

# **British Aphasiology Society**

**Research in Progress Meeting, 23 April 2009**

## ***Measuring Change in Aphasia***

**University College London – Centre for Human Communication**

### **Paper 1**

**Tackling a conundrum: item specific change with anomia therapy but wider changes in communication?**

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This paper addresses the issue of whether reported changes in conversation following therapy for anomia can be measured. In particular, we focus on the puzzle that arises as a result of two findings:

1. people with aphasia and partners report benefits in everyday communication arising from therapy targeting word retrieval and this fits with clinical experience
2. and yet research and clinical evidence suggest that changes following therapy for anomia are limited to treated items for most people (e.g. Nickels, 2002; Fillingham et al., 2006).

These findings are difficult to reconcile. To look at this issue we use data from two therapy studies (Hickin et al., 2002; Best et al., 2008). In each, the first phase of therapy involved cueing with the aim of improving retrieval of a set of experimental and set of personally chosen items. Naming of the experimental items was assessed twice prior to therapy and again immediately afterwards.

In both studies, at the same time points, we also collected conversations between the person with aphasia and a conversational partner. We analysed the conversations using POWERS (Profile of Word Errors and Retrieval in Speech, Herbert et al., 2008).

There were two clear findings:

1. cueing therapy improved people's ability to retrieve targeted words; for a few people there was generalisation to untreated items
2. there was some variability in the conversations across occasions.

We then took a set of conversational variables that were predicted to change with therapy. For example, we predicted there might be an increase in the number of nouns per substantive turn (meaning here a turn containing a content word). We highlight the variation among participants. We correlate the change (post-therapy minus mean pre-therapy) in picture naming with the change in conversation. The data is not straightforward, for example, for several participants there is actually a decrease in noun retrieval in conversation after therapy. Nevertheless there is a significant positive relationship between change in picture naming and change in noun retrieval ( $r=0.43$ ,  $p<0.05$ , 1-tailed) and change in picture naming with change in nouns per substantive turn in conversation ( $r=0.69$ ,  $p<0.01$ , 1-tailed). Finally we consider the implications of this work in progress.

## References

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## **Paper 2**

### **Measuring change in the conversations of speakers with aphasia after interaction therapy: a new tool**

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#### *Background:*

Following publication of the SPPARC conversation training programme (Lock, Wilkinson, Bryan 2001), conversation-focused approaches to aphasia therapy are becoming more widely used. However, there is still a relative lack of evidence of effectiveness. One obstacle to demonstrating improvement following such therapy is the lack of a standard method for measuring change over time in conversational samples. This presentation reports on work to

develop such a tool that is taking place as part of an ongoing therapy study, funded by the Stroke Association, which aims to design and evaluate a new conversation-focused therapy for agrammatism (Beeke, Cooper et al, 2008).

*Method:* The therapy study involves ten dyads where one person has agrammatic aphasia. The 6-month schedule is broken into phases of 8 weeks: a) three pre-therapy assessment phases; b) therapy; and c) two post-therapy assessment phases. During each assessment phase, each dyad video records a weekly 20 minute conversation. In addition, two conversation samples are recorded at spaced intervals during therapy. In total, we have 18 conversation samples from each dyad. We have decided to use a transcription-less approach to analysing the conversation data, to speed up the process of planning therapy and evaluating change over time.

*Results:* This presentation will report on work in progress to design and evaluate a new tool for measuring conversational change over time, based on a conversation analysis (CA) approach (Perkins, Crisp & Walshaw, 1999), and taking ideas from POWERS, a measure of word finding in conversation (Herbert, Hickin, Best, Howard & Osborne, 2008). It will present preliminary work to design the measure.

*Discussion:* We aim to produce a measure that clinicians using conversation-based therapy will be able to use to show efficacy. If this is successful, it will be an important breakthrough for promoting the use of conversation-based therapies in clinical settings.

*References:*

- Beeke, S., Cooper, F., Best, W., Edwards, S., & Maxim, J. (2008). The evaluation of a novel conversation-focused therapy for agrammatism. Stroke Association Project Grant TSA 2007/05. Available online at: <http://www.ucl.ac.uk/conversation-therapy>
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### **Paper 3**

#### **Using neuroimaging to measure recovery of anomia**

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A critical role for Broca's area has been proposed in spoken word production. However, the complete set of brain regions necessary for retrieving spoken words and accounting for anomia, in aphasic stroke patients, are not known. The principal aim of the proposed research is to provide an account of anomia after aphasic stroke and its treatment, within a neural connectivity framework. In this scheme, the most likely cause of anomia following a lesion to

Wernicke's area is functional disconnection of Broca's area during spoken word retrieval tasks, such as picture naming. This account specifies a precise role for both Broca's and Wernicke's areas and formalizes the underlying neural connections. Furthermore, it makes specific predictions about the responses and organization of the spoken word retrieval system in anomic patients that can be tested empirically. By pairing repetitive transcranial magnetic stimulation of Broca's area with intensive behavioural intervention, in anomic patients with isolated lesions to Wernicke's area, I can establish a principled framework to explore the treatment of anomia and measure change following aphasic stroke.

In this presentation I will outline my proposed series of 3 experiments that aim to:

1. characterize the lesion data in acute and chronic stroke patients to identify the critical brain regions necessary for spoken word retrieval;
2. investigate functional and anatomical connectivity in the normal spoken naming system;
3. perform a proof of concept treatment study in a group of chronic aphasic patients, lesions sparing Broca's area, to investigate if excitatory rTMS, paired with an intensive behavioural intervention may accelerate recovery of anomia.

I will present results of preliminary experiment 1 analyses demonstrating areas of brain damage that correlated with chronic deficits on both reading aloud and auditory repetition spoken word tasks, i.e. independent of written word and spoken word input modalities.

## **Paper 4**

### **Conversation and bilingual aphasia: What changes when we change the conversational partner?**

**Leela Koran, Language and Communication, UCL**

Background of the study and aims

Studies on loss and recovery have investigated issues of representation and processing in bilinguals while conversation analysis studies have identified adaptations made by both the aphasics and their conversation partners. This presentation will discuss changes that take place when the same bilingual aphasic engages in conversations with different interlocutors.

Methods

This study began with unstructured observations and interviews at Centres for adults who have had a stroke in Malaysia. Social networks evolve at these centres providing additional conversational contexts outside of their own homes. So, two conversations, of a 63 year-old Malay-English bilingual aphasic with word retrieval problems as his main deficit, were recorded. The first conversation, (C1), with his wife of 37 years was recorded in their home. The second, (C2), was with an English-Tamil-Malay trilingual friend from the Centre.

Results

The analysis of the conversations indicates that question-answer sequences predominate in both C1 and C2. However, there is a shift towards known-answer type questions in C1 while in

C2, the questions more often address genuine information gaps. The aphasic responds to these questions with minimal turns in the form of single syllable or single word answers coupled with gestures. In C1, trouble-sources are rapidly resolved or even preempted with phonemic cues. In C2, many insertions appear, e.g. additional questions, options for answers, etc. These expansions more often end with the eventual abandoning of the repair. Interesting differences in code-switching patterns are also evident in these pre-expansions and expansions.

### Discussion

The changes observed can be linked to reliance on shared knowledge supporting collaborative constructions of the conversations.

### Conclusion

An improved understanding of conversations of bilingual aphasics in a wider spectrum of authentic communicative situations can lead to better integration of these individuals into their linguistically diverse societies.

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### Paper 5

#### **Measuring derailments in aphasic conversation: an example from apraxia of speech.**

**Kath Mumby, Newcastle University**

#### *Background*

The diagnostic controversy about apraxia of speech (AOS) and its conceptual separation from aphasia has led to AOS being side-lined in studies of aphasia. However, effective rehabilitation requires the measurement of errors within their structural context, to understand the derailments which occur at every level of processing during everyday aphasic speech

production. As an example, this study offers a method for identifying apraxic errors within connected speech.

### *Aims*

Quantifying apraxic errors within connected speech is achieved using Text Units. This method could also be applied to aphasic errors (such as phonemic paraphasia and semantic paraphasia) within their grammatical context rather than assuming a purely lexical account of such errors. Reliability measures are reported from a study that measured speech and language therapists' identification of apraxic errors within connected speech using the Text Unit method.

### *Methods*

Video clips of conversation from ten participants with AOS and concomitant aphasia were independently rated for apraxic errors by four specialist speech and language therapists. They noted down the tape counts where they perceived a) an apraxic error or b) an ambiguous error (ambiguous between apraxic and aphasic) and each reference was assigned by the researcher to its corresponding Text Unit in a master transcription. The Text Units were analysed (using Cohen's Kappa) for agreement on error types between the four raters.

### *Results*

There was substantial intra-rater reliability and moderate agreement even without providing definitions, training or the chance to confer. The method offers severity measures for AOS irrespective of aphasia type in terms of the proportion of TUs containing apraxic errors.

### *Conclusions*

This new method of analysing errors in connected speech (including those with AOS and aphasia) provides a platform for conducting further research into AOS within everyday aphasic speech. It also opens the door to further multilevel work in aphasia.

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## Paper 6

### **Measuring gains in oral reading accuracy and text comprehension: a single case therapy study of acquired phonological dyslexia**

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#### Background and aims:

To date, there have been few therapy studies investigating the remediation of text level reading impairments in acquired dyslexia. This presentation reports a therapy programme carried out with an acquired phonological dyslexic reader, MK, whose oral reading was more accurate in word lists than text. It was hypothesised that introducing a “bottom-up” reading strategy that required each word of the text to be read in turn would increase his oral reading accuracy and, possibly, his reading comprehension.

#### Methods and procedures:

The StepReader computer programme was developed in which text was revealed phrase by phrase on the screen. Presentation was self-paced, with a button press required to reveal each subsequent phrase. Texts were adapted from short news articles.

#### Phase 1: (10 therapy sessions)

The focus was accurate oral reading of text. Text was presented phrase by phrase, using StepReader. MK was encouraged to “slow down”, and “read the text word by word”. When a reading error occurred, he was corrected and asked to re-read the whole phrase accurately before revealing the next phrase.

#### Phase 2: (15 therapy sessions)

Emphasis was placed on both accuracy and reading for meaning. StepReader was used to present texts for both oral and silent reading. Text comprehension strategies were introduced. For each passage, MK’s comprehension was probed.

#### Results:

After phase 1, text reading accuracy had improved significantly both with and without StepReader, demonstrating MK was generalising the strategy. Evidence for improved reading comprehension was not conclusive. Some gains in text comprehension were seen after the second therapy phase.

#### Conclusion:

The therapy produced positive effects on MK’s text reading. Measuring change in oral reading accuracy was relatively straightforward. Demonstrating statistically significant improvements in text comprehension proved more challenging. The complexity of text processing and the limitations of currently available assessment materials will be discussed.

## Paper 7

### Measuring change in knowledge in people with aphasia following information provision

Shani Ackford and Carol Sachett, Language and Communication, UCL

*Background:* Recommendations state that information should be provided to people with aphasia using aphasia-friendly written material supported by a verbal explanation<sup>1,2</sup>. Current research focuses on aphasia-friendly written information only<sup>3,4,5</sup>, while there is limited evidence regarding the relative effectiveness of different modalities particularly in the early stages of recovery.

The current study was designed to investigate whether: a) understanding and knowledge about stroke and aphasia increased in a group of people with recent onset aphasia following information provision, and b) there was a greater increase in understanding and knowledge if aphasia-friendly written information was supported by a verbal explanation (as per RCSLT recommendations).

*Aims of presentation:* To present pilot data demonstrating a method for measuring change in knowledge in people with aphasia following information provision.

*Methods and procedures:* Sixteen participants with aphasia were randomly allocated using minimisation to create two matched groups: 1) aphasia-friendly written information leaflet only, 2) aphasia-friendly leaflet supported by a verbal explanation. A simple True/False questionnaire was devised, based on the information in the leaflet, to measure participants' knowledge about stroke and aphasia. Pre- and post-information questionnaire scores were compared to measure change in knowledge following information provision.

*Results:* Participants' knowledge of stroke and aphasia significantly increased in both conditions. There was a trend in the results suggesting that people gained more knowledge when they received a leaflet supported by a verbal explanation. This trend was more marked for participants who were in the early stages of recovery.

*Conclusion:* This pilot study demonstrates potential for measuring change in knowledge in people with aphasia as a means of investigating the effectiveness of different information-giving modalities. Further research is needed to ensure that people with early stage aphasia, who are often excluded from research, receive timely and effective information about their condition.

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