Introduction

- Alzheimer's is a neurodegenerative disorder characterized by cognitive impairment and the formation of amyloid-β plaques and neurofibrillary tangles (Crew, 2010).
- Natural language reflects individuals’ mental states and traits (Tausczik & Pennebaker, 2010), and may offer a more complete picture of psychosocial processes related to cognitive decline than neuropsychological tests alone.
- Mild cognitive impairment can be identified in older adults with 84% accuracy in transcripts of spontaneous speech recordings (Auguri, 2017) using features from the Linguistic Inquiry and Word Count (LIWC 2015) program (Pennebaker, Boyd, Francis, & Booth, 2015).

Research Questions

- Will past results from case studies of written text samples replicate in spoken language? What other differences will emerge?

Method

- Recorded speech samples of the Cookie Theft picture description task, gathered by the Alzheimer and Related Dementias Study at the Pittsburgh School of Medicine (Becker, 1994).
- Samples included 104 neurotypical elderly adults for controls, 208 people probable or possible for Alzheimer's, and 85 patients with other dementia diagnosis (Becker, 1994).
- Dialogue was extracted from transcripts downloaded from www.dementia.talkbank.org.
- Transcripts were analyzed with LIWC 2015 (Pennebaker, Boyd, Francis, & Booth, 2015), a dictionary-based text analysis program that assesses use of over 90 linguistic, psychological, and topical categories.
- Best-fit logistic regression model predicts dementia vs. control classification with 78.8% accuracy.

Dementia

“She’s uh running the water over. Can’t see anything else. No. Okay. She’s she’s step in the water. (more pronouns, informal, periods)

Control

“The mother is washing dishes and she’s obviously thinking of something else because the water’s pouring out over the uh sink.” (more articles, big words, auxiliary verbs)

Edited for readability. Group-typical words are highlighted in red.

Results

- In independent samples t-tests, 37 of 91 LIWC categories differed significantly at the p < .01 level – far more than expected by chance.
- As predicted, dementia patients used significantly more nonverbs (er, hun, umm) when speaking than neurotypical controls in addition to more informal language (swearing and fillers), which may reflect inattention to social norms or word-finding difficulty.
- As originally predicted, dementia patients used fewer 6+-letter words, in contrast with results found in written texts (help forum messages); patients may attempt to retain vocabulary in writing but are unable to do so in speech with real-time processing constraints (Williams, 2018).
- Dementia dialogue included more pronouns and fewer articles, suggesting less concrete or less analytic language use.

Conclusions

- Results differ from analyses of help forums, supporting the hypothesis that dementia symptoms manifest differently in (asynchronous) writing and (synchronous) speech.

References


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