditions such as epilepsy, learning disabilities or severe depression may lead the clinician to focus on these conditions instead of the co-morbid condition of Asperger’s. The failure of professionals to correctly identify and intervene with treatment can contribute to the frustration and confusion that can lead to the development of more severe social disabilities and negative behaviors.

Statistics

Controversy over definitions of subgroups and prevalence of autistic spectrum disorder has increased (Wing, 2005). The prevalence of AS and ASD have been rising rapidly since the inclusion of Asperger’s as a separate diagnosis in the DSM-IV and the ICD-10 in the early 1990’s. This rise is controversial due to a number of factors: the methods used to diagnose AS, HFA and ASD are not standardized; the validity and reliability rates in instruments used to identify AS are variable; and assessment tools may measure classic autism or Asperger’s or HFA
and may not differentiate between the disorders. The results for AS or HFA may be combined in the data for ASD making it difficult to know what data apply consistently to AS. Determining what the actual rates of all of the ASD’s, or each one individually, is made more challenging by the lack of clearly defined criteria, measurement tools and procedures that separate the disorders. The criteria for each disorder is still unclear, and the professionals who perform the assessments do not always have the same training in interpreting the results. This means that the actual numbers of individuals with ASD, AS, or HFA differ according to the variables.

Before the 1990’s the prevalence of autism was thought to be 1 in 10,000 (VanBergeijk and Shtayermman, 2005). Lorna Wing found the numbers in 1993 from sixteen epidemiological studies to vary from 3.3 to 16.0 per 10,000 (Wing, 1993). Estimates of the prevalence of Asperger’s Syndrome in 2001 by several researchers (Bertrand, Mars, Boyle, Bove, Yeargin-Allsop, & Decoufle, 2001; Frombonne, 2001) were between 0.3 to 67 per 10,000 children (VanBergeijk and Shtayermman, 2005). In 2002, Lorna Wing and David Potter reported that the range of rates based on the DSM-IV/ICD-10 criteria for autism was from 3.8 to 60.0 per 10,000. The Autism Society of America currently gives the statistics for the prevalence of Autistic Spectrum Disorders as 1 in 110. This statistic is based on the National Children’s Health Survey done with 78,00 parents in 2007 and published in The Journal of Pediatrics, October 5, 2009. The Centers for Disease Control (CDC) estimates the same number: 1 in 110 children have an Autistic Spectrum Disorder. Although the actual numbers of individuals who fall within each category of an ASD remains unclear, we know the numbers are growing, and the individuals who fall under the umbrella of ASD is substantial.

If there are large numbers of children with ASD, and autism and Asperger’s are
not new disorders, where are the adults with ASD? Lorna Wing and David Potter cite a study done by I. Torben, et al. in 1999 that followed 341 children with ASD for 24 years until the ages of 48 years. Torben found that the mortality rate was 3.5%, almost double the expected rate for the general population of the same age (Wing, Potter, 2002). As it is only since the DSM-IV/ICD-10 in the early 1990’s that the ASD diagnosis became well known, the possible explanation for the lack of adults as of yet is that they remain largely unrecognized, misdiagnosed and undiagnosed. Naming the condition is of vital importance as it has helped many with the syndrome to greater understanding of their skills and disabilities (Wing, 2005).

The believed prevalence of ASD, as large as it is currently, possibly does not reflect the true numbers of individuals living with ASD. In 2007, the Centers for Disease Control estimated that 400,000 families, parents, grandparents, siblings and extended family are impacted by ASD (CDC, 2010).

Explaining the rise in the number of individuals with autism is more difficult. The MMR vaccine (measles, mumps and rubella) has been investigated and dismissed by researchers and scientists as the cause of autism. Possible environmental causes such as toxins, environmental pollutants or antibiotics have been investigated and continue to be under scrutiny even though not one of these possible environmental causes has been confirmed by independent scientific investigation.

Changes in diagnostic criteria, development of the concept of the wide autistic spectrum, different methods used in research, growing awareness and knowledge among parents and professional workers and the development of specialist services that bring attention and participants, as well as the possibility of a true increase in numbers all are thought to play a role in the increase in reported cases. The strongest evidence so far is that complex genetic factors
Asperger play a major role in etiology (Wing, 2002). How genes may interact with environmental factors is as yet unknown.

**Intervention and Treatment**

Early intervention for children with ASD can help them improve their social, communicative, and cognitive skills, and this has led to a push for early and accurate diagnosis (Williams et al, 2009). Accurate diagnosis is essential for parents and professionals to provide suitable intervention based not only on the individual’s impairments but also on their strengths.

The triad of impairments of reciprocal social interaction skills, communication skills, or stereotyped behavior, interests, and activities present in Autism have an impact in several areas of functioning and these impairments need to be addressed in children, adolescents and adults in order to assist the person with ASD. This is made more difficult by the very nature of the disorder; pervasive, developmental, complex, behavioral, with cognitive challenges and unique manifestations. With AS, the intellectual ability can confound early diagnosis of a problem and measuring social skills can have such a large scale as to throw doubt into many diagnoses.

An emphasis on the unique needs of the individual should be the organizing principle of developing intervention and treatment (VanBergeijk and Shtayermman, 2005). Treatment needs to focus on learning social skills, negotiating the complex and frequently confusing social environment, attending to learning difficulties, communication struggles, problematic behaviors that develop out of anxiety and depression, and stabilizing the home environment. Supporting and educating parents and siblings can provide assistance for the family to cope better with the demands of the disorder, and give much needed help to the individual with AS. Areas of deficits that require attention are:
• Social cognition and social skills—the ability to understand other people’s behavior and social cues. The lack creates high social anxiety.

• Theory of mind—the ability to understand what another might be thinking. Simon Baron-Cohen (2004) describes this de-coding as “mind-reading” and a game of social chess that is intuitive and does not, in contrast to the manner used by AS individuals typically involve laborious logical reasoning.

• Empathy—the ability to feel compassion for another, to “put oneself in another’s shoes.”

• Central coherence—the ability to comprehend the “big picture” and not focus exclusively on details.

• Executive functioning—the ability to organize and carry out several things at once, the ability to use new strategies, the ability to control impulses. Compulsivity, perseveration, perfectionism, and motor control may be impacted by deficits in executive functioning among others.

• Inflexible thinking and rigid adherence to rituals and rules—the need to create systems, such as rote memorization, for understanding. The inability to abstract and infer simple social rules may arise from the lack of central coherence and theory of mind.

A variety of techniques have been developed to help the individual with AS function in a school, home and other social settings:

• Social skills training using a technique called “Social Stories” developed by Carol Gray. Social skills groups with other individuals of the same age have shown to be helpful.

• Individual therapy. Cognitive and behavioral therapies are most appropriate as it has not been shown that insight therapies are successful with individuals with AS.
• Family therapy. Support and understanding not only of the needs of the individual with AS but the needs and feelings of parents and siblings.
• Cognitive restructuring that corrects distorted ideas and dysfunctional beliefs.
• Teaching organizational skills and educational interventions.
• Coaching and providing techniques for self-monitoring, impulse control and decision-making can help with specific deficits such as executive functioning.
• Occupational therapy can assist the individual with sensory challenges, and may focus on play, social, academic and attention challenges.
• Speech therapy. Speech therapy assists with understanding ways to communicate with others, it can strengthen reciprocal communication understanding and assist with learning how to moderate voice tone, affect, volume and other communication difficulties.
• Relaxation techniques, stress management and self-reflection activities help the individual recognize their internal state, monitor and reflect on their thoughts and may help to construct a new self-image (Attwood, 2007, Leppicello, 2008, VanBergeijk and Shtayermman, 2005).

Conclusion

Several researchers, (Wing and Gould, 2006, Minshew et al, 2005), make a case for the need for a more scientific approach in the field of autism and for a more detailed analysis of individual differences. Diagnostic criteria have preceded scientific validation of Asperger’s as separate from HFA and Autism. This lack of distinction continues to muddy the diagnostic waters and prevent a clear map of how to provide services specific to the disorder in question (Campbell, 2005). Lorna Wing suggests that until the sub groupings of autism become neurologically based and depend on underlying neuropathology, assessments are “putting the
cart before the horse” (Wing, 2002). Until that happens, an assessment instrument that covers the whole of the autistic spectrum, and therefore provides more detailed and comprehensive information, is needed to reach a definitive decision (Wing and Gould, 2006).

In addition to changes in how the disorder is diagnosed, a multidisciplinary approach is needed to involve all who diagnose, evaluate, educate, treat and live with the person with AS. Collaboration is essential given the individual manifestation of the disorder and the need for specialized services to address the specific needs of each individual with AS. Investigation and research need to include the adult population, not only in ordinary society, but also in prisons, mental hospitals, and eldercare facilities. And lastly, more research must be done to discover the etiology of Asperger’s and the Autistic Spectrum Disorders. Finding the cause of this devastating brain condition will lead to the proper intervention and treatment and to reaching and helping many to have more peaceful and full lives. Individuals with AS, HFA and AD deserve a commitment from all of us to continue to seek answers and healing to this confounding and mysterious brain condition.

In 1944 Hans Asperger said “With the type of personality disorder presented here we can demonstrate the truth of the claim that exceptional human beings must be given exceptional educational treatment, treatment which takes account of their special difficulties. Further, we can show that despite abnormality human beings can fulfill their social role within the community, especially if they find understanding, love and guidance” (Frith, 1991, p. 37).
## Appendix A  Comparison Chart

<table>
<thead>
<tr>
<th>Classic Autism</th>
<th>High-Functioning Autism</th>
<th>Asperger’s Syndrome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Based on the work of Leo Kanner.</td>
<td>Based on the work of Hans Asperger.</td>
<td>Asperger was a Viennese Physician.</td>
</tr>
<tr>
<td>Kanner was a Viennese Physician.</td>
<td></td>
<td>Asperger's paper defining Asperger’s Syndrome was “Autistic Psychopathy in Childhood”---1944.</td>
</tr>
<tr>
<td>Kanner’s Paper defining Classic Autism was “Autistic Differences of Affective Contact”---1943.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kanner immigrated to the United States and was working at Johns Hopkins when his paper was published.</td>
<td></td>
<td>Asperger remained in Austria throughout his life.</td>
</tr>
<tr>
<td>Kanner believed onset to be between birth and 30 months.</td>
<td></td>
<td>Asperger believed onset to be from the second year of life.</td>
</tr>
<tr>
<td>Must have a developmental delay in language. Pre-verbal or non-verbal.</td>
<td>No developmental delay in language. Abnormalities in language and communication. May be more severe than in AS. Skills may appear sophisticated but comprehension is limited.</td>
<td>No developmental delay in language. Abnormalities in language and communication. Skills may appear sophisticated but comprehension is limited.</td>
</tr>
<tr>
<td>---------------------</td>
<td>---------------------------------------------------------------</td>
<td>------------------------------------------------------------------</td>
</tr>
<tr>
<td>Severe degree of social isolation.</td>
<td>Range of social isolation.</td>
<td>Range of social isolation.</td>
</tr>
<tr>
<td>Lack of responsiveness to others.</td>
<td>Lack of ordinary and expected type of responsiveness to others. Difficulties in reciprocal dialogue.</td>
<td>Lack of ordinary and expected type of responsiveness to others. Difficulties in reciprocal dialogue.</td>
</tr>
<tr>
<td>May have attachment deficits or less attachment to family members and others than in AS or HFA. Attachments to objects rather than people.</td>
<td>Adequate attachment to family members. Desire for attachment to others is complicated by inappropriate and awkward approaches. Focus on areas of interest rather a person.</td>
<td>Adequate attachment to family members. Desire for attachment to others is complicated by inappropriate and awkward approaches. Focus on areas of interest rather a person.</td>
</tr>
<tr>
<td>Lower IQ, possibly mental retardation.</td>
<td>Full scale IQ exceeds mentally retarded range. Compared to AS generally have lower IQ’s.</td>
<td>Average to high intelligence.</td>
</tr>
<tr>
<td>Self-soothing behaviors such as rocking, head nodding, hand flapping, finger movements.</td>
<td>Self-soothing behaviors such as rocking and other repetitive behaviors. Less severe than in Classic Autism.</td>
<td>Self-soothing behaviors such as rocking and other repetitive behaviors. Less severe than in Classic Autism.</td>
</tr>
<tr>
<td></td>
<td>Less verbal/performance IQ discrepancies.</td>
<td>Verbal IQ typically exceeds performance IQ.</td>
</tr>
<tr>
<td>Separate diagnosis in DSM-IV and ICD-10.</td>
<td>No separate diagnosis in either DSM or ICD, No widely accepted diagnostic guidelines.</td>
<td>Separate diagnosis in DSM-IV and ICD-10.</td>
</tr>
</tbody>
</table>
Appendix B   DSM-IV-TR Diagnostic Criteria for Asperger’s (1994)

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 or 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 or 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 (American Psychiatric Association, 2000).

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 mannerisms (e.g., hand or finger flapping or twisting, or complex whole-body movements)

(d) persistent preoccupation with parts of objects

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

C. The disturbance is not better accounted for by Rett’s Disorder or Childhood Disintegrative Disorder (American Psychiatric Association, 2000).
Appendix D  ICD-10 Diagnostic Criteria for Asperger’s (1993)

A. There is no clinically significant general delay in spoken or receptive language or cognitive development. Diagnosis requires that single words should have developed by 2 years of age or earlier and that communicative phrases be used by 3 years of age or earlier. Self-help skills, adaptive behaviour, and curiosity about the environment during the first 3 years should be at a level consistent with normal intellectual development. However, motor milestones may be somewhat delayed and motor clumsiness is usual (although not a necessary diagnostic feature). Isolated special skills, often related to abnormal preoccupations, are common, but are not required for diagnosis.

B. Qualitative abnormalities in reciprocal social interaction are manifest in at least one of the following areas:

(a) failure adequately to use eye-to-eye gaze, facial expression, body posture, and gesture to regulate social interaction;

(b) failure to develop (in a manner appropriate to mental age, and despite ample opportunities) peer relationships that involve a mutual sharing of interest, activities and emotions;

(c) lack of socio-emotional reciprocity as shown by an impairment or deviant response to other people’s emotions: or lack of modulation of behaviour according to social, emotional and communicative behaviours

(d) lack of spontaneous seeking to share enjoyment, interests, or achievements with other people (e.g. a lack of showing, bringing, or pointing out to other people objects of interest to the individual).
C. The individual exhibits an unusually intense, circumscribed interest or restricted, repetitive and stereotyped patterns of behaviour, interests, and activities manifest in at least one of the following areas:

(a) an encompassing preoccupation with stereotyped and restricted patterns of interest that are abnormal in content or focus; or one or more interests that are abnormal in their intensity and circumscribed nature though not in the content or focus;

(b) apparently compulsive adherence to specific, non-functional routines or to rituals;

(c) stereotyped and repetitive motor mannerisms that involve either hand/finger flapping or twisting, or complex whole body movements;

(d) preoccupations with part-objects or non-functional elements of play materials (such as their colour, the feel of their surface, or the noise/vibration that they generate);

However it would be less usual for these to include either motor mannerisms or preoccupations with part-object or non-functional elements of play materials.

D. The disorder is not attributable to the other varieties of pervasive developmental disorder: simple schizophrenia, schizo-typal disorder, obsessive-compulsive disorder, anankastic personality disorder, reactive and disinhibited attachment disorders of childhood (Attwood, 1998).
Gillberg and Gillberg Diagnostic Criteria for Asperger’s (1989)

1. **Social impairment** (extreme egocentricity)
   (at least in two of the following):
   
   (a) Inability to interact with peers
   
   (b) Lack of desire to interact with peers
   
   (c) Lack of appreciation of social cues
   
   (d) Socially and emotionally inappropriate behaviour

2. **Narrow interest**
   (at least one of the following):
   
   (a) Exclusion of other activities
   
   (b) Repetitive adherence
   
   (c) More rote than meaning

3. **Repetitive routines**
   (at least one of the following):
   
   (a) On self, in aspects of life
   
   (b) On others

4. **Speech and language peculiarities**
   (at least three of the following):
   
   (a) Delayed development
   
   (b) Superficially perfect expressive language
   
   (c) Formal pedantic language
   
   (d) Odd prosody, peculiar voice characteristics
(e) Impairment of comprehension including misinterpretations of literal/implied meanings

5. **Non-verbal communication problems**

(at least one of the following):

(a) Limited use of gestures

(b) Clumsy/gauche body language

(c) Limited facial expression, inappropriate expression

(d) Peculiar stiff gaze

6. **Motor clumsiness**

Poor performance on neuro-developmental examination (Attwood, 1998).
Appendix F  Szatmari, Bremner and Nagy Diagnostic Criteria for Asperger’s (1989)

1. **Solitary**

   (at least two of the following):

   No close friends
   Avoids others
   No interest in making friends
   A loner

2. **Impaired social interaction**

   (at least one of the following):

   Approaches others only to have own needs met
   A clumsy social approach
   One-sided responses to peers
   Difficulty sensing feelings of others
   Detached from feelings of others

3. **Impaired nonverbal communication**

   (at least one of the following):

   Limited facial expression
   Unable to read emotion from facial expression of child
   Unable to give message with the eyes
   Does not look at others
   Does not use hands to express oneself
   Gestures are large and clumsy
   Comes too close to others
4. **Odd speech**

(at least two of the following):

- Abnormalities in inflection
- Talks too much
- Talks too little
- Lack of cohesion to conversation
- Idiosyncratic use of words
- Repetitive patterns of speech

5. **Does not meet DSM-III-R criteria for**

   Autistic Disorder (Attwood, 1998).
Appendix G  Additional Assessment Tools


2. Asperger’s Syndrome Diagnostic Scale [ASDS]. Myles, Bock and Simpson, 2001. Used to evaluate children. The ASDS has significant weakness in assessment, particularly in the use of questionable normative samples (Campbell, 2005). One requirement is that in order for the test results to be valid, the examiner must have had regular, sustained contact with the examinee for at least two weeks. This may be most used by educators or others actively engaged in daily activities with the child being assessed.

3. The Australian Scale for Asperger’s Syndrome, Garnett & Attwood, 1995; Attwood, 1998. This scale is meant to be used as a screening instrument on which to base decisions about the need for a full diagnostic assessment (Howlin, 2000). Used to evaluate children.

4. Autism Behavior Checklist [ABC], Krug, Aric, & Almond, 1980. Used to evaluate children (Howlin, 2000). The Childhood Autism Rating Scale and the Autism Behavior Checklist have been the most widely evaluated and found to have acceptable levels of reliability and validity (Howlin, 2000). The ABC is not as reliable as the CARS or the ADI-R. The Autism Behavior Checklist (ABC) is widely used and there is extensive data on the validity and reliability. The ABC is used to identify Asperger’s and High Functioning Autism but does not distinguish between the two.

5. Autism Screening Questionnaire, Berument et al., 1999. The Autism Screening Questionnaire has good discriminative validity with respect to Pervasive Development
Disorder (PDD) and non-PDD diagnoses but is less valid with differentiating between Asperger’s and Autism (Howlin, 2000).


7. **Autism Spectrum Quotient [ASQ]**; Baron-Cohen, et al, 2005. This instrument can be used on adults and is intended as an assessment instrument not a diagnostic tool. It does not reliably differentiate between Asperger’s and High Functioning Autism.


9. **Childhood Autism Rating Scale [CARS]**; Scholpler, Reichler, & Renner, 1988 (Howlin, 2000, Williams et al, 2009). The CARS does not require a standardized approach and although it has been shown to have adequate reliability and validity, it is based on outdated diagnostic criteria and does not correctly identify children with pervasive developmental disorders who do not meet the full criteria for autism (Williams et al, 2009). A revised second edition is more responsive to individuals on the high-functioning end of the autism spectrum. The Childhood Autism Rating Scale and the Autism Behavior Checklist have been the most widely evaluated and found to have acceptable levels of reliability and validity (Howlin, 2000). The Autism Behavior Checklist (ABC) is widely used and there is extensive data on the validity and reliability. The ABC is used to identify Asperger’s and High Functioning Autism but does not distinguish between the two.
10. **Childhood Asperger’s Syndrome Test [CAST]**, Scott et al., 2002; Williams et al., 2005. The CAST has significant weaknesses, particularly in the use of questionable normative samples (Campbell, 2005). Used to evaluate children.

11. **Checklist for Autism in Toddlers [CHAT]**, Baron-Cohen, et al., 1996 (Howlin, 2000). The authors of the study stress that CHAT is not used as a diagnostic instrument but is used to alert primary health professionals to the need for referral to an expert.

12. **Gilliam Asperger’s Disorder Scale [GADS]**, Gilliam, 2002. The GADS has significant weaknesses, particularly in the use of questionable normative samples (Campbell, 2005). Used to evaluate children and adolescents.

13. **Gilliam Autism Rating Scale [GARS]**, Gilliam, 1995 (Williams et al, 2009). The GARS requires minimal training and time to administer and score, however it has poor reliability and validity (Williams et al, 2009). Used to identify and diagnose autism in individual’s ages three through twenty-two years old and estimate severity.

14. **Krug Asperger’s Disorder Index [KADI]**, Krug and Arick, 2002. The KADI is the most sound in terms of reliability and validity of the following instruments: ASDS, ASSQ, CAST, and GADS. Used to evaluate children.

15. **Montiero Interview Guidelines for Diagnosing Asperger’s Syndrome [MIGDAS]**, Monteiro, M. This is a team-based approach to gather and organize diagnostic information from multiple sources, the utilization of interviews and evaluations, and the development of a narrative report and diagnostic impressions and recommendations.

17. Prelinguistic Autism Diagnostic Observation Schedule [PLADOS]; DiLavore, Lord, & Rutter, 1995. The PLADOS is a semi-structured observations scale for diagnosing children who are not yet using phrase speech and are suspected of having autism.

18. Rimland Diagnostic For Behavior Disturbed Children, version E-2m Rimland 1971 (Howlin, 2000). Intended as an assessment instrument that differentiates between cases of classic autism and a broader range of children with autistic-like features. This is not a diagnostic instrument.

19. Screening Questionnaire for Asperger’s Syndrome and other High Functioning Autism Spectrum Disorders in school age children [ASSQ] (Ehlers, Gillberg, & Wing, 1999). This questionnaire does not differentiate Asperger’s Syndrome from High Functioning Autism.

For Adults

1. Australian Scale for Asperger’s Syndrome. Meyer, 2000. Used to evaluate adults, this scale is a modified version of the Attwood Australian Scale.


4. Empathy Quotient [EQ], (Baron-Cohen and Wheelwright, 2004). Used to evaluate adults. The EQ is used to measure empathy in individuals with Asperger’s or High Functioning Autism. The EQ determined that adults with AS/HFA scored significantly lower on the EQ than adults in the control group. Empathy is one of the deficits seen in Asperger’s and this scale can be used for adolescents and adults. The reliability and validity of the EQ
findings have not been researched thoroughly nor are confirmed by other studies at this time.

5. **Friendship Questionnaire [FQ]**, Baron-Cohen and Wheelwright, 2003. Used for Adults.
6. **The Reading the Mind in the Eyes Test**. Rutherford, Baron-Cohen and Wheelwright.
7. **Is There a “Language of the Eyes”?** (Baron-Cohen, Wheelwright and Jolliffe). Used for evaluating adults.

Additional assessment tools that have been developed measure other aspects of pervasive developmental disorders and autistic disorders. These include focuses on sensory and neurological abnormalities:

- The Sensory Behaviour Schedule [SBS]) (Harrison, Hare, 2004).
- Assessing drawings of the human face and other art therapy techniques.
- Art therapy and group therapy (Epp, 2008).
- Use of facial information (Spezio, et al, 2007).
- A Video-based test for the evaluation of subtle mind-reading difficulties (Dziobek, I., et al., 2006).
- The Social Attribution Task to assess ability to attribute social meaning to visual stimuli (Klin, 2000).
- Psychological and neurobehavioral comparisons between Asperger’s Disorder and High-Functioning Autism (Thede and Coolidge, 2007).
- Neurological exams and EEG’s are given to children suspected to have Pervasive Developmental Disorder to possibly identify abnormalities that may be used to aid in possible assessment of specific PDD’s (Akshoomoff, Farid, Courchesne, and Haas, 2007).
References


