

Background

To date, the literature on how therapy in a given language may generalize to another language in a bilingual or multilingual person with aphasia reflects conflicting results. In an early study, Fredman (1975) surveyed family members' impressions of 40 bilingual and multilingual individuals with aphasia and found that the home language overall was aided by therapy in a later-learned language. Subsequent studies employed one or several case studies and focused on specific aspects of language. Watamori and Sasanuma (1978) reported parallel improvement in both languages of two Japanese-English bilinguals in the two receptive modalities, auditory comprehension (for both patients) and reading comprehension (for the Broca's patient only), in contrast to the greater improvement in the treated language than in the untreated language in the two expressive modalities, writing (for both patients) and oral production (for the Wernicke's only). Goral et al. (in press) showed generalization from treatment in L2 (English) to the more impaired L3 (French) in morphosyntax in a trilingual individual with non-fluent aphasia. Edmonds and Kiran (2006), in a study of lexical treatment, found influence of treatment in the less-proficient language on performance in the more-proficient untreated language, but not vice versa. Kohnert (2004) found cross-language generalization for cognate words only.

In this study, we aimed to compare lexical retrieval across five languages in which our participant had been premorbidly proficient. We undertook a systematic, intensive treatment study, focusing on object and action naming, deliberately including cognate and non-cognate words. We predicted that related languages would cross-generalize better than less-related ones, and that within any given pair of languages, cognate translation-equivalent items would benefit more than non-cognates. In this paper, we present data from three of the participant's languages (Catalan, Spanish, English) following treatment in Catalan, his first language.

Methods

Participant

Our participant, JM, was a 49-year-old, well-educated chemist, who at the age of 44 suffered a left ischemic stroke in the region of the left medial cerebral artery (MCA). As a native of Barcelona, Catalan and Spanish were his first acquired languages. JM reported that his Catalan was the more proficient of the two languages before the stroke. His career required substantial knowledge of English, German, and French, in which he developed both oral and literate proficiency. These secondary languages were acquired through academic instruction, beginning at age 5 for French and at age 14 for German and English. JM ranked the five languages from most to least proficient (across communicative contexts) prior to the onset of this study: Catalan, Spanish, German, French, and English. He has received speech therapy in Catalan and Spanish for five years, approximately four visits per week and private instruction in German twice weekly from a native speaker.

Pre- and post-treatment measurements

Pre-treatment testing was administered for five consecutive days in Spanish, Catalan, English, French, and German. Each language was tested by a native speaker or a highly proficient speaker. Because the tester and the participant could not always meet at the same location, all testing occurred via a teleconferencing software (Skype©). Each testing session lasted about an hour. Following brief chatting, four subtests from the language production portion of the Bilingual Aphasia Test (Paradis & Libben, 1987) were administered. Then, the participant was instructed to name a series of line drawings of 72 objects and 40 actions selected from the Object and Action Naming Battery (Druks & Masterson, 2000). All responses were audio-recorded, transcribed and scored.

Treatment protocol

Treatment schedule: Following testing, the participant was engaged in language treatment in Catalan. The treatment phase comprised 25 hours administered over a period of three weeks. Treatment sessions lasted between 75 minutes to 120 minutes.

Treatment stimuli: The list of tested objects and actions was divided into four sublists of 18 objects and 10 actions. Three sublists were assigned to each of three treatment phases; the fourth sublist comprised control items. In the first (Catalan) treatment phase, a total of 48 items were treated: the 28 items from the sublist plus an additional 20 items (12 objects and eight actions). The additional items added to the variety of the treatment sessions but were not tested pre- and post-treatment.

Treatment activities: Each treatment session comprised three activities for the objects and actions separately. The first activity was a modified semantic feature analysis (SFA) in which the participant was presented with a picture and was asked to generate an appropriate feature in each of five categories (e.g., location). The second activity was a sentence generation task in which each of the treated words was presented and the participant was instructed to generate a sentence containing the target word. The third activity was a naming task during which the participant was asked to rapidly name the pictures that were worked on during the session.

Results

Following treatment, the participant demonstrated significant improvement in the number of actions and objects correctly named in Catalan, the treated language. He named 59/72 (82%) objects post treatment compared to 39/72 (54%) pre-treatment and 25/40 (62%) actions post treatment vs. 12/40 (30%) pre-treatment. Of the 20 additional objects named post-treatment, six (30%) were treated items; of the actions, seven (39%) were treated items.

In Spanish, his highly proficient, early acquired L2, post-treatment performance revealed a small improvement in the number of objects, but not actions, named. JM named 43/72 (60%) objects pre-treatment and 52/72 (72%) post-treatment but labeled an equal number of actions pre- and post-treatment, 17/40 (43%). He named 15 items in Spanish that he did not name pre-treatment and did not name six items previously named. Of those 15, five were translation equivalents of items that were treated in Catalan (three cognates, two non-cognates), suggesting small cross-language treatment generalization. Ten items were named post-treatment but were

not treated, suggesting cross-language generalization to untrained items. Six items were named pre-treatment and not post-treatment, one of those was a translation equivalent of a trained item.

In English, his least proficient language, action naming was not significantly influenced by treatment with 2/40 (5%) named correctly pre-treatment vs. 3/40 (8%) post-treatment. Object naming showed a slight increase with 14/72 (19%) named correctly pre-treatment vs. 20/72 (28%) post treatment. Ten items that were not named pre-treatment were successfully named post-treatment; two of those were translation equivalents of treated items and two additional ones were untreated but cognate translation equivalents of Catalan.

Discussion

The results of the study reveal lexical retrieval improvement in the treated language for both action and object words. Small cross-language generalization was found for Spanish, a highly proficient untreated language, as well as for English, an untreated language of low proficiency. Improvement was noted not only in items that were translation-equivalents of trained items but also of untrained items. Cognate status did not seem to influence the results. We conclude that SFA can be effective for improving lexical retrieval of both objects and actions and that treating a highly proficient L1 of a multilingual does have a positive effect, albeit small, on performance in his other languages, possibly regardless of level of proficiency. Cross-language treatment effects among JM's additional languages will be analyzed to assess cross-language treatment effects and the effects of cognate status.

References

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