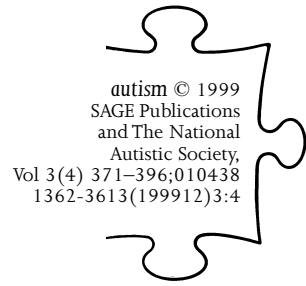


# Pragmatic language impairment without autism

The children in question

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**ABSTRACT** The 'borderlands' of autism are of particular interest to researchers and clinicians as we learn more about pervasive disorders and how to manage them. One group of children who have caused particular controversy are those referred to as having semantic-pragmatic disorder or pragmatic language impairment. The present article examines the profiles of 10 children (selected from a wider project on language impairment) who are definitely considered to have pragmatic impairments by their teachers, their speech and language therapists and the researchers and on the basis of scores from the Children's Communication Checklist (CCC). These children are compared with each other and with children with more typical specific language impairments (SLIs) in the wider study. The 10 children's characteristics are also examined in terms of classification and whether some might be better described using existing autistic spectrum disorder terminology. Children with pragmatic language impairment were all found to have developed first words earlier than the SLI group, but were more impaired than their peers in the areas of stereotyped language, rapport and context. Social communication skills as measured by the CCC did not seem more impaired than in other children with SLI, but on the Harter scale peer interactions were rated as significantly poorer. A preliminary comparison with autistic symptomatology suggested that four of the 10 did have difficulties in this area and might be better described as having autism or Asperger's disorder.

**KEYWORDS**  
communication disorders;  
pragmatic language impairment

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## Introduction

As researchers become increasingly interested in classifying children with communication disorders more precisely, the difficulties in describing the

specific characteristics of different profiles of impairment have been highlighted. One particular group that has been the focus of much debate is the subgroup of children described as having 'semantic-pragmatic syndrome' (Rapin and Allen, 1983; 1998), 'semantic-pragmatic difficulties' (Vance and Wells, 1994) 'conversational disability' (Conti-Ramsden and Gunn, 1986), 'pragmatic disability' (McTear and Conti-Ramsden, 1992), 'semantic-pragmatic disorder' (SPD: Bishop and Rosenbloom, 1987) or more recently 'pragmatic language impairment' (PLI: Bishop, 1998; Conti-Ramsden and Botting, in press).

First, there is debate as to whether children with this type of impairment exist as a valid separate clinical group (Brook and Bowler, 1992; Gagnon et al., 1997). From a clinical perspective, children with primary pragmatic language impairments have been described as having superficially normal language development, unusual language constructions, difficulty using pragmatic cues in conversation, difficulty in turn-taking and complex difficulties with comprehension (Bishop and Rosenbloom, 1987; Rapin and Allen, 1987; McTear and Conti-Ramsden, 1992; Attwood, 1998). Thus, there is controversy as to whether in fact they should be diagnosed instead as having high-functioning autism or Asperger syndrome (Gagnon et al., 1997). The characteristics of children classified by DSM-IV (American Psychiatric Association, 1994) as having pervasive developmental disorders not otherwise specified (PDD-NOS) are also similar to those associated with pragmatic language impairment (Mahoney et al., 1997; Buitelaar and van der Gaag, 1998; Prior et al., 1998).

Currently the term 'semantic-pragmatic disorder' is used (in Britain at least) to refer to children who do not meet a diagnosis for autism. However, Rapin and Allen originally used the term as a descriptive one, which applies to children with specific language impairment, but mainly to those with autism. This is highlighted recently in Rapin's (1996) 'update' paper. The term 'pragmatic language impairment' (PLI) is very recent and represents an attempt to specify more precisely the relevant features of this clinical group. It is used in this article and in Bishop's (1998) work to replace the term 'semantic-pragmatic disorder' for children without autism.

If a group of children with pragmatic difficulties but without autism does exist as a separate entity, the second debate centres around whether these children are more accurately classified as a subgroup of those with language impairment or those with more pervasive developmental disorders (see Boucher, 1998). There have been several suggestions that children with pragmatic language impairment are more similar to those with autism than to peers with specific language impairment although the latter constitutes a fundamentally heterogeneous group (Conti-Ramsden et al., 1997). For example, Shields et al. (1996) emphasize the similarity of semantic-prag-

matic children to an autistic control group on theory of mind tasks. Other authors have also commented on their possible inclusion in the autistic spectrum (Bishop and Rosenbloom, 1987; Rapin, 1996; Boucher, 1998).

One of the major problems appears to be the subjective or clinical nature of classifying children with pragmatic language impairment (PLI). Standardized tests have in general failed to tap the key behaviours and difficulties of this group (Botting et al., 1997). Different educational policies and theoretical viewpoints have meant that, clinically and academically, professionals are in disagreement about which children do and do not have a primary pragmatic language impairment. This has made the literature and research difficult to interpret, and poor at providing practical guidelines. There are disagreements about the level of structural language impairment (both expressively and receptively), about the degree of rigidity exhibited and about the earlier history of these children, which cannot be explored without some level of objective definition of the children.

Studies to date have used either clinical opinion (e.g. Bishop and Adams, 1989; Kerbel et al., 1996; Shields et al., 1996) or checklist data (Bishop, 1998) to define the samples. Others (e.g. Vance and Wells, 1994) appear to have excluded children on the very variables that are of specific interest (understanding semantic anomaly). This latter difficulty is also a problem within the autism literature, in which children who are at the more subtle end of the autistic continuum are often excluded from specific research designs (e.g. Gillberg and Gillberg, 1989).

Third, there is discussion as to whether the terms 'semantic' and 'pragmatic' necessarily co-occur and whether it is useful to use the term 'semantic' when referring to children in this category (Bishop, 1998). Much of the clinical discussion and confusion arises from the association between semantic problems and word-finding or word-naming difficulties. However, Bishop (1998) noted the absence of low scores on a test of word naming in children with pragmatic impairments. Dockrell et al. (1998) found that 23 percent of children in language support services were identified as having word-finding difficulties by speech and language therapists, but these errors were more associated with grammatical difficulties than pragmatic ones. McGregor (1997) compared word-finding errors in a group of young normally developing children and those with clinically defined word-finding difficulties. Few qualitative differences were found between the groups, which may suggest that there is a delay, rather than a disorder, in word-finding skills in many children with specific language impairments.

These studies suggest that the term 'semantic' may falsely imply that lexical semantic difficulties are a particular feature of this group. Other types of semantic disability have been less systematically investigated.

However, some studies exploring semantic understanding, especially literality and idiom comprehension, have shown that whilst children with PLI score more poorly than those with specific language impairments, they are also accurate the majority of the time (Bishop and Adams, 1989; Kerbel and Grunwell, 1998).

### **Present study**

Despite the debate, children fitting the pragmatic language impairment description appear to form a significant minority within language units in England. In a recent study (Botting et al., 1998), we identified 53 out of 234 children with major pragmatic difficulties at both 7 and 8 years of age and this figure does not take into account those not attending language units.

Moreover, the difficulties of children with PLI have proved extremely difficult not only to define but also to remediate, and many units have found their 'turnover' of such children to be considerably slower than that of other language impaired pupils (Botting, 1998; Botting et al., 1998). It is essential, therefore, for both theoretical and practical reasons that research identifies and classifies the problems of children with so-called 'semantic-pragmatic' difficulties. Thus, whilst PLI continues to be confused with autism, it may also be difficult to differentiate it from receptive-expressive language impairments, with some clinicians believing that pragmatic difficulties are purely a result of severe structural language difficulties. For this reason, children with PLI in this study are compared systematically with peers considered to have more typical specific language impairments (SLIs) of all types.

It seems logical to begin by identifying children who are at least clinically thought to have primary pragmatic language difficulties. A recent study by the present authors which assessed over 240 children aged 7–8 years in language units (Conti-Ramsden et al., 1997; Conti-Ramsden and Botting, 1999) found a number of children who appeared to have primary pragmatic language impairments according to teachers and speech and language therapists ( $n = 53$ ). A subset of children from the study also participated in a reliability and validity analysis of a new measure by Bishop (1998), the Children's Communication Checklist (CCC). In this second study, two subgroups were revealed as being separate from children with typical SLI, in that they showed a particular difficulty with the pragmatic elements of language. The first of these ( $n = 8$ ) were children who were thought to have pragmatic difficulties as well as features more typical of autism, and the second subgroup ( $n = 14$ ) were those who appeared to have a pure form of pragmatic language impairment without marked social withdrawal and restricted interests. None of the children had a definite diagnosis of autism.

In this article, we examine a group of 10 children (who took part in both studies) who have been identified as having semantic-pragmatic disorder both by their teacher and their therapist (descriptively over 2 years; diagnostically and using checklist data) and by an independent researcher over a period of 2 years. In using this group, we are at least in agreement clinically that these children have primary pragmatic language impairment.

From here the article aims are threefold: (1) to provide a clearer picture of the children in question using quantitative and qualitative methods; (2) to address the use of the term 'semantic' in relation to this group; (3) to take a preliminary objective look at these children's language profiles, cognitive abilities and other related factors in order to examine whether they might be better described using existing autistic disorder terminology.

## Method

### Participants

The participants in this study were originally part of a wider study reported elsewhere (Botting et al., 1997; 1998; Conti-Ramsden et al., 1997) and also took part in the checklist study by Bishop (1998). The entire cohort was recruited from 118 language units attached to English mainstream schools identified through the I-CAN listing, which is a comprehensive list of all specialist language placements in the UK. All English entries catering for year 2 children (age 6 but not 7 at start of school year in September) were telephoned initially. Those centres enrolling children with hearing impairments or with global delay were excluded. The remaining schools were asked to provide the number of year 2 children attending for at least 50 percent of the week. It was established through this initial contact with schools that across England approximately 500 year 2 children fitted these criteria. Those schools with year 2 children were asked to participate and two schools declined this invitation. Roughly half the eligible children in each unit were sampled. This gave us an entire study cohort of 242 subjects (stage 1). In total 234 of these children were followed up 1 year later and it is data from this second stage that are presented here (stage 2). The age range of the wider cohort at stage 2 was 7:5 to 8:9 years and consisted of 186 boys and 56 girls (girls forming 23.1 percent of the cohort).

Of the 234 children participating at stage 2, data were available on 76 from speech and language therapists and from teachers using the Children's Communication Checklist (CCC: Bishop, 1998). The CCC consists of a number of behavioural questions regarding language ability and social behaviour as well as a 'diagnostic' section in which respondents are

asked to state whether the child has any of a number of formal diagnoses. These include the options ‘semantic-pragmatic disorder’, ‘autistic features’, ‘definite autism’, ‘learning disability’ and ‘developmental language disorder’. Of the 76 children with CCC data available, 23 were considered by teachers and therapists to have ‘semantic-pragmatic disorder’. Children with additional diagnoses of ‘definite autism’ or ‘learning disability’ were not included amongst this group of 23 children. Children who were from bilingual families and those with hearing loss were also excluded. Of the 23 children, 10 also fitted the following criteria:

- 1 Teachers/therapists at stage 1 and stage 2 described the child’s primary problems as semantic/pragmatic.
- 2 CCC ‘pragmatic impairment score’ of <132 (argued by Bishop to best discriminate SLI and PLI groups; see below).
- 3 Independent rating by visiting researcher as having primary pragmatic language impairment.

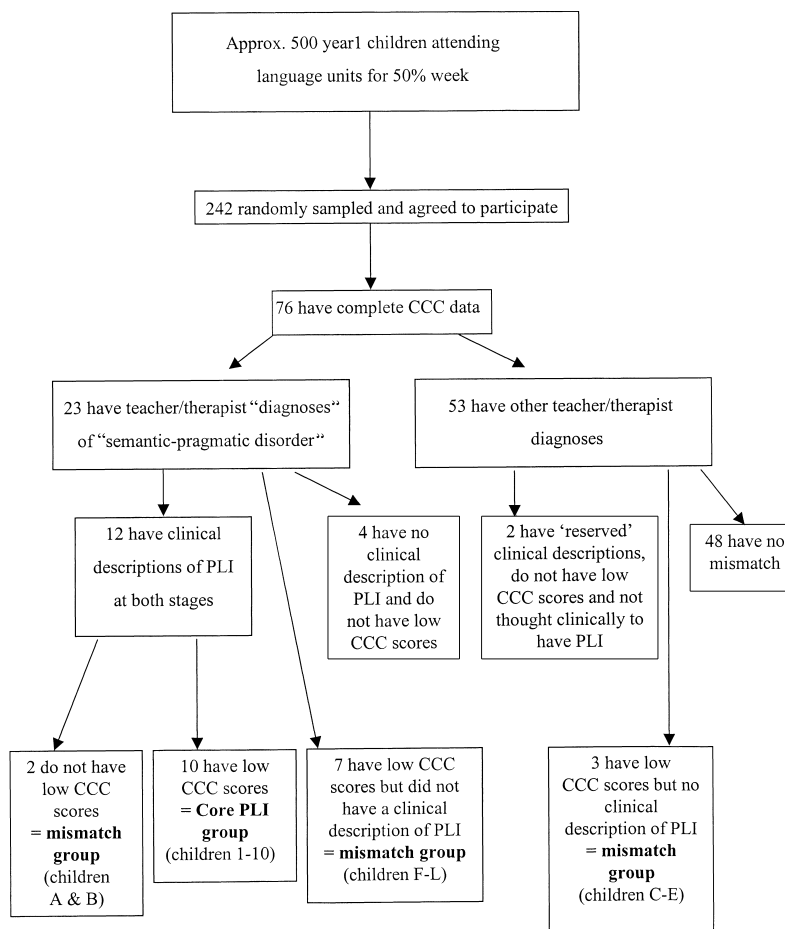
Note that difficulties with semantic elements of language were not used to select children. A breakdown of the selection procedure is shown in Figure 1.

The ages of the 10 target children (two of whom were female) ranged from 7:7 to 8:9 years. Six out of the 10 families provided parent interviews and questionnaires, which are described later. For all of these six children, parents were also in agreement about their primary pragmatic language impairment.

### **Children with pragmatic impairments not selected: ‘mismatch group’**

Of the remaining 13 children who met initial teacher diagnosis, but not other factors, four did not have pragmatic scores below 132 and also failed to meet clinical opinion criteria (teacher or researcher did not report pragmatic difficulties as the primary difficulty over the 2 year span). These four children are not really ‘mismatches’ since clinical opinion agrees in part with CCC scores and will not be discussed further. Two were reported as having pragmatic problems by clinicians but did not have low CCC scores; conversely, a further seven children had low CCC scores but clinical criteria stopped them from being included in our core PLI group. Thus nine children from the original ‘diagnosis group’ showed a mismatch (i.e. between teacher/therapist diagnoses and clinical picture/CCC scores).

There were five further children (not included in the 23 because they were given an SLI ‘diagnosis’ by professionals) who also presented a mixed pragmatic picture. For two children, teachers at both stages thought they had significant pragmatic impairments, but thought that this was due to



**Figure 1** Selection procedure

structural language impairment, i.e. due to problems with formal aspects of language such as syntax and morphology. These children had CCC scores which were above 132 and researchers also agreed that they were best described as SLI; thus these children will also not be discussed later. For three children the opposite was true, with CCC pragmatic scores below 132 but no clinical agreement. This totals 12 children with complete mismatches between CCC pragmatic score and clinical opinion, and the results of this group will be examined briefly later in order to help understand what led clinicians to their descriptions and diagnoses.

### Comparison group

All of the 148 children with language impairments who did not meet any of the

PLI criteria above were selected from the remaining group of children with SLI (including those with no CCC data) as a large comparison group for characteristics other than the CCC. This larger group was selected because of the well-documented heterogeneity of specific language impairments and the fact that the number of children with CCC data was very small.

### Measures

The data fall into three groups: results from standardized tests, results from teacher interviews/questionnaires and results from parent interviews/questionnaires. All standardized tests reported were administered in school year 3 (age 7 but not 8 at start of school year). Teachers completed a questionnaire at this stage and parents were interviewed.

**Standardized tests** In total six formal language assessments were administered to the children as part of this study. They were chosen because they represent commonly used assessments (in both research and practice) which were fairly easy and quick to administer, and because they cover a wide range of formal language skills. They were not intended to be an exhaustive selection. The assessments used were as follows:

Goldman–Fristoe Test of Articulation: single-word level (Goldman and Fristoe, 1986).

British Ability Scales, naming vocabulary (Elliot, 1983): object naming from pictures.

British Ability Scales, word reading (Elliot, 1983): single-word sight reading.

Illinois Test of Psycholinguistic Ability, grammatic closure (Kirk et al., 1968): test of expressive grammar knowledge.

Test for Reception of Grammar (Bishop, 1982): picture based comprehension test.

Renfrew Bus Story (Renfrew, 1991): story retelling with picture cues.

In addition, Raven's Progressive Matrices (Raven, 1986) were completed by children as an assessment of non-verbal cognitive ability; and teachers completed the Rutter Behavioural Questionnaires (Rutter, 1967) and the Harter Scale of Peer Competence, (teacher scale only, Harter and Pike, 1984) for each child. The last is a very simple measure of peer competence consisting of just six items which are scored from 0 to 4 where higher scores are more favourable. Items are summed and *averaged* to give a mean competence score.

**Children's Communication Checklist (CCC)** The CCC (Bishop, 1998) aims to assess communicative abilities using nine subscales:



- 1 speech (output, intelligibility, fluency, e.g. people can understand virtually everything he says)
- 2 syntax (complexity of spoken grammar, e.g. speech is mostly two- to three-word phrases such as 'me got ball' or 'give dolly')
- 3 inappropriate initiation\* (e.g. talks to anyone and everyone; talks too much)
- 4 coherence\* (making sense in conversation, e.g. uses terms like 'he' and 'it' without making it clear what/who is being talked about)
- 5 stereotyped conversation\* (using learned chunks or favourite topics of language, e.g. has favourite phrases, sentences or longer sequences which he will use a great deal, sometimes in inappropriate situations)
- 6 context\* (use of context in understanding conversation, e.g. takes in just one or two words in a sentence and so often misinterprets what has been said)
- 7 rapport\* (use of conversational cues, e.g. poor at using facial expressions or gestures to convey his feelings; may look blank when angry or smile when anxious)
- 8 social (relationships, e.g. is popular with other children; may hurt or upset other children unintentionally)
- 9 interests (restricted interests, e.g. has one or more overriding specific interests and will prefer doing activities involving this to anything else).

A composite 'pragmatic impairment score' can be derived from the middle five scales marked \* in the list, and this score has been used in part to define the children in this report: all have composite scores <132. Teachers or speech and language therapists complete the checklist about a child based on good knowledge of the individual of at least 3 months. Each scale consists of a number of behavioural items such as the examples given for each subscale above. Professionals were asked to say whether the item did not apply, applied somewhat or definitely applied. They were asked to complete the checklist independently of others who knew the child. Interrater reliability for the checklist has recently been shown to be 0.80 overall (range of scales = 0.62 to 0.83) (Bishop, 1998). For this study, 8 out of 10 children have a CCC completed by each of two professionals working with that child. For child 3 only speech and language therapist data were available, and for child 4 only teacher data were available (since the therapist had known the child for less than 3 months).

**Professional opinion** Teachers and speech and language therapists completed questionnaires in which they were asked to identify the child's major difficulties from four options: articulation, phonology, syntax/

morphology and semantic/pragmatic. These categories were not mutually exclusive. They were also asked to suggest an 'ideal' placement type for the child in the following school year (regardless of whether this provision existed or would be available). Teachers' responses were categorized by the researcher as falling into a category such as mainstream with support, school for children with learning difficulties, language unit etc.

**Parent interviews** The parent(s) of each child were interviewed using a semi-structured format. In the majority of cases, this interview was conducted at the child's home without the child present. A questionnaire was sent in advance and collected or completed at the home visit. The items comprised two themes. Some items requested demographic details about the family. These were: family income in five bands; number of adults and children in the house and their relationship to the target child; the employment status of main caregivers; and the level of education of caregivers. Other items concerned the child's early development. These were age of first word; age of first sentence; language difficulties; age of first walking; whether the child still wet the bed; and which hand the child used. Parental opinion of difficulties was gained both by asking questions and prompts (e.g. what sort of difficulties do you feel X has now?) and by eliciting examples from parents regarding the behaviour. The researcher made a final coding regarding language difficulties as to whether articulation/phonology, syntax and morphology, and semantics/pragmatics were thought by the parents to be areas of difficulty. These categories were not mutually exclusive. This interview was carried out to gain a small amount of additional information about the pattern of the child's development in relation to placements and language profile. Again, the developmental data available are limited and are not intended to represent an exhaustive history of the child's problems.

## Results

### Language assessments

The scores shown in Table 1 are those gained from the published test tables comparing performance with a *normally developing population* and transformed to z-scores. A z-score of 0 or above indicates that the child fell at or above the 50th centile. Articulation results were generally high, and indeed on each test the majority of children scored within normal limits. However, half of the children fell 1.5 SD below the normal population mean on at least one test. Structural language impairment is therefore not an exclusionary criterion for children with pragmatic difficulties as understood by clinicians, but neither is it a necessary one.

**Table 1** Language scores for children with PLI (z-scores)

<i>Child</i>	<i>Naming vocabulary</i>	<i>G-F articulation</i>	<i>ITPA gram. clos.</i>	<i>TROG</i>	<i>Word reading</i>	<i>Renfrew Bus Story</i>
1	-1.35	+0.33	<b>-3.00</b>	<b>-1.88</b>	-0.31	<b>-1.65</b>
2	+0.74	-0.25	-1.16	-0.93	+0.00	-0.32
3	-0.05	+2.33	-1.14	-0.32	-0.10	-0.67
4	-0.52	-0.20	-1.16	+0.00	<b>-2.33</b>	<b>-1.65</b>
5	-0.05	+2.33	<b>-0.67</b>	+0.32	+2.33	<b>-1.65</b>
6	-0.05	+2.33	+0.33	-0.67	+0.95	+1.15
7	-1.13	-0.50	<b>-3.75</b>	<b>-2.33</b>	-1.28	-0.93
8	+0.58	+0.15	-1.50	+0.00	-0.61	0.32
9	+0.61	-1.23	-1.16	<b>-1.65</b>	-0.95	<b>-1.65</b>
10	+1.34	+2.33	+1.00	+0.32	-0.15	+0.00

Note: All z-scores for age.  
Scores <1.5 z are bold.

### **Naming tasks and word-finding difficulties**

All children had a naming vocabulary score within 1.5 SD of the normal population mean, suggesting that word-finding difficulties (compared with a normally developing population) were not central to diagnosis. Compared with peers with SLI, seven out of the 10 PLI children scored marginally better on naming vocabulary (SLI mean  $z = -0.26$ , 95 percent CI  $-0.15$  to  $-0.56$ ) although two scored more poorly (child 1 and child 7).

All word-finding errors from the 10 core PLI children were compared with all errors taken from 10 randomly selected children from the typical SLI comparison group. In total 19 word-level errors were made by the PLI children and 27 errors by the typical SLI children. Of the 10 children with PLI, two made no errors, unusual or otherwise, and this was true for one comparison SLI child. Qualitatively, it appears that the PLI group seemed to be making unusual errors (see Table 2). In order to verify this, an independent and highly experienced speech and language therapist and researcher who was blind to the child's classification (SLI versus PLI) and to the first author's rating (unusual versus typical) rated the errors as usual or unusual based on her clinical and academic experience. Overall, there was 80 percent agreement between raters about 'unusual errors' ( $\kappa = 0.416$ ,  $p < 0.001$ ). The first author rated 8/19 of the PLI group errors as unusual compared with 1/27 of the comparison group errors (Fisher's exact  $p < 0.01$ ). The second rater deemed 7/19 and 11/27 as unusual

**Table 2** Examples of word-finding errors

<i>SLI children</i>	<i>PLI children</i>
Bottle (jar)	Stickfire (match)
Things (antlers)	Bedtime uniform (pyjamas)
Tap (sink)	Water (compass)
Bird (robin)	Stunk (stuck)
Glass (jar)	Hoda (scales)
Weigher (scales)	Bumblenest (beehive)
Pour (funnel)	Bit (jumped)
	Snow animal (reindeer)

respectively (Fisher's exact  $p < 0.01$ ). In the PLI group 7/19 (37 percent) errors were deemed unusual by both raters compared with 1/27 (4 percent) in the SLI group (Fisher's exact  $p < 0.01$ ).

These qualitative differences in the type of errors may be very important in pragmatic breakdown. Children with other types of SLI used various strategies to cope with their word-finding difficulties, including using an alternative word of a similar nature (pot), a related function word (pour), a term describing part of the object (tap), a more generic term or a property word (glass). In contrast, the children with PLI used non-typical strategies such as creating new words (hoda), joining words together in an unusual way (bedtime uniform), or using inappropriate alternatives (water). These may illustrate the qualitatively different nature of pragmatic language impairment since both groups of children showed similar scores on a test of naming. It must be noted that despite being clinically relevant these unusual errors were only made on some occasions by children with PLI and do not inform us about other types of related skill such as semantic relations or free association of words. Although the lexical errors presented could be described as semantic, it is our view that they represent a distinctly pragmatic problem compared with other types of error.

### **Child Communication Checklist scores**

The CCC provides summary scores for the nine subscales of communication. Scores were compared with peers who had SLI from the wider cohort (no data from normally developing children currently exist). Based on data produced from the purely SLI section of the wider cohort (Bishop, 1998), CCC scores for each of these 10 children were transformed into the following categories: 2 SD below SLI mean, between 1 and 2 SD. below SLI mean, within 1 SD below mean, within 1 SD above the mean, between 1 and 2 SD above the mean, and more than 2 SD above the mean. These CCC scores are presented in Table 3.

As can be seen from this table, all but one child showed particular difficulty in one or more wider areas of communication as compared with peers with SLI. In some ways this is not surprising, as this checklist was used to select the 10 participants described here. The main areas in which children fell at least 2 SD from the SLI mean were 'stereotyped language', 'context' and 'rapport', and for a few children 'interests', 'social' and 'initiation'. No child was more than 2 SD better or worse than peers with SLI on the language based scales of 'speech' and 'syntax' or on 'coherence'.

### **Other areas of standardized assessment**

Results of other areas of assessment are presented in Table 4. Raven's matrices scores (non-verbal cognitive ability) were generally superior for age (compared with a normally developing population) with seven out of the 10 children scoring above the 90th centile and no children falling below the 10th centile. All but two non-verbal scores were above the 95 percent confidence intervals for the SLI comparison group (mean 62.4, range 53.4 to 71.3). Behavioural problems also appeared to be prevalent in this PLI group: six out of eight for whom data were available had teacher Rutter scores over the normal population threshold for clinical problems. These six scores fell outside the 95 percent confidence intervals for the SLI comparison group (mean 7.1, range 5.4 to 8.7).

Teacher ratings on the Harter scale also revealed peer relationship problems, with eight out of nine children for whom data were available scoring below the mean and confidence intervals of other children with SLI on the peer competence section (mean 2.9, range 2.6 to 3.1).

### **Developmental history and demographic details**

Of the six children for whom these data are available, all began to say single words within the normal age range (from 8 months to 18 months in our PLI sample) but were delayed on sentence production (36 to 84 months). This is unlike the usual history of SLI children in which single-word production is typically delayed (Leonard, 1998). Furthermore, all the children

**Table 3** Standard deviation scores in relation to SLI peers on CCC subscales

Child	Ratings by speech therapist/teacher								
	<u>Speech</u>	<u>Syntax</u>	<u>Initiation</u>	<u>Coherence</u>	<u>Stereotyped</u>	<u>Context</u>	<u>Rapport</u>	<u>Social</u>	<u>Interests</u>
	st t	st t	st t	st t	st t	st t	st t	st t	st t
1	+1/+1	-1/+0	-1/-1	-1/-1	<b>-2/-2</b>	<b>-2/-1</b>	<b>-2/-1</b>	<b>-2/-1</b>	-0/+0
2	+1/+1	-0/+1	<b>-2/-0</b>	-0/-0	<b>-2/-0</b>	<b>-2/-1</b>	-1/-0	+0/-0	-0/+0
3	+0/*	+0/*	-0/*	-1/*	-1/*	-0/*	+0/*	+0/*	+0/*
4	*/+0	*/+0	*/-1	*/+0	*/-2	*/-2	*/-2	*/-2	*/-2
5	+1/+1	+0/+0	<b>-2/-2</b>	-1/+0	<b>-2/-0</b>	<b>-2/-1</b>	<b>-2/-2</b>	-1/-0	<b>-2/-1</b>
6	+1/+0	+0/+0	-0/-1	-0/-0	<b>-2/-2</b>	<b>-2/-1</b>	<b>-1/-2</b>	<b>-1/-2</b>	*/-2
7	+1/+1	+0/+0	-0/-0	-0/-0	<b>-1/-2</b>	-0/-0	-1/+0	+0/+0	-0/-0
8	-0/-0	+1/+0	-1/-1	-1/-0	<b>-2/-2</b>	<b>-2/-1</b>	+0/-0	+0/-0	-0/+0
9	-0/+0	-1/-0	-0/+0	-0/-1	<b>-0/-2</b>	<b>-2/-0</b>	<b>-2/-2</b>	-1/-1	-1/-1
10	+1/+1	+0/+1	-0/-0	-0/-0	<b>-2/-2</b>	-1/-1	<b>-2/-2</b>	-1/-1	<b>-2/-2</b>

-/+2 = 2 SD or more from the SLI mean.

-/+1 = between 1 and 2 SD from the SLI mean.

-/+0 = within 1 SD of the SLI mean.

Scores more than 2 SD from SLI mean according to *either* respondent are bold.

\* = rating not available.

**Table 4 Factors other than language**

<i>Child</i>	<i>Raven's Matrices (centiles)</i>	<i>Rutter Behaviour Scale<sup>a</sup></i>	<i>Harter's Peer Competence Scale</i>	<i>Age at single word (months)</i>	<i>Age at multi- word utterance (months)</i>	<i>Age at walking (months)</i>
1	14	14	2.2	8	84	15
2	25	–	1.7	–	–	–
3	92.5	3	4	18	66	13
4	62.5	13	1	–	–	–
5	97.5	9	2	–	–	–
6	97.5	5	1.5	14	36	14
7	92.5	–	–	–	–	–
8	95	12	2.0	18	36	22
9	97.5	13	1.6	10	36	11
10	97.5	16	1.6	14	72	18
SLI comparison:	63.3	7.2	2.9	22.2	48.7	14.9
Mean (95% CI)	(54.5 to 72.0)	(5.6 to 8.8)	(2.6 to 3.1)	(18.5 to 26.0)	(44.2 to 53.1)	(14.0 to 15.8)

Note: – = data missing.

<sup>a</sup> Abnormal cutoff is 9.

with PLI have first-word ages which fall below the 95 percent confidence intervals for the SLI group (mean 22 months, 95 percent CI 18.5 to 26.2). For all children, some difficulty in communication had begun before the age of 3, but some had not received help this early and all had been initially treated as individuals with language impairment. Only as they became older did they appear to have more pervasive difficulties. All but one had begun to walk at the usual age (range 11 to 15 months). Details are shown in Table 4 along with the means for the SLI group. Four of the six had been neither very quiet nor very noisy babies; the remaining two were described as unusually noisy. All children were right handed and none were frequent bedwetters. Income and education level of the families were spread across the range, although none of the children had families in the lowest income bracket (<£5000), and three out of six for whom data are available had parents with more than basic education (higher than GCSEs).

### **Educational and health support for children with PLI**

All the children in this group held statements of special educational needs, this being a requirement of most language units. When teachers were asked at stage 1, six out of 10 considered that the child ideally needed continued language provision. For the remainder it was thought that special schools (two children) or mainstream (two children) was appropriate. In actuality, nine received continued language provision and one was placed in a mainstream school with support (child 6). In addition to special education, one child was receiving psychological guidance and two received regular physiotherapy.

### **Differential diagnosis**

A qualitative examination of each child was carried out given the data above to determine whether he or she could be more appropriately placed in another diagnostic category, in particular those of high-functioning autism or Asperger syndrome (typical SLI had already been ruled out on the selection basis of early history, low pragmatic scores and clinical concerns). The authors acknowledge that this is a preliminary exploration and that final diagnosis cannot be made purely on the basis of checklist data, especially using measures that were not designed to identify autism. We are particularly aware of the limited information available on restricted interests and other autistic symptomatology. Nevertheless, we considered it important to search for any evidence from available data that some children thought clinically to have PLI might in fact be better described using autistic terminology. We have used the triad of impairments as elaborated in DSM-IV as a guideline.



**Asperger syndrome** As Table 1 shows, five children (1, 4, 5, 7 and 9) showed some element of superficial language impairment, which would probably exclude them from a diagnosis of Asperger syndrome based on DSM-IV criteria. Children 1, 3 and 10 were also delayed in their phrase speech. Children 1, 2, 3, 7, 8 and 9 showed no evidence of the restricted interests that constitute clinical criteria for Asperger syndrome. Only one child (6) showed no superficial language impairment and had a low 'interest' score and thus might, on further investigation, meet criteria for Asperger's disorder.

**High-functioning autism** Three children (4, 5 and 10) had language impairments (or early history of impairment) and restricted interests as well as non-verbal cognitive levels well above the average for age and therefore might be considered to meet criteria for high-functioning autism. Child 4 was also identified using the Harter scale as having severe peer relationship problems. However, these children's language deficits were (relative to other children with autism) fairly mild, with some areas (including comprehension) at levels average or above for their age. Other children either had good current language skills (6 and 10) or showed no evidence of restricted interests and rigid behaviour (1, 2, 3, 7, 8 and 9).

One child in this study (3) did not appear to have severe difficulties in any area: however, data from one CCC respondent were missing, which may have revealed more marked difficulties. His parents, teacher and speech and language therapist and the researcher all considered that he had primary pragmatic language difficulties.

Remember also that no children in this core group have been given a diagnosis of autism, formally or informally, despite being in regular contact with special needs advisers, assessors and teachers, and all were selected from a language unit placement.

### **Other children with mixed pragmatic profiles**

As mentioned under 'Participants', there were some additional children in our cohort who had most, but not all, elements of our selection criteria and were therefore not selected into this group of 10 children. Twelve of these children showed a direct 'mismatch' between clinical opinion over the 2 years and their CCC pragmatic score (two without low CCC scores but clinical opinion of PLI, and 10 with low CCC scores but no clinical opinion of PLI). The two children with the first mismatch both had borderline scores of 133.5 and 140. They presented in a similar way to the 10 core PLI children, as seen in Table 5. Other similarities were that both began using phrases after age 4 and both had normal age of walking. These two cases of 'mismatch' might therefore be best attributed to CCC sensitivity errors.

**Table 5 Children with mixed pragmatic profiles**

<i>Child</i>	<i>Naming vocab. (z-score)</i>	<i>G-F artic. (z-score)</i>	<i>ITPA G. clos. (z-score)</i>	<i>TROG (z-score)</i>	<i>Word reading (z-score)</i>	<i>Renfrew Bus Story (z-score)</i>	<i>Rutter</i>	<i>Harter</i>	<i>First word (months)</i>
A	-1.48	+0.77	-1.28	-0.93	-1.65	-1.65	9	3.4	12
B	+0.61	-0.55	-0.67	-1.65	-0.31	-1.65	13	3.0	10
C	+0.61	-1.13	-0.88	-1.65	-1.65	-1.65	3	3.0	-
D	-0.05	+0.92	-0.58	-1.65	-1.65	-1.65	12	1.1	12
E	-0.71	-	-0.47	-1.28	-1.08	-1.28	8	2.5	10
F	-0.67	-0.55	-0.84	-1.65	-1.28	-1.65	3	2	18
G	-0.05	-	-0.31	-0.93	-1.04	+1.15	8	3	14
H	-0.05	-	-0.67	-0.32	-1.55	+0.32	-	1	48
I	-0.67	+2.33	-0.64	-0.93	-1.55	-0.67	13	3.1	-
J	-0.05	-	-0.23	+1.28	+0.00	-0.67	6	1.6	-
K	-0.05	-0.92	-1.18	-1.88	-2.05	-1.65	7	2	12
L	-0.05	+0.84	-0.44	-2.33	-1.48	-0.32	4	2.2	24

A z-score of 0 or above indicates that child's score is at or above the 50th percentile.

For the 10 children with opposite mismatches (low CCC scores), three were 'diagnosed' by clinicians as having SLI. Two of these had severe expressive and receptive difficulties and one had severe lexical-syntactic problems. One of the three also had poor non-verbal scores and had been transferred to a school for learning disabilities at 8 years. These impairments were probably felt by clinicians to account for the pragmatic difficulties. In addition to details in Table 5, one child was late walking (child E: 21 months). The remaining seven children seemed less impaired than the core PLI group on grammatical assessments, as seen in Table 5. One child who scored poorly on the non-verbal task (child L) was transferred to mainstream with support. Only four had data regarding first use of phrases and all were severely delayed (48 to 66 months). None of this group was delayed in starting to walk.

Peer competence appears to be an important factor in whether children score high or low on the CCC and may explain some of the mismatches. In addition, relative pragmatic skill is probably important in diagnosis, with some children's low pragmatic scores being 'justified' by their structural language impairments.

## Discussion

This article outlines some of the characteristics of children described as having pragmatic language impairment using different sources of information. It is one of the first studies to use a more objective assessment and researcher classification as well as teacher and therapist opinion to define this group of children. It also has the advantage of using children within a narrow age band, thereby controlling for developmental factors.

The data show that whilst children with PLI are generally thought to be verbose and linguistically able, in fact half of the children in this sample showed structural language impairments of some description. These tended to be at the level of syntax in both comprehension and expression. The picture of children with PLI as linguistically able has led to the confusion between these children and those with Asperger syndrome especially when children with PLI show a limited range of conversational topics. Our data indicate that six out of 10 children with PLI examined here in depth would probably not meet criteria for an existing subgroup of autism. One child may meet the criterion for Asperger syndrome and three may be more accurately described as having high-functioning autism.

It is interesting to note that in Brook and Bowler's (1992) discussion of the overlap between categories such as Asperger syndrome, autism and semantic-pragmatic disorder, they define 'autistic continuum' as all conditions in which the triad of autistic impairment exists. The majority of

children in this study only appear to meet one or two areas of this triad of impairment and many of them only in mild forms. Therefore, although our data provide some evidence that children with pragmatic language impairment may fit as a subgroup of children with pervasive developmental disorders, as suspected by Boucher (1998) and Bishop (1998) and others, the patterns are mixed and only four of the 10 children in this study seemed to have difficulties in all of the three areas characteristic of an autistic disorder.

### **Possible factors confusing the description or diagnosis of PLI**

**Terminology** First, there is the issue of the previously used term 'semantic-pragmatic disorder'. Despite the fact that word-finding difficulties are often listed in the literature as a key characteristic of this type of impairment, no children in this pre-defined sample had scores below 1 SD on a naming task and when errors did appear they appeared to be qualitatively different. The data thus support the recent suggestion by Bishop (1998) and the views of many speech and language therapists that the term 'semantic', as used in 'semantic-pragmatic disorder', may not be helpful. Indeed, it is not at all clear what is meant by 'semantics'. Many clinicians seem to refer to word-finding difficulties alone and this is the most frequently cited 'semantic symptom' in children with pragmatic language impairment but not autism. Moreover, the unusual errors reported here are likely to interfere with the pragmatics of conversation more than those that are typical of SLI and hence they are best described as pragmatic errors. For example, a listener would be more likely to understand a child asking for his pyjamas if he used the word 'nightie' than if the child said 'bedtime uniform', and would certainly be more likely to understand 'weigher' than 'hoda' in place of 'scales'. The latter responses also give the impression of bizarre language, which may distract the listener further from the intended meaning and prevent good rapport. Another group of children who have semantic language impairment are often mentioned by clinicians (where the primary difficulty is not the pragmatics of language, but where severe word-finding difficulties and semantic impairment affect normal interaction) and may be confused unhelpfully with those who have more pervasive social and cognitive disabilities.

Our findings support the view that pragmatic problems can sometimes exist for children not meeting criteria for autistic disorder. This is in line with Bishop and Rosenbloom (1987) who use the term 'semantic-pragmatic disorder' (SPD) exclusively for those children who are not autistic. It is clear that in the UK the term is being used for this distinct diagnostic group. Professionals are not 'shying away' from using the term 'autistic' but instead are correctly identifying children for whom neither typical SLI nor autism is an appropriate label.

Rapin and Allen (1998) suggest that a child with some of the triadic behaviours (or behaviours not severe enough to warrant diagnosis as autism) should be given a non-autism diagnosis within the PDD classification. At present, this means either Asperger syndrome or PDD not otherwise specified (PDD-NOS: DSM-IV). However, as we have shown, many of these children do not seem to warrant an Asperger syndrome diagnosis. In default many children thus become labelled as PDD-NOS, a diagnostic category that unfortunately neither informs intervention nor allows children and families better access to support (cf. Boucher, 1998).

**Mild impairments, socio-cognitive skills and imagination** Second, factors other than formal language impairments that are thought to be key indicators of autism may not be present in children with PLI. Motivation and social awareness appear more intact and imagination and pretend play seem less impaired (Kerbel et al., 1996) although this needs further investigation.

Socio-cognitive abilities of children with PLI, such as theory of mind, central coherence (Frith, 1989) or executive function, have also barely been addressed. Initial evidence suggests that children with PLI show clinical deficits in this area, but that these are milder impairments than those of children with autism (with children passing first-order and sometimes but not always second-order tasks: Shields et al., 1996; Prior et al., 1998). As such, a mild impairment in certain areas of socio-cognitive ability may form another helpful diagnostic feature and should be studied further. However, theory of mind tasks do not provide a conclusive indication of autism and impairments are also seen in children with hearing impairments (Peterson and Siegal, 1995), in some children with expressive language impairment and sometimes in those with learning disabilities (Charman and Campbell, 1997). Children with PLI who fail all or some socio-cognitive tasks are at risk of being redefined as autistic. Studies of other cognitive skills are needed to help establish how pervasive the features of PLI are, and to untangle whether they are caused by the same mechanisms as those seen in autistic disorder.

**Lack of uniform profile** The data from this study suggest that children who show one or two of the three areas of difficulty seen in autism (as noted in other studies summarized by Brook and Bowler, 1992) do exist, and that these impairments are of a severe enough nature to warrant identification and intervention. In addition we have been able to show some common pragmatic features and an early history of language development which appears unlike either SLI (Leonard, 1998) or Asperger's disorder (DSM-IV). It is interesting to note that in the study by

Prior and colleagues (1998), the cluster containing most clinically described PDD-NOS children also showed more impairment in the areas of pragmatics identified in this small group.

However, we have not been able to demonstrate the existence of an entirely uniform pattern of impairment in these children. The fact that these 10 children identified as having PLI do not all show structural language impairment, for example, suggests that this is not a positive defining feature as used by clinicians on a day-to-day basis. If it were, one would expect either those with or those without language impairment (depending on standpoint) to be excluded from this diagnosis. Furthermore, the 'mismatch' group described briefly in this report do not reveal any direct insights into the implicit criteria used by clinicians (although see below).

Other difficulties not currently being investigated may prove to be more important in the diagnosis of PLI. These may include the cognitive skills mentioned earlier, as well as a limited understanding of cause and consequence, an impairment in executive function, disinhibition, or a conceptual-level language disorder such as an inability to temporally 'map out' and make sense of conversations, interactions and even relationships. These 'other' factors may be implicitly acknowledged by clinicians when they judge a child to have pragmatic impairments, but have not yet been explicitly formulated into theoretically clear mechanisms.

Future assessment of children suspected to have PLI might include both higher-level linguistic tasks and more cognitive assessments in order to determine accurate diagnosis. Narrative paradigms are currently being investigated by the present authors for this purpose and appear to be yielding interesting results that may distinguish different subgroups of children with complex language impairments, children with PLI and children within the autistic spectrum.

Finally, one factor which seems to help clinicians decide whether to describe children as having pragmatic language impairment is the relationship between the pragmatic difficulties and the structural language impairment. Thus some children in the 'mismatch' group may have been 'discounted' clinically from having a semantic-pragmatic disorder because the pragmatic difficulties were somehow in line with structural language impairment. In addition, there is some evidence from the core PLI group in which two children (1 and 9) with severe formal language scores also had the two lowest pragmatic scores (109 and 112 respectively). Thus whilst structural language impairments do not exclude children from being described in this way, the pragmatic problems may need to be more marked.

Accepted classifications of other disorders (e.g. those in DSM-IV for attention deficit disorders or depression) often allow for quite varied pro-

files within a particular disorder within key areas and do not require absolute uniformity. It is these key areas of PLI that must be accurately researched and identified. As Bowler and Brook (1998) rightly comment, this is a difficult task, especially when those involved have different professional backgrounds (e.g. teachers, speech and language therapists, psychologists, psychiatrists) and are therefore likely to differ in their opinion of what constitutes a key symptom. These authors also usefully suggest that it may be identifying the primary area of impairment (e.g. social interaction for Asperger syndrome, or language and communication for pragmatic language impairment) which defines and differentiates clinical groups (Brook and Bowler, 1992; Bowler and Brook, 1998). In contrast, Gagnon et al. (1997) view this lack of uniformity as fatal to the notion of semantic-pragmatic disorder or PLI, and believe this is one reason that the term is not useful.

**The time factor** Time may also serve as a confounding element. Research now suggests that both language impairment and autism are disorders that change over time. That is, children with an initial diagnosis of one type of language impairment may later fit another (Conti-Ramsden and Botting, 1999) and those originally thought to have autism may later appear to better fit the diagnosis of Asperger syndrome (Bishop, 1989; Brook and Bowler, 1992; Bowler and Brook, 1998). In the case of children with PLI it is possible that they will appear more like individuals with autism as they get older or that they will become more typical of children with SLI, but longitudinal data are scarce. An increasingly Asperger-type profile is sometimes reported in these children, especially where structural language impairments are remediated and social behaviours and interests become less age appropriate.

It may also be the case that children with Asperger syndrome become more like children with PLI. In a recent study by Mahoney and colleagues (1997), children who had previously met criteria for autism but had improved dramatically proved difficult to classify. Nevertheless the early history is likely to be different for the different groups. For example, children with Asperger syndrome do not exhibit any developmental language delay according to DSM-IV and ICD-10 (both of which state that 'communicative phrases' should be used by age 3) whereas all of our sample produced phrases after this age. Whether a final similarity of impairment is enough to regard conditions with differing early patterns of development as the same disorder needs further examination.

## Summary

This article aimed to show that there are children whom professionals

correctly identify as not fitting criteria for either SLI or autism. For the purposes of presenting these profiles, a small group of children chosen using very strict parameters were examined in depth. Our data suggest that some children with PLI cannot easily be subsumed within existing terminology, and that a further subgroup of PDD, 'pragmatic language impairment without autism', is required. However, which criteria best identify such children, and where the boundaries lie, remain important research questions.

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