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Cross-language transfer following monolingual cognate-based treatment in trilingual aphasia: a case study

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1. Theoretical background

Several studies have explored the possibility of a cross-language transfer (CLT) of the therapy benefits from the treated to the untreated language(s) of multilingual patients with aphasia. According to Edmonds & Kiran (2006), transfer is more likely to occur if the treatment language is the weaker one, or if the patient had very high pre-morbid proficiency levels in both languages. Moreover, CLT is more likely to occur for structures that are shared by the different languages. The lexicon, supported by declarative memory for each of a multilingual's languages (in contrast to syntactic aspects), is supposed to be more sensitive to CLT (e.g. Ullman, 2006). One can infer that, in a therapy focusing on lexical aspects, typologically related languages will show more sensitivity to CLT than more distant languages (Goral et al., 2007) and that the choice of the verbal material used for treatment influences CLT. Kohnert (2004) observed CLT on cognate words following such a treatment in a Spanish-English bilingual with aphasia, but not on non-cognate words.

Such an observation can be explained by the fact the cognates have a specific place in the lexical representations of a multilingual, in particular during the production of single words (Costa, Santesteban, & Caño, 2005), due to a possible interactivity between lexical and sublexical levels of representation, both within and across languages. Beneficial effects of cognates on naming abilities in bilinguals have been demonstrated, both on healthy (Costa, Caramazza, & Sebastian-Galles, 2000) and aphasic subjects (Roberts & Deslauriers, 1999). In trilingual subjects, words that are cognates in three languages may show a larger "cognate effect" than cognates of two of the languages only (Dijkstra et al., 2010).

2. Experimental procedure

Starting from Kohnert's study (2004), we provided monolingual lexical treatment to a trilingual aphasic patient with the aim to investigate a) whether treatment is more efficient for cognates and b) whether there is CLT on cognates and non cognates from the treated L2 to the untreated L1 of this patient.

2.1. The patient

The patient, HVL, is a 71-year old male who suffered a left hemispheric stroke in November 2008 leading to severe non fluent aphasia. The patient benefits from language therapy in French 4 times a week since his stroke. His L1 is German, he learned English from age 10 onwards in school and French informally upon his arrival in France in his late twenties. He is reported to have had very good oral and written proficiency prior to the stroke. However, given the patient's present communication needs, it was decided to restrict language assessment to German and French in order to avoid fatigue. The experiment took place 28 months post-onset, allowing the separation of therapy effects from spontaneous recovery.

2.2. Material

Treatment was based on a set of 50 French words including 15 French-German-English cognates, 15 French-German cognates, and 20 non cognates. Before and after treatment, the patient's naming skills were assessed for the 50 treated words and an additional set of 35 non-treated words with similar composition in French, and for the German translation equivalents of these 85 words.

The concrete, imageable words were taken from two sets of pictures standardized for French (Alario & Ferrand, 1999, Bonin et al., 2003). Similarity between potential cognate pairs was based on cumulated phonological and orthographic similarity. Treated and non-treated words were matched for degree of similarity and frequency.

The treatment material included pictures of the 50 words, written words, mobile letters, and sentences to complete. The activities consisted in repetition, picture-naming with different levels of cueing, written picture naming with mobile letters, sentences to complete, picture/written word matching, and card games. Each of the 50 words had to be produced at least once by the patient during each session.

2.3. Schedule

This experiment was divided in 5 parts.

1. A general language assessment was conducted with a short version of the BAT (Paradis & Libben, 1987), in German by a bilingual researcher (L1 German), and in French by a speech pathologist (L1 French).
2. The same examiners assessed the patient's naming skills in both languages with respect to the 50 words used for treatment and the 35 control words. The words were dispatched in 6 blocks and naming was alternated between French and German in order to limit order effects.
3. Then intensive language treatment was provided in French by two French-speaking speech pathologists. During this time the habitual language therapy was stopped. A total of 27 sessions, 45 minutes to 1h length each, have been provided over 3 weeks, on week days, one to two times a day. Intensity of therapy has been shown to lead to better improvement in naming ability, especially at chronic stages of aphasia (Hinckley & Craig, 1998).
4. After treatment, a post-test identical to the pre-test was conducted.
5. General language skills were assessed again with the BAT in French and German.

3. Expected results

Our hypotheses are based on the idea that there is a “cognate advantage” in bilingual naming, and that spreading of therapy effects is more important for words which are similar in the patient's languages. This allows the following predictions:

- a) In the pre-test, the “cognate advantage “ involves better naming for cognates than for non cognates. This effect should be even stronger for cognates involving the three languages.
- b) It is expected that the post-test will show:
 - improvement for all treated French words
 - improvement for the treated German words which are cognates (with stronger effects for words which are cognates in the three languages)
 - little improvement in German non cognate and non treated words and in French non treated words.

We expect better results on the words that have the most important degree of similarity across languages. The results will be discussed with respect to possible effects of semantic category, frequency and word complexity. The results of the BAT will allow to see if general improvements can be observed following this lexical-semantic treatment.

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