

Phonemic and Phonetic Errors in Conduction Aphasia

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Purpose

The purpose of this study was to characterize the relationship between phonemic and phonetic errors in conduction aphasia as well as the quality of these errors.

Background

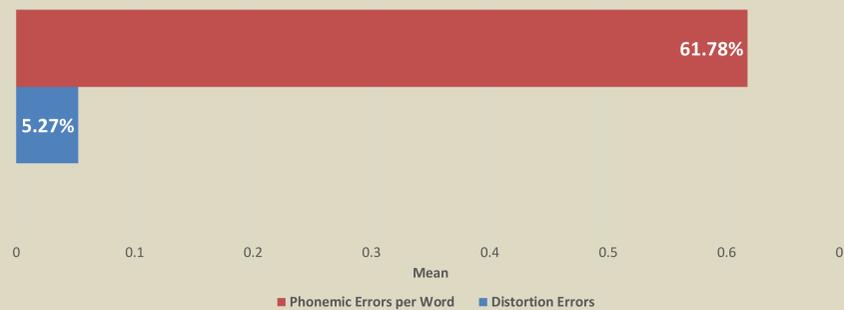
Conduction aphasia is a type of fluent aphasia that is characterized by phonological difficulties and substantial repetition difficulties in the context of relatively spared language functions in other areas. The clinical diagnosis of conduction aphasia is often based on the Western Aphasia Profile (WAB), which is one of the most popular aphasia batteries due to its ease of administration and relatively objective scoring. The most challenging subtest score for this instrument is the fluency rating. The scale takes into consideration multiple dimensions, including phrase length, grammatical competence, and paraphasias of spontaneous speech. A score of 5-10 means the patient has fluent aphasia while a score of 1-4 indicates nonfluent aphasia. Because conduction aphasia is a fluent type of aphasia, it requires a fluency rating greater than 4.

People who are recovering from other presentation profiles may also receive this rating and a WAB diagnosis of conduction aphasia due to persistent repetition difficulties. This may happen even if their presentation profile is not qualitatively indicative of the conduction aphasia syndrome. Further examination of phonological difficulties can help identify the subset of people who have a more classic conduction aphasia profile as those who present a high frequency of phonemic errors and a low frequency of phonetic distortion errors. By definition, the relationship between distortion errors and phonemic errors should be low in this population.

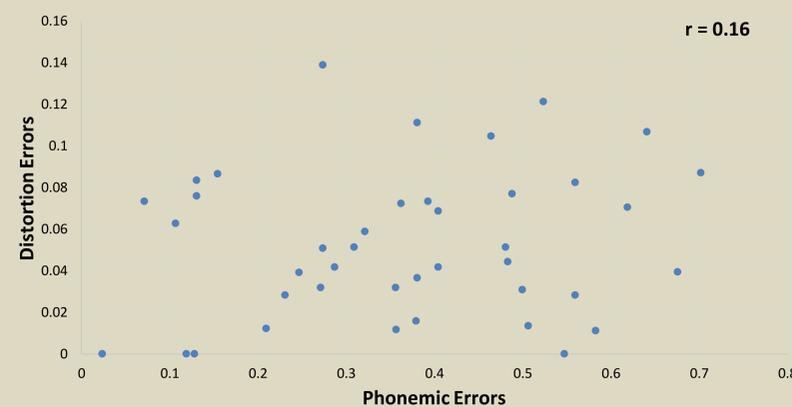
Methods

The speech samples for this study came from AphasiaBank (<http://talkbank.org/AphasiaBank/>). 41 participants classified as having conduction aphasia on the WAB were given the Boston Naming Test (BNT), which includes a list of 15 words. The author transcribed each of the 615 words using a narrow transcription protocol with 12 diacritic marks. The frequency of omissions, additions, and substitutions were then compiled and supplemented by calculation of the edit distance between broad transcription of the target and observed production (Holsinger, 2017). Additionally, distortion type and frequency were determined

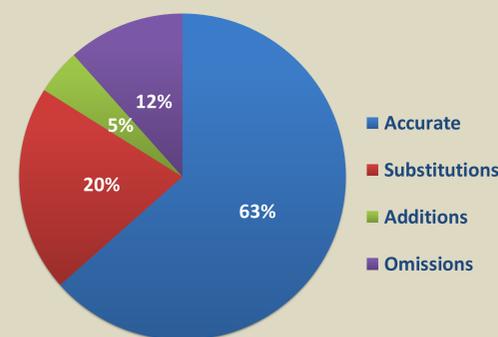
Mean Proportions of Segments with Phonemic and Distortion Errors



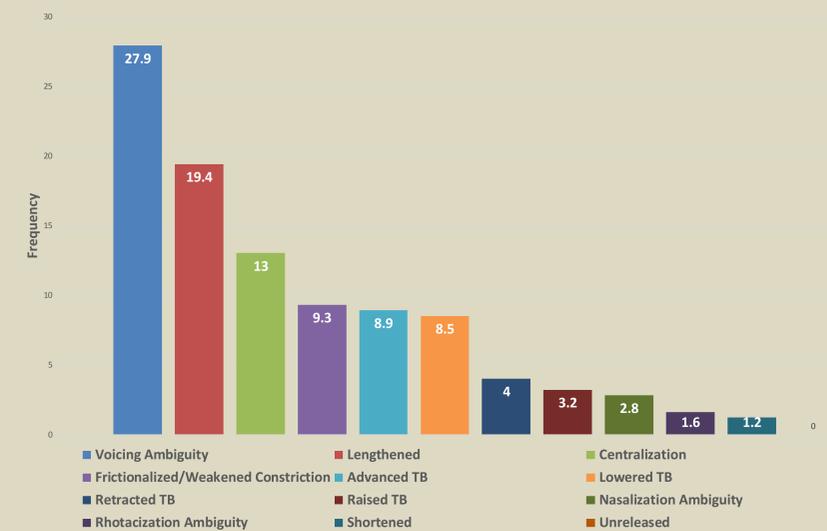
Correlation Between Phonemic Errors and Distortions



Percent Segments with Phonemic Errors



Distortion Types (percent)



Results

The results were consistent both with the clinical characterization of conduction aphasia and the prediction that the relationship between distortion errors and phonemic errors would be low.

- Mean proportion of segments with phonemic errors – 61.79%
- Mean proportion of segments with distortion errors – 5.28%
- Correlation between phonemic and distortion errors – 0.16
- Mean frequency of distorted substitutions – 1.74%
- Mean frequency of substitutions – 20.44%
- Mean frequency of additions – 4.50%
- Mean frequency of omissions – 11.60%

Discussion

As a group, these participants produced relatively high frequencies of sound errors without the distortion quality that is considered typical of motor speech disorders, including apraxia of speech (AOS). We are currently examining the results to determine whether a subset of the 41 speakers had a classic conduction aphasia profile, with high phonemic error rate and low distortion error rate, whereas others may have presented with more evidence of a motor speech disorder (especially AOS). Additionally, we anticipate that further analysis of the specific distortion qualities will advance our understanding of what is characteristic of the conduction aphasia profile.

Acknowledgments and Disclosures

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