Pragmatic assessment and intervention methodologies for children with developmental social communication disorders

Background

Children with pragmatic or social language impairment (PLI) have severe difficulty with the interpersonal use of language in social contexts. These children are typically verbose, have poor turn-taking skills, difficulty staying on topic, semantic problems and difficulty in developing conversational skills (Bishop 2000; Leinonen, Letts & Smith 2000) in the presence of good expressive skills. Teachers and speech and language therapists (SLTs) in language units and mainstream schools are dealing with increasing numbers of these children. Their opportunities to socialise 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 and a higher risk of mental health problems (Goodyer 2000). Understanding of the nature and diagnosis of social communication disorders has now reached a stage at which researchers are ready to address how to promote well-being in these children and their families by facilitating communication.

To intervene meaningfully, however, practitioners need assessment and intervention methodologies which would lead to a greater understanding of how much therapy is needed at what stage in development, and when it should be delivered. There has never been a more pressing time for the speech and language therapy profession to demonstrate the effectiveness of its care and yet the assessment instruments and for recording change under intervention conditions for children with pragmatic problems are not yet in place. A recent systematic review of the evidence to support language intervention (a broader population than PLI) reveals very limited high-quality research to support the effectiveness of interventions (Law, Garrett & Nye 2003).

Current clinical pragmatic assessments are typically based on qualitative analysis of naturalistic interactions (Willcox & Mogford Bevan 1995) and tests of pragmatics (Phelp-Teraski & Phelps-Gunn 1992), both of which have significant limitations. A practical assessment method or set of methods which will be of use in planning intervention/support for the child and his/her family and which can measure change is required. A quantitative assessment of pragmatics (ALICC) which can measure change in pragmatic behaviour has been developed by Professor Dorothy Bishop and the principal investigator (Bishop & Adams 1989, Bishop, Chan, Adams, Hartley & Weir 2000) to a research stage and has potential to meet these requirements.

It is not yet established that pragmatic language impairment is amenable to speech and language intervention. It is not known which aspects of communication behaviour might change as a direct result of therapy, if any at all, or if there is some generalised therapy effect. It is understood that the clinical PLI group contains children with disparate communication profiles, necessitating an individualised
rather than a prescriptive approach to intervention. Without adequate measures and with little information regarding the likely changes in intervention, the way forward is to adopt a serial single case study approach to the evaluation of intervention for PLI children using appropriate measures. The presence and nature of a signal generated from case studies would support the case for more substantial intervention studies and inform their planning.

**Objectives of the study**

The principal aim of this study is to establish whether change in communication behaviours of children with PLI can be detected in an intervention study. Thus it is a signal-generation study and not an efficacy or effectiveness study. Specifically aims:

1. to carry out a preliminary review of current assessment methods for language pragmatics with children. This review was written up and published by invitation. (See Outputs).
2. to develop an assessment tool which would be sensitive to the pragmatic difficulties of children with PLI and which would show sufficient stability to be used as an intervention outcome measure (PHASE A);
3. to carry out a serial single case study evaluation of intervention for children with PLI using the composite quantitative/qualitative instrument derived from the earlier phases of the study (PHASE B).

**Experimental design and methods**

**Method Phase A**

*Subjects*

15 children (10 boys and 5 girls, mean age = 9; 5 years; S.D.= 2; 5; range = 7; 3 - 11; 6) identified as having PLI by their speech and language therapists were included in the study. Diagnostic information was supplemented by data from completed Children’s Communication Checklists (Bishop 1998). An age-matched control group (mean age = 9;4 years; S.D.=1;5; range=7;1-11;0) also took part in the study. All children participated in the elicitation task. A subset of ten children from the PLI group (6 boys and 4 girls) with a mean age of 9;10 years (S.D.=9;10; range=7;11 to 11;6), and 10 children from the control group with a mean age of 9;8 years (S.D.= 1;3; range = 7;3 to 11;0) took part in the conversation study.

*Procedure*

Assessment on elicitation and conversation tasks took place in a quiet room with only the child and tester present. The sessions were videoed and a protocol was developed to score the recordings for the elicitation task. Conversational coding was completed from the video using the procedure described below. To permit an assessment of variation in pragmatic performance, each child was assessed on a second occasion, the period between testing ranged from 2-16 weeks. Three assessors completed the assessments between the groups. Assessors were trained in
advance in the administration of the elicitation script and pre-test checks were made to ensure accuracy of delivery.

**Communicative function elicitation task**

A scripted procedure for eliciting pragmatic behaviours was developed based on the work of Creaghead (1984) and Paul (1995). This approach involves setting up situations that tempt the child to exhibit typical communicative functions using a series of tasks and props. 19 communicative functions were targeted in the procedure (see Appendix 1). The communicative functions elicitors were contained within a written script, based around toys and objects, prepared in advance (Lloyd 2003).

Each communicative function was coded according to:
- yes – the behaviour was elicited
- no – the behaviour was not elicited
- n/o not observable

**Conversation Task**

The subjects were assessed on a conversation task that was based on ALICC (Adams and Bishop 1989; Bishop and Adams 1989; Bishop et al 2000; Adams, Green, Gilchrist and Cox 2002). Conversations were gathered using the semi-structured method devised by Adams and Bishop (1989). This method uses black and white photographs as prompts to initiate particular topics, in this case:
- Time 1 (T1) – a visit by the doctor; a birthday party; a car breaking down
- Time 2 (T2) – building a bonfire; a family day trip; taking a pram from a rubbish tip

**Communicative function analysis of conversation samples**

Communicative acts in conversation were coded at the level of the utterance. In conversations the range of communicative functions is likely to be limited by the constraints of the context. A reduced number of communicative functions were therefore selected for analysis. These correspond to elicited communicative acts as follows:
- Questions: correspond to Request for information and Asking questions in the elicited communicative functions task
- Answers: Explanation, Predicting’ Hypothesising/giving reason, Making choices, Answering
- Statements: Comment on object, Volunteering to communicate
- Requests for clarification by children in the conversational data were also recorded.
- Clarifications, clarification requests and Denial/correction correspond directly
- Recapitulations are utterance that restate or summarise information which has already been stated in the conversation.
- Conversational mechanics: are utterances that are used to establish mutual engagement and turn management and which have no topical content..
Conversational indices

The same conversational data was then subject to further analysis using the conversational indices described in detail in Adams et al. (2002) and Bishop et al. (2000):

- Discourse participation: the ratio of child utterances to tester utterances. It can be used to evaluate each partner’s contribution to the conversational floor time. (Lloyd, Lieven and Arnold, 2001).
- Conversational dominance: the degree to which the child dominates the conversation by repeatedly requesting information or by providing unsolicited information.
- Assertiveness: the child’s tendency to initiate conversational exchanges.
- Verbosity: extended unsolicited talk in a single turn.
- Response problems: the proportion of all responses which were inadequate, pragmatically inappropriate or no responses
- Pragmatic problems: the proportion of child responses which were pragmatically inappropriate

Results Phase A

The elicitation procedure did not distinguish between the PLI and control groups on the number of communicative functions elicited. Both groups were performing at or close to ceiling level for most of the items. For statistical analysis, a 2x2 mixed factorial ANOVA design was employed with conversational measures as the dependent variables. The independent variables were time of testing (2 levels: T1 and T2) and group (2 levels: PLI and Control). Time was manipulated within subjects, while group was manipulated between subjects. Findings suggest no significant differences between the PLI-tester and control-tester conversations concerning the amount of talk that took place between the participants.

Table 1 shows the mean proportions of the communicative function types for the PLI and control groups at T1 and T2. No significant main effect of time, and no significant interaction between time and group, was found for any of the communicative function types. The PLI group used higher proportions of questions \( F(1,18)=5.62, \ p=0.029 \), clarification requests \( F(1,18)=4.83, \ p=0.041 \), clarifying responses \( F(1,18)=6.29, \ p=0.022 \) and recapitulations \( F(1,18)=5.31, \ p=0.033 \) than the control children.

Table 1. Mean proportions of the communicative function types in conversation for the PLI and Control groups at Time 1 and Time 2

<table>
<thead>
<tr>
<th>Communicative Acts</th>
<th>PLI</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>T1</td>
<td>SD</td>
</tr>
<tr>
<td>Questions *</td>
<td>2.08</td>
<td>(1.98)</td>
</tr>
<tr>
<td>Answers</td>
<td>45.31</td>
<td>(8.67)</td>
</tr>
</tbody>
</table>
Table 2 shows the mean conversational behaviour indices for the PLI and control groups at T1 and T2. A significant main effect of group was found for response problems \([F(1,18)=13.954, \ p=0.002]\) and pragmatic problems \([F(1,18)=6.29, \ p=0.000]\), with the PLI group displaying more problematic responses than the controls in both categories.

Table 2. Mean conversational behaviour indices scores for the PLI and Control groups at Time 1 and Time 2

<table>
<thead>
<tr>
<th>Communicative Indices</th>
<th>PLI</th>
<th></th>
<th>CON</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>T1 Mean &amp; SD</td>
<td>T2 Mean &amp; SD</td>
<td>T1 Mean &amp; SD</td>
<td>T2 Mean &amp; SD</td>
</tr>
<tr>
<td>Conversational dominance</td>
<td>0.28 &amp; 0.15</td>
<td>0.25 &amp; 0.20</td>
<td>0.30 &amp; 0.24</td>
<td>0.31 &amp; 0.24</td>
</tr>
<tr>
<td>Assertiveness</td>
<td>0.03 &amp; 0.02</td>
<td>0.04 &amp; 0.03</td>
<td>0.01 &amp; 0.02</td>
<td>0.01 &amp; 0.02</td>
</tr>
<tr>
<td>Verbosity</td>
<td>0.02 &amp; 0.02</td>
<td>0.01 &amp; 0.02</td>
<td>0.03 &amp; 0.02</td>
<td>0.02 &amp; 0.02</td>
</tr>
<tr>
<td>Responsiveness</td>
<td>0.95 &amp; 0.04</td>
<td>0.93 &amp; 0.05</td>
<td>0.95 &amp; 0.28</td>
<td>0.93 &amp; 0.08</td>
</tr>
<tr>
<td>Response problems *</td>
<td>0.27 &amp; 0.13</td>
<td>0.33 &amp; 0.13</td>
<td>0.08 &amp; 0.09</td>
<td>0.12 &amp; 0.16</td>
</tr>
<tr>
<td>Pragmatic problems *</td>
<td>0.20 &amp; 0.11</td>
<td>0.22 &amp; 0.12</td>
<td>0.01 &amp; 0.01</td>
<td>0.02 &amp; 0.02</td>
</tr>
</tbody>
</table>

* PLI > CON, \( p<0.01 \)

Differences between conversational indices derived for both groups at time 1 and time 2 are shown in Table 3. There is no significant difference between groups on any of the indices in the degree to which time 1 and time 2 performance differed from each other.

Table 3: Differences between the mean conversational behaviour indices scores for the PLI and Control groups Time 1 – Time 2

<table>
<thead>
<tr>
<th></th>
<th>PLI</th>
<th>CON</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conversational dominance</td>
<td>-0.03</td>
<td>0.01</td>
</tr>
<tr>
<td></td>
<td>Assertiveness</td>
<td>Verbosity</td>
</tr>
<tr>
<td>--------------------------</td>
<td>---------------</td>
<td>-----------</td>
</tr>
<tr>
<td></td>
<td>0.01</td>
<td>-0.01</td>
</tr>
</tbody>
</table>

**Summary of Phase A**
The elicitation procedure proved to be insensitive to identify the communicative limitations of children with PLI. Most children with PLI could produce the full range of elicited communicative functions with no difficulty. The task may be detect communicative limitations in younger children with PLI. However the communicative functions within conversation analysis and the conversational indices analysis were able to show differences between groups, indicating their potential as outcome measures. The variation in conversational measures which occurs for a group of children with PLI is relatively small compared to the size of the indices and can be factored into Phase B results. For a change in a conversational index to have significance for an individual child, it must exceed the degree of variation identified here.

**Transition to Phase B**
A panel of specialist speech and language therapists was asked to comment on the elicitation procedure and the conversational measures as a precursor to their use in Phase B. Discussion recommended the retention of conversational indices but not communicative function analysis for Phase B. SLTs felt that the data emerging from a conversational index would prove useful for intervention planning and for measuring progress and that detailed measures of narrative could usefully supplement the pragmatic assessment.

**Method Phase B**

**Subjects**
Six boys were recruited from speech and language therapy services in the North West of England with the assistance of NHS special practitioners. We aimed as far as possible to recruit children who:

- Scored below 132 on the Children's Communication Checklist (CCC; Bishop, 1998)
- Scored at or higher than the 16th percentile on Raven's Coloured Matrices (Raven, Court and Raven, 1986)
- Scored no lower than the 16th centile on the Test for Reception of Grammar (TROG) (Bishop 1983)
- Who were not receiving other concurrent speech and language therapy and had no therapy specifically directed at pragmatic ability within the previous three months.

Briefings were held with parents and school teachers/special needs coordinators in advance of acceptance of subjects in order to ascertain that they had sufficient
understanding of the process of intervention and that the facilities for individual and group therapy will be available. Initial characteristics of the subject and inclusion testing information are set out in Table 4.

Table 4: Subject initial assessments

<table>
<thead>
<tr>
<th>Subject</th>
<th>Age*</th>
<th>CCC</th>
<th>TROG centile</th>
<th>Raven's centile</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>9;9</td>
<td>129</td>
<td>99</td>
<td>75</td>
</tr>
<tr>
<td>2</td>
<td>8;4</td>
<td>116</td>
<td>25-50</td>
<td>&lt;5</td>
</tr>
<tr>
<td>3</td>
<td>8;7</td>
<td>141</td>
<td>25-50</td>
<td>25-50</td>
</tr>
<tr>
<td>4</td>
<td>6;5</td>
<td>113</td>
<td>25</td>
<td>50-75</td>
</tr>
<tr>
<td>5</td>
<td>8;01</td>
<td>109</td>
<td>5</td>
<td>25</td>
</tr>
<tr>
<td>6</td>
<td>5;11</td>
<td>113</td>
<td>90</td>
<td>95</td>
</tr>
</tbody>
</table>

*at commencement of study

Table 4 indicates it was not possible to meet all the inclusion criteria for all the PLI children. Given the diverse nature of the children who are diagnosed within the category PLI, the availability of children for intensive intervention in the time frame of the study and the case study nature of the project it was decided to press ahead with the inclusion of these subject, providing that their individual results was carefully interpreted.

Procedure Phase B

Each child participated in a pre-therapy assessment battery with a researcher. All assessments took place in a mainstream school setting in a separate room with just the tester and child present. Assessment pre-therapy consisted of:

- The conversation task described in PHASE A of the study
- The Assessment of Comprehension and Expression (6-11) (Adams et al 2000) Narrative and Inferential Comprehension subtests
- CELF Sentence Recall and Formulating Sentences (Semel et al 2000).
- A spontaneous narrative assessment and a themed narrative task: Measures of narrative were obtained in order to detect any generalisations of progress to other discourse functions
- A parent and teacher questionnaire (undergoing analysis, see Appendix 2)

Children then entered a pre-therapy baseline phase in which the conversation task was administered three times before intervention at weekly intervals. The same or similar materials were used to maintain interest. Previous research has shown that the use of similar materials within the same framework of assessment yields little variation in conversational behaviour for children with PLI. (Bishop, Hartley & Weir 1994).

Children were next seen for the intervention phase by the speech and language therapist only. Each child received eight weeks of pragmatic intervention, three times a week, from a specialist speech and language therapist. Intervention was
planned on an individual basis and reflected current practice, i.e., building on strengths in communication through exercises and games in interpersonal communication and by developing strategies to promote more effective communication with others in the child’s environment. In addition to child intervention the SLT actively engaged with the caregivers, classroom teacher and special needs coordinator for each child, providing assessment results, intervention principles and aims and eventually detailed progress reports. A detailed description of intervention is being prepared for publication.

The conversation task was administered three times after intervention at monthly intervals, starting no later than one week after intervention was complete. The assessor was an SLT unknown to the child, since familiarity with the treating SLT may have skewed results unnecessarily. Post-therapy conversation data were recorded as described above and allocated a code number. Conversations were transcribed by trained assistants and passed to the coder who was blind to the point of assessment via conversation. Narrative tasks were re-administered on the assessment immediately post-therapy as were CELF and ACE subtests. Thus these results are non-blinded.

**Results Phase B**

The nature of the series single case study does not allow for group treatment of data. For brevity’s sake some data are reported in single tables, but the progress of each child has been considered individually. Some points are illustrated with reference to one or two children only.

Conversations from 7 data points were carried out for each child using identical methods and analyses to those of Phase A. Data were averaged across pre- and post-therapy phases to reveal average conversational indices for that phase for each child. One new conversational index, loquacity, was added to the management of data. Loquacity refers to the tendency for the child to produce multiple utterances per turn, thus indicating whether a child tends to produce monologue-type turns.

At the end of the case studies 10% of the conversation samples obtained by one assistant were analysed by the principal investigator who is also trained in the ALICC procedures. Due to staff problems the second analyst was not blind to the data point of sampling of the transcript. Agreements on coding ranged from 88% on conversational communicative function coding to 93% for pragmatic and response problem coding.

Table 5: Pre-and post-therapy standardised assessment subtest standard scores

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Subject 1</th>
<th>Subject 2</th>
<th>Subject 3</th>
<th>Subject 4</th>
<th>Subject 5</th>
<th>Subject 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACE Inference</td>
<td>Pre 99</td>
<td>Post 99</td>
<td>Pre 2</td>
<td>Post 2</td>
<td>Pre 63</td>
<td>Post 98</td>
</tr>
<tr>
<td>ACE Narrative*</td>
<td>Pre 84</td>
<td>Post 98</td>
<td>Pre 50</td>
<td>Post 50</td>
<td>Pre 75</td>
<td>Post 37</td>
</tr>
<tr>
<td>Sentence Recall</td>
<td>Pre 99</td>
<td>Post 99</td>
<td>Pre 1</td>
<td>Post 1</td>
<td>Pre 75</td>
<td>Post 99</td>
</tr>
<tr>
<td>Form/g. Sentence s</td>
<td>Pre 99</td>
<td>Post 99</td>
<td>Pre 84</td>
<td>Post 16</td>
<td>Pre 95</td>
<td>Post 98</td>
</tr>
</tbody>
</table>

*Propositions score only
All individuals showed change, some substantial change, in some subtest scores between initial and follow-up assessments which cannot be explained solely by spontaneous development. Some children, are, however, functioning at or near ceiling on some tests so cannot demonstrate improvement. There is no pattern emerging as to a single aspect of language performance change which is related to the therapy given. So, for instance, many of the children improved on Sentence Recall which was not a skill specifically targeted for any individual, suggesting that there may be generalised rather than specific effects of therapy. This has implications for how the outcomes of therapy are measured.

Individual patterns of change on conversational indices were considered with respect to the data in Appendix 3 and by visual inspection. Individual inspection of data accounting for changes greater than the measures of variation shown in Phase A allows for specific observations to be made.

In a signal-generation study it is necessary to consider whether the conversational indices provide a suitable medium for the measurement of subtle changes in pragmatic performance as a result of therapy. Conversational data can only be viewed as a positive sign of progress (or a sign of no progress) if the individual profiles are compared to individual management programmes. Since children with the PLI population are known to show heterogeneous pragmatic profiles, it follows that individual programmes with specific aims will be aspire to different directions of change in the conversational indices. For example, say to increase conversational participation for the quiet child might be an aim of therapy, but for the talkative child we may wish to help him to improve his ability to share the conversational floor. Therefore the direction of change in a conversational index can only be interpreted as a positive sign if it is congruent with the individual aim of intervention.

Mean discourse participation indices were generally lower post-therapy compared to pre-therapy, suggesting a more equal sharing of the conversational floor time in the post-therapy conversations. (But Phase A had not subjected this ratio to variability testing.) Mean conversational dominance indices for subjects 1, 3, 5 were lower post-therapy compared to pre-therapy, suggesting that these children were taking a less dominant role in the post-therapy conversations. Subjects 2 and 6 showed similar conversational dominance across assessment periods. Four children increased in loquacity across intervention and two remained the same. Assertiveness and verbosity were found to be generally very small indices, rendering their potential to show change limited. Mean verbal responsiveness indices for five out of six children were lower post-therapy compared to pre-therapy. This suggests that each child displayed a higher degree of verbal responsiveness in the post-therapy conversations. The proportion of pragmatically inappropriate responses for Subjects 1 and 2 was higher in post-therapy conversations but this may accompany their tendency to engage more. Mean verbal response problems indices for Subjects 1 and 3 were lower post-therapy compared to pre-therapy, suggesting that these children made more adequate responses to adult solicitations in the post-therapy conversations. But this was not universal. For some children there was insufficient change in response indices to show change beyond natural variation and some children showed increases in problems post-therapy.

Profiles of change at the level of the case will be compared to targets of intervention for illustrative purposes. Subject 6 showed dramatic change on standardised
language tests from pre- to post-therapy stages. Conversational analysis for subject 6 showed a lower discourse participation index indicating less dominance of the conversation which was part of his management aims. There was an increase in loquacity indicating that subject 6 had more to say within turns. This was not specifically targeted in therapy but evidently reflects an overall improvement in language skills and a better ability to remain on topic in conversation. The most striking result for subject 6 is the reduction in response and pragmatic problems which were specifically targeted in intervention. This is in contrast to Subject 1, a linguistically high-functioning child, who showed some limited progress in loquacity (expected from targeted therapy) but little change in other measures.

Table 6: Quantitative measures of the pre- and post-therapy narrative tasks

<table>
<thead>
<tr>
<th>Subject</th>
<th>Task</th>
<th>Pre-therapy</th>
<th>Post-therapy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total words</td>
<td>t-units Mean words per t-unit</td>
<td>Total words</td>
</tr>
<tr>
<td>1</td>
<td>ACE</td>
<td>299 31 9.65</td>
<td>245 35 7.00</td>
</tr>
<tr>
<td></td>
<td>Unstructured</td>
<td>1129 135 8.36</td>
<td>779 132 5.90</td>
</tr>
<tr>
<td></td>
<td>Recall</td>
<td>603 84 7.18</td>
<td>82 12 6.83</td>
</tr>
<tr>
<td>2</td>
<td>ACE</td>
<td>197 23 8.57</td>
<td>209 25 8.36</td>
</tr>
<tr>
<td></td>
<td>Unstructured</td>
<td>57 9 6.33</td>
<td>187 26 7.19</td>
</tr>
<tr>
<td></td>
<td>Recall</td>
<td>41 6 6.83</td>
<td>64 9 7.11</td>
</tr>
<tr>
<td>3</td>
<td>ACE</td>
<td>191 25 7.64</td>
<td>151 22 6.86</td>
</tr>
<tr>
<td></td>
<td>Unstructured</td>
<td>117 16 7.31</td>
<td>55 8 6.88</td>
</tr>
<tr>
<td></td>
<td>Recall</td>
<td>90 14 6.43</td>
<td>39 9 4.33</td>
</tr>
<tr>
<td>4</td>
<td>ACE</td>
<td>183 27 6.78</td>
<td>100 14 7.14</td>
</tr>
<tr>
<td></td>
<td>Unstructured</td>
<td>41 6 6.83</td>
<td>17 2 8.50</td>
</tr>
<tr>
<td></td>
<td>Recall</td>
<td>93 12 7.75</td>
<td>42 6 7.00</td>
</tr>
<tr>
<td>5</td>
<td>ACE</td>
<td>230 36 6.39</td>
<td>288 40 7.20</td>
</tr>
<tr>
<td></td>
<td>Unstructured</td>
<td>626 114 5.49</td>
<td>429 59 7.27</td>
</tr>
<tr>
<td></td>
<td>Recall</td>
<td>181 30 6.03</td>
<td>265 45 5.89</td>
</tr>
<tr>
<td>6</td>
<td>ACE</td>
<td>126 16 7.88</td>
<td>118 13 7.88</td>
</tr>
<tr>
<td></td>
<td>Unstructured*</td>
<td>- - -</td>
<td>77 9 8.56</td>
</tr>
<tr>
<td></td>
<td>Recall*</td>
<td>- - -</td>
<td>22 5 4.40</td>
</tr>
</tbody>
</table>

* did not complete task

Narratives were coded for the quantity of information (number of words) and the length/complexity of utterances (t-units) which are embedded in the narrative. Table 6 shows the individual scores on the three narrative tasks at pre- and post-therapy assessments. For most children formal measures remained fairly static over time although there were some changes (either more or less talk in narratives) which merit
further investigation. It might be anticipated that working on improved informativeness as measured by reduced loquacity and pragmatic problems may also translate to a decreased number of t-units for the children who were initially talkative.

**Summary of Phase B**

1) Intensive pragmatic language therapy resulted in significant changes in language behaviour for all children but not necessarily in the same aspects of language
2) Some of the conversational indices were sensitive to changes beyond normal variation in pragmatic behaviour
3) Some children showed improvements in communication skills which were targeted in therapy
4) Individual children’s progress requires careful interpretation in relation to the aims of therapy
5) Quantitative narrative measures did not show changes over time

**General summary and recommendations**

The study has developed methods of assessment of conversation, communicative function and narrative for children who have pragmatic language impairments. It identified that elicitation procedures are not sensitive instruments for older children with PLI. Changes in pragmatic behaviours were accurately and reliably measured across assessment periods. There is a strong signal that change in pragmatic language behaviour can be measured in well-controlled intervention studies. Conversation measures, narrative and some standardised tests detected the presence of changes in language behaviours in an intervention study.

It may be that for these children management should focus on adaptations to the learning environment rather than concentrating solely on the limited gains which can be made in pragmatic behaviours,

For future research it is recommended that:

- A combination of pragmatic and other language measures (i.e. composite rather than single outcome measures) are used to account for the complex number of changes in behaviour
- Intervention studies which employ conversational or other pragmatically based indices need to state aims of therapy in terms of the direction of change expected in the measures employed
- Individual interpretation at the level of the case should be built in to confirm that a positive improvement is present for that individual. This does not exclude the possibility of group trials, just that outcome measures should be planned to account for individuals’ progress
- a protocol for the choices of therapy to match child should be established by consensus before research commences
- careful attention should be paid to the blinding of coders/assessors and to reliability procedures
- longer baseline periods are incorporated to account for spontaneous progress

This study was by nature a speculative one and therefore had limitations. Although all children showed positive progress in some aspect of communication skills, they varied greatly in their responses to intervention. Conversational indices still require refinement to a more time-limited procedure. Some indices which rely on infrequent problems in the conversational data were difficult to interpret. Detailed inspection of individual scores and the direction of change in scores was important in the interpretation of results, but one should guard against making the data say whatever fits with targets of therapy. A more strict protocol for interpretation needs to be included in further research.

The study also has implications for the nature of PLI. The contrast amongst subjects in terms of original profile and the process of change in therapy is considerable given that these children supposedly fit into one diagnostic category. This is no reason to abandon the label since it has generated research to benefit these children. The study suggests that for a minority of children with PLI, communication problems are intractable and lay principally in the social domain. It may be that for these children management should focus on adaptations to the learning environment rather than concentrating solely on the limited gains which can be made in pragmatic behaviours. The study of intervention, has therefore, plenty to say about the underlying nature of communication disorders.

**Ethical considerations**

Ethical approval was gained from the University of Manchester Ethics Committee and from the Stockport and Salford NHS Local Research Ethics Committees. Information and consent forms were provided for all participants and discussed before involvement of the subject. No identifying information will be provided in any publications of our findings. In research procedures we follow the guidelines of the British Psychological Society (1995).

**Activities/dissemination**

We have discussed our work in a variety of formats to a range of audiences in the UK and US, including academic researchers and clinicians. Dissemination has also been carried out to local speech and language therapists and teachers. Parents of the participants have also received feedback on individual children’s progress.

The following conference papers have been undertaken so far:


Outputs

Outputs published and submitted so far


Outputs in preparation


Impacts

This study has direct implications for speech and language therapy practitioners working with children who have PLI. It provides a first attempt to clarify whether the resources allocated to treatment of these children are being appropriately directed and therefore has implications for the delivery of services to this population at a local service and Primary Health Trust level. Information has been provided for local NHS services in the form of service-based seminars. There is international interest in the treatment of children with PLI. The project has been disseminated in part at
professional speech and language therapy conferences in the UK, US and New Zealand. Details of the intervention rationale and methods are to be disseminated in practitioner journals nationally and internationally. We aim to provide in due course, non-technical summary of Phase B of the study for the ICAN and AFASIC newsletters. We anticipate that the project will add to the current knowledge base of evidence-based practice but more importantly, that it will persuade future funders that a large scale study of intervention for children with PLI will be supported by methodologically sound measures.

**Future research priorities**

This study gives a clear signal that it is possible to effect positive changes in the communication behaviours of children with PLI, given intensive and specialist interventions. The next stage of research will be to carry out a larger scale study, incorporating the measures used and recommendations made here. Future research therefore needs to examine:

- The efficacy of intervention for a larger cohort of children with PLI using a randomised controlled design
- The formalisation of methods of intervention
- To differentiate specific vs generalised effects of therapy
- To address the limitations of impairment-based speech and language therapy for some children and indicate alternative strategies

**References**


Paul R 1995 *Language Disorders from Infancy to Adolescence*. St Louis: Mosby


Appendix

Appendix 1:

Pragmatic behaviours assessed via the elicitation procedure

<table>
<thead>
<tr>
<th>Communicative Functions</th>
<th>Conversational Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Greeting</td>
<td>12. Answering</td>
</tr>
<tr>
<td>2. Request for object</td>
<td>13. Volunteering to communicate</td>
</tr>
<tr>
<td>3. Request for information</td>
<td>14. Attending to the speaker</td>
</tr>
<tr>
<td>4. Comment on object</td>
<td>15. Taking turns</td>
</tr>
<tr>
<td>6. Predicting</td>
<td>17. Asking questions</td>
</tr>
<tr>
<td>7. Hypothesising / Giving reason</td>
<td>18. Requesting clarification</td>
</tr>
<tr>
<td>8. Denial / Correction</td>
<td>19. Clarifying</td>
</tr>
<tr>
<td>9. Making choices</td>
<td></td>
</tr>
<tr>
<td>10. Giving reasons</td>
<td></td>
</tr>
<tr>
<td>11. Closing</td>
<td></td>
</tr>
</tbody>
</table>
Appendix 2

Appendix

Centre of Human Communication and Deafness,
University of Manchester

ROPA parent/teacher questionnaire

Before Therapy

1. Describe ……..’s language and communication at school/home.
2. What did you expect therapy to be like?
3. How did you think …….. Might change at home/ school?

During Therapy

1. What did …….. tell you about the therapy?
2. Did you tell anyone about his/ her therapy? If so what did you say?
3. How were you involved?
4. Describe your activities?

After Therapy

1. Describe ……..’s communication at home now. What is the same and what is different?
2. Describe how easy it is to have a conversation/ chat with ……..
3. How easy is it for …….. to tell you about events, stories?
4. Describe….. spontaneous communication and how he volunteers information or asks for information
5. Describe how….. participates in group discussions/ activities.
6. Describe how……….. interact with you, has this changed in any way?
7. Describe how appropriate………..’s communication is. Has this changed in any way?
8. Are you doing anything different now?
9. In retrospect how did you feel about therapy?
10. What would you change about it?
11. How did you feel about being involved in research?
12. How did you feel about the intensity of the research?
13. How did you feel about therapy being based in school?
### Appendix 3

#### Table X: Mean pre- and post-therapy conversational behaviour indices scores by subject

<table>
<thead>
<tr>
<th>Subject</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
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<tr>
<td></td>
<td>Pre</td>
<td>Post</td>
<td>Pre</td>
<td>Post</td>
<td>Pre</td>
<td>Post</td>
</tr>
<tr>
<td>Discourse Participation</td>
<td>1.10</td>
<td>0.99</td>
<td>1.15</td>
<td>0.98</td>
<td>0.92</td>
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<tr>
<td>Conversational Dominance</td>
<td>0.54</td>
<td>0.41</td>
<td>0.44</td>
<td>0.42</td>
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<td>0.33</td>
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<tr>
<td>Loquacity</td>
<td>0.49</td>
<td>0.38</td>
<td>0.39</td>
<td>0.40</td>
<td>0.26</td>
<td>0.32</td>
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<tr>
<td>Verbosity</td>
<td>0.04</td>
<td>0.02</td>
<td>0.01</td>
<td>0.01</td>
<td>0.00</td>
<td>0.01</td>
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<tr>
<td>Assertiveness</td>
<td>0.02</td>
<td>0.01</td>
<td>0.01</td>
<td>0.01</td>
<td>0.01</td>
<td>0.02</td>
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<tr>
<td>Responsiveness</td>
<td>0.76</td>
<td>0.69</td>
<td>0.75</td>
<td>0.59</td>
<td>0.83</td>
<td>0.79</td>
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<tr>
<td>Response Problems</td>
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<td>0.11</td>
<td>0.29</td>
<td>0.25</td>
<td>0.04</td>
<td>0.11</td>
</tr>
<tr>
<td>Pragmatically Inappropriate</td>
<td>0.07</td>
<td>0.09</td>
<td>0.19</td>
<td>0.19</td>
<td>0.01</td>
<td>0.08</td>
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