Semantic feature analysis for treatment of anomia in early Alzheimer's disease: Two cases studies

Melike SEMIZ, Aurélie MICELI, Sandrine BASAGLIA-PAPPAS and Isabelle SIMOES LOUREIRO

Cognitive Psychology and Neuropsychology Department, UMONS, Research Institute for Health Sciences and Technology, University of Mons, Belgium

(Contact: melike.semiz@umons.ac.be)

INTRODUCTION

Alzheimer's disease (AD) is one of the most common neurodegenerative diseases. In the early stages of the disease, a semantic memory deterioration can be observed, manifesting itself through lexico-semantic difficulties as anomia, semantic paraphasia and circumlocutions. Semantic Feature Analysis (SFA), proposed by [1] and developed by [2-3], aims to reduce anomia in patients with aphasia by reinforcing lexico-semantic network. However, studies regarding the efficiency of SFA in AD are scarce [4-5]. The aim of this study was to investigate the effect of SFA on anomia in early AD.

METHODOLOGY

Two study cases were conducted (table 1).

POPULATION

	Participant MS (♀)	Participant MV (♀)
Age	87	87
MMSE	24	20
Education level	Elementary school	Higher education
Anxiety	Normal range	Normal range
Depression	Normal range	Normal range
BECS-GRECO Naming	z = - 2,14*	z = - 6,36*
Semantic Matching	z = - 3,73*	z = - 5,14*
6-items Questionnaire	z = - 6,78*	z = - 9,41*

Table 1: Cases studies

Z-score = (score – mean) /standard deviation
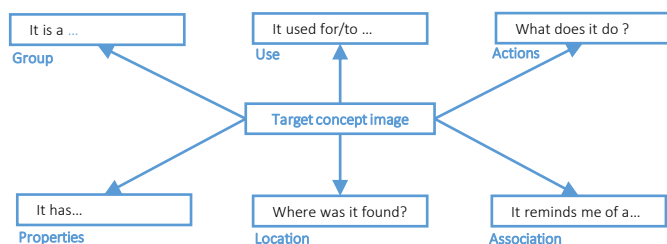* = deficient score

MATERIAL

Figure 1: SFA chart

PROCEDURE

Naming abilities of participants were assessed by a naming task of 100 pictures during the pretest phase. Then, 15 concepts among the failed pictures were trained with SFA chart (figure 1) for eight weeks. Twice a week, participants attended a 60-minutes session. Finally, the naming abilities were reassessed in the posttest and follow-up phases.

RESULTS

To compare naming task performances at different assessment phases, the Q of Cochran statistic was used. Z-score were used for two by two comparisons.

Participant MS. Results showed a significant improvement (Q(2) = 19.5 ; p <.001) in naming performances, particularly between pretest and posttest phases (z = 3.34 ; p <.001 *) (figure 2). Moreover, the qualitative analysis of lexical errors (figure 3) showed a decrease of the non-response rate. Indeed, MS produced more semantic paraphasias, as well as more circumlocutions.
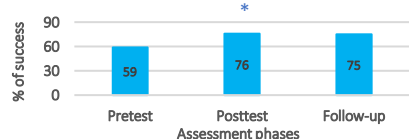

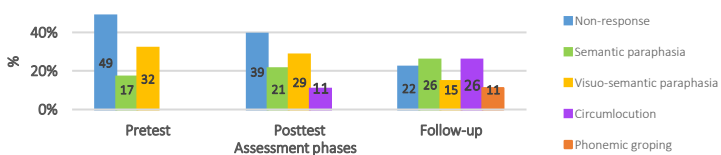Figure 2: Naming performance of MS at different assessment phases

Figure 3: Percentages and types of lexical errors produced by MS

Participant MV. No significant improvement in naming was observed (Q(2) = 1.28 ; p >.05) (figure 4). However, the qualitative analysis of lexical errors showed a change in lexical production (figure 5). Indeed, the non-response rate decreased and more semantic paraphasias and circumlocutions were observed.
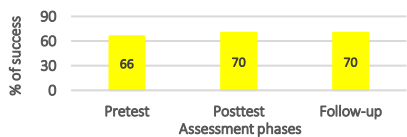

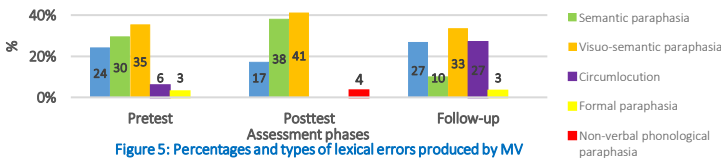Figure 4: Naming performance of MV at different assessment phases

Figure 5: Percentages and types of lexical errors produced by MV

DISCUSSION AND CONCLUSIONS

In this study, we explored the benefits of SFA in two case studies, MS and MV. The method was efficient only for MS, showing a significant improvement in naming as well as a sustained benefit in the follow-up. We also observed a semantic reorganization, with fewer non-responses and an increase in lexical productions. In contrast, MV's naming performances did not significantly change. This lack of response could be partly explained by a more severe general cognitive and semantic decline. While we observed no improvement in MV, there was an increase in lexical productions, albeit erroneous in posttest phase. In conclusion, the SFA-based treatment of anomia yielded significant positive evolutions in one of our AD participants, reinforcing her lexical-semantic network, given that the semantic deterioration was not too severe. Our initial findings provide evidence-based recommendations for managing anomia in AD, though more research is needed to support our preliminary results.

References. 1. Ylvisaker, M., & Szekeres, S. (1985). Cognitive-language intervention with brain-injured adolescents and adults. Annual Convention of the Illinois Speech-Language-Hearing Association, Chicago, Illinois. 2. Massaro, M., & Tompkins, C. A. (1994). Feature analysis for treatment of communication disorders in traumatically brain-injured patients: An efficacy study. Clinical aphasiology, 22, 245-256. http://aphasiology.pitt.edu/174/1/22-19.pdf. . 3. Boyle, M., & Coelho, C.A. (1995). Application of Semantic Feature Analysis as a Treatment for Aphasic Dysnomia. American Journal of Speech-Language Pathology, 4(4), 94-98. doi: 10.1044/1058-0360.0404.94. 4. Mo, K. O., Sung, J. E., & Jeong, J. H. (2015). The effects of semantic feature analysis treatment on naming performance in Korean individuals with early dementia of the Alzheimer's type: using a familiarity of nouns scale. Communication Sciences & Disorders, 20(1), 34-47. doi: https://doi.org/10.12963/csd.14215 5. Sémédard, M. (2020). Effets de la méthode Semantic Features Analysis (SFA) sur l'anomie dans une tâche de dénomination chez une patiente présentant une maladie d'Alzheimer au stade modérément sévère : étude de cas [Mémoire, Université de Bordeaux]. Archive ouverte pluridisciplinaire HAL. https://dumas.ccsd.cnrs.fr/dumas-03087103/document