2014-05-13

Inter- and Intra-Individual Variability in Non-Linguistic Attention in Aphasia

Villard, Sarah

http://hdl.handle.net/2144/8479

Boston University
Inter- and Intra-Individual Variability in Non-Linguistic Attention in Aphasia

Sarah Villard & Swathi Kiran

Boston University, Sargent College of Health and Rehabilitation Sciences

### INTRODUCTION

- Attention is a prerequisite to other cognitive skills and processes.
- A number of studies have identified impairment in one or more types of attention processing in persons with aphasia (PWA) relative to healthy controls; variability among PWA has also been noted (e.g. Tseng, McNeil, & Milenkovic, 1993; Huntington-Pompon, Randall, & Moore, 2011; Murray, 2012).
- Many studies on attention in aphasia have used linguistic tasks and have found PWA as a group to have poorer attention than controls on these tasks (e.g. Murray, 2000; Hula, McNeil, & Sung, 2001).
- Several studies have used purely non-linguistic tasks and have also found PWA as a group to have poorer attention and/or attention allocation than controls (Robin & Rizzo, 1989; Erickson, Goldinger, & LaPointe, 1996).
- It has also been suggested that an impairment in attention allocation may underlie or influence language impairment in aphasia (McNeil, Odell, & Tseng, 1995; Hula & McNeil, 2008).
- The present study looks systematically at five types of non-linguistic attention in aphasia.

### Between Session Intra-Individual Variability (BS-IIV) in task performance:

High BS-IIV has been noted in neurologically impaired populations (e.g. Stuss et al., 1994); however, this has not been examined in aphasia. We suggest that BS-IIV could impact treatment outcomes:

- Improvement in theory

### METHODOLOGY

#### PARTICIPANTS

- 18 individuals with chronic aphasia from a unilateral stroke (6M, mean age = 63.4, sd = 7.5) & age-matched controls (3F, mean age = 65.3, sd = 5.9)

#### EXPERIMENTAL TASK

- Five conditions, each assessing a different type of non-linguistic attention.
- Participant was instructed to press a key to indicate whether the target was on the left, on the right, or absent. For Condition 5, the target was L/R congruency between the two stimuli.

- Condition 1: Sustained visual attention
- Condition 2: Selective auditory attention
- Condition 3: Selective visual attention
- Condition 4: Auditory/visual integrative attention
- Condition 5: Auditory/VISUAL INTEGRATIVE attention

#### RESULTS

For Condition 1 PWA COVs > control COVs.

#### POST-HOC ANALYSES FOR THE PWA GROUP CONSISTENTLY REVEALED:

- a complexity effect: Condition 3 > Condition 2; Condition 4 > Condition 2 (p < .05)
- a modality effect: Condition 4 > Condition 3; Condition 2 > Condition 1 (p < .01)
- Condition 5 vs. Condition 4: no significant difference.

#### DATA ANALYSIS

- For RQ1: raw RTs for correct L/R responses → RTs
- For RQ2 and RQ3: raw RTs for correct L/R responses → COV (difference/mean)

#### CONCLUSIONS

- On a non-linguistic attention task, increased task complexity elicits slower response times for both PWA and age-matched controls.
- Increased task complexity also elicits a higher degree of between-session intra-individual variability for PWA (but not for controls).
- This suggests that PWA may have difficulty maintaining consistent attention levels from day to day, particularly in situations that require more complex types of attention (e.g. when asked to attend to auditory information while visual information is also present), a finding which could have implications for prognosis in therapy.
- Additionally, PWA were found to exhibit a higher degree of between-session intra-individual variability than controls overall.
- Within the PWA group, different patterns of intra-individual variability were found; some individuals were high in variability within this group. One sub-group was characterized by high variability on both selective auditory and auditory/visual/intentional attention, another sub-group was characterized by high variability on selective visual attention, and a third sub-group exhibited generally lower variability.
- This is the first demonstration of between-session intra-individual variability in PWA on a purely non-linguistic task.
- Future studies should directly investigate the link between intra-individual variability in non-linguistic attention and treatment outcomes.

#### SELECTED REFERENCES

- Erickson, R. L., Gattis, C. T. & Stuss, D. T. (1996). Auditory attention in aphasic individuals: variability within versus between subjects, suggesting inter-individual variability in this group. One sub-group was characterized by high variability on both selective auditory and auditory/visual/intentional attention, another sub-group was characterized by high variability on selective visual attention, and a third sub-group exhibited generally lower variability.
- This is the first demonstration of between-session intra-individual variability in PWA on a purely non-linguistic task.
- Future studies should directly investigate the link between intra-individual variability in non-linguistic attention and treatment outcomes.