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Asperger's syndrome : a review of literature

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Asperger's syndrome : a review of literature

Abstract

This paper contains a review of literature on Asperger's Syndrome (AS). This disorder is characterized by deficits in social interaction skills and communication skills (such as the absence of eye contact or facial expressions). Individuals with AS also insist on routines in behaviors, and pursue a relatively narrow range of interests and activities. Etiology is thought to be multifactorial. Studies have indicated that AS may be influenced by genetic factors as well as pre-, peri-, and postnatal trauma. The disorder is also more common among boys than girls.

In this paper, the general clinical features of AS are reviewed, with specific attention to social skill deficits. Social skill interventions are also considered. Finally, recommendations for research are described.

ASPERGER'S SYNDROME:
A REVIEW OF LITERATURE

An Abstract of a Master's Paper
Submitted
In Partial Fulfillment
of the Requirements for the Degree
Master of Arts

Tracy L. Gappa
University of Northern Iowa
August 1998

ABSTRACT

This paper contains a review of literature on Asperger's Syndrome (AS). This disorder is characterized by deficits in social interaction skills and communication skills (such as the absence of eye contact or facial expressions). Individuals with AS also insist on routines in behaviors, and pursue a relatively narrow range of interests and activities. Etiology is thought to be multifactorial. Studies have indicated that AS may be influenced by genetic factors as well as pre-, peri-, and postnatal trauma. The disorder is also more common among boys than girls.

Asperger's Syndrome was first described by Austrian physician Hans Asperger in 1944. Asperger's Syndrome remained relatively unknown until a 1981 literature review by Wing. Since that writing AS has received more recognition worldwide. In 1994 AS was recognized as an official disorder by the American Psychiatric Association and was placed in the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV).

However, there is still disagreement among scholars as to whether AS is its own clinical disorder or whether it is part of the autistic continuum and should be referred to as "high functioning autism." This paper takes the position that the two disorders are separate diagnoses.

Another area of disagreement related to the diagnosis of AS is the issue of diagnostic criterion. Several sets of criteria exist, each slightly different. Although the DSM-IV is the most commonly used criteria, it is not the only criteria being used in research. One of the main differences among the criteria is whether or not individuals

with AS experience language deficits. While some criteria include language delays as a diagnostic standard, others explicitly state that no language delay is present.

In this paper, the general clinical features of AS are reviewed, with specific attention to social skill deficits. Social skill interventions are also considered. Finally, recommendations for research are described.

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This Research Paper by: Tracy L. Gappa

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CHAPTER 1

INTRODUCTION

Until recently, the term Asperger's Syndrome (AS) was relatively unrecognized outside the research field. First described in the 1940s, AS went unknown in the United States until the 1980s. Since that time, recognition of the disorder has spread; however, lack of a consensual definition has resulted in considerable confusion among researchers. For those children "diagnosed" with AS, there were many questions related to "what they had" as well as what interventions and treatments were available to help them. Without an official diagnosis, individuals with AS and their families were only poorly educated about the disorder. This situation began to improve with the inclusion of AS in the American Psychiatric Association's Diagnostic and Statistical Manual, Fourth Edition (DSM-IV) (1994).

Currently, AS is believed to manifest itself after the age of three. Although exact etiology is unknown, it is tentatively believed to be multifactorial. Evidence in a study by Gillberg (1989) suggests some degree of genetic heritability. There is also some evidence which suggests pre-, peri-, and postnatal environmental influences may also play a role in this syndrome. The incidence of AS varies, depending upon which diagnostic criteria are used to identify cases. Ehlers and Gillberg (1993) reported a minimum prevalence of 3.6 per 10,000 children with a male-to-female ratio of 4:1. Prevalency has been reported to be as high as 71 out of every 10,000 children (Gillberg, 1993) and male-to-female ratios as high as between 10 and 20 to 1 (Rickarby, Carruthers, & Mitchell, 1991).

Children with AS generally have normal Full Scale IQ scores on the Wechsler

scales (Atwood, 1998). However, deficits in several areas impair the ability of individuals with AS to function normally in an educational environment, as well as in everyday life. One deficit, impairment in reciprocal social interaction and play, especially influences success and enjoyment at school. Children with AS often have difficulty making and maintaining friendships due to deficits in their ability to have reciprocal interactions. In addition, both verbal and non-verbal social communication deficits result in inappropriate behaviors such as excessive bluntness or coldness toward peers and a lack of awareness of non-verbal feedback from peers (Myles & Simpson, 1998). These same deficits impair relationships with teachers as well. For example, a child with AS may have to be verbally reminded again and again to get back on task because non-verbal cues are not understood. Students with AS may also appear inflexible in the classroom and experience great difficulty adapting to an unplanned change in the schedule. Children with AS may interrupt a class due to confusion, an inability to focus, overloading of the senses, or a lack of understanding of classroom rules or instruction. These interruptions are not intended to interfere with class, but rather are “necessary” for the student with AS in order to gain focus or clarity (Myles & Simpson, 1998). These students do cope better in a structured, predictable environment, where rules are simple and clear (Attwood, 1998). However, social skills deficits make life at school an everyday challenge.

This paper will review the literature on AS, including prevalency, etiology, general characteristics, and areas of disagreement among scholars. A main source of disagreement among scholars is whether AS represents a disorder separate from autism,

or whether AS represents a specific severity level of autism, often referred to as high functioning autism (HFA). For the purpose of this paper, the position will be taken that AS is a separate disorder. This review will specifically address the topic of social skills deficits and social skills training for children with AS and this paper will conclude with a discussion of the implications of current research for interventions and recommendations for future research in the field of AS.

CHAPTER 2

LITERATURE REVIEW

Historical Review

In a paper published in 1944, Viennese child psychiatrist Hans Asperger described a pattern of behaviors which he termed “autistic psychopathology.” This term described the abnormal personality structure of the children he worked with, who in many ways, as was later discovered, were similar to children with autism (Asperger, 1991/1944).

According to Asperger (1991/1944), the main clinical features of the children he worked with included deficits in social skills, reciprocal interactions, and empathy. Asperger noted odd posture and gait, as well as clumsy large and small motor movements in his patients. His patients also frequently exhibited an intense interest in a specific, narrow subject, such as cars or bus schedules. Asperger reported conversations that consisted of one-way interactions which were repetitive and pedantic, a term Asperger used to refer to the child’s narrow and intense interests (Frith, 1991). His clients also exhibited poor nonverbal communication, often lacking facial expression and using inappropriate gestures such as pinching or tickling other children for no particular reason. Finally, these individuals enjoyed repetitive activities and resisted change in strict daily routines. Asperger also noted these features were more common among boys and were seldomly recognized before the age of three (Asperger 1991/1944; Happè, 1994; Wing, 1981).

Asperger firmly believed the disorder he described could appear in people of various levels of intelligence, even those with mental retardation. Asperger also believed

the syndrome was transmitted genetically (Frith, 1991). However, in some cases such as where additional physical abnormalities were present, he attributed AS to a different type of cause, such as encephalitis (Frith, 1991).

In the United States one year earlier (1943), Leo Kanner had described 11 children with “early infantile autism” (Asperger, 1979; Frith, 1991; Miller & Ozonoff, 1997). Unlike Asperger’s research, Kanner’s findings became internationally well-known, describing what is now referred to as autism. Features of the children Kanner saw included language peculiarities such as delayed echolalia and pronoun reversal (Happé, 1994). These children also exhibited obsessive perseveration on routines, becoming extremely upset by changes of routine such as taking a different route home. The children generally had excellent rote memories, being able to memorize large amounts of meaningless materials such as a list of names in a telephone book. These children were also oversensitive to some stimuli, such as the hum of a fan or furnace. Kanner also observed repetitive body movements such as rocking or hand flapping. His patients showed some cognitive potential and often came from highly intelligent families, though this may have been the result of a referral bias. Perhaps most importantly, these children showed extreme social isolation and appeared happiest when left alone. This was evident from the earliest stages of life, when these children did not use gestures to request to be picked up, nor “snuggle” when being held.

Despite being unaware of each other’s work, Asperger and Kanner’s descriptions were quite similar in many ways. Both chose the term “autistic” when describing their patients. The term comes from Bleuler (as cited in Happé, 1994), who used the word to

describe the social withdrawal of adults with schizophrenia. “Autos” is a Greek word meaning “self.” This similarity reflects the importance both Asperger and Kanner put on the social impairments associated with these disorders. The researchers both noted poor social interaction skills, such as a lack of eye contact and a lack of interest in the feelings or ideas of others. Asperger and Kanner referred to strong, isolated interests exhibited by the children, an obsessive interest in trains for example. The same problems in language use were also described by both authors (Wing, 1991). These problems included a lack of using language to interact with others, the long winded pedantic speech in AS and children with autism who had enough speech, or the tendency to invent words. Wing (1981) used the term pedantic to describe the type of speech used by individuals with AS. The term refers to bookish quality in one’s speech, or the use of obscure words when simpler words are more appropriate. This differed from the way Asperger used the term, referring to narrow and intense interests rather than speech.

A clear separation from childhood schizophrenia was insisted on by both researchers. This separation was marked by improvement, rather than deterioration of their patients over time, the absence of hallucinations, and the presence of abnormalities early on (Frith, 1991; Happé, 1994). Both authors noted the attractive appearance of the children they saw. The children’s resistance to change and marked insistence on routines were reported by both Asperger and Kanner, and both described similar stereotypes of speech (repetition of words) and movement (such as rocking). Each researcher emphasized the number of cases was dominated by boys. Finally, Asperger and Kanner noted that the parents of these children also displayed “autistic” behaviors.

Happè (1994) identified three main areas in which Asperger and Kanner reported different findings. Asperger described the motor abilities of his patients as clumsy, both in fine and gross motor skills. Kanner, however, reported clumsiness in only one case and reported skillful fine motor coordination (determined by the patients' success on the Seguin form board and their ability to spin objects). In the area of learning, Asperger believed his patients were abstract thinkers whose spontaneous performances were their best performances. Meanwhile, Kanner noted that his patients were best at learning in a rote manner. The most evident difference between the two diagnoses was noted in language abilities. While Asperger reported each of his four patients spoke fluently, Kanner noted that three of his 11 patients never spoke, and the others did not use the language they had to communicate. Kanner described children who displayed significant language and social skill impairments, while Asperger described children who were generally able in both domains. These differences provide the basis for the argument that AS is a separate disorder from autism.

Wing (1991), in a review of Asperger's and Kanner's work, reported other discrepancies between the two disorders. Kanner reported the age of onset for autism to be within the first month of life, while Asperger reported onset in the third year or later. Kanner believed eye contact was poor because children with autism lived in their own world and other people did not exist; Asperger indicated individuals in his study also lived in their own world, but in their own way and evaded eye contact. Finally, Kanner's autism was seen as a psychotic process with poor social prognosis, while the disorder described by Asperger was seen as a personality trait with good social prognosis.

Asperger's early work (1944) went relatively unrecognized in the United States until Wing (1981) described the clinical characteristics of AS and first penned the term "Asperger's syndrome" to describe differences between those high functioning autistic individuals described by Asperger and individuals with Kanner's autism (Happé, 1994). However, Wing modified Asperger's descriptions according to her own clinical experience. Wing added a delay in language acquisition and suggested atypical development prior to age three may be evident. For example, the child might play with toys in a nontypical manner, such as spinning the wheels on cars rather than pushing the cars around. She also found children with AS were not creative; for example, they did not exhibit pretend play. Wing was concerned about the children who exhibited less severe autistic features; for Wing, the term Asperger's Syndrome was a means to recognize these individuals (Happé, 1994).

Most researchers have incorporated Wing's suggestion into their diagnostic criteria. By the late 1980s, a consensus seemed to have emerged. Burd and Kerbeshian (1987) described five features of individuals with AS: speech was pedantic and stereotyped; non-verbal communication was impaired; social interactions were peculiar and lacked empathy; interests were circumscribed and included repetitive activities; and movements were clumsy and stereotyped. Tantam (1988) and Gillberg and Gillberg (1989) included nearly the same characteristics in their criterion for diagnosis.

As a result of increased interest in and research of Asperger's Syndrome, recognition of AS has spread, particularly over the past few years, and the prevailing view is that AS is its own disorder. In 1994, AS became a subgroup of the Pervasive

Developmental Disorders (PDD) in the DSM-IV (1994). However, there is still an ongoing debate among investigators as to whether AS is a discrete disorder or is part of the autistic continuum, designated as high functioning autism (HFA). Some researchers argue AS actually describes a type of high functioning autism (Frith, 1991; Schopler, 1985, 1996; Volkmar, Paul, & Cohen, 1985) while others believe AS should have its own clinical diagnosis (Bowler, 1992; Gillberg, 1991; Gillberg & Gillberg, 1989; Mahoney et al., 1998; Ozonoff, Rogers, & Pennington, 1991; Szatmari, Bremner, & Nagy 1989; Tantum, 1988, 1991; Wing, 1981, 1986, 1991). These researchers base their argument on the diagnostic criteria which differentiate AS from autism.

Prevalency

Data on the prevalency of AS are limited, and prevalency rates vary considerably according to the particular diagnostic criteria used within a given study. Based on a study in Sweden involving 13,000 subjects, Ehlers and Gillberg (1993) reported incident rates of 0.29% when the criteria for the International Classification of Diseases (ICD), Tenth Revision draft (World Health Organization, 1990; as cited in Ehlers & Gillberg, 1993) were applied. The application of Szatmari, Bremner and Nagy's (1989) and Gillberg and Gillberg (1989) criteria to the same subjects resulted in incidence rates that were nearly twice as high, 0.5% and 0.6% respectively. It is estimated that AS is much more common in boys than girls. Ratios range from 4:1 (Ehlers & Gillberg, 1993; Gillberg, 1989) to 9:1 (Wing, 1981), to as high as between 10 and 20 to 1 (Rickarby, Carruthers, & Mitchell, 1991).

Etiology

Following is a review of the literature describing possible causes of AS. Family history as well as experiences with prenatal, perinatal or postnatal stress have most often been reported as factors associated with AS. However, the precise etiology of AS is unknown and likely to be multifactorial.

Genetic Factors

As early as his original paper, Asperger (1991/1944) noted similarities in social behavior between parents and children with AS, particularly between fathers and sons. The DSM-IV (1994) reported a higher frequency of cases of AS in the family histories of individuals with AS. According to a literature review of family studies by Bonnet (1996), having one child with AS increased the risk of having more than one AS or autistic individual among siblings to 6%, which is 200 times the incidence rate of the general population. Gillberg (1989) also reported several incidences of AS in the same family. Parents of individuals with AS were reported to have mild social deficits similar to those seen in individuals diagnosed with AS in 13 of the 23 cases in the study. Support of genetics as a causal factor also was provided by Burgoine and Wing (1983) in a case study of identical triplet males with AS.

Baron-Cohen and Hammer (1997) tested the genetic hypothesis of AS by giving parents of children with AS the adult versions of the Embedded Figures Test and The Reading of the Mind in the Eyes Test (Eyes Test). Thirty parents (15 couples) of children with AS, were matched with 30 parents of children without autism or AS.

The Reading of the Mind in the Eyes test consists of 25 different facial

photographs of the eye region taken from magazine photos. All photos showed the same region, midline along the nose to slightly above the eyebrow. Each photo was shown for 3 seconds, and then a choice of two mental states was given. Subjects had five seconds to respond. In the Embedded Figures Test (EFT) (Witkin, Oltman, Rasking, & Karp, 1971) the subjects are given up to three minutes to find a simple target shape in a more complex design. Subjects work as quickly as possible and each item is timed. The complex design, which the subject describes to ensure he/she is attending, is presented for 15 seconds. Then complex design is removed and the simple target shape is presented for 10 seconds. This process is repeated for test 12 items.

Results indicated that first-degree relatives of persons with AS display a milder degree of Asperger traits. Parents of children with AS were significantly faster on the EFT than controls and significantly less accurate at reading mental states by viewing photographs of the eye regions of the face. Normal males, compared to normal females, tended to be slightly faster on the EFT and slightly, but significantly, less accurate on the Eyes Test. This was slightly increased in the test results of fathers of children with AS. The authors concluded that first degree relatives exhibit a lesser variant of the cognitive profile of AS. Results also seemed to indicate that deficits in responding appropriately to facial expressions may be related to a broader deficit in interpreting mental states. Although no specific conclusions regarding heritability can be made from these studies, they indicate the possibility of a genetic influence. It is also possible that children with AS learned these behaviors by modeling their parents, particularly fathers. Substantially more research in this area must be conducted before any definitive conclusion can be

drawn.

Prenatal, Perinatal, and Postnatal Trauma

Although etiology remains undetermined, prenatal, perinatal and postnatal stress have been reported in multiple case studies on AS and may be related to the severity of the disorder, exacerbating the degree of symptoms in some cases. In a case study of three 17 year-old identical males with AS, Burgoine and Wing (1983) found the triplet who experienced the most perinatal and postnatal difficulties exhibited the most severe expression of AS. Data were collected through studying case histories and hospital notes. The Handicapped Behavior and Skills Schedule (HBS) (Wing & Gould, 1978) was given to the three boys to elicit clinical information for a diagnosis and assess the children's level of development and degree of behavioral abnormality. Medical examinations, the Wechsler Intelligence Scale for Children, Third Revision (WISC-III-R), chromosomal examinations, and a test for zygosity were also conducted. At the time of the study, the mother reported experiencing severe emotional stress during the pregnancy (due to unreported reasons) as well as a loss of weight (amount unspecified) during the last trimester. She also had hypochronic anemia and was admitted to the hospital the last month of her pregnancy. All three children were born breech and were placed in incubators. W weighed the least at birth (3 lb., 11 oz. compared to 4 lb., 6 oz. and 4 lb, 2 oz.), was somewhat blue in color and required oxygen, and remained in an incubator the longest (4 ½ weeks). No additional information was provided. At the age of one, W was infected with pneumonia and was hospitalized for one month.

Results of the HBS indicated that of the three boys, W was the most distant, disliked social contact, objected to change, and had the most difficult behavior. Meanwhile, R, the triplet who had the fewest perinatal problems and weighed the most at birth, was the most socialable and most able physically and academically. Results of the WISC-III showed R and B had scores in the normal range, while W's scores were in the upper end of the mildly retarded range. The Vineland Adaptive Behavior Scales survey measured the adaptive functioning in communication, socialization and activities of daily living. The Vineland social quotients indicated that all three boys were in the severely deficient range, with W being the most deficient and R the least deficient. This was generally the pattern found throughout this study. Results of the zygosity test indicated a .9975 likelihood that the triplets are monozygous. Although this study did not resolve the part genetic influence plays in AS, it does suggest that trauma before, during, or after birth may affect the severity of AS.

In a study of 23 children with AS, Gillberg (1989) found that almost 50% ($n = 10$) of the subjects had experienced prenatal or perinatal trauma that might have resulted in brain damage. Among these 10 children, 8 were also reported small for their gestational age or had experienced toxemia.

Similar findings have been reported by Szatmari, Bremner, and Nagy (1989). Their data indicated an increased frequency of complications during pregnancy and/or the neonatal period of subjects with AS. These complications included prematurity or postmaturity, abnormal birth presentation, or anoxia. However, the increase in these complications was not statistically significant.

Wing (1981) compiled a report describing the etiology, clinical features, course, epidemiology, differential diagnosis, and management of AS based on the author's own patients and patients studied by Asperger. In three of the six case studies Wing included in her report, patients with AS had a history of pre-, peri-, or postnatal difficulties (e.g., lack of oxygen at birth) that could have resulted in cerebral damage. One patient was born four weeks prematurely and had feeding problems the first two weeks following birth; another patient had to be delivered by forceps, experienced trouble breathing which resulted in cyanosis, and was kept in special care for two weeks. The third child had his head accidentally bruised at six months (although severity was not reported) after which his mother noted a change in behavior. She reported the child became socially aloof and isolated.

It is important to note that the work of Wing (1981) and Gillberg and Gillberg (1989) came before the ICD-10 (World Health Organization, 1993) or DSM-IV (1994) criteria for defining AS patients were official. This may have affected the number of patients diagnosed by those authors since individuals with mental retardation and delayed speech cannot be given a label of AS according to the ICD-10 and DSM-IV definitions.

These studies suggest that pre-, peri-, and postnatal trauma may influence the severity of AS or be linked to AS. However, research in this area is limited and conclusions cannot be made based on these limited studies. Further research in this area is necessary before definitive conclusions can be made.

Prognosis

The prognosis for persons with AS is better than that for persons with autism (Gillberg, 1991; Nordin & Gillberg, 1998). Although information is limited because of the newness of the diagnosis, reports indicate that children with AS are likely to become independently functioning adults. Currently, indirect observations of relatives who appear to have AS themselves has been one of the best sources for predicting the prognosis for children with AS (Bauer, 1997). Persons with AS can live independently, hold full time jobs, and have families (Attwood, 1998; Bauer, 1997; Gillberg, 1991).

Gillberg (1991) reported that adults with Asperger's Syndrome typically hold jobs. Employment was often in the area of their consuming interest, such as math or science (Bauer, 1997). Persons with Asperger's have been described as extremely diligent, reliable, and insistent on quality over quantity (Attwood, 1998), characteristics which are often valued by employers. However, adults with AS often experienced difficulty socializing with coworkers (Attwood, 1998) had restricted, repetitive interests, and used formal and pedantic speech even as adults (Gillberg, 1991). A job with a regular routine, as well as an employer and coworkers who are aware of and sensitive to needs and limitations of the person with AS would be ideal (Attwood, 1998).

In his recent book, Attwood (1998) described the relationships of individuals with AS. Persons with AS often meet their partners through their career and they are extremely dependable, honest, and faithful in their relationship. However, at times the person with Asperger's confuses and upsets her/his partner. Physical and emotional intimacy is challenging for people with Asperger's, as they have difficulty with the

expression of love . For example, people with AS do not understand why they should say “I love you” to others who already know. Also, the dominance of the special interest often interferes with other priorities.

Several authors have found an increased risk of mood disorders such as depression and anxiety as children with AS become adults (Bauer, 1997; Gillberg, 1991; Tantam, 1988; Wing, 1981; Wolff & Chick, 1980). A relationship between AS and affective illness/depression as adults was reported by Wing (1981) and Tantam (1989).

Wing (1981) reported that 40% of the patients in her study had affective illness or depression, while two of the 18 had attempted suicide. Suicide attempts seem to be a main expression of such problems. In comparison, community rates for depression reported in the DSM-IV (1994) ranged from 10%-25% for women and 5%-12% for men. In a study of 19 individuals with AS, Wolff and Chick (1980) reported that 10 AS subjects expressed suicidal thoughts compared to two individuals in the control group, and that five AS individuals had attempted suicide by early adulthood. These attempts included cutting wrists ($n = 2$), taking drugs ($n = 2$), and suffocation ($n = 1$). None of the controls had attempted suicide.

While there is some evidence of patients with AS developing schizophrenia, this evidence does not establish such a relationship clearly. For example, Asperger found schizophrenia in one of his 200 patients (Asperger, 1991/1944); however, this finding has not been repeated in other studies. Despite the fact that bizarre and borderline behaviors, such as intense preoccupations with rubbish and rubbish disposal, (Tantam, 1991) are reported in late adolescence and throughout adult life, the diagnosis of schizophrenia is

very rare (Gillberg, 1991; Tantam, 1986, as cited in Frith, 1991).

Criteria for Differential Diagnosis

There have been four different diagnostic criteria developed for AS in recent years and there is presently no universal agreement on which to use (Attwood, 1998). The first two were developed by clinicians, the latter two by organizations. Until AS became an official disorder in the ICD-10 (1993) and the DSM-IV (1994), the criteria established by Gillberg and Gillberg (1989) and Szatmari, Bremner, and Nagy (1989) were used by most researchers in the field. The most stringent and restrictive criteria are those put out by the ICD-10 and the DSM-IV (Attwood, 1998).

In 1989, Gillberg and Gillberg identified six criteria for diagnosing AS based on their studies in Sweden. Social impairments marked by extreme egocentricity and at least two of the following behaviors constitute Criterion 1: (a) inability to interact with peers, (b) lack of desire to interact with peers, (c) lack of appreciation of social cues, and (d) socially and emotionally inappropriate behavior. Narrow interest marked by either the exclusion of other activities, repetitive adherence to specific activities, or engaging in more rote learning than meaningful learning make up Criterion 2. To meet Criterion 3, *Speech and Language peculiarities*, clients must exhibit at least three of the following behavioral patterns: (a) delayed development (in comparison with that expected from the child's social language background), (b) superficially perfect expressive language, (c) formal pedantic language, (d) odd regulation of voice or peculiar voice characteristics, and (e) impairments of language comprehension including misinterpretations of literal and/or implied meanings. This last criterion differs significantly from the other

diagnostic criteria for AS, the DSM-IV (1994), ICD-10 (1993), and the Szatmari, Bremner and Nagy (1989) criteria which specify no general delay in spoken or receptive language as part of the criteria for an AS diagnosis. Non-verbal communication problems, including at least one of the following behavior patterns, make up Criterion 5: limited use of gestures, clumsy and/or gauche body language, limited facial expression, inappropriate facial expression and peculiar gaze (does not make eye contact). The sixth criterion, motor clumsiness is unique to the Gillberg and Gillberg (1989) criteria. Motor clumsiness is defined by poor performance on a neuro-developmental examination.

The diagnostic criteria of Szatmari, Bremner and Nagy (1989) consist of five criterion, three of which focus on social deficits. These deficits refer to high frequencies of solitude and include at least two of the following descriptions: no close friends; avoids others; no interest in making friends; and/or a loner. The impaired social interactions of AS individuals consist of at least one of the following behavior patterns: approaching others only to have one's own needs met; a clumsy social approach; one-sided responses to peers; difficulty sensing the feelings of others; and a strong detachment from the feelings of others. At least one of the following behaviors must be characteristic of the impaired nonverbal communication of AS patients: limited facial expression; inability to read emotion from facial expression of another child; inability to give messages with the eyes; avoidance of looking at others; failure to use hands to express oneself; or, uses gestures which are large and clumsy, or coming too close to others. Several aspects in these criteria were not emphasized in the Gillbergs' criteria, such as having difficulty sensing the feelings of others or being detached from them, not looking at others, not

being able to “give messages with the eyes,” and coming too close to others (Atwood, 1998). The criterion characteristics for odd speech consist of abnormalities in inflection, talking too much or too little, non-cohesive conversations, idiosyncratic use of words, and repetitive patterns of speech. For a diagnosis of AS to be made, the person must display at least two of these speech difficulties. Finally, the person must not meet DSM-III criteria for autistic disorder.

The criteria established by the World Health Organization in the ICD-10 (1993) are nearly identical to the clinical standards and requirements of the DSM-IV (1994), although the ICD-10 notes that the distinction between AS and HFA is still controversial (Klin, Volkmar, Sparrow, Cicchetti, & Rourke, 1995). The ICD-10 stresses that the child’s social play will reflect an inability to identify play behavior according to the social context and to spontaneously seek to share the interests, enjoyment or achievements of others (Atwood, 1998).

Myles and Simpson (1998) noted that the most widely used criteria are those included in the DSM-IV (1994). The first criterion consists of severe and sustained impairment in social interaction. This criterion includes a failure to develop, or a failure in the desire to develop, friendships as well as a lack of social or emotional understanding. For example, individuals with AS typically do not recognize the needs or the distress of others. Other criteria include the development of restricted, repetitive patterns of behavior, interests, and activities, such as an insistence on routine, stereotyped and repetitive motor mannerisms, and a persistent preoccupation with the parts of objects. Impairments must be clinically significant in social, occupational, or other important

areas of functioning. There must not be a clinically significant delay in language or cognitive development, in the acquisition of appropriate self-help skills, in adaptive behavior, or in curiosity about the environment during childhood. Also, a diagnosis of AS cannot be made if criteria for another specific PDD or Schizophrenia have been met.

Interestingly, the DSM-IV (1994) criteria are almost identical to the criteria for autism; however, differentiating criteria for a diagnosis of AS include: exhibiting no clinically significant delays in cognitive or language development, or in the development of age-appropriate self-help skills, adaptive behavior, and curiosity about the environment.

General Characteristics

Wing (1981), in a literature review and a series of case studies, presented general characteristics of AS based on her own experiences with children with the disorder. Wing included items in developmental history not previously mentioned by Asperger such as a lack of the urge to communicate in general, including less gesturing, movement, smiling, laughing, babbling, and speaking than is exhibited by normal babies and toddlers. Imaginative play was often absent, but if present, consisted of one or two themes repeated over and over. Wing also disagreed with Asperger's observations in two areas. While Asperger noted that speech developed before walking, Wing found slightly less than half of her 34 patients walked at the usual age, but were delayed in speaking. Half of her subjects talked at the normal age, but were slow to walk, and one walked and talked at the expected times. Along with this discrepancy, she described speech content as impoverished and as being imitated inappropriately from people or books. Secondly,

Asperger reported that individuals in his studies were capable of original and creative work in their careers. Wing described their thought processes as narrow, pedantic and methodical, arguing that creativity may be possible, but only in very few, specific areas. Since 1981, clinical descriptions have changed based on continued research.

Gillberg (1989) conducted a study which attempted to determine whether a clear distinction could be made between autism and AS. One group of subjects consisted of 23, 5 - 18 year-old, children and adolescents who fulfilled the first five criteria for the Gillberg and Gillberg (1989) criteria for AS. Clumsiness, the sixth criteria, was excluded in an attempt to determine whether it could be used as a differential symptom between AS and autism. A comparison group was made up of 23 individuals with a DSM-III diagnosis of autism. Subjects were matched for age and Wechsler Full Scale IQ. Subjects' social class was assigned according to their father's occupation. Mothers were interviewed about the presence of other conditions such as autism and learning disorders. All but two of the participants were given the Griffiths IQ scale, while many had been assessed with other instruments as well, generally the WISC-III and the Leiter scales. The Autistic Behaviour Checklist (ABC) (Krug, Arick, & Almond, 1980) was given during interviews with the mother and used to rate the severity of autistic symptoms of the child. Scores of 70 or higher on this scale are typical of children with autism. The presence of trauma during prenatal, perinatal, and neonatal periods was assessed using medical records. The following neurobiological exams were given in 12 of the 23 cases of AS: an EEG, an auditory brainstem response (ABR) exam, a CAT-scan of the brain, and a chromosomal exam. Eight of the individuals completed one, two, or three of these

exams, while three did not complete any. Of the children with infantile autism, 20 of the 23 completed all four of the examinations, while two only completed the chromosomal exam and the EEG, and one did not complete any of the exams. A two hour clinical assessment by the author was also conducted.

Results indicated significant differences between the group with AS and the group with autism in two of 14 background factors: high parent IQ in at least one parent (based on clinical judgements) and problems associated with AS exhibited by a parent. The group with AS exhibited higher levels of both of these factors. In clinical characteristics, three of eight categories and one subcategory (extreme echolalia within the language problems category) presented significant differences. Being bilingual before the age of 10, motor clumsiness, and circumscribed interests were more often found in the AS group, while extreme echolalia was found more often in individuals with autism than individuals with AS.

Results did not differ between the groups in the sex ratio, social background, or neurobiological findings. No differences were found between the two groups for prenatal, perinatal, or neonatal problems or clinical characteristics such as ABC score, school achievement, intellectual level, general language problems, and number without a peer with whom they could play once a month. Gillberg concluded AS differed from autism in that individuals with AS were not so pervasively impaired. Gillberg also formed the following hypotheses: (a) individuals with AS exhibit relatively poorer motor skills, (b) although children with AS are late in acquiring speech, expressive speech is better than that of individuals with autism, and (c) children with AS are not regarded as

deviant until 30-36 months, whereas children with autism are regarded as deviant within their first year.

Szatmari, Bremner and Nagy (1989) conducted a study which described some of the clinical features of AS. Subjects included 28 children and adolescents diagnosed with AS based on an adapted version of Wing's (1981) description. The outpatient control group (OPC) consisted of children and adolescents referred for social withdrawal or peer relationship problems. Parents of the subjects were given a 40 item structured parent interview as well as a detailed questionnaire regarding the pregnancy, birth, and neonatal periods. A family history and a child medical history were completed. A Vineland Adaptive Behavior Scales-Survey form was also completed on each child with AS.

Results of the Vineland Adaptive Behavior Scales indicated subjects in the AS group were impaired and scored in the "mentally disabled" range in socialization. Differences between the groups in socialization included parents' reports of the children with AS as having a very clumsy social approach, having mostly one-way interactions, and having difficulty reading the feelings of others; these behaviors were rarely reported by parents of the controls. Three of the 28 AS patients had definite neurological disease, while none of the OPC group scored positive for any neurological disease. Impairments in non-verbal communication and reports of odd speech (for example, flat or exaggerated intonation) were more frequent in the AS group. Finally, a lack of cohesion in conversation was "always" reported for the AS group, while this was noted only during parent-child conflict for the control group. Significant differences were not found between the groups for problems experienced during prenatal or neonatal periods.

Significant differences between the AS group and controls were also found in several areas related to language. Differences were found in these subcategories: abnormalities of inflection, talking too little or talking too much, idiosyncratic use of words, one-sided social interactions, and repetitive speech. Abnormalities of inflection were described as either monotonous, inappropriate or exaggerated and were measured by three parent interview items. Talking too little and talking too much were defined as either non-communicative or long winded and pedantic and were measured by four items on the parent interview. Idiosyncratic use of words included using words uniquely out of context or applying the literal meaning of words and was measured by five interview items.

The authors concluded that children with AS exhibit different impairments in socialization and communication than do children with more usual childhood psychiatric disorders and that verbal and non-verbal communication impairments prevent children with AS from modulating social interaction impairments. Based on the severity of interactions they observed, these authors believed AS is a mild form of autism, however, why some people develop autism and others AS remained unanswered. Prognoses for treatment were considered positive and the authors suggested social skills interventions at several levels including at home and in the school, as well as screening for learning disabilities, particularly comprehension. Finally, authors concluded AS may be more common than originally thought.

In a study to determine whether it is possible to identify subtypes of PDD, Szatmari, Bartolucci, and Bremner (1989) found significant differences between an

individuals with AS and individuals with autism. Two of the groups, one group of 28 patients with AS and an outpatient control group of 42, were the same subjects as those used by Szatmari, Bremner and Nagy, (1989). A second comparison group, a group of 25 high functioning autistic individuals with a Full Scale IQ > 65, was used in this study. Data were collected through a parent interview using the Interview for Social and Communication Disorders (ISCD) and parts of the Diagnostic Interview for Children and Adolescents (DICA). Children were interviewed using the DICA and information was collected from school history forms. Information on each child's early history in the areas of social responsiveness, deviant language, bizarre behavior, impairments in nonverbal communication, clumsiness, and age at onset were gathered during the parent interview.

Significant differences were found between the AS group and the HFA group on the social responsiveness measures. Children with AS were more interested in social relationships than the children with HFA. Significant differences were found in other areas as well. Language development was more deviant in the HFA group; however, rates of repetitive speech patterns and low speech motivation were similar for the HFA and AS groups. Bizarre behavior measures, such as preoccupations with the sameness, were higher in the HFA group. However, no differences were found between the two groups (HFA and AS) in nonverbal communication, sensitivity to unusual stimuli, or clumsiness.

These authors concluded there were no substantial, qualitative differences between the HFA and AS groups and suggested that clinical differences probably reflect

differences in the severity of a single disorder rather than two distinct disorders. However, these clinical differences were not trivial; no AS subject had ever been diagnosed with autism, although they had been given other confusing labels such as borderline schizophrenia or adjustment reaction. As a result of such labeling, these authors suggested that AS may be more common than originally thought. Data also indicated that AS and autism resulted in different outcomes for individuals with these disorders. For example, those with autism spent significantly more time in special education. The authors noted that an age discrepancy between the AS and HFA groups could have accounted for some of this difference.

Eisenmajer et al. (1996) completed a study to determine what clinical characteristics clinicians had been using to differentiate AS from autism. Subjects included 48 children diagnosed with autism and 69 individuals diagnosed with AS. Subjects and their parents completed an interview based on the diagnostic criteria of the DSM-III-R (1987) and ICD-10 (1993).

Results indicated that the only developmental and family variables that predicted diagnosis were those of delayed language onset. Several clinical differences between AS and autistic subjects were noted. Subjects with AS were more likely to participate in more social behaviors than the children with autism. Unlike subjects with autism, avoiding eye contact was less severe in individuals with AS when they were young, and their capability and desire to play with others increased as they got older. Early speech in subjects with AS was less likely to be echolalic than children with autism. Turn taking during conversation was also absent in the speech of children with AS. From an early

age, subjects with AS were more likely than autistic subjects to engage in monotone, lengthy, pedantic patterns of speech, talk repeatedly about one topic, and ask repetitive questions. Finally, although DSM-IV (1994) diagnostic criteria for AS specify no language delay is present, Eisenmajer et al. found 43% of the AS subjects in this study were reported to have experienced language delays. The authors concluded that researchers were diagnosing AS and autism on the basis of published research, as opposed to official diagnostic criteria, which raised the concern of whether the ICD-10 (1993) and DSM-IV criteria adequately describe AS, particularly in the area of communication.

Asperger's Syndrome and Autism

Asperger's Syndrome and autism are similar in several ways, which can make differentiating between the two difficult. The two disorders share common etiologies. For example, both have a similar sex ratio (boys outnumber girls) and a similar family pattern.

Both disorders are characterized by social skills deficits such as failure to make eye contact, failure to make friends, lack of emotional or social reciprocity, and a lack of seeking to share accomplishments or interests with other people (DSM-IV, 1994). Patterns of interest, behaviors and activities which are narrow, repetitive, and stereotyped are present in both AS and autism (DSM-IV). For example, a child with autism or AS may get upset over a change in routine or may be preoccupied with lining up blocks or match box cars.

However, there are several features which distinguish AS from autism. Gillberg

(1989) reported that AS symptoms were less severe than autistic symptoms.

Additionally, AS symptoms generally tend to appear later in development than do autistic symptoms, for which onset must be prior to age 3 (DSM-IV, 1994; Eisenmajer et al., 1996; Gillberg, 1989). Individuals with AS also exhibit considerably greater verbal abilities than persons with autism.

Severe and sustained impairments in social interaction are essential diagnostic features of both AS and autism (DSM-IV, 1994). Whereas children with autism show little if any interest in social interactions, AS subjects want social interaction, but do not have the skills to be successful in them. For example, children with AS carry on one way, one topic conversations which generally focus on their subject of interest without regard to their listeners' interests or needs. These interactions are also characterized by pedantic speech patterns and the use of idiosyncratic words (Bowler, 1992; Eisenmajer et al., 1996; Fine, Bartolucci, Szatmari, & Ginsberg, 1994; Gillberg, 1989; Szatmari, Bartolucci, & Bremner, 1989). Children with autism, however, tend to show no interest in social interaction action, do not make eye contact with others, and appear happiest when left alone (Happé, 1994).

Another disagreement related to diagnostic criteria involves the characteristic of clumsiness. Before the publication of the DSM-IV (1994), researchers in AS used Asperger's descriptions to identify persons for the purpose of investigating and elaborating on a variety of impairments including cognitive delays and early language development (Gillberg, 1989; Szatmari, Bartolucci, & Bremner, 1989; Tantam, 1988; Wing, 1981). These researchers noted clumsiness and pedantic or unusual speech

(another area of debate) as essential criteria for diagnosis of AS, as were social deficits and circumscribed interests (Eisenmajer et al., 1996). Clumsiness is no longer included as a major diagnostic feature for AS (Ghaziuddin, Tsai, & Ghaziuddin, 1992). However, the presence of clumsiness is noted in the DSM-IV and it appears in many cases (Tantam, 1988). For instance, Gillberg and Gillberg (1989) reported that almost all of the 23 children in their study exhibited poor overall performance on the neurodevelopmental examination.

Finally, outcomes are said to be more positive for AS than autism. Szatmari, Bartolucci, and Bremner (1989), when comparing outcomes for AS and autism, reported more positive educational outcomes for individuals with AS.

There are two main reasons for differentiating between AS and autism. Connotations associated with a diagnosis of autism are considered more negative than those associated with AS because of the degree of severity of the disorder and projected outcomes. One of the most important reasons for differentiating between AS and autism is related to implications for appropriate interventions.

Language Debate

Although the course of childhood language development is usually agreed upon by professionals, disagreements about the time of language onset for children with AS exist (Myles & Simpson, 1998). Asperger observed that language onset occurred at the appropriate age, while Wing (1981) reported that many individuals with AS were slow to talk. Later Frith (1991) indicated that children with AS acquire fluent speech by the age of five, even if the development of language was slow at first, and even if their use of

language for communication is odd. Currently, according to the DSM-IV (1994), the diagnostic criteria for language development in AS specify that there is “no clinically significant delay in language” (p. 77). However, Twachtman-Cullen (1997) noted that the language of individuals with AS is impaired for social communication purposes. Also, many researchers believe that most persons with AS do not develop language normally, but rather go through a stage in which language abnormalities similar to those seen in autism are manifested (Wing, 1988).

Social Skills

Researchers have defined social skills as distinct behaviors that guide children in solving social tasks or gaining success in social interactions (Rubin, Bukowski, & Parker, 1998). Social skills include thoughts, emotions, and the management of observable behaviors. These broad categories can be further broken down into discrete social skills. The following list, based on a compilation by Rubin et al., includes many of the skills necessary in social life: (a) understanding the emotions, thoughts, and intentions of others; (b) summarizing information about a social partner and context of the interaction; (c) having the skills to open, maintain, and successfully complete a conversation; (d) understanding the consequences of one’s social interactions on oneself and the social partner; (e) guiding social interaction through mature judgments; (f) expressing feelings appropriately; (g) inhibiting the sharing of negative feelings one may have about the social partner; (h) communicating verbally and nonverbally, in a manner that enhances a partner’s social comprehension; (I) attending to the partner’s communicative attempts; and (j) complying with the partner’s social requests. The application of discrete skills

such as these determines the achievement of social success.

Unfortunately, not all children demonstrate the social skills listed above, and individuals with AS often have clearly identifiable deficiencies in these skills. Because of their actions, manner of speaking, and odd behavior, children with AS are often treated cruelly and teased by other children (Asperger, 1991/1944). Lack of friendships, the presence of loneliness, difficulty in interpersonal relationships, as well as an inability to understand the feelings of others are features of AS. The poor social interaction skills of people with AS are likely to have lifelong consequences.

Rubin et al. (1998) reported that being able to understand the emotions, thoughts, and intentions of others is a necessary social skill. This skill is referred to as theory of mind and has been studied in children with AS. Some researchers suggest that children with AS may have an impaired theory of mind because they have trouble reading the thoughts and emotions of others (Attwood, 1998; Happe, 1994). However, in theory of mind studies children over the age of five with AS did not differ from normal controls on theory of mind tasks (Bowler, 1992; Ozonoff, Rogers, & Pennington, 1991). This suggests children with AS do not have theory of mind deficits. Subjects with AS passed theory of mind tests while subjects with autism failed these tests, which may suggest the two disorders can be distinguished on this basis.

The normal age to pass theory of mind tests is five. In a literature review Frith (1996) reported that no children with AS have been found who can pass theory of mind tests before the age of five. Frith concluded that children with AS acquire this skill later than other children. Based on the limited research, children with AS do seem to

demonstrate a theory of mind, although it may develop slightly later than the normal age of five.

Rubin et al. (1998) also reported that having the skills to successfully open, maintain, and close a conversation and guiding social interaction through mature judgments were skills necessary for social success. However, Szatmari, Bremner, and Nagy (1989) reported impairments in these areas of social behavior in their review of the clinical features of AS. These features included broad social impairments such as isolation and deviant social interaction that were not explained by lack of experience, aggression, timidness, or a short attention span. The authors found significant differences between the AS and control groups in social interaction impairments such as preferring solitary play or only engaging in interactions which focus on their obsessive interests, with the individuals in the AS group showing more severe impairment. Deficits were found in areas such as approaching others only to have their own needs met and having a clumsy social approach. Individuals with AS were also reported to have one-sided verbal interactions rather than typical two-way interactions.

Individuals with AS also experience difficulty when changing topics. Transitions are often unclear since these individuals may start in the middle of a topic and make unclear references. Fine, Bartolucci, Szatmari, et al. (1994) conducted a study to investigate the use of cohesive links by individuals with AS during reciprocal conversation. Three groups of children were formed. The subjects with AS were the same individuals used in the Szatmari, Bremner, and Nagy (1989) study. Eighteen children and adolescents with HFA autism based on DSM-III criteria and Wechsler Full

Scale IQ Scores of 70 or greater made up a second group. The third group, outpatient controls (OPC), was made up of 34 adolescents with a variety of nonspecific social problems.

In this study, subjects engaged in a 10 minute conversation with an examiner. The conversation was audio taped, transcribed and coded for cohesive links. Results indicated nearly all communication strategies, such as bridging, making endophoric (verbal) and exophoric (nonverbal) references, were used similarly by the AS and OPC groups. Individuals in the group with AS made more unclear references than the HFA or OPC group. This was mainly because children with AS made substantially more references which were difficult to interpret and defined as ambiguous or additioning. Ambiguous comments made it impossible for the listener to make a choice between two antecedents. For example, "Dan and Eric play basketball. He can dunk." Additioning references often had no available antecedent, for example, "Nora took the other bus." The groups also differed in their use of references to culture, the group with autism made more of these references than the other two groups. Subjects with HFA also made fewer references to the preceding conversation.

The conversation of individuals with AS was richer and more complex than that of the individuals in the HFA group, and the HFA group was more likely to make errors in the use of cohesive links, especially additioning references. The authors noted that the criterion for language deviation is less severe for AS, thus it could be that the difference in use of specific cohesive links among HFA and AS individuals is related to this characteristic of language development. Unfortunately for individuals with AS, these

deficits can go unnoticed due to superficially above average skills in fluency and vocabulary, in a sense, hiding weaknesses with their strengths. This is unfortunate because social communication deficits will impact everyday functioning.

Understanding the consequences of one's social interactions on oneself and one's partner was reported by Rubin et al.(1998) as an essential social skill. However, children with AS often have significant impairments in self-disclosure, either a lack of or too much, which can result in embarrassing situations for the child with AS and peers and often leads to ridicule (Attwood, 1998). Perhaps the reason children with AS often play with children younger than themselves, is because younger children are less critical of awkward social behaviors. For similar reasons, children with AS prefer to interact with adults, who they also find more interesting (Attwood, 1998). Thus, although the child with AS may not be able to change their social interaction behavior, they do associate with different aged social partners, possibly because they are not ridiculed by adults or children younger than themselves.

Communication with strangers is also impaired. Children with Asperger's make embarrassing comments, ask inappropriate questions, and do not understand social distance. They are also unable to pick up social cues from the listener, the environment, or the context of the interaction (Atwood, 1998). In sum, the child with AS may have difficulty in several areas of social communication including starting and maintaining conversations, engaging in two-way conversations, sharing a conversation, and taking the other person's perspective. These often result in lifetime consequences such as an inability to make or maintain friendships.

Rubin et al. (1998) identified communicating verbally and nonverbally in a manner that enhances a partner's social comprehension as a skill needed for social success in life. Numerous researchers have reported nonverbal communication deficiencies in individuals with AS (Attwood, 1998; Davies, Bishop, Manstead, & Tantam, 1994; Szatmari, Bremner & Nagy, 1989; Tantam, Holmes, & Cordes, 1993; Wing, 1981). Davies, Bishop, Manstead, and Tantam (1994) conducted a study of children with diagnoses of either autism or AS and their abilities to process facial and nonfacial stimuli. Subjects included ten high ability (eight given AS diagnoses) matched with ten high ability controls and ten low ability (IQ < 75) autistic children matched with nonautistic low ability (IQ < 75) controls.

In the first experiment subjects were presented a set of stimuli which were made up of several dimensions (e.g., color, size, and shape) and, therefore, had several ways in which they could be classified. For example, given a set of forms that vary in size, color and shape, the experimenter might pick two objects that matched in shape. The subject had to determine in which dimension the pair matched, then demonstrate this knowledge by picking two other forms that matched on the criterion of shape.

A second experiment was used to see if results from the first task could be replicated using a different type of task, one that involved several tests of facial perception. This experiment measured what strategies the subjects used to judge facial stimuli. There were four tests in this experiment. Tests one through three were designed to test aspects of face perception. They were as follows: "(1) matching face identity despite changes in the orientation of the face; (2) matching face identity despite changes

in emotional expressions; and (3) matching emotional expressions despite changes in identity. . .” (p. 1044). In these tests as many featural cues as possible were removed, forcing subjects to rely on configural information rather than piecemeal strategies to assemble the face. Subjects had to view and process the face as a whole rather than as separate parts in order to pass these tests. The fourth test was a nonfacial task which also required the subject to process a whole configuration as opposed to individual details. This test required “. . .matching a pattern of symbols despite changes to its configuration” (p. 1044). This test measured whether the subject was taking in the whole pattern of dots, which was necessary to note changes in the exact positioning of the dots, or just focusing on parts.

Differences between the low ability autistic group and low ability controls in these experiments were not significant. Thus, it was possible that test performance was related to mental disability in these patients. Results showed that the high ability autistic and AS subjects performed worse than high ability controls across all tests. The authors posited that this meant HFA and AS individuals did have perceptual problems recognizing configural patterns involving facial stimuli which led to deficits in facial perception. Because the deficit also applied to nonfacial stimuli, these findings supported Frith’s (1989) hypothesis that autistic children’s inability to combine separate parts of a stimulus make it difficult to construct a meaningful whole (as cited in Davies et al., 1994). The authors also noted it was unlikely that the facial and nonfacial perception deficits found in this study explain all of the social, linguistic, and behavioral defects displayed by children with AS. However, it could play a part in leading to poor social

skills as a result of a misreading of social cues and identity in faces.

Tantam, Holmes, and Cordes (1993) conducted a study of nonverbal expression among individuals with AS. Fifteen subjects with AS based on ICD-10 (1993) criteria participated in the study. Initially, nine AS subjects were interviewed by nine interviewers who at the same time interviewed nine normal controls. In a comparison trial, six individuals with AS were interviewed along with six schizoid subjects with social difficulties by three interviewers (each interviewed two groups). Interviews were conducted in a video studio and were video recorded. Subjects were told that the experiment was to “find out what people say to each other when they first meet.” The interviewers knew that some of the subjects were patients and that some were students; however, the interviewers did not know whether they were interviewing a volunteer or a patient. Body movements of the subjects were video taped, then analyzed to compare groups. These movements included: self-stimulation (a hand movement touching some part of the body or an object), head and neck movements, other-directed gaze (looking at the eyes of another person), smile, vocalization (mainly, but not entirely speech), gesture (hand movement away from the body), and postural change (movement of the trunk not attributable to passive movements secondary to arm, leg, or head movements).

Only one significant difference, other directed gaze, was found between the AS group and the control group; the individuals with AS looked less at the interviewer when speaking and listening. The authors postulated these differences could be the result of a general reduction of other-directed gaze in persons with AS or that in individuals with AS the inborn tendency to focus on human faces and vocalization is impaired.

Results of the Szatmari, Bartolucci, and Bremner (1989) study indicated that subjects with AS differed significantly from normal controls on every measure of nonverbal communication. These impairments included an inability to read emotions in the facial expression of others, lack of adequate facial expressions, an inability to give messages with the eyes or look directly at others, not using the hands to express oneself or using clumsy gestures, and coming too close to others. Both the Tantum, Holmes, and Cordes (1993) and the Szatmari, Bartolucci, and Bremner (1989) studies reported persons with AS have impaired nonverbal interaction, while several of the above studies reported impaired verbal communication. Thus, these studies suggest both verbal and nonverbal communication is impaired in individuals with AS, resulting in social skill deficits in several of the key areas mentioned by Rubin et al. (1998).

Interventions

Social skills are vital to almost all of life's endeavors, ranging from school success to career to interpersonal relationships. The consequences of poor social skills can be lifelong, and social skill deficits frequently result in social adjustment problems (Matson & Swiezy, 1994) such as negative relationships with peers and adults. Developing social skills that contribute to successful relationships is one of the most important accomplishments of childhood (Gresham & Elliot, 1990). In order for children with AS to develop these skills special interventions must be implemented. Unfortunately only one study has focused on social skill interventions for individuals with AS.

Marriage, Gordon and Brand (1995) conducted a study with AS children using

methods similar to those Mesibov (1984) used for teaching social skills to autistic children. In this experiment, social skills (e.g., greeting a new acquaintance, making eye contact, or deciding when one has talked enough about a subject to a particular listener) were taught to eight males with AS, who ranged in age from 8 to 12 years. The training took place during 14 sessions broken into 2 terms. The first term lasted 8 weeks and was followed by a 6 week session in which 6 of the boys participated. (The 2 most socially skilled boys chose not to return.) Major teaching methods included a warm-up activity, role play, and games. Parents formed a parent support group which met at the same time as the children's intervention group.

Pre- and post-training questionnaires showed only a few individual improvements, but comments written by parents reported progress was being made. However, this data should be interpreted carefully, as parents may have been biased, resulting in a Hawthorne effect. It is important to note the researcher reported that the measuring instruments were somewhat non-sophisticated (e.g., rating scale questionnaires), in part because this was a pilot study. More detailed questionnaires during the entire experiment would have been desirable. Also, skills were reported not to generalize to other situations (e.g., school, home, and community). Parent reports also indicated the parent group was popular.

Several positive outcomes were enumerated. Researchers observed increased self-confidence and the acquisition of concrete social skills in the boys. For example, one boy who was nearly silent early on gradually increased his confidence and by the end of the project was participating regularly. Another boy who originally sat and muttered to

himself, gradually became more focused on conversations and began to participate during sessions. The perceived benefits of this training, (e.g., increased self-confidence in the children with AS), the success of the parent group and the possibility of future group gatherings for the benefit of the children indicate a need for continued research and experiments in this area.

As important as social skills are to everyday living, it is unfortunate that more studies have not been done in this area. However, with more awareness of and interest in AS, these opportunities are likely to present themselves to more researchers.

Summary

The prevalence of AS varies with the diagnostic criteria used to establish whether or not an individual represents a case of AS. Etiology has not yet been determined, but it appears to be multifactorial and, based on a few studies, may reflect genetic influences and/or pre-, peri-, or postnatal trauma. Prognosis for individuals with AS appears to be better than for individuals with autism, in that living independently and having a career and a family are all realistic and common.

Although much of the research completed to date has been designed to establish the clinical characteristics of AS, there are several areas of disagreement among researchers in their descriptions of individuals with AS. For example, language delays and age of onset are not yet clearly established definitive criteria, nor is the significance of clumsiness in determining whether a person should receive a diagnosis of AS.

Finally, social skills deficits may affect the daily functioning of individuals with AS more significantly than other deficits associated with the disorder. Therefore,

interventions in this area should be a primary focus of treatment. However, research in this area is currently very limited and needs to be expanded.

CHAPTER 3

IMPLICATIONS AND RECOMMENDATIONS

Due to several disagreements regarding diagnostic criteria and uncertainties within these criteria, it is clear that research related to the field of AS should be expanded. There is also a lack of research in areas such as treatment and intervention, long term outcome, and support for families. Future research should be directed toward determining whether AS and HFA represent two degrees of severity along a single continuum or if they indeed are two separate diagnostic conditions with similarity in features. Perhaps more importantly, future research should focus on interventions which improve the deficit areas of children with AS.

Over the years, new diagnostic criteria have been developed, but these criteria have differed in areas such as speech and cognitive delays. Also, there are often disparities regarding the characteristics of pedantic speech and clumsiness, with neither the ICD-10 (1993) nor the DSM-IV (1994) including them as diagnostic criteria. Future research should include studies which focus on diagnostic criteria with the goal of establishing criteria which best represent AS.

An important part of the above research will be determining whether or not a language delay exists in individuals with AS. Language deficits related to social communication do seem to exist; however, disagreements about whether or not language is delayed still needs to be resolved. For example, the diagnostic criteria for AS put forth by Wing (1981) and Gillberg and Gillberg (1989) include the presence of a speech delay,

whereas, Szatmari, Bremner and Nagy (1989) make no reference to language development, and the ICD-10 (1993) and DSM-IV (1994) indicate no language delay is present.

Currently, there are no long-term outcome studies of individuals with AS (Atwood, 1998). Such research is needed to establish levels of functioning throughout the lifespan as well as what types of interventions will be most useful to individuals with AS who are preparing for their adult future. Prognosis is reportedly good; however, these reports are not based on substantial research evidence, but rather on predictive outcomes of less severe cases. For example, an individual with AS whose social functioning is not severely impaired can be expected to hold a steady job, live alone, and possibly have a family. An important question to answer is whether the severity of the disorder is linked to outcomes or is just assumed to be linked?

Family, marital, and friendship dynamics are clearly affected by a diagnosis of AS (Attwood, 1998; Myles & Simpson, 1998). For example, in families with several children, children with AS often alienate themselves from siblings because they prefer to be alone and/or only have a limited number of interests. Also, children with AS may be easily upset by certain stimuli such as the loud noise of a vacuum or changes in a daily routine which can result in outbursts that scare younger siblings. Currently, families often receive little or no training in effective management or methods of working with the family member with AS (Myles & Simpson, 1998). Future research should be directed in this area.

Little research has been performed in the area of treatment and interventions. Resources with suggestions and guidelines for teachers and parents exist; e.g., *Asperger Syndrome: A Guide for Educators and Parents* (Myles & Simpson, 1998). However, these suggestions are not supported by research, but rather appear to be based on the symptoms of AS. Studies related to whether interventions for individuals with autism should be used as guides to good interventions for individuals with AS need to be conducted. Another question is whether or not persons with AS have a theory of mind. For example, will children with AS respond well to social skills training, in which having a theory of mind (understanding another person's behavior) is necessary?

Since the world is essentially social, individuals with AS need to have certain basic skills to cope with daily life in a functional manner. However, research in the area of social skill deficits related to AS has also been limited. Further research in this area is critical to the success of many of those diagnosed with AS because social interaction is such an important part of everyday life. The more effectively people with AS can cope with social situations, the more effectively they are likely to cope with life in general.

Careers such as school psychology, which involve advocating for children, include suggesting and implementing interventions for children with AS. However, a lack of research support could result in wasted time for not only those delivering interventions for children with AS, but also for the children with AS. In addition, some treatments may have more negative than positive effects.

Interventions should focus on taking advantage of the strengths of children with

AS. For example, most of these individuals are intellectually capable of completing assigned tasks and have good rote skills. Intervention should focus on improving the weaknesses of children with AS, such as social skills, peer relations, and motor skills.

It may also be particularly important for school psychologists to help the school faculty and staff understand the nature of AS; that is, AS is a developmental disorder and that the actions of students with AS are the result of the disorder and are not meant to be manipulative. It will also be important for school psychologists to make suggestions to the teacher regarding how to accommodate children with AS in his/her classroom. These suggestions may include keeping class routines consistent and predictable, implementing clear and concise rules, using visuals, and role-playing social interactions (Myles & Simpson, 1998).

The difficulties of an individual diagnosed with AS cannot be overlooked. Research is needed in order to clearly define the disorder, help those afflicted with AS, address the above questions, and create a better future for these individuals.

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