Development of a Core Function Word Set for Clinical Use
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BACKGROUND

- **Discourse Analysis**
  - Discourse analysis requires arduous processes, such as transcribing and analyzing language samples (Dietz & Boyle, 2018; Kim et al., 2019)
  - External influences such as time constraints and lack of training obstruct application and use of discourse (Maddy et al., 2015)
- **Function Words**
  - Function word production in discourse is indicative of elaborative phrase or utterance in binding story elements (Halliday & Hasan, 1976)
  - Function word production in discourse differs between adults with fluent and non-fluent aphasia (Gordon, 2006; Rochon et al., 2000; Saffran et al., 1989).
  - Despite the potential clinical relevance of function word production in PWA, limited attention paid to performance of function word retrieval in PWA discourse
- **Core Lexicon**
  - Lexicon-based analysis is time-efficient and highly reliable because clinicians only count how many lexical items are present (MacWhinney et al., 2010)
  - Based on previous research, the core lexicon measure differentiated PWA’s impaired lexical access from healthy controls (Dalton & Richardson, 2015); and, captured aphasia severity (Kim et al., 2019)
- **Purpose of Study**
  - We propose a quantitative measure of function word production for clinical practice in the core lexicon framework

METHOD

- **Discourse elicitation task stimuli**
  - To create the core lexicon list, the 25 most commonly used function words were extracted from transcripts of 470 normative samples using Computerized Language Analysis (CLAN, MacWhinney, 2000)
  - If PWAs produced any function words in the list, they would receive 1 point, regardless of how many times the word may have been used.

- **Participants**
  - 470 healthy adults (20-80s age group)
  - Discourse tasks: Two wordless picture books (Picnic & Good Dog Carl)
  - Between-subject variable: Age groups
  - Within-subject variable: Two narrative tasks

- **Participants**
  - 11 PWA
  - Variables:
    - Percent agreement for the function word produced by the PWA
    - Aphasia severity determined by the WAB AQs

- **Participants**
  - 208 PWA samples (Fluent 110; Non-fluent 98) retrieved from AphasiaBank (MacWhinney, 2000)
  - Discourse tasks: Cinderella story
  - Dependent variable: Fluent vs Non-fluent aphasia
  - Independent variable: Function word production using the core lexicon list

RESULTS

- **RQ1: Does core function word production differ across age groups & task?**
  - Sig. main effect for the narrative task, F(1, 452) = 9.009, p = .003
  - Cognitively healthy adults produced slightly more core function words for Picnic compared to GDC using age-invariant core lexicon list
  - No main effect for age
  - Sig. two-way interaction, F(6, 452) = 2.616, p = .017
  - 50s cohort produced more core function words for GDC than Picnic using age invariant core lexicon list

- **RQ2: Correlations between core function words aphasia severity?**
  - Sig. correlations for GDC, r = .825, p < .001
  - Sig. correlations for Picnic, r = .589, p < .001
  - Sig. correlations for combined story, r = .877, p < .001

- **RQ3: Does core function words differentiate aphasia types?**
  - Cut-off score of 12 out of 25
  - Sensitivity: 82.7%; Specificity: 65.3%
  - AUC: .814 (95% CI [.757, .871], p < .001)

- **Between-subject variable:** Fluent vs Non-fluent aphasia
- **Within-subject variable:** Function word production using the core lexicon list

- **Dependent variable:** Fluent vs Non-fluent aphasia
- **Independent variable:** Function word production using the core lexicon list

SELECTED REFERENCES


DISCUSSION

- Age does not play a significant role in core function word production
  - The average English speaker uses a limited number of function words (approximately 40) in their daily life (Bayen et al., 1995)
- Discourse elicitation stimuli was a factor to consider for function word production
  - Different discourse structures and characters lead to unique function words required to build the story
  - The strongest, significant correlations were found between the core function word list based on the combined story and aphasia severity
  - The core set of function words was an accurate classifier for differentiating participants with fluent aphasia from participants with non-fluent aphasia
  - The results highlight the potential of the tool as a reliable and time-efficient diagnostic tool suitable for clinical settings
  - Future studies should consider a systematic approach for establishing criteria for determining core lexicon items for higher accuracy