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Citation:

Devers, C and Howard, D and Webster, J (2016) Pronoun Processing in People with Aphasia. In: 2016 International Aphasia Rehabilitation Conference, 14 December 2016 - 16 December 2016, London, UK.

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Introduction

What are pronominal words (pronouns)?

- Linguistic items used to refer to contextual information and rely on intact syntactic and semantic processing ability for successful interpretation
- Are crucial in functional expressive and receptive communication
- Do not naturally occur on their own without a contextual antecedent (i.e. a girl → she/her)

Why pronouns?

- Demonstrable difficulty for people with aphasia (PWA)
- Knowledge gaps and asymmetry of investigation in the current literature re: pronoun comprehension in PWA
- Insufficient knowledge at word and discourse levels
- Inconsistent findings at sentence level using online and offline methodologies with both simple transitive sentences and complex sentences.

In sentences:

PWA show inconsistent performance of pronoun comprehension during sentence processing (Varlokosta & Edwards, 2003)

Representational account

- Interpretation failure attributed to an underlying syntactic impairment in which PWA are unable to extract and resolve grammatical information (Edwards & Varlokosta, 2007; Love et al, 1998)

Processing account

- Interpretation failure attributed to extra-linguistic impairments e.g. general depressed aptitude for syntactic and/or semantic computations, delayed processing, restricted working memory, or lexical integration difficulties (Caplan et al, 2007; Choy & Thompson, 2005, 2010; Grodzinsky et al, 1993; Piñango & Burkhardt, 2001; Ruigendijk & Avrutin, 2003)

Impaired pronouns Impaired reflexives	Impaired pronouns Spared reflexives	Spared pronouns Impaired reflexives	Spared pronouns Spared reflexives
Love et al (1998) Choy & Thompson (2005, 2010) Thompson & Choy (2009) Edwards and Varlokosta (2007) Ruigendijk et al. (2006) Ruigendijk and Avrutin (2003)	Grodzinsky et al (1993) Love et al (1998)	Varlokosta and Edwards (2003) Piñango and Burkhardt (2001) Burkhardt et al. (2008)*	Ruigendijk et al. (2006)

In discourse:

PWA demonstrate a select difficulty when processing discourse-linked information compared to processing non-discourse-linked information (Avrutin, 2000, 2006; Bos et al., 2014; Peristeri & Tsimpli, 2013; Pesetsky, 1987).

- Implicit discourse-linked pronoun processing:** pronouns and their contextual antecedent must be bound locally within the same sentential clause.
- Explicit discourse-linked pronoun processing:** pronouns are coindexed with a contextual referent, or set of referents, in a different location within the discourse matrix.

Study Aim

Aim: To systematically investigate comprehension of personal pronouns (e.g. he, she, they, him, her, them) and reflexives (i.e. themselves, himself, herself) in PWA to better understand under what conditions these difficulties arise.

Methodology

Participants:

Study group: 20 people with aphasia (13 fluent, 7 nonfluent) (12 males, 8 females; aged 50 to 80 years, \bar{x} =66.25)

Control group: 10 healthy adult speakers was used, and matched appropriately

Methodology:

Experiment	Measure	Task Paradigm	Data analysis
1	Pronoun comprehension in sentences	Auditory sentence-picture matching task	GLMM
2	Pronoun comprehension in discourse	Auditory comprehension task + <i>who</i> -comprehension probes	GLMM

In sentences:

- 1-, 2-, 3-argument sentences with nouns and pronouns
- Sentence conditions tested: active, passive, nonreversible, reversible, reversible + pronoun competition

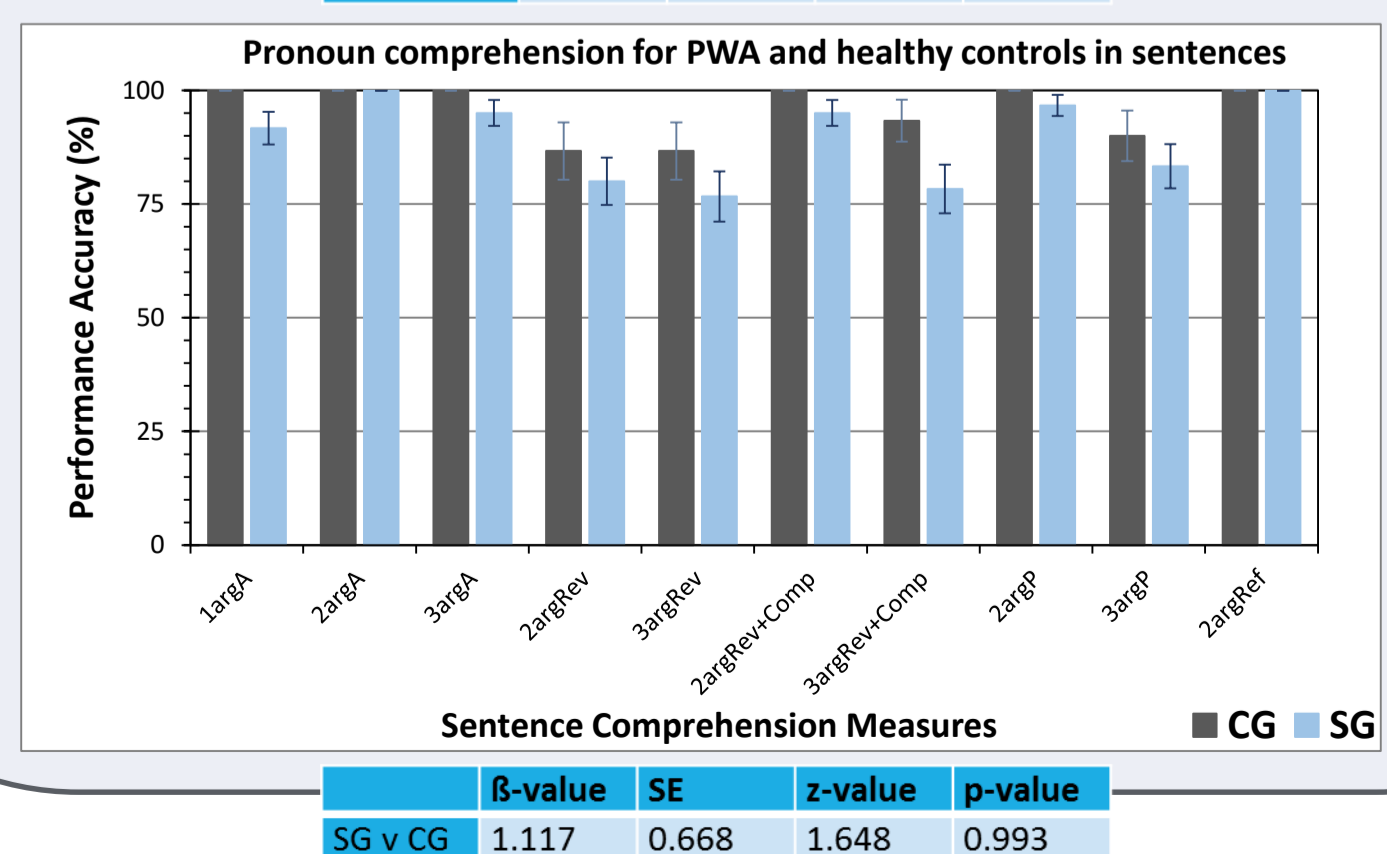
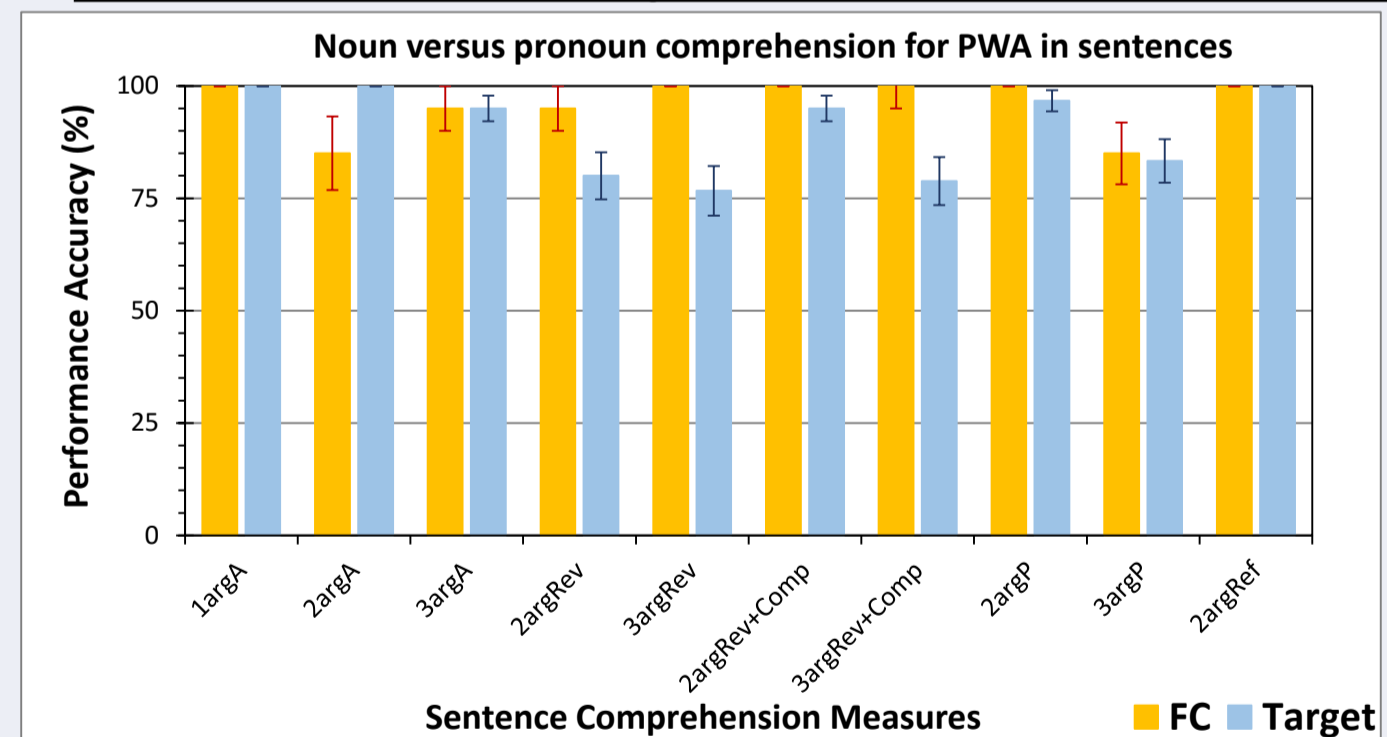
In discourse:

- 2-, 3-, and 4-sentence discourse structures with nouns and pronouns
- Discourse conditions tested: length (number of sentences in discourse), pronoun competition (inter- and intrasententially)

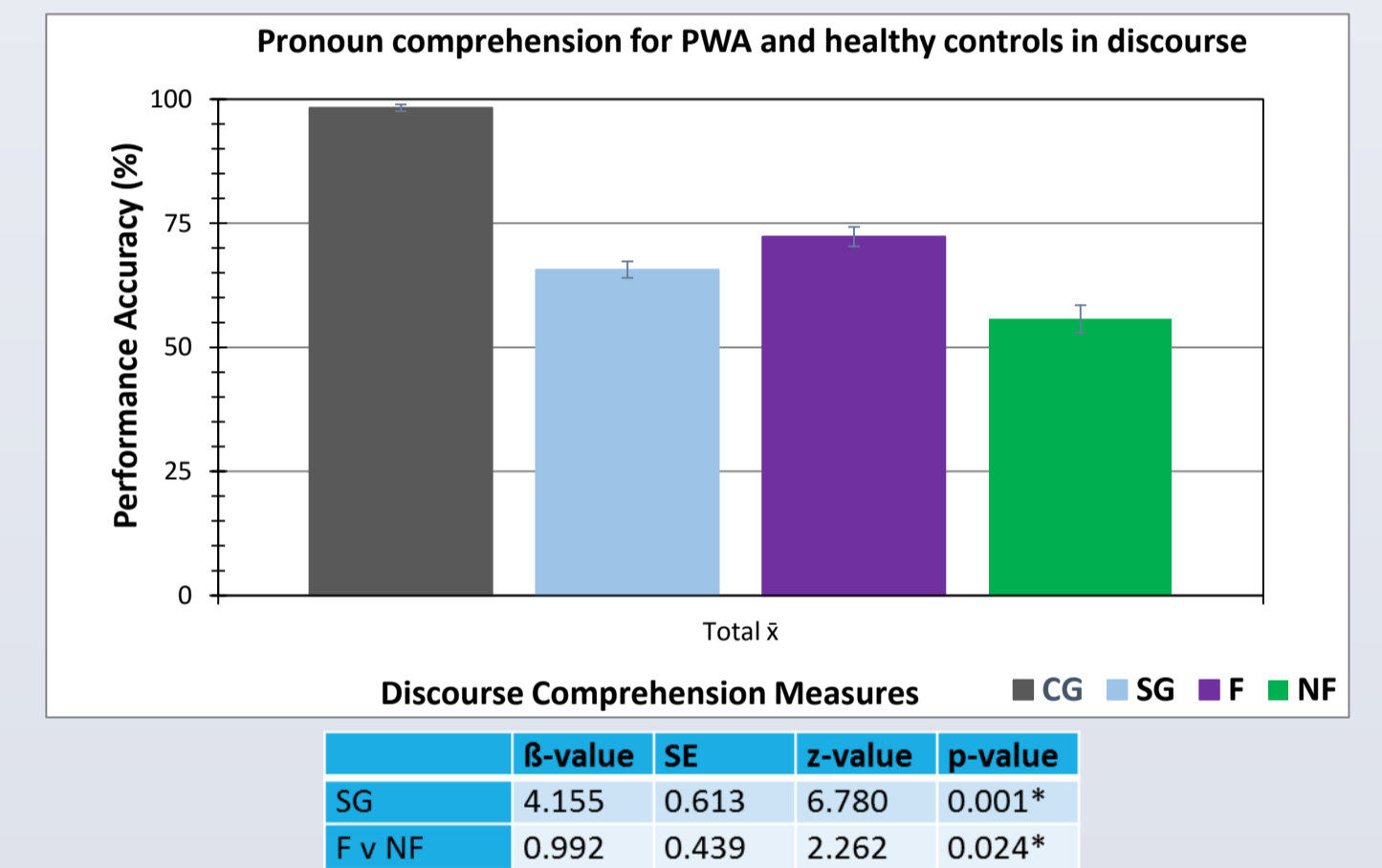
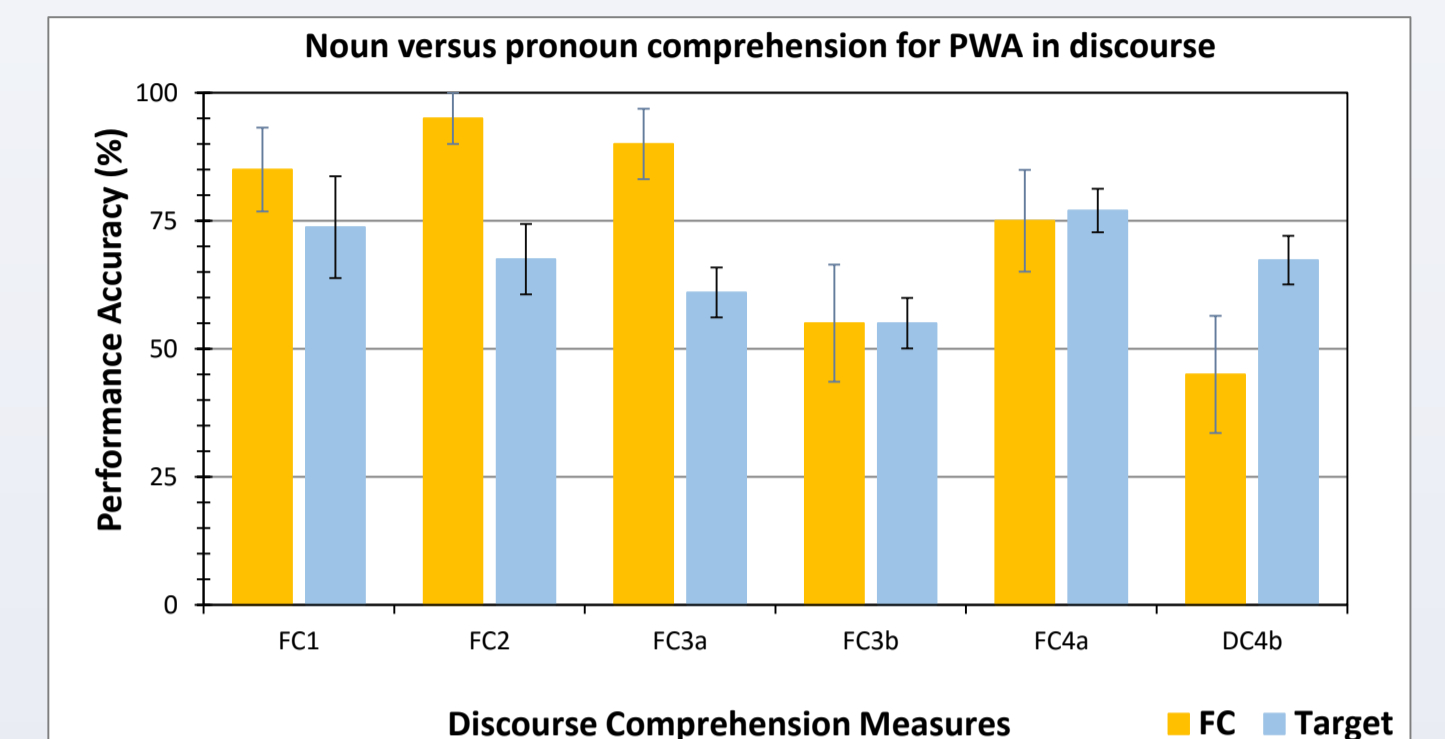
Data Analysis

Generalized linear mixed model (GLMM) fit by maximum likelihood (Laplace Approximation) (Baayen, Davidson, & Bates, 2008; Barr, Levy, Scheepers, & Tily, 2013; Boeck et al., 2011; Gelman & Hill, 2007).

Sentence Comprehension Results



Discourse Comprehension Results



Discussion

- Pronoun processing difficulties arise when pronouns are processed as explicitly discourse-linked elements rather than when processed as implicitly-discourse linked elements.
- PWA process pronouns similarly to healthy controls when the pronoun and its contextual antecedent occurs within the same sentence.
- Processing multiple pronouns (pronoun competition) does not appear to negatively impact pronoun processing.
- Working memory ability does not appear to be negatively impacted by pronoun processing in PWA.
- People with fluent and nonfluent aphasia process pronouns similarly within sentences.
- People with nonfluent aphasia process pronouns with significantly more difficulty in discourse when compared to people with fluent aphasia.

Avrutin, S. (2000). Comprehension of discourse-linked and non-discourse-linked questions by children and Broca's aphasics. In Y. Grodzinsky, L. Shapiro & D. Swinney (Eds.), *Language and the brain: Representation and processing* (pp. 49-62). San Diego, CA: Academic Press.

Avrutin, S. (2006). Weak syntax. In Y. Grodzinsky & K. Amunts (Eds.), *Broca's Region* (pp. 49-62). Oxford: Oxford University Press.

Bos, L., Dragoy, O., Avrutin, S., Iskra, E., & Bastiaanse, R. (2014). Understanding discourse-linked elements in aphasia: A threefold study in Russian. *Neuropsychologia*, 57, 20-28.

Caplan, D., Waters, G., Kennedy, D., Alpert, N., Makris, N., DeDe, G., Reddy, A. (2007b). A study of syntactic processing in aphasia II: Neurological aspects. *Brain and Language*, 101, 151-177.

Choy, J., & Thompson, C. (2005). Online comprehension of anaphor and pronoun constructions in Broca's aphasia: Evidence from eye-tracking. *Brain and Language*, 95, 119-120.

Choy, J., & Thompson, C. (2010). Binding in agrammatical aphasia: Processing to comprehension. *Aphasiology*, 24(5), 551-579.

Edwards, S., & Varlokosta, S. (2007). Pronominal and anaphoric reference in agrammatism. *Journal of Neurolinguistics*, 20, 423-444.

Grodzinsky, Y., Wexler, K., Chien, Y., Marakovitz, S., & Solomon, J. (1993). The breakdown of binding relations. *Brain and Language*, 45, 396-422.

Varlokosta, S., & Edwards, S. (2003). Pronominal reference in aphasia. *Studies in Greek Linguistics*, 23, 555-565.

Peristeri, E., & Tsimpli, I. (2013). Pronoun processing in Broca's aphasia: Discourse-syntax effects in ambiguous anaphora resolution. *Aphasiology*, 23(11), 1381-1407.

Pesetsky, D. (1987). Wh-in-situ: Movement and unselective binding. In E. Reuland & A. ter Meulen (Eds.), *The representation of (in) definiteness* (pp. 98-129). Cambridge, MA: MIT Press.