Aphasia associated with poor short-term memory: Diagnostic and therapy issues

**Aphasia and Short Term Working Memory**

- The term “ working memory” refers to information that is held in the mind for a brief period of time and used in the service of current cognitive tasks.
- STM/UIW span is diminished in aphasia.
- Among short-term memory impairments, phonological STM/UIW may be the most important.

**Differential Diagnosis**

- Severely limited STM/UIW with aphasia occurs in Repetition Conduction Aphasia and Deep Dysphasia.
- These two disorders may represent two different severities of a similar underlying dysfunction. Martin et al. (1992) described a patient with deep dysphasia who improved into repetition conduction aphasia.

**Repetition Conduction Aphasia (CA)**

- Repetition CA vs. Repetition CA (Deutsch & Watters, 1977): poor repetition = very poor CA.
- Poor lexical access = phonological output problem.
- Poor recovery effect = problems with items from the past.
- Poor phonetic discrimination = phonological STM/UIW impairment.

- Repetition CA symptoms vary in severity, with poor repetition and poor name retrieval (Barber, Schacter, Eichenberger, 2007).

**Deep Dysphasia**

- Extremely poor non–word repetition.
- Relatively normal spontaneous language.
- Few literal paraphasias (Nadeau, 2006).
- Repetition takes place through direct access to semantic representation (Nadeau, 2001).
- Deep dysphasia symptoms vary in severity, severe anoma (Majerus et al., 2003), few semantic paraphasias (Whitney & Fischer, 2016).

**Case Study**

- Jane: patient with aphasia (AQ = 49).
- Fluent.
- Poor comprehension, word finding, and repetition (Table 1).
- Poor AVSTM with word repetition.
- Jane is a woman, 57 years of age, married, and has three children.
- Jane stated that she must focus on the speaker lips to comprehend the message being conveyed.
- Jane also stated that she was not able to remember every item and word.
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**Therapy**

- Rehabilitation in our clinic consists twice a week during regular semesters.
- Goals included naming, self-monitoring, phonological STM/UIW, and some task-oriented objectives (making correct change, naming family members).
- STM/UIW goal used repetition with an increasing delay paradigm (Kalinyak–Fitzar et al., 2008). Koeng, Brunn & Studer-Eichenberger, 2007, Majerus et al., 2009.

**Results and Interpretation**

- Improved naming, comprehension, and repetition (Table 4 & 5).
- Paraphasias did not improve (Table 6).
- Numbered repetition improved minimally. She can currently repeat 90% of CV and 70% of CVC combinations. However, her attempts are significantly lower to target phonology (similar to the patient in Martin & Saffran, 1992), and she self-monitoring has also been impaired.
- Other authors have described patients with deep dysphasia who improved in naming, and repetition, but whose number repetition remained impossible (Althoff, 1992; Huber, 2003).
- It is conceivable that Jane’s improvement in numbered repetition be due to a slight improvement in phonological STM/UIW but still too limited to allow repetition of longer nonsensical or even a sequence of two unrelated words (Table 6). This is supported by an increase in formal paraphasias in Jane’s word/sentence repetition performance.
- Jane’s improved comprehension (Table 3) suggests the hypothesis that phonological STM/UIW may not be a necessary skill for routine comprehension. Although WM and comprehension may be correlated with formal and normalization errors in nonword repetition, writing, and reading.
- Jane’s improved comprehension may represent better use of phonological STM/UIW in the early stages of language processing rather than an improvement in phonological STM/UIW. This matches limited improvements in comprehension described by other authors who attempted to focus on STM/UIW in therapy (Francis et al., 2003; Majerus et al., 2005).

**Conclusions**

- STM/UIW problems co-occur with aphasia.
- Improvements in comprehension and repetition may not translate into increased performance in STM/UIW.
- Improvements in comprehension may be exclusively linguistic in nature, independent of STM/UIW.
- These skills should be treated concurrently, or STM/UIW should be targeted before linguistic skills.