Exploring Generalisation Processes following Lexical Retrieval Intervention in Primary Progressive Aphasia

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Primary Progressive Aphasia (PPA)

- Focal dementia
- Three variants
- Loss of language
- Word finding difficulties (WFD)
- Preservation of non-language functions

Harciarek & Kertesz (2011)
Speech-Language Pathology role

Survey conducted by Taylor et al. (2009) revealed:

- Under-referred
- Ill-equipped
- Overall lack of service
Understanding generalisation

What is it?

• Benefits extend beyond therapy
• Untreated words
• Everyday conversation / connected speech
• Various contexts / environments

Why is it important?

• Maximise therapy effectiveness
• “Making a difference”
### Lexical retrieval therapy outcomes

**Treated Items**
- 17/17 studies report significant treatment effects

**Untreated Items**
- 6/15 studies report generalisation

**Connected Speech**
- 2 studies included measures of connected speech
- Correct Information Unit (CIU) analysis (Nicholas & Brookshire, 1993)
- Conflicting results (Beeson et al., 2011; McNeil et al., 1995)
What factors influence generalisation?

- Clinician versus client generated cues (Henry et al., 2013)
- Language profile (Jokel et al., 2014)
- Word class
  - nouns, verbs, adjectives
- Language and cognitive components
  - semantic (meaning), phonological (sounds), orthographic (letters), autobiographical (memory)
Research questions

- Can a novel self-cueing intervention using semantic, phonological, orthographic, and autobiographical cues, targeting noun, verb, and adjective word classes, improve lexical retrieval of treated and untreated items in participants with PPA?

- Do treatment effects and generalisation patterns differ between different word classes (nouns, verbs, and adjectives)?

- Is there any change in the connected speech of those participants who improve following intervention?
Participants

Participant One

• 53 year old male
• Semantic variant
• 2 years post onset
• Primary difficulties; WFDs, comprehension, retention of new information, reading

Participant Two

• 70 year old male
• Semantic variant
• 19 months post onset
• Primary difficulties; WFDs, comprehension, retention of new information, reading
Participants

Participant Three
- 60 year old male
- Semantic variant
- 2 years post onset
- Primary difficulties; WFDs, following instructions, retention of new information

Participant Four
- 58 year old female
- Logopenic variant
- 1 year post onset
- Primary difficulties; pronunciation of words, WFDs
Intervention

- **Intensity:**
  8 sessions over 4 weeks; 90 minutes each

- **Stimuli:**
  60 treatment items
  20x nouns, 20x verbs & 20x adjectives

- **Strategy:**
  Self cueing
  Autobiographical, semantic, orthographic & phonological
Example cue card

**Meaning**
- What do we associate this action with?
- How do we do this?
- When do we do this?
- What do we need to do this?

**Memory**
- What memories do you have about this?
- Do you do this? Or do you know someone who does this?
- When do you do this?
- Do you enjoy doing this?

**Letter**
- What letter does the word start with?
- Can you write the letter?
- Can you find it on the letter sheet?
- Can you write the word?

**Sound**
- What sound does the word start with?
- What are the other sounds in the word?
- Read the written word

**What is the person doing?**
Treatment effects

Participant One

Participant Two
Treatment effects

Participant Three

Participant Four
Generalisation effects

Single word level; Untreated items

<table>
<thead>
<tr>
<th>Untreated Items</th>
<th>P1</th>
<th>P2</th>
<th>P3</th>
<th>P4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Nouns</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Verbs</td>
<td>✓</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Adjectives</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

✓ Cochran q = < .05
Generalisation effects

Connected Speech; Correct Information Unit (CIU) Analysis

- **CIUs/min** → measure of communication efficiency
- **%CIUs** → measure of overall informativeness of communication

<table>
<thead>
<tr>
<th>Measure</th>
<th>Time</th>
<th>P1</th>
<th>P2</th>
<th>P3</th>
<th>P4</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIUs/min</td>
<td>Pre Tx</td>
<td>32.2</td>
<td>23.8</td>
<td>27.5</td>
<td>57.8</td>
</tr>
<tr>
<td></td>
<td>Post Tx</td>
<td>51.8</td>
<td>68.7</td>
<td>65.8</td>
<td>59.5</td>
</tr>
<tr>
<td>%CIUs</td>
<td>Pre Tx</td>
<td>43.4</td>
<td>25.6</td>
<td>32.4</td>
<td>66.9</td>
</tr>
<tr>
<td></td>
<td>Post Tx</td>
<td>68.5</td>
<td>56.5</td>
<td>62.4</td>
<td>69.4</td>
</tr>
<tr>
<td>Statistical Significance (Wilcoxon, p&lt;.005)</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>
Generalisation effects

Connected Speech; Word Classes

<table>
<thead>
<tr>
<th>Word Class Counts</th>
<th>P1</th>
<th>P2</th>
<th>P3</th>
<th>P4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nouns</td>
<td>X</td>
<td>✓</td>
<td>X</td>
<td>✓</td>
</tr>
<tr>
<td>Adjectives</td>
<td>X</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Verbs (all)</td>
<td>X</td>
<td>✓</td>
<td>X</td>
<td>✓</td>
</tr>
<tr>
<td>Light verbs</td>
<td>X</td>
<td>✓</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Heavy verbs</td>
<td>✓</td>
<td>✓</td>
<td>X</td>
<td>✓</td>
</tr>
</tbody>
</table>

✓ Wilcoxon p = < .005
Psychosocial effects

“You have taken me to a better, more confident person. You have helped to get me back on the bike and to not overthink words.”

- Participant 4
Summary of findings

- Significant treatment effects
  - Consistent with current literature
  - Improvement for all word classes

- Generalisation effects; untreated items
  - Some generalisation to untreated items
  - Suggest potential for word class differences

- Generalisation effects; connected speech
  - 3/4 participants improved on adjectives and verbs
  - Underlying differences in language processing impairment
Implications

- Evidence to further support development of management pathways for PPA
- Evidence to support the effectiveness of speech-language pathology services / intervention
- Promise for different patterns of generalisation across word classes and connected speech
- Therapy approaches tailored to the breakdown in language processing
Upcoming Projects

- The intervention project will be extended and trialed with a larger cohort of people.

- The project will be expanded to include people with all variants of PPA and Alzheimer’s disease.

- **Recruitment** will begin in **September 2015**, pending ethics approval.

- For further information or to express your interest, please contact the primary researcher:

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Thank you for listening

Any Questions?

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References


