INT. J. LANG. COMM. DIS., 2001, VOL. 36, NO. 3, 289–305

Clinical diagnostic and intervention studies of children with semantic–pragmatic language disorder

Catherine Adams

Human Communication and Deafness, University of Manchester, UK

(*Received November 2000; accepted January 2001*)

Abstract

The diagnosis of semantic–pragmatic language disorder (SPLD) has been the subject of a number of research studies over the last two decades. Classification and diagnostic debates, while illuminating, have done little to develop tools to improve services to these children. In this paper, two children whose communication difficulties are suggestive of an SPLD diagnosis but who have differing profiles are studied. Using existing models of psycholinguistics and pragmatics to guide assessment and intervention, the diversity of language and social communicative behaviours that are covered by the label SPLD are exemplified. Consideration is given to whether the term SPLD is appropriate for both children or whether Bishop's revision of the diagnosis to 'pragmatic language impairment' might be more useful. Methods of intervention and evaluation for semantic and pragmatic deficits in these two cases are described. It is argued that existing tools can enable accurate explanation and modelling of the communication of children with SPLD and that there is a role for intervention studies in helping to refine those tools, to improve therapies and to understand the nature of the condition more fully.

Keywords: semantic–pragmatic language disorder, intervention, diagnosis, narrative.

Introduction

History of developmental semantic–pragmatic impairments

In 1983, Rapin and Allen proposed a classification of children with developmental language disorders, which included children with autism as well as those with specific language impairments (SLI). As part of this classification they described a

Address correspondence to: Catherine Adams, Human Communication and Deafness, School of Education, University of Manchester, Oxford Road, Manchester M13 9PL, UK; email: catherine.adams@man.ac.uk

International Journal of Language & Communication Disorders
ISSN 1368-2822 print/ISSN 1460-6984 online © 2001 Royal College of Speech & Language Therapists
http://www.tandf.co.uk/journals
DOI: 10.1080/13682820110055161

syndrome of language impairment which they termed 'semantic–pragmatic deficit syndrome'. Several variations of that label have subsequently appeared, but the one which has remained until the present is the term 'semantic–pragmatic language disorder' (SPLD) (Bishop and Rosenbloom 1987). The literature (Rapin and Allen 1983, Adams and Bishop 1989, Bishop and Adams 1989) refers to these children as being verbose, having poor turn–taking skills and having difficulty staying on topic. Children with SPLD do not always take into account the knowledge of a conversational partner, they may have subtle difficulties of comprehension, tend to be over–literal, and the ability to infer can also be restricted or delayed in development (Smedley 1989).

The response to this debate was a number of further papers that drew attention to the similarity of children with SPLD to those on the autistic spectrum (Lister Brook and Bowler 1982, Boucher 1998). Detailed case studies of children with SPLD provided examples of behaviour, some of which appeared to overlap with receptive language disorders and word-finding problems and some of which overlap with the social and language behaviours typical of high-functioning autistic children (McTear 1985, Conti-Ramsden and Gunn 1986, Jones *et al.* 1986, Willcox and Mogford Bevan 1995). The first group studies of children with SPLD (Bishop and Adams 1989, Adams and Bishop 1989) indicated that it was possible to distinguish children with SPLD and children with SLI, but on pragmatic measures only. There was no clear cut-off between the groups and they shared many common elements typical of language disorder such as delayed comprehension development.

The linking of pragmatic and semantic factors in Rapin and Allen's account of SPLD led to an assumption that there was an indivisible link between these characteristics in the SPLD group. More recent research (Bishop *et al.* 2000) has indicated that children diagnosed at SPLD do not necessarily have additional grammatical or semantic problems. This has led Bishop (2000a) to propose a new label for these children: pragmatic language impairment (PLI).

PLI and autism

There is a growing body of evidence that children with PLI are not necessarily autistic. As Bishop (2000b) states, 'there are children with significant pragmatic difficulties who do not have any difficulties in the domains of peer relations or interests', which are the hallmarks of autism. Botting and Conti-Ramsden (1999) provide some evidence to support Bishop's claim of overlapping conditions. They found that children with PLI tended to develop first words earlier than children with SLI but that the social impairment ratings of both groups were similar. This study also showed that only a proportion of children with the diagnosis of PLI had specific deficits of peer interactions typical of autism and that this was not a defining characteristic of PLI. Bishop emphasized the variation in symptoms from child to child and stated that there is a need for broad recognition across professional boundaries that 'these children (PLI) have some symptomatic overlap with both SLI and autistic disorder, rather than forcing them into one category or the other' (p. 255).

Semantic knowledge and secondary pragmatic impairments

There is evidence then that children with PLI may or may not have additional language deficits which go beyond the domain of language use. Bishop and Adams

(1989) identified a range of semantic and syntactic language learning difficulties in the SPLD group they studied. There are reports of SPLD children who have word-finding deficits or grammatical deficits (Culloden *et al.* 1986). It may be that these earlier studies of SPLD had included children with pragmatic language impairments secondary to disorders of vocabulary or auditory comprehension problems (McTear 1985, Prutting and Kirchner 1987). There remains a possibility that autistic-like social communication problems and elements of formal language disorder may coexist in some of these children.

A commonly reported deficit in children with SPLD is word-finding problems. Dockrell *et al.* (1998) described word-finding difficulty as an inability to find the appropriate lexical item in the presence of comprehension of the same item. These children are described as being relatively quiet and under-confident or relatively verbose because of the use of conversational strategies to mask the struggle to retrieve words. Word-finding deficits have been related to or interpreted as semantic deficits. Little is known about the semantic abilities of children with SLI and SPLD. Landells (1989) suggests children have difficulty acquiring semantic field boundaries and showing slow semantic development. Children with SLI are thought to be less adept at using syntactic information to infer word meanings—a process known as syntactic bootstrapping (van der Lely 1994, Bishop 1997). Thus, the prospect of isolated semantic deficits in children with SLI is more likely as a residual part of an earlier more complex language learning problem. Systematic studies of these children's semantic and vocabulary abilities are needed.

Assessment and intervention with children with SPLD

Overlapping conditions present intractable problems for diagnosis and uncertainty about intervention. Teachers and speech and language therapists in language units and mainstream schools are dealing with increasing numbers of children with SPLD or PLI (hereafter referred to as PLI except in discussion); they have long-term needs in both academic and social realms, thus placing heavy stress on resources. Their opportunities to socialize with peers is restricted by poor communication skills and this can lead to decreasing social participation often resulting in exclusion from social groups in later life. There is general agreement from experts that the facilitation of communicative interaction skills and support for families in the early and school-age years is an important part of intervention. To intervene meaningfully, however, practitioners need assessment and intervention methodologies founded on basic research which has been in very short supply. An overview of some available assessment and intervention techniques is given below.

Assessment techniques

Psychometric tests and questionnaires

Allocation of a diagnosis of SLI is typically confirmed with the use of published psychometric tests (McCauley and Demetras 1990). This has been less successful with children who have PLI, since many of these children tend to perform with the normal range on measures of language such as expressive syntax. Conti-Ramsden *et al.* (1997) in a large cohort study of children from UK language units identified a cluster of children who presented a profile of semantic and pragmatic deficits (based on a teacher questionnaire). They performed within the normal range on

tests of phonology, naming and word reading, but less well on receptive language tests and a narrative task.

Bishop (1998) used the Children's Communication Checklist (CCC) to identify a sample of children with PLI. The CCC consists of a series of rating scales of communication and social behaviour and aims to identify pragmatic language impairment in a single case. It is not intended as a diagnostic instrument but can provide an objective means of profiling a pragmatic disorder, as opposed to say a purely receptive language disorder. The diagnosis of PLI, however, generally rests on the presence or absence of social impairments in addition to the language problem.

Narrative assessment

Narrative deficits are common in children with higher-level language impairments and can manifest themselves as the inability to structure a sequence of ideas into connected discourse in the absence of overt grammatical errors. Merritt and Liles (1989) found that the retold stories of children with language impairments are shorter, have fewer cohesive ties and include less of the information in the original story than children who are developing language normally. Weaver and Dickinson (1982) studied the retold stories of children with language impairments and found similar results. Stories sometimes contained wrong information and fewer linguistic features which indicated time and cause–effect relationships. Conti-Ramsden *et al.*'s (1997) finding that children with PLI contribute less information in a story retelling task than do children with SLI indicates that a narrative or story-telling assessment might be sensitive to the sorts of organization and sequencing deficits which are present in children with PLI. Story length increases rapidly in the school-age years with rapid expansion of conjunctions, locatives and other more complex notions such as causal statements and comparatives (Sutton-Smith 1986). Therefore, it may be a sensitive enough instrument to profile language learning problems in children with PLI and to measure any changes over time, especially in the school-age child.

Conversation analysis

Conversation analysis has also been proposed as an appropriate technique for the assessment of pragmatic deficits of children who have PLI (Willcox and Mogford Bevan 1995). Analysis of conversations has tended to be qualitative and descriptive, with adjacent turns considered in the context set up by the interlocutors. From a clinical point of view, and especially from an assessment and outcome viewpoint, it is desirable to be able to measure or quantify conversational ability as well as to describe it. Studies of the clinical application of conversation analysis with adults who have acquired aphasia (e.g. Perkins 1995) have found that that quantification of conversational data had merit in measuring progress in therapy, but the qualitative data has an essential role to play in guiding the planning of intervention. Bishop and Adams (1989) and Bishop *et al.* (2000) developed a quantitative conversation analysis procedure: Analysis of Language Impaired Children's Conversation (ALICC). This provides a communicative profile by profiling behaviours such as turn-taking skills, responsiveness and initiation of topics, which can serve as a baseline to plan intervention and evaluation of therapy. Preliminary studies (Bishop

et al. 1994) showed that good interrater reliability ratings of coding of conversational data were achievable.

Referential communication tasks

The ability of children with PLI to communicate information efficiently can be assessed using a referential communication task. This typically takes the form of a barrier task or a game in which partners are asked to give each other instructions to perform a task. Leinonen and Letts (1997) found that children with PLI made fewer requests for clarification of information than children with normal language development on such a task. They proposed that one explanation for this may be that experience of communication failure throughout development had led to less confidence in asking for communication clarifications. They conclude that it is 'difficult to tease out effects on performance that may relate to pragmatic impairment or to general linguistic or cognitive limitations' (p. 62).

Innovative assessment procedures have been described to assess children with PLI during play activities. Kerbel *et al.* (1996) used a play-based activity to assess children's comprehension of a range of idiomatic expressions and their ability to act these out in further play. Such assessments in which the child can play an active role hold promise as methods by which other abilities of children with SPLD or PLI might be assessed.

Relevance Theory

Leinonen and Kerbel (1999) applied Sperber and Wilson's (1995) Relevance Theory to the investigation of three children with PLI. The fundamental notion of Relevance Theory is that the speaker will attempt to make utterances relevant for the listener. In their analysis Leinonen and Kerbel examined conversational implicature, comprehension of linguistic meaning and disambiguation of utterances. They suggest that the usefulness of Relevance Theory is that it provides a means to explore the reasons for communication failure in interactions with children who have PLI. The importance of this is that it allows the assessor to relate communication failures to underlying cognitive deficits which may be present in these children, such as an inability to employ world knowledge to the act of communication.

Effectiveness of intervention with children who have PLI or SPLD

The PLI/SPLD intervention research base contains descriptive case studies (Letts and Reid 1994, Willcox and Mogford Bevan 1995) and group studies which have considered broadly defined groups of language-impaired children (SLI and PLI) or which attempt to evaluate specific service provision models (Bedrosian and Willis 1987, Camarata and Nelson 1992). There are no quantitative intervention studies of effectiveness of intervention for children with PLI.

However there are studies of the effectiveness of intervention for semantic and word-finding problems which may be associated with PLI. McGregor and Leonard (1995) investigated the effects of what they termed elaboration and retrieval therapies for word-finding problems. Therapy was based on either (1) elaboration information known about the word or (2) practising retrieval of the word. Target words that were trained in elaboration plus retrieval mode (as opposed to therapies which

separated these strategies) were the most effective. Other studies have shown similar results, e.g. Hyde Wright (1993), Wittman (1996). Chiat and Hunt (1993) and Lahey and Edwards (1995) analysed data from children with complex language disorders including semantic impairments. They propose that there is a subgroup of children who have deficits of phonological representations underlying the word-finding problem and that psycholinguistic models of phonological processing could be used to provide a rationale for the treatment of semantic deficits.

Single case study approaches

Current intervention methods for SLI and PLI children are based on developmental principles. Relatively little is known about normal language development in the older child, especially in the semantic and pragmatic domains. Much more is known about the early development of intentionality and basic vocabulary. Few guidelines exist for practitioners to plan intervention on conversation, narrative and later lexical learning. More basic research into the rationale and effectiveness of intervention methodologies is necessary if practitioners are to set appropriate goals of therapy for these children. By using the single case study or a series of single case studies information about effectiveness of intervention and appropriate methodologies for investigating intervention can be gained. Statistical treatment of case study data is possible and qualitative examination of data is also employed. Singles case studies of children with PLI (Willcox and Mogford Bevan 1995) have included interventions based on improving conversational abilities and verbal reasoning. Results of single case studies can be difficult to generalize, but they have a role in establishing methods of assessment which function as outcome measures and which indicate possible methods of studying effectiveness of different intervention strategies in larger scale studies.

Aims

This paper presents two case studies of children referred with PLI. The examples given in this paper are not necessarily intended to represent typical children with PLI, and equally cannot offer conclusive directions about assessment or intervention. However, given the scarcity of information regarding these children and the lack of formal description regarding difficulties currently referred to as PLI or SPLD, this paper aims to:

- describe children referred as possible cases of PLI and examine the relevance of the current label;
- describe intervention carried out with these children and report on possible clinical effects; and
- through these to identify shortcomings in current clinical knowledge to be addressed in future research.

Case A: background

A (10;03 years old) had a history of severe receptive language delay in addition to early behavioural and attention problems. Up to approximately 5 years of age he showed little communicative intent, poor eye contact and insistence on sameness. He has normal hearing and has never had a diagnosis of autism. Most of these

traits have now resolved and A is a fluent but not a verbose speaker. The most noticeable surface feature of his language impairment is abnormality of prosody, which tends to be monotonous. He attends a mainstream school where he receives support from a specialist speech and language therapy team. There are some problems of intonation and eye contact in listening and speaking as observed using the Social Use of language Programme's Communication Skills Rating Chart (Rinaldi 1992). On the Clinical Evaluation of Language Fundamentals Test (CELF-R UK; Semel *et al.* 1997) the following results were obtained indicating a low normal receptive/expressive language ability:

- Expressive language score: 86.
- Receptive language score: 89.
- Total language score: 86.

Pre-intervention assessment and goal planning

A had received previous intervention based on comprehension and concept development. The priority now was considered to be interactional communicative skills. To provide guidance on aspects of pragmatics which should be prioritized, conversational skills were assessed using a semi-structure conversation analysis (ALICC; Bishop *et al.* 2000) before therapy (assessment 1). One hundred turns of conversation interaction between A and the researcher (based around a series of selected pictures) were recorded onto audiotape using a SONY Walkman Professional WM-D6C and a Beyerdynamic M58 professional microphone. The conversation was then transcribed onto an Excel file in preparation for analysis using the transcription conventions in ALICC.

Specific goals of therapy were derived by inspection of the first conversational analysis and by discussion between the speech and language therapist and researcher. Therapy was based on a combined developmental approach (practising and modelling relevant pragmatic acts expected at this age) and on a metapragmatic approach. Anderson-Wood and Smith (1997) refer to metapragmatic training as 'helping the client to become consciously aware of communication rules and knowledge' (p. 72). For instance, recognition of the need to ask for clarification when something is not understood rather than producing an unexpected response. These activities can be approached through role-play for the school age child.

The goals specified were:

- Giving adequate information to the interlocutor.
- Being concise.
- Sequencing of events in narrative.
- Use of prosody to convey meaning.
- Interpretation of complex auxiliary and modal verbs.

Therapy was carried out over 10 weeks, three times a week by a specialist speech and language therapist in a mainstream classroom. At the end of this period a further conversation sample (assessment 2) was recorded using similar materials to those used in assessment 1. The researcher also carried this out. The two samples were transcribed by the researcher and coded by a co-researcher who was blind to the point of assessment. The first researcher then recoded 20% of the data, which provided an 89% agreement between coders as a measure of reliability.

Rationale for assessment and intervention

Method of analysis

The overall sequential scheme of coding for conversation data using the ALICC scheme was as follows:

- Transcription.
- Code communicative acts.
- Code meshing.

Conversation coding commenced with transcription of the whole sample from A. Utterance boundaries were determined and any turn-taking devices indicated (for example, specific use of prosodic patterns to indicate the handing over of the conversational turn). Communicative acts were coded for both partners (e.g. *acts that develop or maintain topic*), for example:

q Function of requesting information.
a Function of providing information which is solicited.
s Function of providing information which is not solicited.
cl Giving clarification in response to a request for clarification.

Conversational mechanics, e.g. acknowledgement (topic empty utterances that maintain smooth running of conversation), are:

ack Acknowledgement of preceding information.
rf Reinforcement of a preceding utterance (no topic content).

(The ALICC system is extensive. For the sake of space all acts were coded but only those conversational acts which are of frequency of greater than 1% are used in the interpretation of results.)

Mesh coding was then applied. Meshing is a measure of how well the second parts of adjacency pairs fit with their first parts, i.e. demonstrates the goodness of fit between assertive communicative acts and their responses. This is not the same as the notion of appropriacy as described by Bishop and Adams (1989) and Prutting and Kirchner (1987). In any conversation there are likely to be hitches and repairs on both sides. To capture the nature of the problems evident on qualitative inspection of the data, the relationship between first and second parts of adjacency pairs was examined and reliability of meshing judgements between different coders was calculated.

Mesh codes

The types of mesh coded in the conversations were:

e Extended response providing relevant additional information.
e– Extended response providing relevant additional information inadequate.
e! Extended response providing relevant additional information pragmatically problematic.
m Minimal response providing solicited information.
m– Minimal response providing solicited information inadequate.
m! Minimal pragmatic problem response pragmatically problematic.
x Incomplete response.
dk– don't know immature response

(This is not a comprehensive list of codes; other codes in the ALICC scheme that had zero or low frequency are omitted for clarity. For further information about the coding procedure, see Bishop *et al.* (2000).)

The frequency of codes was recorded for all turns and then calculated as a percentage of one hundred turns of talk. For clarity it was decided to concentrate on A's conversational abilities in this context and the code frequencies of A's speech only is presented.

Results

The types and proportions of conversational acts used by A at assessments 1 and 2 are shown in figure 1. The pattern of acts and the proportion are relatively stable over time and any apparent differences are not statistically significant. This may indicate that the within participant variation is small as predicted by the sampling technique.

Mesh codes and frequencies from assessments 1 and 2 are shown in figure 2. The proportion of 'e' codes is relatively high over both sessions, indicating a fairly talkative style and is higher at time 2 than time 1. This was considered to be a relatively mature style in that A tends to give very full and informative answers. The increase in e codes may reflect an increased ability to produce these mature responses, but the frequency of behaviours is small. Other codes, especially those indicative of pragmatic mismatches, showed a tendency to decrease at time 2 and may represent a therapy effect, but again frequencies are small. The proportion of summed mismatch codes (all – and ! codes) drops from 15.79 to 7.7% after therapy indicating an overall reduction in meshing problems for the conversation.

Case B: background

B was referred to speech and language therapy from a child psychiatry unit at age 7;03 where he was an in-patient undergoing assessment. The child psychiatrist

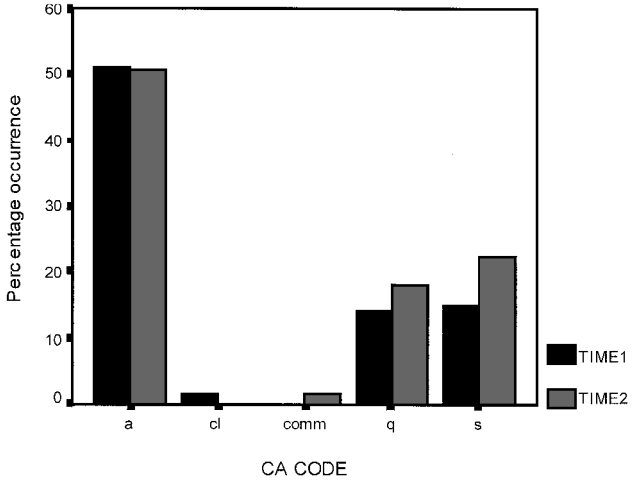

Figure 1. Conversational act percentages at times 1 and 2: Case A. Key: a—answer; cl—clarification; comm—command; q—question; s—statement.

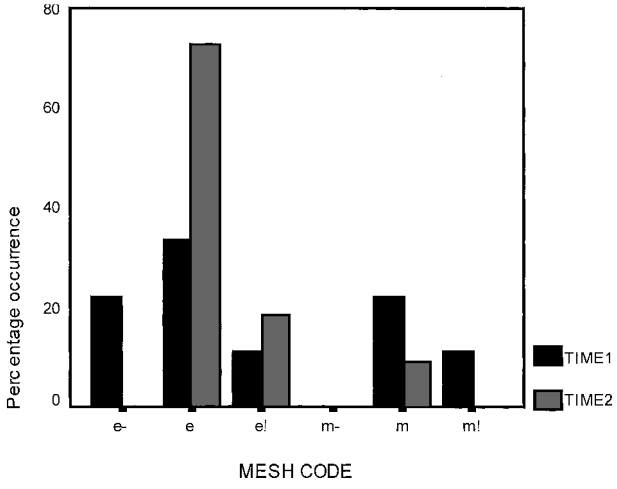

Figure 2. Mesh code percentages at times 1 and 2: Case A. Key: e—extended response providing relevant additional information; e–—extended response providing relevant additional information inadequate; e!—extended response providing relevant additional information pragmatically problematic; m—minimal response providing solicited information; m–—minimal response providing solicited information inadequate; m!—minimal pragmatic problem response pragmatically problematic.

suggested a diagnosis of SPLD. There was no evidence of any neurological or medical disorder but there is a family history of communication disorder. At 18 months B was given grommets for persistent ear infections, but his hearing has been normal at all times. He said his first words at 4 years of age and exhibited extreme frustration at his inability to speak. He still uses gestures to support speech. He was extremely active and destructive as a preschooler. By 5 years he was speaking in sentences and discharged from speech and language therapy. Throughout his early development his mother reports that his interaction with other children was poor and that his interests were narrowly focused but he has never been diagnosed as autistic.

Pre-intervention assessment and goal planning

Psychometric assessment of B revealed a number of specific memory and sequencing deficits but that his IQ was average (British Abilities Scale (BAS), Elliott 1996 and WIPPSI, Wechsler 1990). Speech and language tests revealed delayed comprehension of grammar but a receptive vocabulary in the normal range (British Picture Vocabulary Scale (BPVS), Dunn *et al.* 1982). The results of standardized tests carried out prior to intervention are set out in table 1. Superficially B appeared quite capable linguistically because he uses a range of lengthy sentences, e.g. 'and then the waves comes and washed the sandcastle away and it was just flat like a pancake', but there are many false starts, hesitations and maze type sentences. There is also evidence of dysfluency particularly at the start of sentences. Several errors were noted during naming tasks, including semantic substitutions ('fire' for flame), phonological paraphasias ('pocial worker' for social worker, 'ankelait' for anchor). He was able to respond to some phonetic cues to improve his naming performance. His ability to name items within a category is extremely limited for his age. Non-word repetition

Table 1. Case B preliminary assessment data (CA 7;3)

British Abilities Scale	immediate visual recall	65–71
	delayed visual recall	2–3
	recall of digits	2
WIPPSI-UK	performance IQ	105
	verbal IQ	95
	full-scale IQ	101
TROG	blocks passed	9
	age equivalent	5;0
	centile	5
BPVS	raw score	61
	standard score	96
	percentile rank	40
	age equivalent	6;7
Test of Word Finding	raw score	48
	standard score	72
	centile	3

was poor. Ability to group items according to semantic categories was fair, suggesting that B has a word retrieval rather than a storage problem. Table 1 summarizes pretreatment assessment data.

B was able to participate in conversation, but became confused when the input level was made more complex. He also presented problems of inadequate reference and could change topic suddenly. There was some use of stereotyped phrases and intonation but this was not marked. Video analysis revealed no deficits in non-verbal communication of the sort found by Bishop in a majority of PLI children (Bishop *et al.* 2000).

In addition to standardized assessments B also participated in a narrative assessment. The narrative procedure was a story-retelling task based on a children's storybook with no written text. The story presented was structured in order to assess:

- a range of grammatical constructions (a checklist of a range of constructions of increasing complexity—one point awarded for the presence of that construction even if only used once);
- the use of linking conjunctions such as 'so' and 'but' (excluding 'and');
- the ability to use cohesive devices such as pronouns; and
- the total number of propositions or main ideas in the child's version of the story.

Narratives were transcribed by the author and coded by the co-researcher, who was blind to the point of assessment. For additional details about the framework for scoring the narrative procedure, see Adams *et al.* (2001). In addition, repeated measures of comprehension and word-finding skills were made at the end of the intervention period.

Therapy procedure

Whereas B had some characteristics of PLI there was reason to believe that semantic and comprehension deficits more characteristic of the child with SLI may have

been causing pragmatic problems. It was decided to offer intervention for semantic and word-finding difficulties as a priority for B's communication development and to evaluate the outcome for his pragmatic ability via a narrative assessment procedure. B attended weekly therapy sessions with additional practice and support at home.

Specific goals of therapy were based on the retrieval hypotheses of Nippold (1992) and Lahey and Edwards (1999). These theories state that retrieval deficits are founded on phonological memory deficits and that by strengthening phonological awareness and memory, access to the phonological store of words in the lexicon is promoted.

Specific aims were to:

- strengthen phonological awareness skills;
- strengthen memory skills and in particular phonological memory skills;
- over-rehearse memory tasks and phonological awareness tasks;
- retrieve lists of alliterative words and rhymes; and
- sequence ideas in narrative and conversation.

At the end of this period, narrative and word-finding skills were reassessed.

Results

The results of the Test of Word Finding (German 1987) are shown in table 2.

From assessments 1 to 2 there was a highly significant increase in word-finding skills (McNemar, one-tailed, $p < 0.001$) to within the normal range and more than would be expected by maturation alone. Narrative skills also improved in terms of total number of propositions used. Figure 3 demonstrates the change in narrative skills over time. The number of cohesive devices used increased and there are modest improvements in use of conjunctions and grammatical structure. A re-administration of the TROG indicated that his comprehension has also improved from times 1 to 2 although grammatical comprehension was not a direct focus of intervention. B was now much more confident and outgoing and was clearly more willing to converse with adults and other children. He still had persistent difficulties with verbal concept development, and some word-finding difficulties and dysfluency remained.

Table 2. Test of word finding results at times 1 and 2 for Case B

Subtests	Raw scores time 1 age 7;3	Raw scores time 2 age 8;0
Picture naming: nouns	13	19
Sentence completion	4	11
Description naming	5	10
Picture naming: verbs	18	16
Picture naming: categories	8	14
Total raw score	48	70
Centile	3	56
Standard score	72	102

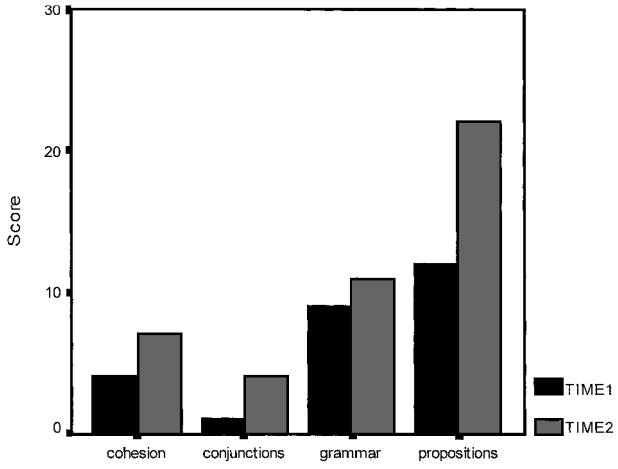

Figure 3. Narrative scores at times 1 and 2: Case B.

Discussion

The results of the single case studies presented here demonstrate that with carefully targeted intervention and appropriately sensitive assessments it is possible to observe and measure changes in pragmatic abilities in children with language impairments. In conjunction with psychometric approaches these measures provide an appropriate battery for assessment of children with pragmatic language impairments. The effectiveness of metapragmatic therapy as a technique for facilitating pragmatic abilities has been demonstrated and led to a reduction in problems between conversational partners. Similarly, phonological awareness and memory intervention techniques were shown to cause robust improvements in word-finding and narrative abilities in a child with a secondary pragmatic impairment.

The conversational data are based on relatively small frequencies of behaviour and it cannot be definitely concluded that there is a therapy effect. However, the case study indicates what measures might be useful in future studies. It is necessary to estimate the amount of variability in within participant conversational profiles. Bishop *et al.* (1994) suggested that this type of profiling, if carefully controlled, can show very consistent behaviours over time for any one individual. Thus, a multiple baseline design with repeated conversational measures might be adopted and an estimate of variation factored into post-therapy outcomes.

The type of therapy in terms of specific goals and methods, amount of contact time and input also needs to be controlled more carefully. Approaches to pragmatic therapy currently in use tend to be eclectic and a 'method' of intervention would currently be difficult to identify, but to pinpoint which aspects of intervention are necessary or essential a comparative design of well-controlled interventions is necessary.

Certain features of conversation analysis lend themselves well to quantification, such as the counting of turns, and others do not. There is therefore a need to ensure the reliability of repeated measures (Perkins *et al.* 1999). It is essential to ensure, by adequate sampling, that any change in conversation behaviour has not arisen due to, say, the presence of a different interlocutor, or (in some cases) to

constrain the similarity of the test–reset topics. Reliability of coding and observations needs to be monitored through blind double coding.

The study of clinical conversation analysis with PLI children is still at an early stage. If conversation analysis is to become a clinical tool for practitioners working with children who have PLI a streamlined system of analysis which is based on thorough, well-grounded research can then be distilled through case and group studies until a reliable and valid instrument is developed which will become part of the therapist's assessment/outcome repertoire. There is probably no need for the comprehensive analyses that are employed in diagnostic research. More likely a combination of qualitative and quantitative techniques which have roles in planning and evaluation will be required.

Case B's language improvement generalized to aspects of language development not targeted in therapy. It is possible that B responded to structured language input in a general way, re-organizing existing linguistic knowledge with support from adults. The second possibility is that extensive individualized phonological awareness and memory therapies had direct effects on word-finding and verbal sequencing skills. The psycholinguistic approach used as the rationale for therapy suggests that the second hypothesis is true, but in order to confirm this further research is necessary. One way forward would be to employ the psycholinguistic model proposed by Chiat and Hunt (1993) who placed emphasis on the interactions amongst different levels of processing, i.e. 'work on phonology might be expected to contribute to the consolidation of semantics'. The consolidation of skills in B has generalized and led to an improvement in the richness of story retelling, both in the amount of information recalled and retold and in formal structure.

The narrative assessment in case B was considered a key measure of language competence and was sensitive to changes after therapy. Narrative assessment is potentially a valuable instrument of assessment. In this case it was used to demonstrate aspects of progress in sequencing, inference and informativeness, i.e. in pragmatic abilities. Other aspects of narrative could be employed to assess, say, grammatical ability, at the same time. There is some evidence that narrative provides one of the best 'windows' into overall language competence in the school-age child (Adams *et al.* 2001). Used in conjunction with specific processing tasks (such as phonological or grammatical ability) narrative assessment may be a useful way of comparing specific and generalized effects of intervention. As with conversational analysis the stability of baseline measures needs to be ensured to account for variability in performance.

This paper has indicated that measures of pragmatic ability, conversation analysis and narrative may serve as measures of improvement following intervention for school-age children with PLI and has suggested some of the methodological constraints required in future work. The two children considered in this paper were both referred as having SPLD and both have characteristics which would fit with the descriptions of that disorder in the literature. However, the nature of these children's communication problems were very different. Case A fitted the revised diagnosis of PLI (Bishop 2000b) closely, but not Case B who had more extensive language deficits than A, responded to therapy based on phonological principles, and had secondary pragmatic deficits which diminished as his language skills improved. Case B was therefore more like a child with SLI with secondary pragmatic impairment. A's intervention focused on strengthening social communication skills with no requirement for formal language intervention. The finding that such

different intervention approaches were required for two children who both have an SPLD diagnosis questions the need for the diagnosis of SPLD. The condition has been over-identified in children with SLI, particularly in cases of word-finding or semantic deficits. This is important as it may lead to less than effective therapy being offered. If child B had undergone pragmatic therapy then progress may have been limited by persisting phonological memory problems.

Conclusions

Two contrasting cases of children with a diagnosis of SPLD have been presented. Of these one appeared to fit well with Bishop's notion of pragmatic language impairment, demonstrating disturbance in non-verbal communication as well as language pragmatics. The other child had relatively mild features of pragmatic disturbance but pronounced language developmental difficulties of the type found in children with SLI. The purpose of diagnostic classifications is to promote communication between professionals, to allow parents to conceptualize thoughts about their child around a label and to predict intervention strategies (Boucher 1998). The label SPLD, with reference to these two illustrative cases, does not fulfil these criteria. Botting (1998) argues that the conflict over terminology and information about these children provokes frustration amongst professionals working with these children as well as possibly inappropriate interventions.

Leinonen *et al.* (2000) doubted that the adoption of PLI as a diagnostic label would help the current debate. A reconceptualization of the group of children with pragmatic language impairments as being at the interface of autism and language disorder is required. At the same time it must be acknowledged that individual children have complex developmental profiles in which social, cognitive and linguistic abilities vary. A category such as PLI may be useful as it has the potential to describe a group of children without significant additional formal language disorder who will require a different approach to that of SLI, as Case A demonstrated.

Fundamental work on the nature of SLI and PLI has yielded important and valuable information. Evidence to support intervention methodologies for children with PLI and related conditions remains limited. Indications for future research include longitudinal studies of PLI; investigations of multidisciplinary approaches which combine speech–language assessments and developmental social cognitive approaches (Adams and Green 2001); studies of the effects of comprehension limitations on pragmatic skills and investigations of the process of change in children's pragmatic profiles during interventions.

Acknowledgements

The author is most grateful to the children and their families for taking part in the research and to the speech and language therapists who provided advice and therapy for A. Thanks are also due to Karen Sage who provided much needed guidance on conversational analysis in the field of acquired aphasia, and to Dorothy Bishop for her continuing support.

References

Adams, C. and Bishop, D. V. M., 1989, Conversational characteristics of children with semantic–pragmatic disorders. I: Exchange structure, turn-taking, repairs and cohesion. *British Journal of Disorders of Communication*, **24**, 211–240.

Adams, C., Cooke, R., Crutchley, A., Hesketh, A. and Reeves, D., 2001, *ACE (6–11): Assessment of Comprehension and Expression (6–11)* (Windsor: NFER-Nelson) (in press).

Adams, C. and Green, J., 2001, Conversational profiles of children with Asperger's syndrome (submitted).

Anderson-Wood, L. and Smith, B. R., 1997, *Working with Pragmatics* (Bicester: Winslow).

Bedrosian, J. L. and Willis, T. L., 1987, Effects of treatment on the topic performance of a school age child. *Language, Speech and Hearing Services in Schools*, **18**, 158–167.

Bishop, D. V. M., 1983, *The Test for Reception of Grammar* (Manchester: author, available from Age and Cognitive Performance Research Centre, University of Manchester M13 9PL).

Bishop, D. V. M., 1997, *Uncommon Understanding: Development and Disorders of Language Comprehension in Children* (Hove: Psychology Press).

Bishop, D. V. M., 1998, Development of the Children's Communication Checklist (CCC): a method for assessing qualitative aspects of communicative impairment. *Journal of Child Psychology and Psychiatry*, **39**, 879–893.

Bishop, D. V. M., 2000a, What's so special about Asperger's syndrome? The need for further exploration of the borderlands of autism. In A. Klin, F. R. Volkmar and S. S. Sparrow (eds), *Asperger Syndrome* (New York: Guildford), pp. 254–277.

Bishop, D. V. M., 2000b, Pragmatic language impairment: a correlate of SLI, a distinct subgroup, or part of the autistic continuum? In D. V. M. Bishop and L. B. Leonard (eds), *Speech and Language Impairments in Children: Causes, Characteristics, Intervention and Outcome* (Hove: Psychology Press), pp. 99–114.

Bishop, D. V. M. and Adams, C., 1989, Conversational characteristics of children with semantic–pragmatic disorders. II: What features lead to a judgement of inappropriacy? *British Journal of Disorders of Communication*, **24**, 241–261.

Bishop, D. V. M., Chan, J., Adams, C., Hartley, J. and Weir, F., 2000, Conversational responsiveness in specific language impairment: evidence of disproportionate pragmatic difficulties in a subset of children. *Development and Psychopathology*, **12**, 177–199.

Bishop, D. V. M., Hartley, J. and Weir, F., 1994, Why and when do some language-impaired children seem talkative? A study of initiation in conversations of children with semantic–pragmatic disorder. *Journal of Autism and Developmental Disorders*, **24**, 177–197.

Bishop, D. V. M. and Rosenbloom, L., 1987, Classification of childhood language disorders. In W. Yule and M. Rutter (eds), *Language Development and Disorders* (Oxford: MacKeith), pp. 16–41.

Botting, N., 1998, Semantic–pragmatic disorder (SPD) as a distinct diagnostic entity: making sense of the boundaries. *International Journal of Language and Communication Disorders*, **33**, 87–90.

Botting, N. and Conti-Ramsden, G., 1999, Pragmatic Language Impairment without autism: the children in question. *Autism*, **3**, 371–396.

Boucher, J., 1998, SPD as a distinct diagnostic entity: logical considerations and directions for future research. *International Journal of Language and Communication Disorders*, **33**, 71–81.

Camarata, S. M. and Nelson, K. E., 1992, Treatment efficiency as a function of target selection in the remediation of child language disorders. *Clinical Linguistics and Phonetics*, **6**, 167–178.

Chiat, S. and Hunt, J., 1993, Connections between phonology and semantics: an exploration of lexical processing in a language impaired child. *Child Language Teaching and Therapy*, **9**, 200–213.

Conti-Ramsden, G., Crutchley, A. and Botting, N., 1997, The extent to which psychometric tests differentiate subgroups of children with SLI. *Journal of Speech, Hearing and Language Research*, **40**, 765–777.

Conti-Ramsden, G. and Gunn, M., 1986, The development of conversational disability: a case study. *British Journal of Disorders of Communication*, **21**, 339–352.

Culloden, M., Hyde-Wright, S. and Shipman, A., 1986, Non-syntactic features of semantic–pragmatic disorders. In *Papers: Advances in Working with Language-Impaired Children* (London: AFASIC).

Dockrell, J. E., Messer, D., George, R. and Wilson, G., 1998, Children with word-finding difficulties—prevalence, presentation and naming problems. *International Journal of Language and Communication Disorders*, **33**, 445–454.

Dunn, L. M., Dunn, L. M., Whetton, C. and Pintilie, D., 1982, *British Picture Vocabulary Scale* (Windsor: NFER-Nelson).

Elliott, C., 1996, *British Abilities Scales*, 2nd edn (Windsor: NFER-Nelson).

German, D. J., 1986, *National College of Education Test of Word Finding (TWF)* (Allen: DLM Teaching Resources).

Hyde Wright, S., 1993, Teaching word finding strategies to severely language impaired children. *European Journal of Disorders of Communication*, **28**, 165–175.

Jones, S., Smedley, M. and Jennings, M., 1986, Case Study: a child with a high level language disorder, characterised by syntactic, semantic and pragmatic difficulties. In *Advances in Working with Language Disordered Children* (London: AFASIC).

Kerbel, D., Grunwell, P. and Grundy, K., 1996, A play-based methodology for assessing idiom comprehension in children with semantic–pragmatic difficulties. *European Journal of Disorders of Communication*, **31**, 65–77.

Lahey, M. and Edwards, J., 1999, Naming errors of children with specific language impairment. *Journal of Speech, Language and Hearing Research*, **42**, 195–205.

Landells, J., 1989, Assessment of semantics. In K. Grundy (ed.), *Linguistics in Clinical Practice* (London: Taylor & Francis).

Leinonen, E. and Kerbel, D., 1999, Relevance theory and pragmatic impairment. *International Journal of Language and Communication Disorders*, **34**, 367–390.

Leinonen, E. and Letts, C., 1997, Referential communication tasks: performance by normal and pragmatically impaired children. *European Journal of Disorders of Communication*, **32**, 53–65.

Leinonen, E., Letts, C. and Smith, R., 2000, *Children's Pragmatic Communication Difficulties* (London: Whurr).

Letts, C. A. and Reid, J., 1994, Using conversational data in the treatment of pragmatic disorders. *Child Language Teaching and Therapy*, **10**, 1–22.

Lister Brook, S. and Bowler, D., 1992, Autism by another name? Semantic and pragmatic impairments in children. *Journal of Autism and Developmental Disorders*, **22**, 61–81.

McCauley, R. J. and Demetras, M. J., 1990, The identification of language impairment in the selection of specifically language-impaired children. *Journal of Speech and Hearing Disorders*, **55**, 468–475.

McGregor, K. K. and Leonard, L. B., 1995, Intervention for word-finding deficits in children. In M. Fey, J. Windsor and S. F. Warren (eds), *Language Intervention: Pre-School Through the Elementary Years* (Baltimore: Paul Brookes), pp. 85–106.

McTear, M., 1985, Pragmatic disorders: a case study of conversational disability. *British Journal of Disorders of Communication*, **20**, 129–142.

Merritt, D. and Liles, B. Z., 1989, Narrative analysis: clinical applications of story generation and story retelling. *Journal of Speech and Hearing Disorders*, **54**, 438–447.

Nippold, M., 1992, The nature of normal and disordered word-finding in children and adolescents. *Topics in Language Disorders*, **13**, 1–14.

Perkins, L., 1995, Applying conversation analysis to aphasia: clinical implications and analytic issues. *European Journal of Disorders of Communication*, **30**, 372–383.

Perkins, L., Crisp, J. and Walshaw, D., 1999, Exploring conversation analysis as an assessment tool for aphasia: the issue of reliability. *Aphasiology*, **13**, 259–281.

Prutting, C. A. and Kirchner, D. A., 1987, A clinical appraisal of the pragmatic aspects of language. *Journal of Speech and Hearing Disorders*, **52**, 105–119.

Rapin, I. and Allen, D., 1983, Developmental language disorders: nosological considerations. In U. Kirk (ed.), *Neuropsychology of Language, Reading and Spelling* (New York: Academic Press), pp. 155–184.

Rinaldi, W., 1992, *The Social Use of Language Programme* (Windsor: NFER-Nelson).

Semel, E., Wiig, E. H. and Secord, W., 1997, *Clinical Evaluation of Language Fundamentals*, revised UK edn (Hove: Psychological Corporation).

Smedley, M., 1989, Semantic–pragmatic language disorder: a description with some practical suggestions for teachers. *Child Language Teaching and Therapy*, **5**, 174–190.

Sperber, D. and Wilson, D., 1995, *Relevance: Communication and Cognition* (Oxford: Blackwells).

Sutton Smith, B., 1986, The development of fictional narrative performances. *Topics in Language Disorders*, **7**, 1–10.

Van der Lely, H. K. J., 1994, Language modularity and grammatical specific language impairment in children. In M. Aldridge (ed.), *Child Language* (Clevedon: Multilingual Matters).

Weaver, P. and Dickinson, D., 1982, Scratching below the surface structure: exploring the usefulness of story grammars. *Discourse Processes*, **5**, 225–243.

Wechsler, D., 1990, *Wechsler Pre-school and Primary Scale of Intelligence*, revised UK edn (WIPPSI–RUK) (Hove: Psychological Corporation).

Willcox, A. and Mogford Bevan, K., 1995, Assessing conversational disability. *Clinical Linguistics and Phonetics*, **9**, 235-254.

Wittman, S., 1996, A case study in word finding. *Child Language Teaching and Therapy*, **12**, 300-313.