Asperger Syndrome and/or High Functioning Autism

Clinical Application of Findings from Research into Language and Communication Skills

Fiona M. Lewis, Bruce E. Murdoch, and Gail C. Woodyatt

University of Queensland, Australia

Background: Historically the terms Asperger syndrome (AS) and high functioning autism (HFA) have been used synonymously. The inclusion of AS as categorically distinct from Autistic Disorder in DSM-IV, however, constituted a break from the historical view of AS and HFA being similar presentations. Yet the question of a shared etiology between AS and HFA has defined a number of differing theoretical approaches to examining the language and communication abilities associated with the disorders. Debate regarding the external validation of AS from HFA has been the focus of research for more than a decade. Within the same time frame, and separate from the validation debate, a small number of studies have examined a range of language and communication skills associated with participant groups composed of individuals with autism with normal intelligence, AS, and/or HFA. In response to the validation debate, an alternative conceptualization, that of AS and HFA being presentations on a spectrum of autistic disorders, has been proposed.

Aims: This review seeks to establish whether recent research findings have had a positive contribution to the clinical understanding of language and communication difficulties associated with AS and HFA.

Conclusions: An evaluation of the literature suggests that the ongoing validation debate has had limited research and clinical value. Furthermore, the review findings suggest that conclusions from combined AS/HFA studies have limited clinical application due to the heterogeneity of the AS/HFA presentation. The results of the current review suggest that the conceptualization of AS and HFA as presentations on a spectrum of autistic disorders may have more useful application, both in research and clinical practice.

Introduction

As language and communication skills are implicated in the presentations of both Asperger syndrome (AS) and high functioning autism (HFA), definitive descriptions of the associated language and communicative profiles would be of clinical import in the long-term provision of intervention and support. The current literature review identifies three differing foci of AS/HFA re-
search. The theoretical framework for each of the three research approaches reflects the ongoing debate regarding if and how AS fits into the autism paradigm. The three theoretical approaches to research are validation studies (e.g., Howlin, 2003; Mayes & Calhoun, 2001), combined AS/HFA studies (e.g., Booth et al., 2003; Enzerich et al., 2003; Losh & Capps, 2003; Ozonoff & Miller, 1996), and studies that examine the range of skills on a spectrum of autistic disorders (Prior et al., 1998). The aim of the current review is to determine the clinical applicability of research findings to date.

Historically, the term Asperger syndrome (AS) has been linked with autism (Baron-Cohen et al., 1997; Klin & Volkmar, 2003; Schopler, 1985; Tantam, 2005). AS has been referred to as higher level autism (Schopler, 1985), high functioning autism (Baron-Cohen et al., 1997; Mestrovic et al., 2001), little more than high-IQ autism (Miller & Ozonoff, 2000), a milder version of high functioning autism (Miller & Ozonoff, 2000), falling within the autistic spectrum disorders (Wing, 1981), a mild variant of autism (Gillberg, 1989), a mild form of autism (Stone et al., 1998), able autistic people (Frith, 1991), and autism without mental retardation (Croen et al., 2002). The interchangeability of the terms reflect the historical background of AS and its relationship to Autistic Disorder (AD) which provides the theoretical perspective for the three different research approaches.

Historical Overview

In 1943, Leo Kanner, an Austrian-born American child psychiatrist published a work titled Autistic Disturbances of Affective Contact (Kanner, 1942-3). The following year Hans Asperger, an Austrian-born German pediatrician, published a thesis titled Autistic Psychopathy (Frith, 1991). Unaware of each other’s work, they both independently described similar presentations. Both wrote of children with disturbing deficits. Both used the term autistic, a term initially used by the Swiss psychiatrist Bleuler in 1916 (Frith, 1991). Bleuler’s use of the word was to describe a schizophrenic patient’s loss of contact with the world. The choice of word relates to its Greek origins (auto = self). Asperger (Asperger, 1991, p. 38) described “the autistic is only himself.”

Kanner’s (1942-3) description of the communicative skills of these children suggests early language development was delayed. The children had shown early skills of repetition of words, but normal development of language was absent. For instance, the communicative skills of these children were described by Kanner as “semantically and conversationally valueless... there is no fundamental difference between the eight speaking and the three mute children... When sentences are finally formed, they are for a long time mostly parrot-like repetitions of heard word combinations” (p. 243).

Meanwhile, Asperger (1991) described the characteristics of four boys seen in his clinic. His description included extremely limited relationship with the outside world, stereotypic movements, not reacting to stimuli appropriately, following their own internally generated responses, inappropriate responses to people, things, and situations, rigidity of behavior, unfocused eye gaze, difficulty learning practical skills, deep absorption in their own preoccupations, and clumsiness.

Asperger (1991) reported on the boys’ difficulties of social integration. Characteristics noted were speech and language onset usually being at the appropriate developmental time, peculiarity of eye gaze, poor use and comprehension of facial expression and gesture, an absence of a sense of humor, unnatural or “original” use of language, a narrow field of interest, difficulties with the mechanics of learning, restricted social relationships, a range of cognitive abilities, and a disharmony between emotion and disposition. Asperger claimed the “fundamental disorder of autistic individuals is the limitation of their social relationships” (p. 77).

Both accounts describe deficits in social communication. However, language onset and development appeared to differentiate Kanner’s Infantile Autism (1942-3) from Asperger’s Autistic Psychopathy (1991). Kanner’s children were characterized by their delayed onset of language and the use of echolalia. In contrast, Asperger’s children were described as having normal onset and development of language, but with subsequent novel or original use of language.

DSM-IV Diagnostic Criteria for AS and AD

AS (formally Autistic Psychopathy) and AD (formally Infantile Autism) are currently two of five pervasive developmental disorders listed separately in the Diagnostic and Statistical Manual of Mental Disorders—Fourth Edition (DSM-IV) (American Psychiatric Association [APA], 1994). The inclusion of AS as a separate disorder from AD established AS as a categorically distinct presentation. This challenged the perceived relationship between AD and AS with normal intelligence (high functioning autism/HFA).
Reflecting the differences in language onset described by Kanner (1942–3) and Asperger (1991), developmental language history is the pertinent diagnostic distinction between AS and AD in DSM-IV (APA, 1994). For a diagnosis of AS, DSM-IV stipulates that although nonverbal communication skills may be impaired, there is to be “no clinically significant general delay in language (e.g., single words used by age 2 years, communicative phrases used by age 3 years)” (p. 77). In contrast, a diagnosis of AD (and HFA) requires a “delay in, or total lack of, the development of spoken language” (p. 70).  

Both disorders present with the triad of autistic symptoms (impaired social interaction and relationships, abnormal communication, and rigid and limited imagination and play) (Bachevalier, 1994; Bradshaw, 2001; Maurer & Damasio, 1982; Rutter, 1978; Tantam, 1991; Wing, 1989), again reflecting the original descriptions (Asperger, 1991; Kanner, 1942–3). Complete DSM-IV criteria for Autistic Disorder and Asperger’s Disorder (AS) (APA, 1994) are presented in Appendixes A and B, respectively.

**Current Research Approaches**

**Clinical Application of Findings From Validation Studies**

The establishment of the categorical distinction between AS and AD in DSM-IV (APA, 1994) has resulted in ongoing debate regarding the external validity of the diagnosis of AS from the diagnosis of HFA (e.g., Frith, 2003; Klin et al., 2005; Klin & Volkmar, 2003; Leekam et al., 2000; Macintosh & Dissnayake, 2004; Mayes et al., 2001; Miller & Ozonoff, 1997, 2000; Rutter, 1978; Szatmari et al., 1986). The theoretical basis for this research focus reflects the historical dilemma of determining the relationship, if any, between AS and AD. In attempts to determine the external validation of AS, a number of studies have examined the relevance of developmental language history on linguistic outcomes in AS and HFA (Ghaziuddin et al., 2000; Howlin, 2003; Mayes & Calhoun, 2001; Szatmari et al., 1995; Szatmari et al., 1990). Although there are broader aspects of language development such as morphologic and syntactic content, meaning, and structure (Semel et al., 2003), these studies have been restricted to basic linguistic skills only, as subsequent development of communicative competence is not a DSM-IV diagnostic issue.

Mayes and Calhoun (2001) examined whether a history of early speech/language delay with the attendant diagnosis of autism, and a history of normal language onset and development and the associated diagnosis of AS, had significantly different outcomes for children. Using data from parent interviews, clinical observations of the child, teacher reports, and previous evaluations to complete the Checklist for Autism in Young Children (Mayes & Calhoun, 1999), they determined that there were no significant differences on any of the expressive language measures between the two groups. With these results, Mayes and Calhoun (2001) argued against the validity of AS as distinct from HFA, and called for the removal of AS from the next DSM. In a subsequent work, Mayes and Calhoun (2003) argued that “early speech delay may be irrelevant to later childhood outcome in children who have ASD [autism spectrum disorder] and normal intelligence, and that the absence of a speech delay as a DSM-IV criterion for Asperger’s disorder (vs. autism) may not be justified” (p. 21).

Just as Mayes and Calhoun (2001) determined an irrelevance of language history in the outcome of young autistic children, another study, involving adults, supported their conclusions. Howlin (2003) examined the outcome of adults with autism, with and without a history of early language delay, and using the British Picture Vocabulary Scale (Dunn et al., 1997; Dunn et al., 1982) and the Expressive One Word Picture Vocabulary Test (Gardner, 1982), found only marginally significant differences between the two groups on receptive and expressive language skills.

In contrast, Szatmari et al. (1995), using the Verbal Comprehension Scale A of the Rey/Neale Developmental Scales (Reynell & Huntley, 1987), the Grammatical Completion Test of the Test of Language Development—2 (Newcomer & Hammill, 1988), and the Word Knowledge, Part 2, of the Oral Vocabulary section of the McCarthy Scales of Children’s Abilities (McCarthy, 1972), described children with HFA as being consistently two standard deviations below the mean on a range of language tests, whereas the AS group performed just below or within one standard deviation from the mean. The authors concluded differences between AS and HFA may be quantitative rather than qualitative.

A small number of studies have examined aspects of communication other than basic linguistic skills to determine the external validity of AS from HFA. Ramberg et al. (1996), for instance, argued pragmatic skills do not differentiate AS from HFA. Yet others have suggested that of the two disorders, individuals with AS are better conversationalists (Gilchrist et al., 2001), with the failure to build on previous exchanges resulting in a difficulty in building reciprocal conversation being evident in HFA (Fine et al., 1994). The discourse skills of individuals with AS also have been described as more complex than those with HFA (Fine et al., 1994), as individuals with AS use more bridging devices than HFA, but at the same time are more likely to make errors in the use of cohesive links (Fine et al., 1994). Individuals
with AS show a tendency for obsessive and repetitive topic expression (Shriberg et al., 2001), and as a group, score higher than HFA on total pedantic speech scores (Ghazuddin & Gerstein, 1996). Moreover, significant differences have been identified between the speech and prosodic characteristics of the two spectrum disorders (Shriberg et al., 2001), with AS using more functionally useful intonation and less nonuseful intonation patterns than HFA (Fine et al., 1991).

Although findings to date suggest that communicative skills beyond outcomes in linguistic abilities may differentiate AS from HFA, findings from validation studies should be viewed cautiously as concerns have been raised regarding the reliability and validity of diagnostic decisions based on developmental history (Prior et al., 1998), which is the basic premise of such studies. The application of DSM-IV (APA, 1994) relies on the retrospective recall of language milestones. This diagnostic method is open to question, as it cannot be assumed that recall of developmental milestones is always accurate (Tager-Flusberg, 2003; Woodbury-Smith et al., 2005). This is particularly applicable to AS. Although some children are identified as young as three years of age (Semrud-Clikeman & Hynd, 1990), the average age at diagnosis is eight years (Attwood, 1998), with some individuals reaching adulthood before a diagnosis of AS is given (Frith, 2003). In such cases, developmental history may be unreliable or unavailable.

Furthermore, one group of researchers (Lord et al., 2000) has argued that developmental history and parent report should be considered in tandem with scores from a standardized observation of current behaviours such as the Autism Diagnostic Observation Schedule—Generic (ADOS-G) (Lord et al., 1999). Use of scores from a test such as ADOS-G provides information on current social-communication behavior which assists the diagnostic process, but does not adequately address the ongoing diagnostic issue of the DSM-IV (APA, 1994) reliance on developmental history.

An additional concern regarding DSM-IV (APA, 1994) is that the interpretation of reported developmental language history may lead to conflicting diagnoses (Woodbury-Smith et al., 2005). For instance, DSM-IV's criterion for AS, that of the use of single words by two years of age, and the use of communicative phrases by three years of age, would be viewed as delayed onset and development if using normative data from typically developing children (e.g., Tager-Flusberg, 2003). For some practitioners, such a presentation would be classified, not as AS, but as AD, due to delayed onset of speech and language. The reliability of studies that have designated participants into AS and HFA based on language onset as the participant inclusion criterion must therefore be questioned. Given Mayes and Calhoun (2001) and Howlin (2003) classified their participants using developmental histories, their results, therefore, may be unreliable.

There are also concerns regarding the interpretation of findings from validation studies, as the DSM-IV (APA, 1994) distinction between AS and HFA may not be applied in diagnostic and clinical practice (Klin et al., 2005). Despite the categorical distinction established in DSM-IV, Klin and Volkmar (2003) cautioned the terms AS and HFA continue to be used synonymously. The resultant overlap in terms has important research implications as unreliable diagnosis may lead to contaminated research findings.

To offer research utility, accuracy and clarity are needed in defining research populations to allow for comparisons across studies and for the replication of studies (Bishop, 2006; Klin & Volkmar, 2003). To offer clinical utility, accurate and consistent diagnostic decisions are needed, as access to services may depend upon the given diagnosis (Bishop, 2006). Likewise, qualitatively different impairments may need different intervention strategies (Klin, 2000; Szatmari et al., 1986). The methodologic concerns regarding the reliance on developmental language history to inform diagnostic decisions may be reducing the clinical application of findings from validation studies.

**Clinical Application of Findings from Combined AS/HFA Studies**

The second research focus is based on the theoretical assumption that AS and HFA are similar presentations. A number of studies examining language and communication skills have been undertaken where participants have been AS and/or HFA, with no delineation attempted between the two groups. Comparison groups have included normally developing peers and language-impaired controls, matched on measures including age, sex, IQ, socioeconomic status, handedness, and educational level. Compared to normally developing peers and/or language-impaired controls, individuals with AS/HFA have been described as experiencing linguistic deficits (Rumsey & Hamburger, 1988; Shields et al., 1996), as well as difficulties with pragmatics and discourse (Booth et al., 2003; Emerich et al., 2003; Losh & Capps, 2003; Ozonoff & Miller, 1996; Rumsey & Hamburger, 1988; Shields et al., 1996). In addition, difficulties with planning and problem-solving (Booth et al., 2003; Prior & Hoffmann, 1990; Rumsey, 1985; Rumsey & Hamburger, 1988) have been identified.

Findings from combined AS/HFA studies suggest difficulties in both the form and use of language (Bloom & Lahey, 1978). Rumsey and Hamburger (1988), for instance, detected mild linguistic deficits in adults with
HFA compared to typically developing controls. Furthermore, children with AS/HFA have been found to use a restricted number of linguistic devices in discourse, provide irrelevant material, and require more prompts for elaboration than typically developing children (Losh & Capps, 2003). Pragmatic deficits described in AS/HFA have included problems with nonliteral language such as humor (Emerich et al., 2003; Ozonoff & Miller, 1996), inference, and indirect requests (Ozonoff & Miller, 1996). Deficits in problem-solving abilities have been detected in both nonverbal and verbal tasks (Runsey & Hamburger, 1988).

Yet, combined AS/HFA studies do not take into account the heterogeneity of the language skills within the AS/HFA group which may be evident, possibly due to their different diagnoses. Tager-Flusberg (2004) argued the variance within combined AS/HFA studies may hide potentially significant group differences on aspects of language performance. Some authors acknowledged significant heterogeneity within their sample populations (Emerich et al., 2003; Runsey, 1985; Runsey & Hamburger, 1988) but no further analyses were undertaken to define the skills within the AS/HFA groups.

If, however, the heterogeneous language skills within AS/HFA represent differing autistic presentations, the necessary intervention strategies and associated outcomes also may differ (Klin, 2000; Szatmari et al., 1986). The findings of combined AS/HFA studies do not clarify the language and communicative status of individuals within AS/HFA, and therefore may have limited clinical application in terms of guiding the development of intervention and support services. An examination of within-group differences may be needed before combined AS/HFA studies offer clinically relevant findings.

Clinical Application of Findings from ASD Studies

A third theoretical perspective, again reflecting the historical link between AS and autism, is evident in the literature. A recent shift in the terminology used in research, which acknowledges both the similarities and differences in the AS and HFA presentation, is evident. Importantly, this shift avoids the limitations associated with reliance upon developmental language history to differentiate AS and HFA. The term “autistic continuum/autistic spectrum” (ASD) was introduced by Wing (1989) as a means of acknowledging all individuals presenting with the triad of autistic characteristics, irrespective of the severity of the symptoms. It is now being used to describe research populations that have previously been referred to as AS or HFA (e.g., Mandell et al., 2005; Paul et al., 2005; Prior et al., 1998; Seltzer et al., 2003; Sperry & Mesibov, 2005; Volden, 2004; Warreyn et al., 2005), even though a diagnosis of ASD does not exist in the International Classification of Diseases—10th Edition (World Health Organization, 1992), or DSM-IV (APA, 1994).

Adopting a spectrum approach, Prior et al. (1998) assessed current functioning of a group of children with a diagnosis of either AS, HFA, or a related pervasive developmental disorder. Measures included social interaction, communication, imagination, chosen self-behavior, first- and second-order theory of mind tasks, and verbal abilities. Although all the children had intelligence close to normal range, Prior et al. (1998) described three clusters of children within the participant group. The clusters differed significantly on verbal abilities as measured by the Peabody Picture Vocabulary Test—Revised (Dunn & Dunn, 1981) or the British Picture Vocabulary Test (Dunn et al., 1982), and theory of mind tasks. Interestingly, developmental language history was not significant in determining the differentiation of the clusters, and Prior et al. cautioned against using developmental history for differential diagnosis.

As such, the spectrum approach to research coupled with an examination of within-group differences taken by Prior et al. (1998) has the potential to provide a better clinical picture of the language and communicative skills in AS/HFA. There are, however, theoretical concerns that limit Prior et al.’s findings. Verbal skills assessed in the study were restricted to semantic development only, reflecting Bloom and Lahey’s (1978) language content. This theoretical perspective aligns with DSM-IV’s (APA, 1994) focus on language onset and early development. Further research is needed to extend the findings of assessments of basic skills of language development, such as the semantic areas examined by such researchers as Prior et al. (1998).

A possible limitation of Prior et al.’s (1998) research is the mean age of the participants. Although the age range of their participants was from 3 to 21 years, the mean age was only 10; 2 years. A cohort with more participants in the older age range may present with different results, given the developmental progression of language acquisition. For instance, skills such as the understanding of homonymy (Doherty, 2000), making word associations (Cronin, 2002; Ervin, 1961; Palmer, 1971), speaking and listening skills (Lloyd et al., 1998), understanding referentially ambiguous pronouns (Sekirina et al., 2004) and complex syntactic structures (Ninio, 2004), production and comprehension of functional contrasts through varied intonation (Wells et al., 2004), and the ability to produce figurative language (Leverato & Cacciari, 2002) all develop over a lengthy period of time.

Although Prior et al. (1998) examined language content, pragmatic communication, or how individuals on the autism spectrum use language, would be of clinical
relevance, given the pragmatic difficulties identified in AS and HFA populations (see, e.g., Dennis et al., 2001; Emerich et al., 2003; Ozonoff & Miller, 1996; Sabbagh, 1999). One study that has investigated language use was undertaken by Volden (2004), who focused on conversational repair skills in children with diagnoses of autism or pervasive developmental disorder—not otherwise specified. She described the significant likelihood of children with ASD responding to requests for clarification with inappropriate responses when compared to language-matched controls. Similarly, Paul et al.'s (2005) study of expressive and receptive prosodic skills in a group of participants with ASD found significant differences between the ASD group and a typically developing control group. Unlike Prior et al.'s study however, neither Volden nor Paul et al. examined within-group differences. Given the heterogeneity of the autistic presentation encompassed by the collective term ASD (Wing, 1989), an analysis of within-group differences in ASD studies may provide clinically relevant information regarding the communication skills of children on the autism spectrum.

Future research studies should aim to extend the findings of previous research by determining whether subgroups are evident within ASD, based on performance on a range of tasks encompassing not only semantic development, but also morphologic and syntactic content, meaning, language structure, and social communication skills such as pragmatics, verbal problem-solving, and abstract language skills (Manjiviona, 2003).

**Influence of Cognition**

In any discussion of language development and functioning, the dilemma of the interplay between cognition and language should, necessarily, be included. The exact nature of the interdependence between language and cognition is difficult to determine (Wetherby & Gaines, 1982). Mayes and Calhoun (2001) found no significant linguistic differences in two groups of children with similar full-scale IQ, nonverbal, and performance IQ. Similarly, Howlin (2005) detected no major linguistic differences between groups that were similar in nonverbal IQ. In contrast, Szatmari et al. (1995) described distinct language subgroups between two groups of children whose nonverbal skills were significantly different. Due to incomplete data, Prior et al. (1998) were not able to examine the relationship between IQ and subgroup membership in their study. As yet, the influence of cognitive performance over language performance has not been clarified. It may be that cognitive skill is one marker differentiating individuals within the spectrum of autistic disorders.

**Conclusions and Future Research Directions**

The historical conceptualization of AS and HFA being variations on a theme has provided the theoretical basis for three differing approaches to research. All three approaches examine language and/or communication skills associated with AS and HFA. The results of the current literature review, however, suggest that research findings associated with AS and HFA to date may have had limited clinical application due to methodologic or theoretical concerns regarding such studies.

From the validation studies there is support for a lack of difference between AS and HFA on linguistic outcomes. There is, however, support for differentiation between the two disorders on pragmatic, discourse, and prosodic abilities. Due to the unreliability of a diagnosis based on developmental history, validation studies have limited applicability in clinical practice. A number of studies combining AS and HFA have described difficulties with both the content and use of language in AS and HFA. The heterogeneous nature of the AS/HFA presentation was acknowledged in a small number of the combined studies, but studies examining within-group differences are needed to provide clinically applicable results. The findings of the review support the alternative conceptualization, based on a spectrum of autistic disorders, which has the potential to extend the current clinical understanding of AS and HFA.

The findings of subgroups within ASD that differ on semantic skills only warrant further consideration. To allow for a comprehensive examination of language and communication skills (not just semantic skills), future research designs should include standardized language and communication tests that investigate both the content and use of language. Then, using a similar approach taken by Prior et al. (1998), research studies should look for within-group differences based on current performance. Future research should also focus on language and communication skills in older children and adults, as the development of skills that emerge later in the process of language acquisition has yet to be examined.

This review supports findings that suggest that cognitive skill may influence the formation of language subgroups within ASD. The nature of the relationship between language skill and cognitive skill, therefore, should be pursued further in the within-group studies.

The hallmarks of clinically useful findings from research into AS and HFA are encapsulated in Gillberg's (1998) management guidelines for AS and HFA, where the first guideline states "appropriate assessment and correct diagnosis is essential for optimal understanding and service" (p. 208) (italics added). The current re-
view suggests that, due to methodologic and theoretical limitations, recent research findings have not facilitated clinical advancement toward meeting Gillberg’s management guidelines.

Address Correspondence to  Fiona Lewis, Division of Speech Pathology, School of Health and Rehabilitation Sciences, University of Queensland, Australia 4072; E-mail: f.lewis@uq.edu.au, Telephone: (International prefix +61 7) 3365-1877, Fax: 3365-4754

References


