autism © 1997
SAGE Publications
London,
Thousand Oaks
and New Delhi,
Vol 1(1) 37–55
ISSN 1362-3613

Questioning the validity of the semantic-pragmatic syndrome diagnosis

LOUISE GAGNON *Université de Montréal, Canada*
LAURENT MOTTRON *Hôpital Rivière-des-Prairies, Montréal, Canada*
YVES JOANETTE *Université de Montréal, Canada*

ABSTRACT The classification of developmental language disorders has recently witnessed the birth of a subsyndrome, semantic-pragmatic syndrome, used to describe the case of children with specific language and communication impairments. However, there are striking similarities between children with semantic-pragmatic syndrome and those with high-functioning autism on a communicative, behavioural and cognitive level. This article questions the validity of semantic-pragmatic syndrome as a diagnostic concept distinct from high-functioning autism and, consequently, its use as a clinical entity.

KEYWORDS *Asperger syndrome; autism; developmental language disorders; diagnosis; semantic-pragmatic syndrome*

ACKNOWLEDGEMENTS *Funding for this article was provided by a doctoral fellowship award from the Fonds de la Recherche en Santé du Québec to Louise Gagnon. Dr Laurent Mottron was supported by a chercheur boursier from the Fonds de la Recherche en Santé du Québec and a grant from the Conseil Québécois de recherche sociale. This work was also partly supported by a grant of the Conseil de recherche la médicale du Canada to Dr Yves Joanette. We are grateful to Dr Isabelle Rapin and to Mirelle Larose for their apt and incisive comments on this article. We also thank Elizabeth Ohashi, Lauren Ptito and Paul Di Biase for editing the manuscript.*

ADDRESS *Correspondence should be addressed to:* LOUISE GAGNON, *Clinique spécialisée de l'autisme, Hôpital Rivière-des-Prairies, Psychiatrie adulte, 7070 boulevard Perras, Montréal, Québec, Canada H1E 1A4*

It is a much more difficult task to abandon an outdated or ill-founded clinical entity than it is to introduce a new one. In this article, we call into question various aspects of the semantic-pragmatic syndrome or disorder as described by Rapin and Allen (1983), Bishop and Rosenbloom (1987) and Bishop (1989), and attempt to justify its elimination as an autonomous clinical condition. We will proceed with a critical review of the empirical and theoretical bases of this syndrome. We will then discuss its relationship to other neighbouring diagnostic conditions, autistic disorder, and particularly high-functioning autism and Asperger syndrome.

Finally, we will question the relevance of its use in current clinical practice. This critical review is prompted by the fact that semantic-pragmatic syndrome is part of the diagnostic culture of various clinical settings, despite serious disagreements regarding its validity and distinctiveness (Wing, 1988; Brook and Bowler, 1992; Lord and Rutter, 1994; Happé, 1995).

A brief history of the semantic-pragmatic syndrome

Over the past decades, the field of language acquisition and communication disorders has witnessed the emergence of various clinical labels (Ajuriaguerra et al., 1958; Aram and Nation, 1975). These taxonomies developed parallel to the classifications issued with each successive edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-III, DSM-III-R, DSM-IV: American Psychiatric Association, 1983, 1987, 1994). Until DSM-IV, children's verbal and communication disorders were separated into two groups: receptive and expressive. These classifications were derived from, and therefore share the same limitations as, the taxonomies of adult-acquired aphasia formulated at the beginning of the century (for a review, see Caplan, 1987). One of these shortcomings is the inability to account for the heterogeneity of the symptomatology observed among individuals with *expressive* or *receptive* communication deficits. As a result, the DSM classifications are considered by many to be overly simplistic, as they fail to recognize the variety of functional deficits in children with severe language development and communication disorders (Rapin and Allen, 1983).

Fortunately, other taxonomies seem more concerned with acknowledging the diversity of this population's clinical manifestations. Of these classifications, the taxonomy of Rapin and Allen (1983) has attracted the greatest attention from clinicians and researchers, particularly in the United States, England, Québec and France. We will focus here on one of Rapin's six subtypes of developmental language disorders: the semantic-pragmatic syndrome. This syndrome was originally proposed in order to acknowledge the existence of a number of children whose verbal and communicational deficits were perceived as the most severe form of dysphasia.

According to Rapin and Allen (1983, 1987) and Rapin (1995), the clinical picture of semantic-pragmatic syndrome is characterized primarily by severe receptive deficits and by expressive deviations affecting the semantic and pragmatic aspects of language and communication. In children with this syndrome, the formal and structural aspects of language, such as syntax, are well preserved, and there are no deficits affecting articulation. Expression is also characterized by poor conversational skills with inappropriate use of language (stereotyped utterances, incessant

questioning). Expressive skills may be more advanced than comprehension abilities. Problems with comprehension concern various semantic aspects of language.

The clinical features (Rapin and Allen, 1983) and the neuropsychological profile of children with semantic-pragmatic syndrome (Shields et al., 1996), however, bear a striking resemblance to those of children with autism. Thus, the validity of semantic-pragmatic syndrome as a developmental language disorder and as a distinct diagnostic concept from high-functioning autism has been questioned since its introduction. Rapin and Allen first referred to a 'semantic-pragmatic syndrome without autism' (1983, p. 174). Later, Rapin and Allen (1987), Allen and Rapin (1992) and Rapin (1995) suggested this syndrome be considered an autonomous language and communicational syndrome that can be found in a number of clinical conditions such as hydrocephaly, developmental language disorders and autism. Finally, these authors have favoured the expression 'semantic-pragmatic deficit syndrome' to signify a group of communication and language deficits more frequently found in autism than in any other condition. At about the same time, Bishop (1989) and Bishop and Rosenbloom (1987) described a clinical entity marked by language and communication impairments distinct from autism and referred to it as 'semantic-pragmatic disorder'. For these authors, this diagnosis applied to children with language deficits resembling those in autism, but who presented an insufficient number of symptoms to be diagnosed with autism under DSM-III-R.

Diagnostic criteria for semantic-pragmatic syndrome

The identification of a clinical entity requires explicit and distinctive diagnostic criteria. Only under these conditions can the proposed clinical entity be empirically validated. This section will examine the various problems posed by the defining criteria of semantic-pragmatic syndrome, as well as its supporting empirical basis.

The first problem is that the criteria used by Rapin and her colleagues to define the semantic-pragmatic syndrome are more aetiological than empirical. The 'semantic-pragmatic' label implies that its symptoms are grouped on the basis of a supposed aetiology, the locus of which is a semantic processing module, rather than on their clinical co-occurrence. Although the principle of an aetiological syndrome is not a problem *per se*, it still remains to be proven that a semantic deficit is indeed responsible for the observed language symptoms. Moreover, for this argument to stand, it must be demonstrated that the population concerned presents a semantic deficit. Such a deficit, however, has not yet been evidenced in semantic-

pragmatic syndrome, nor has it been found in high-functioning autism (Tager-Flusberg, 1991).

Second, despite the fact that semantic-pragmatic syndrome was introduced in the literature more than 10 years ago and has attracted much attention, its phenomenological features still stem solely from vague clinical descriptions. This is particularly troublesome for the future of this syndrome because, as we shall see later, the symptoms in semantic-pragmatic syndrome overlap with those of high-functioning autism, leaving the two clinical entities to be distinguished solely by the number and the severity of the clinical symptoms (Bishop, 1989).

Finally, the inclusive and exclusive criteria for semantic-pragmatic syndrome are difficult to report unequivocally. More specifically, the clinical picture of this syndrome remains imprecise over time and its definition still suffers from a lack of uniformity among researchers. Table 1 gives the diagnostic criteria for semantic-pragmatic syndrome as extracted from the descriptions of this clinical entity available in studies that have investigated the syndrome over the years. As can be seen, it has evolved from a developmental language disorder excluding autism (Rapin and Allen, 1983), to a condition mutually non-exclusive of autism and of developmental language disorder, and, finally, to a condition rarely encountered separately from autism (Rapin and Allen, 1987; Allen and Rapin, 1992).

Such flux is normal when a clinical entity is in the process of being identified or isolated. However, after a period of debate, a list of clinical symptoms is usually finalized and agreed upon by clinicians and researchers. The aim of this process is not to set in stone the description and definition of a syndrome. On the contrary, changes are possible and occur usually on the basis of international consensus, as allowed for in the DSM editions. The semantic-pragmatic syndrome could be considered to be at the beginning of this process. By contrast, other recently introduced clinical entities have already successfully completed the cycle. Asperger syndrome, for example, went from an initial description (Asperger, 1944) to a series of contradicting descriptions (Wing, 1991) before a closed description of its symptoms was finally recognized by DSM-IV. As we shall attempt to show, the same, however, cannot be expected in the case of semantic-pragmatic syndrome.

Empirical studies

The initial descriptions of semantic-pragmatic syndrome (Rapin and Allen, 1983; Bishop and Rosenbloom, 1987) were based on clinical observations. In two studies only (Allen and Rapin, 1992; Rapin and Allen, 1987),

Table 1 **Characteristics symptoms and exclusion criteria for semantic-pragmatic syndrome**

Authors	*Type and purpose of article*	*Characteristics symptoms*	*Criteria for exclusion*
Rapin and Allen (1983)	Theoretical article on the definition of six developmental language disorders including semantic-pragmatic syndrome	History of delayed, age-appropriate or precocious expressive language acquisition Echolalia Very fluent expressive language Good surface language (phonology and syntax) Pronominal confusions Inability to encode relevant meaning Impaired comprehension in conversation Possible comprehension of isolated words and simple sentences Questions answered but odd responses Language not really communicative Inability to engage in communicative discourse Utilization of canned sentences Disruption of sentence prosody Possible hyperlexia	Autism
Rapin and Allen (1987)	Experimental article on the prevalence of semantic-pragmatic syndrome in developmental language disorder and autistic population	Added characteristics to Rapin and Allen (1983): Verbose Circumlocutions Semantic paraphasias Lack of semantic specificity Incessant chatter Perseveration Comprehension deficits for the meaning of verbal messages, notably questions Tendency to interpret messages literally Poor turn-taking Tendency to respond to one or two words in a sentence rather than to the entire message Difficulty maintaining a topic in discourse	Autism and semantic-pragmatic syndrome are not considered mutually exclusive syndromes (but children with autism are supposed to be more severely impaired)
Bishop and Rosenbloom (1987)	Theoretical article on the definition of specific language impaired children including semantic-pragmatic disorder	Delayed language development Early language by echolalia and jargon Expression better than comprehension Good verbal fluency Normal sentence complexity Minor syntax and phonology problems Pronominal and verb-tense confusions Repetition of rhymes and jingles Possible word-finding problem Phonemic paraphasias on denomination Continually asking questions Better comprehension in structured than unstructured context Poor reading comprehension but also possibly not delayed Possible failure to comprehend and produce non-verbal meaning cues Tendency to interpret messages literally Inattention Inappropriate social behaviours Poor imaginative play Fascination with mechanical objects Possible clumsiness Possible ritualistic and obsessional behaviour	Autism Intellectual retardation Hearing loss Elective mutism Landau–Kleffner syndrome Asperger syndrome

Table 1 continued

Authors	*Type and purpose of article*	*Characteristics symptoms*	*Criteria for exclusion*
Bishop (1989)	Theoretical article on the nosological status of the semantic-pragmatic disorder relative to Asperger syndrome and autism	Added characteristics to Bishop and Rosenbloom (1987): Possible slight restricted repetitive and stereotyped interests	Autism
Adams and Bishop (1989)	Experimental article on the comparison between children with semantic-pragmatic disorder and children with other specific language impairment	Added characteristics to Bishop and Rosenbloom (1987): Higher rate of violation of turn-taking in semantic-pragmatic disorder than other specific language impaired children	Autism
Bishop and Adams (1989)	Experimental article on the comparison between children with semantic-pragmatic disorder and children with other specific language impairment	Added characteristics to Rapin and Allen (1983, 1987), Bishop and Rosenbloom (1987): Semantic-pragmatic children provide too little or too much information to the listener	Autism
Allen and Rapin (1992)	Experimental article on the prevalence of semantic-pragmatic syndrome in developmental language disorder and autism	cf. Rapin and Allen (1983, 1987), Allen et al. (1988)	Severe mental deficiency Hearing loss Cerebral palsy
Bishop and Adams (1992)	Experimental article on the comparison between children with semantic-pragmatic disorder and children with other specific language impairment	cf. Bishop and Adams (1989)	Autism
Bishop et al. (1994)	Experimental article on the description of semantic-pragmatic disorder	Added characteristics to Rapin and Allen (1983), Bishop and Rosenbloom (1987): Tendency to initiate conversation more frequently than normal control with a familiar or unfamiliar adult	Autism
Shields et al. (1996)	Experimental article on the comparison between children with semantic-pragmatic syndrome, other developmental language disorders, and high-functioning autism on neuropsychological tests sensitive to left–right hemisphere damage	cf. Rapin and Allen (1987)	Autism

the impairments of semantic-pragmatic syndrome were empirically compared with those of its two closest categories, developmental language disorders and autism. The aim was to determine the prevalence of language and communication disorders characteristic of semantic-pragmatic syndrome at the boundaries of autism. To this end, two large cohorts of children were compared, one meeting the diagnostic criteria for developmental language disorders without autism and the other meeting criteria for both autism and pervasive developmental disorders not otherwise specified, as defined by DSM-III-R. Results indicated that a higher percentage of children with autism presented a clinical picture corresponding to that of semantic-pragmatic syndrome, compared with children without autism (37 versus 23 percent, respectively). As we can see, these findings failed to draw a clinical distinction between semantic-pragmatic syndrome and autism, as they did not clearly distinguish semantic-pragmatic syndrome in and outside the boundaries of autism. Other studies (Adams and Bishop, 1989; Bishop and Adams, 1989; Sahlen and Nettlebladt, 1993; Bishop et al., 1994; Leinonen and Smith, 1994) aimed to characterize the pragmatic communication impairments in children with semantic-pragmatic syndrome. To this end, children with this syndrome, children with other types of developmental language disorders, and normal controls were compared on the basis of their performance on tasks evaluating pragmatic abilities. One distinctive characteristic of children with semantic-pragmatic syndrome was their tendency to produce conversational initiations with adults (Adams and Bishop, 1989) more frequently than either normal subjects or subjects with developmental language disorders.

Several limitations may have tainted the results of these studies. For one, the diagnoses for the older children at the time of the study were made retrospectively on the basis of their clinical files as per DSM-III and DSM-III-R criteria (Rapin and Allen, 1987; Allen and Rapin, 1992). Such retrospective diagnoses are risky, particularly given the numerous modifications that have occurred over recent years regarding the diagnostic concept of autism. This is particularly the case with high-functioning autism when it introduced a broader concept of the autistic condition. The boundaries of developmental language disorders and autism are difficult to define, and certain children seem to present a mixed clinical picture (Rutter, 1978). Furthermore, the complexity and the variability of the array of clinical symptoms presented by young children with autism, pervasive developmental disorders not otherwise specified, and developmental language disorders with severe receptive impairments make it difficult to reach an adequate diagnosis. Given these facts, the comparability and homogeneity of the diagnoses made throughout these studies,

notably those regarding subjects at the boundaries of autism, are questionable.

The most important objection that can be made about these studies pertains to their conceptual and methodological framework. The principal aim of these studies was to determine the relationship between semantic-pragmatic syndrome on the one hand and autism and developmental language disorders on the other. All possible sources of contamination associated with the establishment of diagnoses should have been eliminated by setting strict *a priori* criteria for these two clinical entities. Moreover, inter- and intra-judge reliability measures would have ensured that the *a priori* criteria were properly applied to the subject population. Without such precautions, and by using retrospective diagnoses to differentiate syndromes, authors run the risk of falling into the trap of circularity.

Relationship between semantic-pragmatic syndrome and pervasive developmental disorder

The preceding sections call for a closer examination of the relationship between semantic-pragmatic syndrome and pervasive developmental disorders. This section will examine: (a) the overlap between the clinical symptoms of autism and semantic-pragmatic syndrome; (b) the aptness of grouping the language and communication symptoms of high-functioning autism under one particular label; (c) the importance of recognizing the existence of individuals of normal to near normal intelligence with autism; and finally, (d) the similarities between neuropsychological profiles in high-functioning autism and semantic-pragmatic syndrome.

Clinical overlap between semantic-pragmatic syndrome and high-functioning autism

Autism is by far the best defined and most widely accepted of the pervasive developmental disorders (Rutter and Schopler, 1992). DSM-IV recognizes the existence of three areas of impairment under which the symptoms of autism are grouped. These areas cover deficits in (a) reciprocal social interactions, (b) communication and (c) imagination and interests. For autism to be diagnosed, a minimum critical number of symptoms in each of the three areas is required. These criteria provide a more or less nuclear definition of autism and enable us to make a distinction between autism and neighbouring conditions (Asperger syndrome, pervasive developmental disorders not otherwise specified, developmental language disorders). Consequently, hypotheses may be formulated regarding the nature of the

border between autism and closely related diagnostic entities, based on the number and type of symptoms required to reach a diagnosis of autism.

Given the similarities between semantic-pragmatic syndrome and autism, a comparison of their respective symptoms is required before the two clinical entities can be declared distinct. As can be seen in Table 2, semantic-pragmatic syndrome and autism share many common symptoms. The overlap is particularly evident in the area of language and communication perturbations, but also clearly extends to other areas of impaired behaviour. Moreover, *there are no differential symptoms or features present in either disorder to anchor a distinction between semantic-pragmatic syndrome and autism.* It is on these grounds, for instance, that autism was successfully differentiated in the DSM-IV from Asperger syndrome and Rett's syndrome. Although the underlying basis for separating these syndromes from autism remains questionable, important nosographical distinctions have been made based on the developmental history of Asperger syndrome and on the course of Rett's syndrome, which is marked by deterioration and other associated characteristic symptoms.

Recently, Rapin (1995) suggested that semantic-pragmatic syndrome designates a set of language and communication abnormalities present in high-functioning autism, and rarely encountered in isolation in other clinical conditions. This position, however, is difficult to defend. Why arbitrarily isolate the communication area from the various deficits that contribute to the definition of a syndrome properly validated as an independent clinical entity? This separation would be justified only if the deficit in this area appears more frequently in isolation than in association with other areas of impairment. According to the very authors who introduced semantic-pragmatic syndrome, however, this syndrome is more frequently found in autism. Therefore, the rare cases of isolated autistic-like deficits in the communication area should be described as incomplete or atypical autism, rather than as a specific clinical entity.

Isolation of communication deficits in semantic-pragmatic syndrome

The hypothesis that semantic-pragmatic syndrome is a disorder specific to language or communication cannot be supported at either a descriptive or a theoretical level. Table 2 illustrates that children with this syndrome present impairments in each of the three areas of impairment associated with autism. For example, poverty of imaginative play (Bishop, 1989), poor social skills and poor utilization of non-verbal communication are listed as characteristics of the syndrome (Shields et al., 1996). These characteristics go well beyond the initial proposal made by Rapin and Allen (1983, 1987) and Allen and Rapin (1992), who strove primarily to

Table 2 **Shared characteristics of autism and semantic-pragmatic syndrome in reference to the DSM-IV criteria**

DSM-IV criteria for autism	*Corresponding symptoms for semantic–pragmatic syndrome in literature*
Reciprocal and social interaction	
1 Marked impairment in the use of non-verbal behaviours	1 Possible failure to comprehend and produce non-verbal cues[a]
2 Failure to develop peer relationships appropriate to mental level	2 Poor social skills[b]
3 Lack of spontaneous seeking to share enjoyment, interests or achievement with other people	
4 Lack of social or emotional reciprocity	4 Inappropriate but quasi-normal social behaviours[a,c]
Communication	
1 Delay in or total lack of development of spoken language (not accompanied by compensation)	1 History of delayed development[a,c,e] Poor use of non-verbal communication[b]
2 In individuals with adequate speech, marked impairment in the ability to initiate or sustain a conversation	2 Inability to engage and sustain a communicative conversation. Comprehension problem in conversation. Inability to understand non-literal language[a,c,d,e]
3 Stereotyped and repetitive use of language or idiosyncratic language	3 Stereotyped and repetitive use of language[a,c,d,e]
4 Lack of varied, spontaneous make-believe play or social initiative play relative to developmental level	4 Symbolic representation impairments[e] Poor imaginative play[a]
Restricted repetitive and stereotyped behaviours, interests and activities	
1 Encompassing preoccupation with stereotyped and restricted patterns of interest that is abnormal in either intensity or focus	1 Possible slight restricted repetitive and stereotyped interests[a,c]
2 Inflexible adherence to specific, non-functional routines or rituals	
3 Stereotyped and repetitive motor mannerisms	3 Only mild tendencies to ritualistic and obsessional behaviour[a,c,f]
4 Persistent preoccupation with parts of objects	4 Possible ritualistic and obsessive behaviour[a]

[a] Bishop and Rosenbloom (1987).
[b] Shields et al. (1996).
[c] Bishop (1989).
[d] Rapin and Allen (1983).
[e] Allen and Rapin (1992).
[f] Lord and Rutter (1994).

isolate semantic-pragmatic syndrome as a disorder of the language and communication area. Consequently, this syndrome is a *de facto* pervasive developmental disorder that involves more than language and communication deficits. However, semantic-pragmatic syndrome has been included in the developmental language disorders family since it first made its appearance in the scientific literature (Rapin and Allen, 1983). Bishop (1989) is a staunch proponent of this view. She has suggested placing autism, Asperger syndrome and semantic-pragmatic syndrome on a two-dimensional continuum defined in one direction by meaningful verbal communication and in the other by interests and social relationships. Under this scenario, children with semantic-pragmatic syndrome present a marked and isolated deficit in the verbal communication sphere with preserved social abilities and an absence of marked restricted interests. The opposite pattern has been observed in the majority of individuals with Asperger syndrome. This population presents deficits in the social interaction area, restricted interests and a relatively spared communication area (DSM-IV). Finally, the areas of verbal communication, social interactions and restricted interests are simultaneously affected in children presenting a clinical picture corresponding to autism.

From an experimental point of view, Bishop's proposal could be validated only if information on areas of impairments other than language and communication were systematically documented and if these areas were shown to be unaffected in children with semantic-pragmatic syndrome. Unfortunately, as Brook and Bowler (1992) highlighted in a review of studies of children with this syndrome, there is a lack of systematic information on pre-verbal history, social functioning, imaginative activities and restricted interests in this population. The studies conducted since that review (see Table 1) incur the same criticism. The semantic-pragmatic syndrome continues, therefore, to be primarily defined and studied on the basis of these verbal communication alterations, artificially reinforcing the notion that it is a syndrome specific to this sphere.

From a theoretical perspective, we might believe that well-documented studies on semantic-pragmatic syndrome should probably reveal alterations in socialization and imagination in this population. Autism has indeed acquired the status of a 'syndrome' on the basis of the systematic co-occurrence of impairments in the three areas of alterations (DSM-IV). This strong co-occurrence has led to the assumption of a common cognitive anomaly (or a set of anomalies) underlying the constellations of impairments within these three areas. The co-occurrence of apparently heterogeneous symptoms cannot be attributed to some unprincipled random effect but could rather correspond to the clinical expression of a

common cause in the three areas of impairments (Morton and Frith, 1994).

Semantic-pragmatic syndrome, autism with normal or superior intelligence and Asperger syndrome

Semantic-pragmatic syndrome is a diagnosis generally attributed to children with normal to quasi-normal intelligence and with well-developed formal and structural language. Until recently, the diagnosis of autism was rarely given to individuals with a normal to superior level of intelligence. Semantic-pragmatic syndrome appears, then, to have filled this very gap by being used as a diagnosis for autistic patients with normal intelligence. The relationship between autism and intellectual level has since been clarified. More specifically, the nature of the symptoms retained in current diagnostic scales makes it possible to discriminate between mental retardation and autism (Le Couteur et al., 1989; Lord et al., 1989). It has been clearly demonstrated that the absence of an intellectual deficit in an autistic patient does not entail that the autistic symptoms are minor. It was consequently established that individuals with low- or high-functioning autism do not differ in their autistic symptoms (Yrmiya et al., 1994). It should also be noted that there is currently no upper limit of intelligence in the diagnosis of autism in the DSM. The diagnosis of autism for individuals with normal to superior intelligence, and well-developed language with communication deviations, can therefore no longer be excluded. More generally, the decisions made by the DSM-IV are leaning towards the independence of intelligence and global developmental deficits. Hence, the DSM-IV criterion used to differentiate autistic disorder and Asperger syndrome is not level of intelligence, as is still widely believed in some clinical settings, but the onset of the condition and the absence of a language delay. Furthermore, it should be noted that postulating an initial language delay for semantic-pragmatic syndrome (Rapin and Allen, 1983; Bishop and Rosenbloom, 1987) would make this syndrome more akin to high-functioning autism than to Asperger syndrome, according to the DSM-IV criteria for this condition.

A comparison of cognitive profiles in semantic-pragmatic syndrome and high-functioning autism

Differences in the neuropsychological profiles of children with semantic-pragmatic syndrome and those with autism would provide a sound basis for distinct diagnostic status. In this connection, Bishop (1989) suggested that children with symptoms of semantic-pragmatic syndrome could be distinguished from those with Asperger syndrome on the grounds of their performance profile on the Weschler Intelligence Scale (Weschler, 1974, 1981). The latter apparently obtain significantly higher scores on the

verbal scale than on the non-verbal or performance scale (Klin et al., 1995), whereas children with semantic-pragmatic syndrome, like other developmental language disorders subgroups, present the reverse dissociation. The literature so far contains no information on the Weschler profile of children with semantic-pragmatic syndrome. Moreover, some individuals with high-functioning autism present a cognitive profile similar to that in developmental dysphasia (non-verbal intelligence quotient > verbal intelligence quotient) and, therefore, distinct from that attributed here to Asperger syndrome (non-verbal intelligence quotient < verbal intelligence quotient) (Klin et al., 1995). Minshew et al. (1996) have recently shown an unexpected variability among children with high-functioning autism on their Weschler profiles, without significant differences between verbal and non-verbal scales. Finally, Shields et al. (1996) compared children with high-functioning autism and semantic-pragmatic syndrome on batteries of neuropsychological tests. The results revealed striking similarities between both groups. These findings shed serious doubt on the possibility of a distinction between semantic-pragmatic syndrome and autism based on Weschler profiles and support the existence of cognitive similarities, other than language and communication, between the two diagnoses.

In summary, many factors militate in favour of the inclusion of semantic-pragmatic syndrome in autistic disorder as defined in DSM-IV:

1 The documented symptoms of semantic-pragmatic syndrome and those of autism clearly overlap.
2 Semantic-pragmatic syndrome cannot be isolated only on the basis of an affected language and communication sphere, because it also comprises symptoms of reciprocal social interaction, restricted interests and imaginative play.
3 The existence of individuals exhibiting autistic symptoms in the language area but with other areas intact has not been demonstrated empirically.
4 The cognitive profile proposed for children with semantic-pragmatic syndrome is no different from that of children with high-functioning autism.
5 Individuals with normal intelligence and superior language abilities in adulthood can be diagnosed with autism.

Semantic-pragmatic syndrome and dysfunctions of the right hemisphere

Shields (1991) explored the possibility of semantic-pragmatic syndrome being a disorder resulting from a dysfunction of the right hemisphere.

According to this author, children with lesions to the right hemisphere acquired early in life bear striking similarities to persons with right cerebral lesions acquired at maturity (for a review, see Joanette et al., 1990) in terms of their communication, cognitive and socio-affective impairments. We shall now argue that this hypothesis cannot be used as a reason to consider semantic-pragmatic syndrome as a distinct entity.

First, similarities in verbal communication deficits observed in persons with brain lesions acquired at maturity and those present in individuals with a developmental disorder, such as semantic-pragmatic syndrome, should not be considered as other than a surface resemblance. These similarities do not constitute empirical evidence for a common cognitive functional aetiology, let alone for a common anatomical localization of the deficits (Joanette et al., 1990).

Second, empirical evidence supporting an association between lesions to the right hemisphere over the course of development and clinical symptoms closely resembling those of autism cannot form the basis for isolating such a right-hemisphere developmental syndrome from autism. The suggestion made by Shields (1991) favouring the existence of a right-hemisphere dysfunction in children with semantic-pragmatic syndrome should be recast as follows: developmental injury of the right hemisphere constitutes one of many medical anomalies occasionally associated with autism. Autism is associated with a large number of apparently heterogeneous neurobiological conditions (Rutter et al., 1994), including rubeola, seizures, tuberous sclerosis and hydrocephalia. Therefore, it is not the pathologies associated with the autistic picture that make this syndrome an entity, but the high inter-class correlation among its clinical symptoms.

Two aspects of the relationship between autism and neuropsychological deficits associated with right-hemisphere lesions must also be emphasized. First, the search for right-hemisphere anomalies in autism is legitimate, regardless of the interpretation given to the causal status of these anomalies. An association between the two has already been demonstrated in a small number of cases with neuroimaging methodology (McKelvey et al., 1995). Klin et al. (1995) showed a strong convergence between Asperger syndrome and the non-verbal learning disabilities syndrome that suggests a right-hemisphere abnormality. However, the authors failed to demonstrate these so-called right-hemisphere deficits in high-functioning autistic subjects, while Shields et al. (1996) observed right-hemisphere type deficits in children with semantic-pragmatic syndrome and high-functioning autism. Second, it appears that the isolation of clinical pictures for right-hemisphere patients may originate from a failure to assess for autistic syndrome. This suggests that the isolation from pervasive developmental disorders of right-hemisphere deficit syndrome

(Voeller, 1986), social emotional processing disorder (Manoach et al., 1995) and non-verbal learning disabilities syndrome (Rourke, 1989) should perhaps be reconsidered under this aspect.

Use of semantic-pragmatic syndrome diagnosis by clinicians

Semantic-pragmatic syndrome is frequently diagnosed by clinicians, despite the controversy surrounding its definition. Ongoing changes in the criteria distinguishing this syndrome from neighbouring conditions and the absence of a detailed and distinct clinical picture prevent a consensus on its definition and its clinical use. This situation has resulted in health professionals being polarized into those who support the existence of semantic-pragmatic syndrome as a diagnostic entity distinct from autism, namely speech and language pathologists, and those who perceive this disorder as a form of autism, namely psychiatrists and psychologists.

Moreover, certain researchers (e.g. Bishop, 1989) have suggested that the confusion surrounding the status of semantic-pragmatic syndrome relative to autism may stem from a reference bias that directs patients to certain professionals rather than others, depending on the severity and the area of their deficits. Under this hypothesis, children presenting a symptomatology of mild autistic features with near normal intelligence and a predominance of communication deficits are referred to speech and language pathologists (and later considered children with semantic-pragmatic syndrome), whereas those more severely afflicted in the social and behavioural sphere are sent to psychologists or psychiatrists (and diagnosed with Asperger syndrome or high-functioning autism). As a result, professionals in a given camp are less knowledgeable of the patient population less frequently referred to them. This situation prevents recognition of the similarities between autism and semantic-pragmatic syndrome and adds to the belief that they are two distinct conditions. Brook and Bowler (1992) underlined a similar bias when they indicated that language symptoms may appear predominant in individuals with semantic-pragmatic syndrome only because of a failure to investigate symptoms in other areas. In other words, speech and language pathologists believe the problem is primarily a communication impairment because they do not systematically look for other symptoms. Conversely, psychologists and psychiatrists look for symptoms in the three areas of impairment (i.e. reciprocal social interaction, communication and imaginative play) but may balk at formulating a diagnosis of autism in the case of individuals with normal to near normal intelligence.

The use of the semantic-pragmatic diagnosis may also result from the

reluctance of certain health professionals to give the heavily connotative diagnosis of autism to mildly affected young children. A diagnosis of semantic-pragmatic syndrome avoids pinning the label of autism on a child in whom a significant improvement has been observed or is expected. Improvement in a condition, however, should not be equated with the absence of an autistic syndrome, especially when the clinical symptoms observed in high-level autism normally improve in adulthood (Piven et al., 1996).

At the clinical level, the inclination of certain health professionals to exclude semantic-pragmatic syndrome from autism has enormous repercussions on the nature of the treatment recommended for those patients. Children currently receiving a diagnosis of semantic-pragmatic syndrome rather than high-level autism may not benefit from the appropriate explanations and rehabilitation guidelines for their condition. Consequently, they are more likely to be channelled into classes intended for children with developmental language disorders. This misrecognition also bears consequences for public health care. The exclusion of less affected individuals from the category of autism artificially diminishes the estimated prevalence of this condition; proper recognition of high-functioning autism and Asperger syndrome could instead justify increasing the services offered to the autistic population.

If the semantic-pragmatic syndrome diagnosis does nothing more than arbitrarily group the verbal communication deficits present in autism under a separate category, what use is there in keeping such a confounding diagnosis? Those who favour retention of this syndrome, despite the existence of a well-defined diagnostic category (i.e. high-functioning autism) whose symptoms coincide with those of semantic-pragmatic syndrome, must provide empirical evidence to support their case. However, in the clear absence of a single differential criterion between autism and semantic-pragmatic syndrome, a systematic clinical and empirical research process aimed at proving the existence of the latter separate from autism is inconceivable *a priori*.

Conclusion

We suggest that individuals presenting a clinical picture resembling that of autism, whether they meet all the criteria for such a diagnosis or not, should be described in relation to a consensual syndrome. Descriptive and detailed diagnostic instruments such as the Autism Diagnostic Interview, Revised (Lord et al., 1993), and the Autism Diagnostic Observation Schedule (Lord et al., 1989), which are used to measure symptoms present

in this condition, yield a more refined characterization than does the DSM, especially for individuals at the boundaries of autism. These instruments can also provide a better description of the clinical picture for autism, whether with or without mental deficiency. Describing handicaps at the boundaries of autism in this manner would facilitate the identification of possible subgroups of individuals who do not present enough symptoms to justify a diagnosis of autism, yet are closer to this category than any other.

References

ADAMS, C. & BISHOP, D.V.M. (1989). 'Conversational Characteristics of Children with Semantic-Pragmatic Disorder. I: Exchange Structure, Turntaking, Repairs and Cohesion', *British Journal of Disorders of Communication* 24: 211–39.

AJURIAGUERRA, J. DE, BOREL-MAISONNY, S., DIATKINE, R., NARLIAN, S. & STAMBAK, M. (1958). 'Le Groupe des audimutités', *Psychiatrie de l'enfant* 1(1): 7–62.

ALLEN, D.A., & RAPIN, I. (1992) 'Autistic Children Are Also Dysphasic', in H. NARUSE & E.M. ORNITZ (eds) *Neurobiology of Infantile Autism*, pp. 157–68. Elsevier.

ALLEN, D.A., RAPIN, I. & WIZNITZER, M. (1988) 'Communication Disorders of Preschool Children: The Physician's Responsibility', *Developmental and Behavioral Pediatry* 9: 164–70.

AMERICAN PSYCHIATRIC ASSOCIATION (1983) *Diagnostic and Statistical Manual of Mental Disorders*, 3rd edn (DSM-III). Washington, DC: APA.

AMERICAN PSYCHIATRIC ASSOCIATION (1987). *Diagnostic and Statistical Manual of Mental Disorders*, 3rd edn rev. (DSM-III-R). Washington, DC: APA.

AMERICAN PSYCHIATRIC ASSOCIATION (1994) *Diagnostic and Statistical Manual of Mental Disorders*, 4th edn (DSM-IV). Washington, DC: APA.

ARAM, D.M., & NATION, J.E. (1975) 'Patterns of Language Behavior in Children with Developmental Language Disorders', *Journal of Speech and Hearing Research* 18: 229–41.

ASPERGER, H. (1944) 'Die autistischen Psychopathen im Kindesalter', *Archiv für Psychiatrie und Nervenkrankheiten* 117: 76–136.

BISHOP, D.V.M. (1989) 'Autism, Asperger Syndrome and Semantic-Pragmatic Disorder: Where Are the Boundaries?', *British Journal of Disorders of Communication* 24: 107–21.

BISHOP, D.V.M. & ADAMS, C. (1989) 'Conversational Characteristics of Children with Semantic-Pragmatic Disorder. II: What Features Lead to Judgment of Inappropriacy?', *British Journal of Disorders of Communication* 24: 241–63.

BISHOP, D.V.M. & ADAMS, C. (1992) *Journal of Speech and Hearing Research* 35: 119–29.

BISHOP, D.V.M. & ROSENBLOOM, L. (1987) 'Classification of Childhood Language Disorders', in W. YULE & M. RUTTER (eds) *Language Development and Disorders*. Clinics in Developmental Medicine, no. 101/102. London: MacKeith.

BISHOP, D.V.M., HARTLEY, J. & WEIR, F. (1994) 'Why Do Some Language-Impaired Children Seem Talkative? A Study of Initiation in Conversation of Children with Semantic-Pragmatic Disorder', *Journal of Autism and Developmental Disorders* 24(2): 177–97.

BROOK, S. L. & BOWLER, D.M. (1992) 'Autism by Another Name? Semantic and Pragmatic Impairments in Children', *Journal of Autism and Developmental Disorders* 22(1): 61–81.

CAPLAN, D. (1987) *Neurolinguistics and Linguistic Aphasiology*. Cambridge: Cambridge University Press.

HAPPÉ, F. (1995) *Autism: An Introduction to Psychological Theory*. Cambridge, MA: Harvard University Press.

JOANETTE, Y., GOULET, P. & HANNEQUIN, D. (1990) *Right Hemisphere and Verbal Communication*. New York: Springer.

KLIN, A., VOLKMAR, F.R., SPARROW, D.V., CICCHETTI, D.V. & ROURKE, B.P. (1995) 'Validity and Neuropsychological Characterization of Asperger Syndrome: Convergence with Nonverbal Learning Disabilities Syndrome', *Journal of Child Psychiatry* 36(7): 1127–40.

LE COUTEUR, A., RUTTER, M., LORD, C., RIOS, P., ROBERTSON, S., HOLDGRAFER, M. & MCLENNAN, J. (1989) 'Autism Diagnostic Interview: A Standardized Investigator-Based Instrument', *Journal of Autism and Developmental Disorders* 19: 363–87.

LEINONEN, E. & SMITH, R.B. (1994) 'Appropriacy Judgments and Pragmatic Performance', *European Journal of Disorders of Communication* 29: 77–84.

LORD, C. & RUTTER, M. (1994) 'Autism and Pervasive Developmental Disorders', in M. RUTTER, E. TAYLOR, & L. HERSOR (eds) *Child and Adolescent Psychology: Modern Approaches*, 3rd edn, pp. 509–93. Oxford: Blackwell.

LORD, C., RUTTER, M., GOODE, S., HEEMSBERGEN, J., JORDAN, H., MAWHOOD, L. & SCHOPLER, E. (1989) 'Autism Diagnostic Observation Schedule: A Standardized Observation of Communication and Social Behavior', *Journal of Autism and Developmental Disorders* 19: 185–212.

LORD, C., STOROSCHUK, S., RUTTER, M. & PICKLES, M. (1993) 'Using the ADI-R to Diagnose Autism in Preschool Children', *Infant Mental Health Journal* 14: 235–52.

MCKELVEY, J.R., LAMBERT, R., MOTTRON, L. & SHEVELL, M.I. (1995). Right-Hemisphere Dysfunction in Asperger Syndrome', *Journal of Child Neurology* 10: 310–14.

MANOACH, D. S., SANDSON, T. A. & WEINTRAUB, S. (1995) 'The Developmental Social-Emotional Processing Disorder is Associated with Right-Hemisphere Abnormalities', *Neuropsychiatry, Neuropsychology, and Behavioral Neurology* 8(2): 99–105.

MINSHEW, N.J., SIEGEL, D.J. & GOLDSTEIN, G. (1996) 'Weschler IQ Profiles in Diagnosis of High-Functioning Autism', *Journal of Autism and Developmental Disorders* 26(4): 389–406.

MORTON, J. & FRITH, U. (1994) 'Causal Modelling: A Structural Approach to Developmental Psychopathology', in D. CICCHETTI & D.J. COHEN (eds) *Manual of Developmental Psychopathology*, vol. 1, ch. 13. New York: Wiley.

PIVEN, J., HARPER, J., PALMER, P. & ARNDT, S. (1996) 'Course of Behavioural Change in Autism: A Retrospective Study of High-IQ Adolescents and Autism', *Journal of the American Academy of Child and Adolescent Psychiatry* 35(4): 223–29.

RAPIN, I. (1995) 'Communication Disorders in Autistic and Non-Autistic Preschool Children', paper presented at the Forum sur les troubles spécifiques du langage chez l'enfant, Québec, May.

RAPIN, I. & ALLEN, A. (1983) 'Developmental Language Disorders: Nosological Considerations', in U. KIRK (ed.) *Neuropsychology of Language, Reading and Spelling*, pp. 155–84. London: Academic.

RAPIN, I. & ALLEN, D.A. (1987) 'Developmental Dysphasia and Autism in

Preschool Children: Characteristics and Subtypes', in *Proceedings of the First International Symposium on Specific Speech and Language Disorders in Children*, pp. 20–35. England: Association For All Speech Impaired Children (AFASIC).

ROURKE, B. (1989) *Nonverbal Learning Disabilities: The Syndrome and the Model*. New York: Guilford.

RUTTER, M. (1978) 'Language Disorder and Infantile Autism', in M. RUTTER & E. SCHOPLER (eds) *Autism: A Reappraisal of Concepts and Treatment*. New York: Plenum.

RUTTER, M. & SCHOPLER, E. (1992) 'Classification of Pervasive Developmental Disorders: Some Concepts and Practical Considerations', *Journal of Autism and Developmental Disorders* 22: 459–82.

RUTTER, M., BAILEY, A., BOLTON, P. & LE COUTEUR, A. (1994) 'Autism and Known Medical Conditions: Myth and Substance', *Journal of Child Psychology and Psychiatry* 35: 311–22.

SAHLEN, B. & NETTLEBLADT, U. (1993) 'Context and Comprehension: A Neurolinguistic and Interactional Approach to the Understanding of Semantic-Pragmatic Disorder', *European Journal of Disorders of Communication* 28(2): 117–40.

SHIELDS, J. (1991). Semantic-Pragmatic Disorder: A Right Hemisphere Syndrome? *British Journal of Disorders of Communication* 26: 383–92.

SHIELDS, J., VARLEY, R., BROKS, P. & SIMPSON, A. (1996) 'Hemispheric Function in Developmental Language Disorders and High-Level Autism', *Developmental Medicine and Child Neurology* 38: 473–86.

TAGER-FLUSBERG, H. (1991) 'Semantic Processing in the Free Recall of Autistic Children: Further Evidence for a Cognitive Deficit', *British Journal of Developmental Psychology* 9: 417–30.

VOELLER, K.S. (1986) 'Right-Hemisphere Deficit Syndrome in Children', *American Journal of Psychiatry* 143: 1004–9.

WESCHLER, D. (1974) *WISC-R Manual: Weschler Intelligence Scale for Children, Revised*. New York: Psychological Corporation.

WESCHLER, D. (1981) *WAIS-R Manual: Weschler Adult Intelligence Scale, Revised*. New York: Psychological Corporation.

WING, L. (1988) 'The Continuum of Autistic Characteristics', in E. SCHOPLER & G.B. MEALBOV (eds) *Diagnosis and Assessment in Autism*, pp. 93–121. New York: Plenum.

WING, L. (1991) 'The Relationship between Asperger Syndrome and Kanner's Autism', in U. FRITH (ed.) *Autism and Asperger Syndrome*, pp. 93–121. Cambridge: Cambridge University Press.

YRMIYA, N., SIGMAN, M. & FREEMAN, B.J. (1994) 'Comparison between Diagnostic Instruments for Identifying High-Functioning Children with Autism', *Journal of Autism and Developmental Disorders* 24: 281–91.