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Introduction

Primary progressive aphasia (PPA) is a speech-language syndrome caused by neurodegenerative disease (Mesulam, 2001). The semantic (svPPA) and logopenic (lvPPA) variants are characterized by prominent anomia and selective written language deficits (Gorno-Tempini et al., 2011; Henry et al., 2012). Written naming is a functionally relevant outcome that is rarely assessed in individuals with PPA, although spelling intervention has shown promise in remediating written language deficits in this population (e.g., de Aguiar et al., 2020; Tsapkini & Hillis, 2013; Tsapkini et al., 2014, 2018). In the current study, we evaluated whether written naming ability improves following treatment primarily focused on spoken naming in participants with sv and lvPPA.

Methods

Participants (n=24 lvPPA; n=15 svPPA) were administered Lexical Retrieval Treatment (LRT), which targets spoken naming via a series of tasks designed to capitalize on residual semantic, orthographic, and phonological knowledge (Henry et al., 2019). Importantly, production of the orthographic word form is a component within the training hierarchy during clinician-led sessions as well as home practice (modified Copy and Recall Treatment, or CART, Beeson & Egnor, 2006).

Written naming probes for trained items (eight sets of five nouns) and matched, untrained items (two sets of five nouns) were collected at pre- and post-treatment. We examined the effect of LRT on written naming accuracy by calculating the proportion of correct letters for each word at each timepoint (Goodman & Caramazza, 1985). To examine whether written responses effectively conveyed the participants' intended meaning, blinded coders attempted to identify the target based on written responses. Responses were coded as 1 (correctly recognized) or 0 (not recognized) and summed for trained and untrained sets.

Results

Letter-by-letter scoring was highly reliable between two independent raters (ICC =.93 95% CI [.92, .94], F (780, 780)= 27, p < .0001). Accuracy data were analyzed using 2 x 2 mixed ANOVAs (between-subjects factor = lvPPA/svPPA, within-subjects factor = timepoint).

For trained sets, the main effect of timepoint ($p < .001$) and the interaction ($p = .01$) were significant, indicating that both groups of participants improved from pre- to post-treatment ($M_{pre} = .18$, $M_{post} = .76$) and that individuals with svPPA performed worse at pre-treatment and better at post-treatment relative to individuals with lvPPA (Figure 1a). For untrained sets, there was a significant main effect of timepoint ($p < .001$), reflecting better performance at post-treatment for both groups ($M_{pre} = .20$, $M_{post} = .32$; Figure 1b). Wilcoxon signed-rank tests revealed that target items were more recognizable at post-treatment for trained sets for individuals with svPPA ($Z = -3.38$, $p < .001$) and lvPPA ($Z = -4.13$, $p < .0001$), but not for untrained sets of items ($p's > .2$).

Conclusion

Overall, our findings indicate that naming treatment incorporating orthographic self-cueing and CART leads to improved written naming for trained and untrained words in individuals with lvPPA and svPPA. Moreover, improved recognition of target words by naïve readers supports the functional utility of this treatment. Future studies should evaluate maintenance of written naming at follow-up timepoints.

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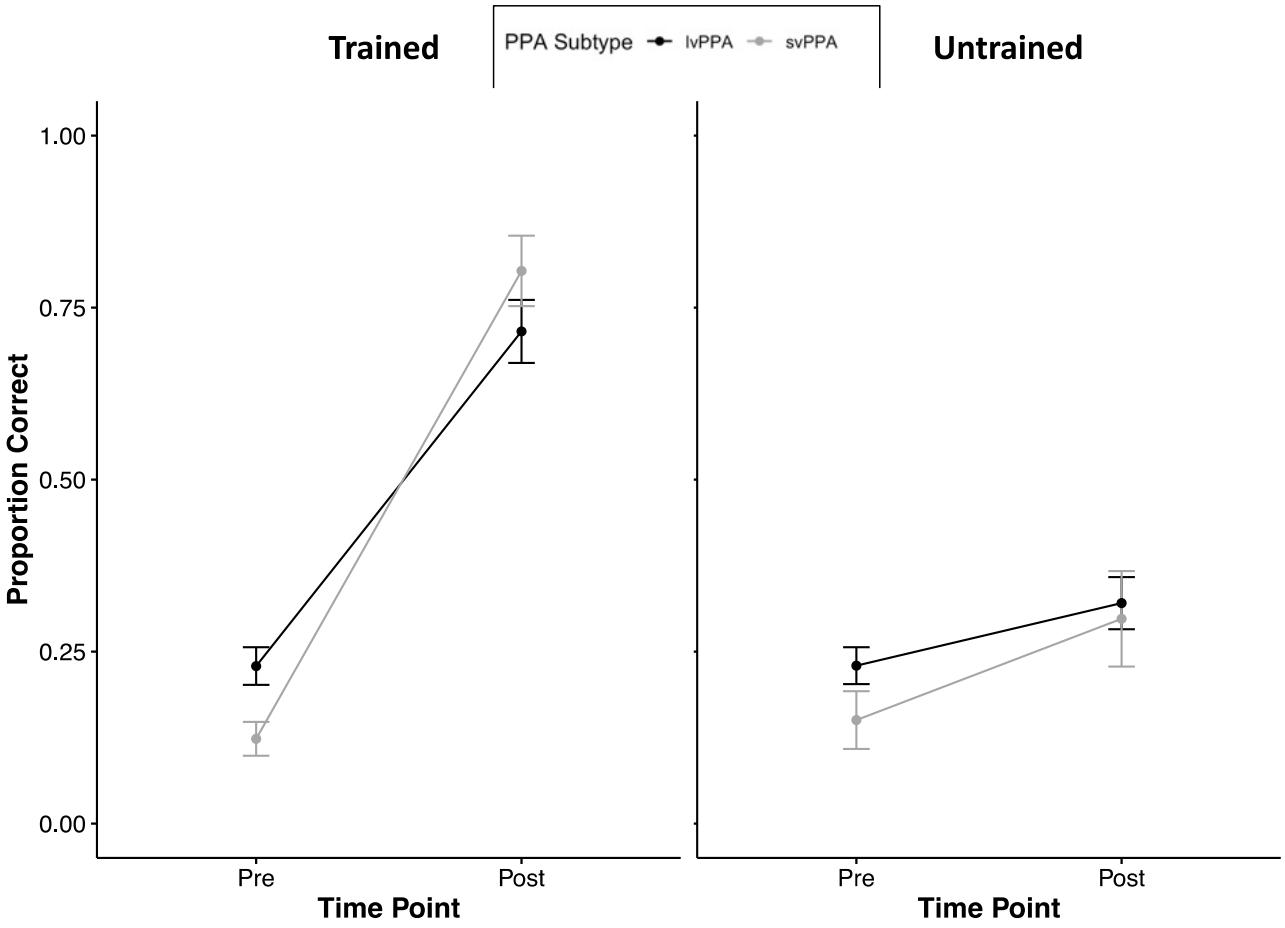

Figure 1a.

Figure 2b.

Figure 3a. Proportion correct trained items by PPA subtype and timepoint. *Figure 1b.* Proportion correct untrained items by PPA subtype and timepoint. Error bars reflect standard error.