ABSTRACT

Background

Logopenic variant of primary progressive aphasia (lvPPA) has been identified as more challenging to diagnose compared to other PPA-variants. A more nuanced characterization of lvPPA symptoms may be needed to facilitate accurate and timely diagnoses. Spelling engages a range of neural networks, some of which are more susceptible to lvPPA-atrophy than others, resulting in variable spelling outcomes, depending on which systems are recruited for the task. This variability may be influenced by the specific psycholinguistic characteristics of the word being spelled.

Aims

The primary aim of this study is to examine the effects of psycholinguistic variables of words on spelling accuracy for people with lvPPA.

Methods and Procedures

Sixteen participants completed an abbreviated spelling assessment of 40 words taken from the Arizona Battery of Reading and Spelling (ABRS). Thirteen psycholinguistic variables, potentially relevant to orthographic, phonological, and/or lexical-semantic processing, were identified in the literature. Values for psycholinguistic variables of interest for each word were pulled from the SCOPE: South Carolina Psycholinguistic Metabase. Multilevel logistic regression modeling was used to evaluate the effect of psycholinguistic variables (at word-level) on spelling accuracy, as well as participant-level clustering effects. The main outcome variable was spelling accuracy (accurate/inaccurate). The final parsimonious model included regularity (REG), age-of-acquisition (AOA), orthographic (ONLD) and phonological neighborhood density (PNLD) measured by Levenshtein's distance (LD), and emotional valence (VAL) as predictors. Predicted probabilities were calculated to estimate effect sizes for each significant variable.

Results

REG, AOA, ONLD, and VAL were significant predictors of lvPPA spelling accuracy. The effect of PNLD was not significant. REG had the largest effect on spelling accuracy, with a 93% probability of spelling accuracy on REG words compared to a 67% probability on irregular (IRREG) words. Words acquired at an earlier age (low AOA), as well as those

with denser orthographic neighborhoods (lower ONLD) and positive emotional valence (high VAL) were significantly associated with greater probability of spelling accuracy.

Conclusions

Differences in psycholinguistic variables of words significantly impact spelling accuracy for people with lvPPA. Findings illustrate the utility and value of spelling assessments in PPA diagnosis. Further research is needed to determine if these effects are distinct to lvPPA.