Bridging the gap: can impairment-based therapy for anomia have an impact at the psycho-social level?

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Abstract

Background: Studies of therapy with people with aphasia tend to use impairment-based and functional measures of outcome. The views of participants are not formally evaluated. Current health and social care practice requires intervention to be explicitly client-centred and evidence-based. It is therefore important to investigate the broader effects of speech and language therapy.

Aims: To explore the outcome of a therapy for anomia using the Communication Disability Profile (CDP), focusing particularly on participants’ ratings of ‘activity’.

Methods & Procedures: Overall eight people with aphasia and their conversation partners participated in the study. There was a range of severity and type of aphasia. Following two baselines (at least 8 weeks apart), there were two phases of therapy for anomia each lasting 8 weeks. This first involved the use of spoken and written cues to aid word finding. The second encouraged the use of targeted words in connected speech and conversation. Eight weeks later, after no further therapy, participants were reassessed.

Outcomes & Results: Participants’ word finding in picture-naming improved significantly, as did their activity ratings. The relationship between the group’s word-retrieval scores and CDP activity ratings over the course of the study tended towards significance, although there was considerable variation across individuals. Furthermore, all participants rated participation in activities requiring communication higher at the end than the start of the project.

Conclusions: The findings suggest that therapy which targets word retrieval can have an impact on people with aphasia’s views of their communicative activity and life participation. The findings support therapists’ clinical insight that...
impairment-based interventions can effect change beyond scores on language tests.

Keywords: Anomia, therapy, phonological cues, orthographic cues, communication disability, activity, participation, impairment, outcome measures, aphasia therapy.

What this paper adds
The views of people with aphasia are rarely formally evaluated in studies of aphasia therapy. In particular, the impact of impairment-based aphasia therapy on people's views of their activity and participation has not previously been investigated.

This study suggests the Communication Disability Profile (CDP) will be a useful clinical and research tool. All participants in an impairment-based anomia therapy study rated their participation as greater at the end than at the start of the study, and strikingly there was a relationship (that bordered on significance) between change in word retrieval and change in activity ratings on the CDP over the course of the study.

The findings suggest impairment-based aphasia therapy can influence individuals' views of their aphasia and their daily activities.

Introduction
Whilst there is now strong evidence that aphasia therapy can alter specific aspects of language processing (e.g. Nickels 2002a), questions concerning real-life impact are being raised (e.g. Hewitt and Byng 2003). When speech and language therapists use impairment-based techniques, they do so in the belief that changes in the speech and language of people with aphasia will affect communication and everyday life. Generally these individuals do not have difficulties with use of language, i.e. the pragmatics of communication is intact. The assumption is often that once the linguistic tools (e.g. the understanding of a different sentence structure, retrieval of more people's names) are available, people with aphasia will utilize their improved language skills to maximize communication in daily life. There are, however, two issues. First, in these days of evidence-based practice, transfer of linguistic skills to everyday life needs to be demonstrated objectively. Douglas et al. (2004, p. 54) review the evidence base for treatment of aphasia and state that 'outcome measures employed in efficacy research to date have dealt exclusively with diminution of impairment, measuring only a small component of outcome'. Second, in health services which are increasingly aiming to be patient-centred, it is imperative that one considers the impact of therapy on the life of the person with aphasia from the individual's own viewpoint (Taylor-Goh 2005, p. 98, working in partnership). This paper focuses on the second of these areas in the context of a study of anomia therapy in a clinical setting. In the study we used the Communication Disability Profile (CDP; Swinburn with Byng 2006) to explore the effects of aphasia for individual participants and to help investigate the impact of therapy on their everyday language activities.

This introduction will provide an overview of three areas relevant to the study: (1) therapy for anomia, (2) measuring the impact of aphasia, beyond impairment,
focusing particularly on the CDP, and (3) the relationship among different levels of ability/disability (impairment, activity and participation) in people with aphasia. The review is necessarily selective and focuses on studies most relevant to the current investigation.

Therapy for anomia

There is a large and growing literature on therapies for word-retrieval problems in aphasia. It is now well-established that both semantic and phonological approaches can aid word finding and that the effects of therapy can maintain a long time after intervention (e.g. Miceli et al. 1996). Often, however, the changes are restricted to treated items and there is no evaluation of wider impact on conversation or everyday life, although some studies have investigated the effect on connected speech (e.g. Best et al. 1997).

One particular area that has long been the subject of investigation is the use of cues in therapy to aid word retrieval (Berman and Peelle 1967, Webb and Love 1977). Hickin et al. (2002) found phonological and orthographic cues to be effective for improving word retrieval. While many other studies also report positive outcomes (e.g. Raymer et al. 1993, Wambaugh 2003; for a review, see Nickels 2002a) questions still remain regarding the most efficacious form of delivery. One such question concerns the use of progressive cues (increasing information about the word form) versus vanishing cues (commencing with the whole word form). Findings from the errorless learning literature suggest equivocal outcomes (e.g. Fillingham et al. 2005, McKissock and Ward 2007). However, there is some evidence that the effects of progressive cues exceed those obtained from providing the whole word form (Basso et al. 2001, Abel et al. 2005).

Thus, there is evidence that therapies for anomia can aid word retrieval. However, despite positive outcomes on measures of word finding, there has been little systematic investigation of the views of participants before and after therapy.

Measuring the impact of aphasia: beyond impairment

There are very well-established measures of language processing (Psycholinguistic Assessment of Language Processing in Aphasia (PALPA); Kay et al. 1992) and functional communication for people with aphasia (e.g. Communication Activities of Daily Living (CADL); Holland et al. 1998). The traditional method of assessing the functional communication of people with aphasia is to assess their performance in simulated everyday tasks such as making an appointment; but Worrall (cited in Code and Muller, 1995) suggests the needs of the client may not have been taken into account.

More recently, there has been a growing interest in measuring ‘Quality of Life’ (QOL) in Aphasia (e.g. Hilari et al. 2003a, b). The Communication Disability Profile (CDP; Swinburn with Byng 2006) offers ‘a means of appraising language disability from the perspective of the person with aphasia’. It aims to redress the balance with respect to the variety of impairment and functionally based assessments that do not take into account the views of the individual with aphasia (Simmons-Mackie 2000). The CDP focuses solely on the impact of the language disability on the individual’s life and allows the person to express this ‘regardless of his or her access to spoken or written language’.
The CDP provides a measure of the impact of living with aphasia and can be used to provide a measure of change. It was chosen for inclusion in this study as it is an aphasia specific tool, with 55 items\(^1\) and has a focus on communication.

The CDP explores the impact of acquiring and living with aphasia by focusing on issues within four sections: (1) activity, (2) social participation, (3) external influences and (4) emotional consequences. The ‘activity’ section looks at commonly occurring situations and communication activities and asks the person with aphasia to rate the impact of their aphasia upon these. The ‘participation’ section focuses on how the person with aphasia perceives his or her ability to participate within his or her own individual social circumstances, doing things he or she may have to do or want to do. ‘External influences’ looks at who or what the person with aphasia feels are barriers and facilitators of communication, and the final ‘emotional consequences’ section seeks to measure both the positive and negative emotional impact of aphasia on the individual. Examples of the questions within each of these sections are given in appendix A. The person responds to each question by rating their ability on a pictorial visual analogue scale, which can then be translated into a numerical score. The profile is completed in discussion with the therapist and contains pictures to complement both the spoken and written words.

The assessment results in an extensive profile of the real life effects of living with aphasia for each individual. A great deal of qualitative information is shared when completing the profile, and, in clinical practice, it is this information which is most important in jointly planning therapy and formulating goals. However, this study will focus on the quantitative information which allows measurable links with the word-finding scores obtained from the impairment based assessments. The complete CDP was carried out at the first and last stage of assessment, but the ‘activity’ section was identified as being most appropriate for more frequent baseline assessment as it enabled participants to rate the impact of their aphasia, at that time, on many commonly occurring communication activities.

### Relationship between different levels of ability/disability (impairment, activity and participation) in aphasia

The relationship between different levels of functioning in people with aphasia is not straightforward and deserves further exploration. For example, Ross and Wertz (2002) found there were no significant relationships between language impairment measures and QOL measures within a group of people with aphasia. In contrast, Cruice \textit{et al.} (2003) found that communication (particularly functional communication but also language functioning) predicted QOL, both psychological well-being and social health, in their participants with aphasia. The conflicting findings suggest perhaps we need both longitudinal and therapy studies to help understand these relationships further.

More recently Fucetola \textit{et al.} (2006) found that functional communication (measured using CADL-2; Holland \textit{et al.} 1998) was predicted by aphasia severity, semantic impairment, and reading comprehension. They did not investigate QOL.

Lyon \textit{et al.} (1997) carried out a therapy study with communication partners which focused on changing life participation and communication in natural settings. There was no change on measures of language impairment or functional communication but significant gains in well-being and communication on two
investigator-constructed questionnaires. Approaching therapy from a different angle, Wade, Mortley and Enderby (2003) carried out a computer-based therapy study that resulted in changes in participants’ language processing and, as measured by in-depth interviews, in changes in functional communication which were attributed to improved language skills. Very few studies of impairment-based aphasia therapy report participants’ views of the outcome.

The study reported herein used the CDP to measure the outcome of a therapy for word retrieval using cues and it will focus on the following major questions:

1) Did participants’ word finding change as a result of language-based therapies?
2) Did participants’ ratings on the communication profile vary across the study?
3) What was the relationship between participants’ own ratings of their communication and their word finding over the therapy study?

Method

Eight people with aphasia and their conversational partners were included. All participants with aphasia were more than one year post-stroke and had word-finding difficulties that formed a significant part of their aphasia. They had a range of types and severity of aphasia and varying support from family/friends. An overview is shown in table 1 with more detailed information on assessments of language processing given in appendix B.²

All participants had received speech and language therapy before their involvement in this study.

There were five points during the study when participants were assessed on a number of tasks including parts of the CDP; picture naming as a measure of word finding, control language tasks, connected speech, and conversation. In picture-naming only error-free responses were scored as correct. For one participant with apraxia scoring was repeated with ‘apraxic distortions’ scored as correct. There was no difference in the pattern of change. Similarly, for one participant with fluent aphasia, scoring was repeated including single phoneme errors as correct, again there was no difference in the pattern of outcome. The design is illustrated below:

A1 (Pre-therapy assessment 1)
  Language assessments
A2 (Pre-therapy assessment 2)
  Cueing therapy
A3 (Post-cueing therapy)
  Connected speech therapy
A4 (Post-connected speech therapy)
  Follow-up
A5 (Follow-up assessment)

A1 and A2 were baseline assessments before intervention and took place two months apart. During this period there was regular weekly contact with the researcher who
# Table 1. Background information on participants

<table>
<thead>
<tr>
<th>Participant</th>
<th>Gender</th>
<th>Years post-onset</th>
<th>Age (years)</th>
<th>Aphasia type</th>
<th>Support for conversation at home</th>
<th>Occupation at time of cerebral vascular accident (CVA)</th>
<th>Major life events during the study</th>
</tr>
</thead>
<tbody>
<tr>
<td>TE</td>
<td>male</td>
<td>1</td>
<td>69</td>
<td>F anomic</td>
<td>spouse</td>
<td>ran a building business</td>
<td>illness between the first and second phase of therapy</td>
</tr>
<tr>
<td>FA</td>
<td>female</td>
<td>2</td>
<td>64</td>
<td>NF some apraxia</td>
<td>visiting friends</td>
<td>personal assistant</td>
<td></td>
</tr>
<tr>
<td>GB</td>
<td>male</td>
<td>3</td>
<td>71</td>
<td>NF</td>
<td>spouse</td>
<td>retired florist</td>
<td></td>
</tr>
<tr>
<td>CM</td>
<td>male</td>
<td>5</td>
<td>52</td>
<td>NF</td>
<td>visiting friends</td>
<td>plumber</td>
<td>obtained employment during the first phase of therapy</td>
</tr>
<tr>
<td>CV</td>
<td>female</td>
<td>2</td>
<td>56</td>
<td>NF</td>
<td>visiting friends</td>
<td>florist/gardener</td>
<td>moved home after the first phase of therapy</td>
</tr>
<tr>
<td>DJ</td>
<td>female</td>
<td>1</td>
<td>65</td>
<td>F</td>
<td>friends in supported accommodation</td>
<td>volunteer</td>
<td>death of a child chemotherapy during the second phase of therapy</td>
</tr>
<tr>
<td>PP</td>
<td>female</td>
<td>2</td>
<td>75</td>
<td>F Wernicke's</td>
<td>spouse</td>
<td>homemaker</td>
<td></td>
</tr>
<tr>
<td>LM</td>
<td>female</td>
<td>7</td>
<td>42</td>
<td>NF Broca's</td>
<td>friends and parent</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Age and years post-onset are shown at the start of the study. Aphasia type: participant's aphasia is described as F, fluent, or NF, non-fluent, and where a classic aphasia type is clear from the clinical judgement of two speech and language therapists, it is also listed. Finally, information is provided on conversational partners and major life events during the study. This information is necessarily brief but is provided to indicate the wide variety and size of other events occurring while the study was taking place.
carried out background language assessments. This design exposes any effects of ‘therapist charm’ or change as a result of assessment (Nickels 2002b). Between A2 and A3 there were eight weekly sessions of a ‘cueing therapy’ for word finding. This first phase of therapy was similar to that reported in Hickin et al. (2002).

In the current study combined phonological and orthographic cues were used to treat 100 words taken from a set of 200, which were named at all five assessments. Progressive cues were used as there is some evidence that the effects of these may exceed those obtained from providing the whole word form. Furthermore, we have used such cues successfully in the past and wished to compare outcomes across the two studies (Hickin et al. 2002). The treated and control sets were matched for baseline naming and thus differed across participants. For 50 words participants were given a single combined (i.e. spoken and written) cue, and for the other 50 words they were given a choice of combined cues. An example of a choice of cue is a picture of a computer being presented with the target phoneme/grapheme C alongside the two distracter cues P and T. This would be followed by the target cue COM alongside the distracter cues POT and LAWN and, if necessary, the whole word forms: COMPUTER accompanied by POTATO and LAWNMOWER. The results for single and choice of cues did not differ. In this paper therefore the results are collapsed across the two cueing conditions and this issue is not discussed further.

After A3 there was a second 8-week phase of therapy centred around using treated words in connected speech and conversation (similar to that reported in Herbert et al. 2003). The treated items were changed such that, for each participant, half of those treated in the first phase of therapy became controls and half those who had been controls in the first phase became treated items. Activities moved from tasks involving pictures, through structured exchanges designed to elicit treated words, to conversation on topics related to treated items. In order to make this possible the treatment words were grouped semantically. For example, focusing on ‘occupations/ interests’, one participant moved from naming pictures of these using the cues, to listing those she came across regularly, to discussing, using a local map, where people might be located, e.g. teacher in school, fisherman by river. Finally, therapy moved to discussion of which of the jobs/interests she would have liked/disliked to do herself and why, as far as was possible. In addition to the 100 words, each participant chose a set of 40 functionally relevant items. As these items were chosen during the baseline phase they were not assessed at A1 and are not, therefore, included in the analyses with the CDP. Assessment tasks were repeated at A4, after both phases of therapy, and finally there was a follow-up assessment at A5 to investigate the maintenance of any therapy effects. Participants completed the full CDP at A1 and A5, i.e. the start and end of the study, and the ‘activity’ section at all five assessments.

Thus, with interruptions such as holidays and illness, participants were involved in the study for around 10 months, with each phase of therapy occurring once a week for 8 weeks.

Results and discussion

1) Word finding

All participants showed significant changes in naming pictures of treated items after therapy. The findings for the whole research set of 200 items (i.e. treated and untreated items combined) are summarized for each participant in table 2.
There was significant change from scores before the cueing therapy (A1A2) to scores after cueing therapy (Wilcoxon matched samples test, $p < 0.025$, one-tailed) for all eight participants analysed individually. Detailed description of individual findings is beyond the scope of this paper. The key findings are listed below:

- Most participants (six out of eight) show some positive change from A1 to A2, i.e. during pre-therapy baseline. In all these cases, however, this is numerically smaller than the change between A2 and A3, i.e. over the first (cueing) phase of therapy. This suggests that while a period of focused assessment may improve word retrieval (Nickels 2002b), therapy involving

![Figure 1. Example of picture and cues used in therapy](image)

Single cue
1) Participant presented with picture to name
2) If unable, cued with spoken and written cue: /k/ and C
3) If still unable to name cued with /kom/ and written COM
4) If still unable presented with spoken and written form of whole word: “computer” and COMPUTER.
the production of targeted words is likely to produce greater change (also McKissock and Ward 2007).

On average there is very little change in naming from A3 to A4, i.e. over the second (connected speech) phase of therapy. The pattern differs, however, across individuals (see, for example, DJ). The lack of a clear effect of the second phase of therapy focusing on the production of a target set of words in connected speech is surprising given that a very similar therapy can produce significant change in word retrieval (Herbert et al. 2003). Further studies are needed to explore the key ingredient in this therapy and why it may benefit some participants and not others.

The changes in word retrieval were maintained at follow-up assessment (A5), 7 8 weeks or more after the end of the second phase of therapy.

In summary, the study adds to those in the literature demonstrating significant effects of cueing therapies on word-finding abilities in adults with aphasia. The tendency to find changes limited to treated items highlights once again the importance of choosing items of functional relevance for each individual. The strong maintenance effects with no drop off at follow-up are very positive and reflect other studies with long-term changes in word retrieval (e.g. Miceli et al. 1996).

2) Participants’ views

The quantitative scores from the CDP are summarized in table 3. It is important to note that use of the CDP enabled the therapists to gain a better understanding of people’s views of their aphasia and their world. This was true in some cases even when the therapist and participant had known each other well before the study:

(i) The first analysis was carried out to investigate whether participants were providing similar CDP activity ratings on the two assessments before

Table 2. Picture-naming score on 200 items, A1–5 (i.e. from the start to the end of the study)

<table>
<thead>
<tr>
<th>Participant</th>
<th>A1 Pre-therapy</th>
<th>A2 Pre-therapy</th>
<th>A3</th>
<th>A4</th>
<th>A5</th>
</tr>
</thead>
<tbody>
<tr>
<td>TE</td>
<td>143</td>
<td>152</td>
<td>182</td>
<td>172</td>
<td>182</td>
</tr>
<tr>
<td>FA</td>
<td>35</td>
<td>45</td>
<td>84</td>
<td>84</td>
<td>83</td>
</tr>
<tr>
<td>GB</td>
<td>38</td>
<td>29</td>
<td>38</td>
<td>48</td>
<td>38</td>
</tr>
<tr>
<td>CM</td>
<td>106</td>
<td>116</td>
<td>131</td>
<td>124</td>
<td>142</td>
</tr>
<tr>
<td>CV</td>
<td>96</td>
<td>127</td>
<td>167</td>
<td>a</td>
<td></td>
</tr>
<tr>
<td>DJ</td>
<td>96</td>
<td>109</td>
<td>123</td>
<td>153</td>
<td>154</td>
</tr>
<tr>
<td>PP</td>
<td>39</td>
<td>35</td>
<td>63</td>
<td>67</td>
<td>58</td>
</tr>
<tr>
<td>LM</td>
<td>100</td>
<td>123</td>
<td>148</td>
<td>109</td>
<td>121</td>
</tr>
<tr>
<td>Overall mean(^a)</td>
<td>82</td>
<td>92</td>
<td>117</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean (n=6)(^c)</td>
<td>87</td>
<td>94</td>
<td>114</td>
<td>112</td>
<td>116</td>
</tr>
</tbody>
</table>

\(^a\)Sadly, CV died after the second phase of therapy.

\(^b\)Overall mean is for all eight participants.

\(^c\)Mean is for six participants. CV is excluded. FA’s scores are also excluded from this mean as she was not given the Communication Disability Profile (CDP) at A4. In order to compare sensibly naming and CDP scores for the group across the five occasions of testing, only six participants can be included (see the third section of the results).
their involvement in therapy. The results demonstrated a strong correlation between participant’s scores on the activity section of the CDP during the baseline phase of the study (i.e. between A1 and A2, \( r = 0.92, p < 0.005 \)).

The finding of a highly significant correlation between CDP activity scores at A1 and A2, before therapy, suggests participants were using the profile in a similar way on the two occasions. Therefore, the CDP activity section appears to have good ‘test–re-test reliability’ and this warrants investigation with more people. It is an important finding as individuals’ ratings of their communication can vary widely across occasions of testing (Hickin et al. 2007).

(ii) Second, participants’ change in communication activity ratings between the first assessment and follow-up was analysed. The results showed a significant change in activity ratings over the course of the whole study (i.e. between A1 and A5, Wilcoxon matched pairs test, \( z = 1.68 \), one-tailed, \( p < 0.025 \)).

This significant change in participants’ activity ratings suggests that their involvement in the study might have resulted in their participation in a wider range of communicative activities or in their viewing their daily activities in a more positive light; examples are given in appendix C. It is acknowledged, however, that this change could result from factors other than inclusion in the study and this is given further consideration in the main discussion. It is encouraging that all but one participant rated their activity level as the same or greater at the end than the start of the study.

Table 3. Communication Disability Profile (CDP) scores (%) for eight participants A1–5

| Participant | Activity | | | | | | Emotional consequences* |
|-------------|----------|----------|----------|----------|----------|----------|
|             | Assessment | Assessment | Assessment | Assessment | Assessment |
| TE          | 67        | 69        | 84        | 78        | 86        | 58        | 92        | 60        | 85        |
| FA          | 53        | 46        | 59        | 68        | 58        | 67        | 58        | 65        | 58        |
| GB          | 45        | 43        | 73        | 45        | 41        | 50        | 75        | 56        | 58        |
| CM          | 55        | 56        | 53        | 39        | 64        | 42        | 83        | 25        | 88        |
| CV          | 45        | 47        | 36        | –         | –         | –         | –         | –         | –         |
| DJ          | 63        | 59        | 70        | 67        | 83        | 58        | 92        | 79        | 69        |
| PP          | 64        | 63        | 55        | 66        | 67        | 75        | 83        | 92        | 90        |
| LM          | 45        | 33        | 39        | 44        | 45        | 25        | 58        | 65        | 40        |

A1 and A2 are pre-therapy measures. A3 after the first phase of therapy, A4 after the second phase of therapy, and A5 at follow-up.

No scores are given for section (iii) of the CDP ‘barriers and facilitators’ because these are discussed but not rated when the profile is completed.

*In the ‘emotional consequences’ raw scores a reduction is a change in a positive direction, the percentage scores have been reversed to bring them in line with the other sections.

The number of items in the activity section was 64 for all participants except FA and GB where \( n = 80 \).

The number of items in the participation section was 12 for all participants except GB for whom it was 8. The number of items in the emotional consequences section was 48.

All participants gave ratings for the same items on each occasion of testing.
(iii) At the start and end of the study (A1 and A5), i.e. pre-therapy assessment 1 and at follow-up, additional information on ‘emotional consequences’ and on ‘participation’ was available for seven of the participants (sadly one person, CV, died during the course of the study). Four showed a change in a positive direction with respect to ‘emotional consequences’, one was stable, and two gave less positive views at A5 than A1. One of these was LM who had undergone chemotherapy.

All seven participants viewed ease of participation as greater at the end than the start of the study; this was a statistically significant change (Wilcoxon matched pairs test, $z= -2.3, p<0.025$). The greatest change in rating, from 42 to 83%, was given by the participant (CM) who obtained employment.

The change in emotional consequences for most participants and the increase in ease of participation rating for everyone in the study is perhaps the most encouraging finding. This supports therapists’ clinical intuition that impairment-based intervention can impact on everyday communication. However, the change in profile over the study may not necessarily simply reflect involvement in therapy; major life events will also have an impact. It is key, therefore, to examine the relationship between change in language measures, in this case naming, and change in participants’ views within a well-controlled study with baseline testing and follow-up phases. We turn, therefore, to the relationship between the two.

3) Word finding and activity ratings

The set of analyses below were carried out in order to answer questions designed to investigate the relationship between naming and activity ratings.

(i) Is there a correlation between participants’ naming and CDP activity scores before therapy? When the mean score from naming before therapy (A1A2) was correlated with the mean activity score before therapy (A1A2) no significant relationship was found ($r=0.22, \text{n.s.}$).

The lack of a relationship between word finding and CDP activity score before therapy is not surprising. People with very similar scores on a naming task can communicate very differently from one another in conversation. In addition, the activity rating is made up from several subsections. This adds to the potential for confounding factors to exert influence on the activity rating score (e.g. use of non-verbal strategies, discrepancies between spoken and written language). The participants in this study also varied greatly in terms of the support that they had available to mitigate potentially the effects of their communication impairment. The papers in a special issue of *Aphasiology* (Worrall and Holland 2003) suggest QOL is not easy to measure. Whilst it may relate to communication disability (Hilari *et al.* 2003a), as discussed in the introduction, QOL does not necessarily relate to language impairment. The CDP does not measure QOL, but its relationship to language functioning may be similarly complex; indeed, the lack of a predictable relationship between impairment and perceived disability was one of the motivating factors behind the CDP.
Is there a relationship between change in word finding and change in CDP activity rating from A1 to A5 (i.e., over the course of the whole study: only activity ratings were completed from A1 to A5, so it was not possible to answer this question for other sections of the CDP)? This question was answered with data averaged from the six participants for whom it was complete. The results, illustrated in figure 2, 9 show a relationship that approaches significance (Spearman rank $r=0.82$, one-tailed: $r \geq 0.9$ for significance at a 5% level for five data points).

The strong relationship between change in word finding and in activity rating across the intervention study is particularly striking. While caution should be exercised, as the number of participants is small, the results tend to suggest that, for the group, change in word retrieval is likely to link with changes in communication activity. Whilst we might expect improved naming to facilitate enhanced communicative interaction in everyday situations, this is not universally accepted and there has been very little evidence from previous studies to support such a claim. Any relationship between changes in language and changes in wider activity may be obscured in individuals due to variability, but when scores are averaged across participants, a significant relationship may emerge. While the change does not necessarily relate to inclusion in the therapy (correlation is not causation) the lack of increase in CDP activity scores over the baseline phase of the study (A1 to A2), illustrated above, fits well with the fact that therapy was not carried out during this time. Looking at the pattern of scores, there is then some change in both measures over the first phase of therapy (A2 to A3), a small reduction after the second phase of therapy (A3 to A4), 11 and finally a small increase in both during the follow-up.
non-contact phase. This suggests a change in impairment can be reflected in a measurable change in activity.

(iii) What were the patterns for individual participants? The patterns were very varied. One individual (TE) showed a near perfect relationship between word-finding and CDP activity rating across the five occasions. Others provided varied ratings at different points in the study and these could not all be related straightforwardly to events in their lives. For example, one participant (CM) obtained employment during the study (after A3), but his CDP activity score decreased following this relative to his other activity ratings. Another participant (LM) underwent chemotherapy during the study and her views of her activity remained stable despite the stress and physical illness she experienced during this period. During this time the improvement previously seen in her naming regressed to improve again later (table 2).

As discussed above, there is not necessarily any straightforward relationship between language impairment and activity ratings. Therapists are skilled at interpreting individuals’ scores and ratings, taking into account their wider communication and life contexts. The CDP is similar to other assessments in this respect; the findings will not be considered in isolation, and the profile can itself help provide a wider understanding of the impact of aphasia.

**General Discussion**

A key issue for discussion is the use of averaged group data, whereas the emphasis of the CDP is on the differences between individuals. We justify this on the following basis; for individuals we predict a relationship between therapy outcome and real-life change. However, this relationship may not be straightforward and people’s views of their lives are influenced by many variables. When the results are averaged over a group and a relationship is found, this then suggests that of the many variables influencing participants’ views, impairment therapy may be important.

In a recent study of group communication training with adults with aphasia, Barber (2007) used well-being questionnaires, but noted that:

> it was impossible to prove that any improvement in client or partner well-being was directly linked to the communication training, given the presence of multiple, uncontrolled variables which also had the potential to affect well-being.

(p. 17)

There are also many uncontrolled variables in the current study, but the design, with two measures before therapy, allows us to link progress in word finding with changes in activity ratings over the course of the study. In the future, studies with two or more baselines are recommended. If a change in outcome measures occurs immediately following intervention, it is more likely that it is the therapy that is causing the changes. However, it is also recognized that in clinical studies of effectiveness, the number of baseline assessments that are feasible is limited to only two or three at most (for further discussion of methodological issues in therapy studies, see Best *et al.* in preparation).
Whilst the relationship between change in naming and change in activity ratings might also be achieved with other types of therapy for word-retrieval deficits in aphasia, the results from this study relate only to the therapy described here. The first phase of therapy was most effective at improving word finding and it was after this phase that there was the largest change in activity rating. Further research is necessary to examine whether this generalization to everyday activity occurs with other word-retrieval therapies. However, this strong relationship, from only six participants, suggests the effect is robust and other therapies that alter word retrieval may also have an impact on activity.

Three general points will be highlighted before drawing final conclusions. First, it is usual in the area of aphasia therapy to make use of single case or case series designs. This study is unusual in the UK as it combines the results from a number of participants with very different types of aphasia. What was uniform in the study was the type of therapy given; the averaging across participants allowed the overall relationship between word retrieval and participants’ own views of their activity to be revealed. The pattern was not the same for all participants and we would certainly advocate considering individual profiles as well as group means (e.g. Greenwood et al. in preparation). We would also advocate larger studies, although we recognize the difficulty of collecting such detailed data from large numbers of participants over the course of a therapy project.

Second, the CDP provides a rich source of information on individuals’ views about their aphasia and its impact. Both clinically and in research this wider picture is crucial. The focus of this paper has been on the quantitative aspects of part of the profile. The relationship between people’s ratings of their aphasia and its impact and therapy for word retrieval highlighted here may prove to be important to those assessing evidence of effectiveness and making decisions about service provision.

As cautioned in its manual, the CDP may be prone to inappropriate use. This might include administering the profile in the absence of resources to support the person with aphasia with any issues that arise. This is of particular importance when considering use of the CDP in research projects where there may be a limited opportunity for follow-up. We would suggest that the profile should be completed only when the person with aphasia and therapist have already established a rapport.

Finally, the CDP was designed to be used with adults with aphasia and the careful planning that has gone into this is evidenced by the reliability of the current participants’ ratings across occasions. The profile has the potential to be modified for use with other adult populations. Furthermore, some of the ideas could transfer to children and parents where tools for gauging views of speech and language difficulties and their impact are also lacking.

Conclusions
The study provides further evidence that therapy for anomia can improve word-finding abilities in adults with aphasia and that these changes can last.

The Communication Disability Profile provides a useful tool allowing the exploration of a person’s views of their aphasia and its consequences.

The study demonstrates a strong relationship between change in word finding and change in participants’ communication activity ratings over the course of an impairment-based intervention.
All the people with aphasia rated their participation as higher at the end than at the start of their involvement in the project.

Acknowledgements
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Notes
1. We have not included a detailed overview of measures of quality of life as this paper does not focus on this. Here we simply describe an important new measure and why the CDP was chosen for the current study. The Stroke and Aphasia Quality of Life scale (SAQOL) (for a discussion, see, for example, Hilari et al. (2003a, b)) is an interviewer administered, self-report measure of health-related quality of life (HRQOL) in people who have had a stroke and aphasia. HRQOL reflects the impact of the health state on a person’s ability to lead a fulfilling life. In so doing, it incorporates individual evaluation of physical mental/emotional, family and social functioning. The SAQOL has 39 questions in four domains: physical, psychosocial, communication and energy. In covering different aspects of a person’s life, inevitably the focus on communication is less than in the CDP. The SAQOL asks seven questions about communication with only two asking about impact on family/social life.

2. The background language assessments are not considered in detail here as the focus is on the relationship between therapy outcome on naming and on wider measures of ability/disability.

3. The items are described in detail in Howard et al. (1995). The set has ratings for imageability and, familiarity from the MRC database and frequency from the Celex database, the items range in length from one to three syllables.

4. An example of a choice of cue is a picture of a computer being presented with the target phoneme/grapheme C alongside the two distracter cues P and T. This would be followed by the target cue COM alongside the distracter cues POT and LAWN and, if necessary, the whole word forms: COMPUTER accompanied by POTATO and LAWNMOWER. The results for single and choice of cues did not differ. In this paper therefore the results are collapsed across the two cueing conditions and this issue is not discussed further.

5. The issue of generalization to untreated items is being addressed elsewhere in conjunction with the findings from the study described by Hickin et al. (2002), Best et al. (2006, in preparation). See also note 6.

6. The change in word finding over the first phase of therapy was limited to treated items for all but two participants (TE and PP), both of whom showed generalization to unseen items from the first phase of therapy. There is not a straightforward relationship between generalization to untreated items in naming and change as measured by the CDP. This relationship is explored for TE in Greenwood et al. (2007). It is also important to note that, although item specific, the changes in some participants word finding were not inconsiderable. For example F.A., named a further 39 experimental items after therapy and also made gains on her personally chosen set.

7. LM’s score at final assessment returned to less that that at A2, but remained above A1 and above the mean of the two baseline assessments.

8. All participants who had used the CDP at A1 and A5 were included.

9. The y-axis for naming and the y-axis for CDP activity rating are not meaningfully related. The two lines are shown on the same graph for ease of comparison. It is the relationship between the two lines across the five occasions that is important.
10. A non-parametric test is used here as the relationship is investigated over only five occasions of testing.
11. This phase of therapy was less effective on average. This was not the case for all individuals. Indeed one individual benefited considerably more from the second phase of the therapy than from the first.

References
Examples of questions from the prototype version of the Communication Disability Profile (CDP).

Activity section. For example:

- During the last week, how easy is it for you to talk with a group of friends?
- During the last week, how easy is it for you to read and follow a headline?

(Pictures are used to set the context for each subsection, augment all questions and facilitate rating.)

Participation section. For example:

- Who helps?

(People, for example, friends, family and professionals are identified within a pictured group.)
What makes it harder?

(Possible barriers, for example, two people talking at once, are illustrated with pictures.)

Emotional consequences section. For example:

- Does aphasia make you feel embarrassed? When/why do you feel that?
- Do you feel content? When/why do you feel that?

(Pictorial rating scales allow strength and frequency of emotion to be rated.)

Appendix B: Assessment results from baseline testing between A1 and A2

<table>
<thead>
<tr>
<th>Participant</th>
<th>SWPM</th>
<th>WWPM</th>
<th>PPT</th>
<th>Rep Wd</th>
<th>Read Wd</th>
</tr>
</thead>
<tbody>
<tr>
<td>TE</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>0.87</td>
<td>0.48</td>
</tr>
<tr>
<td>FA</td>
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<td>0.90</td>
<td>0.79</td>
<td>0.36</td>
<td>0.33</td>
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<tr>
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<td>0.90</td>
<td>0.94</td>
<td>0.36</td>
<td>0.20</td>
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<tr>
<td>CM</td>
<td>0.83</td>
<td>0.90</td>
<td>0.94</td>
<td>0.70</td>
<td>0.29</td>
</tr>
<tr>
<td>CV</td>
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<td>0.73</td>
<td>0.65</td>
<td>0.89</td>
<td>0.76</td>
</tr>
<tr>
<td>DJ</td>
<td>0.97</td>
<td>0.97</td>
<td>0.96</td>
<td>0.45</td>
<td>0.12</td>
</tr>
<tr>
<td>PP</td>
<td>0.87</td>
<td>0.97</td>
<td>0.83</td>
<td>0.57</td>
<td>0.28</td>
</tr>
<tr>
<td>LM</td>
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<td>1.00</td>
<td>0.92</td>
<td>1.00</td>
<td>0.05</td>
</tr>
</tbody>
</table>

The proportion correct on the following tasks is provided: SWPM, spoken word to picture matching, n=30, Comprehensive Aphasia Test, Swinburn et al. (2006); WWPM, written word-to-picture matching, n=30, Comprehensive Aphasia Test, Swinburn et al. (2006); PPT Pyramids and Palm Trees Test, three picture version, Howard and Patterson (1992); Rep Wd, repetition of words, n=182, Howard (personal communication); and Read Wd, reading aloud words, n=182, items as for repetition, Howard (personal communication).

Appendix C

DJ was socially active before her involvement in the study, in particular in events where she lived, in a warden-controlled flat, and in relation to the Church. Her word-finding appeared to benefit from the second, conversational, phase of therapy (table 2). Through the Communication Disability Profile (CDP) she indicated at the end of the study that she would like to take a more active role in a local charity, which led to her becoming a member of the committee. She also moved home during the course of the study (towards the end of the first phase of therapy), but it is unclear how/whether this influenced her word-finding/ratings.

In contrast to DJ, TE’s word retrieval appeared to benefit from the first, cueing phase of therapy (table 2). TE did not, however, give examples of changes in his activity and participation immediately after the cueing therapy. Instead, the comment listed below emerged at the final two assessments (A4 and A5, i.e. after connected speech therapy and at follow-up):
Examples of reported changes in activity for TE following therapy:

- How easy is it for you to talk to a stranger, someone you don’t know?
  *Talks to people he does not know on holiday, in his wife's absence.*
  *Talks to people on his exercise walks.*

- How easy is it for you to talk under pressure?
  *Answers the telephone instead of leaving it for his wife or for the answerphone.*

Examples of reported changes in participation for TE following therapy:

- External influences: Who helps?
  *Does not feel embarrassed with grandchildren as he did before the stroke.*
  *Now tells people that he has had a stroke.*

This study was not qualitative in nature and the above are offered to give a flavour of the information provided by participants.