Examining Cognitive-Linguistic and Learning Abilities in PWA Utilizing Language Retrieval and Novel Object Pairing Tasks

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Introduction

Research is increasingly acknowledging cognitive processes that may impact outcomes in language therapy for people with aphasia (PWA) (Helm-Estabrooks, 2002). We hypothesize that better understanding the mechanisms of learning and whether individual profiles of learning arise in aphasia, is essential for tailoring intervention to optimally recruit supporting networks. The area within aphasia rehabilitation where learning approaches have received the most attention is in studies of anomia therapy investigating errorless and errorful instruction. Errorless instruction focuses on eliminating or reducing the potential for errors while errorful learning does not intentionally control for errors. Group-level analyses have suggested that method of instruction does not change outcomes (Fillingham et al., 2005a, 2005b, 2006). However, individual variability is present and merits further study. The current study aims to examine errorless and errorful learning under four conditions in PWA. We evaluate outcomes within theoretical frameworks of learning to better understand the contribution of cognitive-linguistic abilities on outcomes.

Methods

To date, nine native-English speaking individuals with anomia in the chronic phases of aphasia due to left hemisphere stroke have been enrolled. Assessments and tasks were administered remotely via Zoom. To characterize cognitive-linguistic variables that may correlate with learning, each participant completed a cognitive-linguistic assessment battery evaluating aphasia severity, semantic processing, phonological encoding, motor speech, verbal and nonverbal short-and long-term memory, and executive functioning.

Participants completed four learning tasks: errorless novel object pairing (NOP), errorful NOP, errorless word retrieval (WR), and errorful WR. In the NOP task, participants learned ten visual stimulus pairs, repeated three times for each condition. For the errorless version, the correct novel object pairing was indicated. For the errorful condition, participants learned the pairings via trial and error given feedback about response accuracy. For the WR tasks, after completing a naming probe to identify retrieval errors, two 23-item stimulus lists matched on frequency and imageability were created for each participant. In errorless WR, an object picture was shown with its written name and auditory form, and participants repeated the word. In errorful WR, participants attempted to name pictures prior to receiving feedback about accuracy and the correct response. Task order was counterbalanced, and each task was evaluated three times: *immediate retention, delayed test* one day later, and *follow-up test* seven days later.

Results

Preliminary paired t-tests comparing errorful and errorless NOP scores approach significance with an errorful advantage on delayed tests (immediate ($p=0.12$), delayed ($p=0.08$), follow-up

(p=0.40)). No differences arise in WR. Variability in success arises at the individual level with some participants learning under all conditions, and others learning under one. Learning profile may relate to cognitive-linguistic abilities. Data collection and analyses are ongoing.

Conclusions

Consistent with prior work, preliminary NOP data suggest that some PWA learn in one type of context, errorless or errorful, while others learn in both (Vallila-Rohter & Kiran, 2013). More variability arises in WR task that may relate to the nature of errors (semantic vs. phonological) and how these levels of access are differentially stimulated in errorful and errorless retrieval practice (Schuchard & Middleton, 2018).

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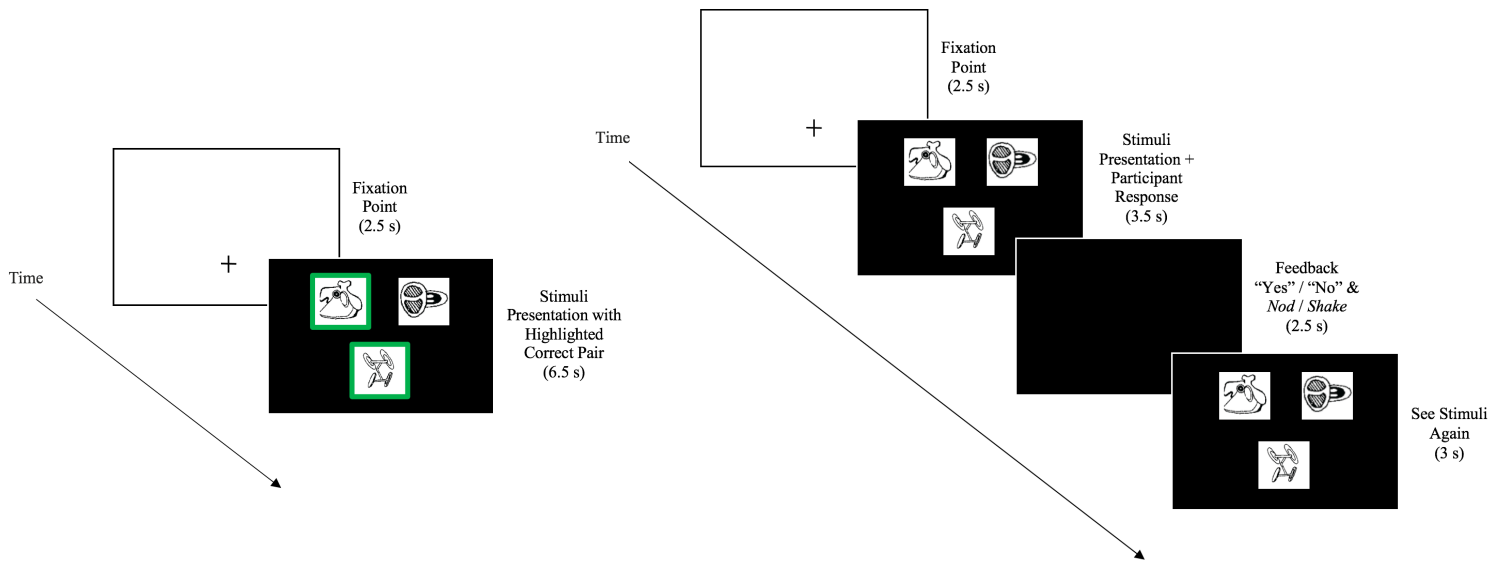
Figures

Figure 1. Errorless and Errorful Design for Novel Object Pairing Task