Towards a Theory of Naming Treatment: Delineating the Impact of Retrieval Practice in Aphasia

Middleton E.*, Schwartz M.

Moss Rehabilitation Research Institute

Introduction

Rehabilitation practices can benefit from treatment theories, which aim to theoretically ground interventions by illuminating their mechanisms of action. The goal of this study was to establish an empirical foundation for a naming treatment theory based on the retrieval practice principle (RPP), derived from basic psychological research. Retrieval practice, i.e., retrieval of target information from long-term memory, has powerful effects on verbal learning and retention; and, these effects can be maximized through judicious use of schedules of learning. This study take a first step towards such a theory, by definitively establishing a role for retrieval practice in ameliorating naming impairments in aphasia. Using a facilitation framework, (i.e., one training event per item and a short retention interval) the impact of training that permitted retrieval practice (cued and noncued naming) was compared to an “errorless” condition (repetition training), where presentation of the name for repetition preempted its retrieval from long-term memory. The effects of the training conditions were evaluated on subsequent naming tests.

Method

Eight adults with chronic aphasia from left-hemisphere stroke participated who showed good repetition, good comprehension and mild-to-moderate anomia. Participants named a baseline picture corpus of 600 common objects twice; and, for each participant error-prone items were retained to create sets matched for several psycholinguistic variables between the training conditions. Each condition was administered in a separate week, with order counterbalanced across participants. At the start of a session, each picture in a set was studied once (i.e., the name was seen/heard with the picture for repetition). After 10 minutes, each item underwent one training trial depending on the condition: (1) Repetition—the name was presented (seen/heard) for repetition at picture onset; (2) Cueing—the name’s first sound/letter was presented to facilitate picture naming; (3) No-cueing—only the picture was presented. On all trials, training was followed by feedback, where the name was provided (seen/heard) for repetition. The dependent variable was naming accuracy (i.e., correct/error where correct $\geq 0.75$ proportion of target phonemes out of uttered phonemes in the first naming attempt) on post-training retention tests held after 10-min, 1-day and 1-week. A “retrieval practice effect” would be indicated if onf the retention tests, performance in the cueing and no-cueing conditions exceeded the repetition condition.

Results & Conclusions

See Figure 1 for baseline and retention test naming accuracy. Individual mixed logit regressions

* Corresponding author.
E-mail address: middlee@einstein.edu.
were applied to each retention test, with random by-items and by-subjects intercepts and a fixed factor of training condition. Cueing outperformed repetition at the 1-day (coefficient = 0.41, SE = 0.14, p = 0.002) and 1-week test (coefficient = 0.39, SE = 0.13, p = 0.002). The group pattern in each analysis was present in 5 and 6 of 8 participants, respectively. No-cueing outperformed repetition at the 1-day test (coefficient = 0.27, SE = 0.13, p = 0.04). The results of this study suggest that training that encourages retrieval from long-term memory is more powerful than naming treatment methods that do not, an important first step towards development of the RPP theory of treatment.

Figure 1: Overall Naming Success by Training Condition

![Figure 1: Overall Naming Success by Training Condition](image_url)