



Academy of Aphasia 2012

Verb Production in Semantic Dementia: Impact of Semantic Memory Impairment on Derivational Morphology

Auclair-Ouellet N.^{a,*}, Fossard M.^b, Houde M.^c, Routhier S.^d, Lévesque A.^d, Macoir J.^d^a 1. Université Laval, Québec, Canada; 2. Centre de Recherche de l'Institut universitaire en Santé Mentale de Québec, Canada; 3. Université de Neuchâtel, Switzerland^b 3. Université de Neuchâtel, Switzerland^c 4. CHA - Hôpital de l'Enfant-Jésus, Québec, Canada^d 1. Université Laval, Québec, Canada; 2. Centre de Recherche de l'Institut Universitaire en Santé Mentale de Québec, Canada

Introduction

The impact of semantic memory deficits on language abilities closely linked to semantic processing (e.g. naming, reading, spelling) has been the subject of numerous studies. In recent articles (e.g. Patterson et al., 2006), impairments in domains less related to semantic memory, such as inflectional morphology, have also been reported. This study aimed to specify the impact of semantic impairment on the application of derivational morphology rules in verb production.

Methods

We report the case of MF, a 71-year-old native speaker of French with 12 years of education. MF received a diagnosis of semantic dementia in May 2010. Her ability to generate verbs was assessed through a task in which she was asked to produce a verb semantically related to a noun. The experimental list comprised 150 nouns from which a verb could be derived by using derivational morphological rules, such as the verb "brosser" ('to brush') from the noun "brosse" ('brush'). The experimental list also comprised 50 nouns from which a verb could not be produced by relying on derivational morphology. For those words, the participant therefore had to rely on semantic knowledge only to perform the task. Finally, the relationship between MF's comprehension of the nouns used in the verb generation task and her ability to produce a semantically related verb was assessed using a definition judgment task in which she was asked to judge if the definition she heard (e.g., "jewel worn around the neck") corresponded ('necklace') or not ('ring') to the noun presented.

Results

The participant's results on the experimental tasks are presented in *Table 1*.

Conclusions

MF could generate verbs from nouns by using morphological derivational rules. However, her semantic memory impairment led to substantial difficulties when asked to produce verbs by relying on semantic information only. These difficulties led to the inappropriate application of rules (e.g. bocal ('jar'): **bocaler*), which constituted the majority of errors. MF's partial or total lack of semantic knowledge for more than half of the nouns used in the verb

* Corresponding author.

E-mail address: noemie.auclair-ouellet.1@ulaval.ca.

production task did not prevent her from correctly applying derivational morphology rules. On the other hand, she made errors, even with nouns for which she had preserved semantic knowledge. These results suggest that the semantic impairment in MF directly affects the mechanism responsible for blocking the application of derivational rules in inappropriate contexts. Further research is needed to clarify the relationship between derivational morphology and semantic memory.

References

Patterson, K., Lambon-Ralph, M. A., Jefferies, E., Woollams, A., Jones, R., Hodges, J. R., & Rogers, T. T. (2006). “Presemantic” cognition in semantic dementia: Six deficits in search of an explanation. *Journal of Cognitive Neuroscience*, 18, 169-183. doi:10.1162/jocn.2006.18.2.169

Table 1. Performance on the verb generation task (a) and the verb definition judgment task (b) for nouns for which it is possible to produce a verb through morphological rule application or not

a. Verb Generation Task

	Rule Application (n=150)	No Rule Application (n=50)
Correct Answer (%)	139 (92.67)	21 (42)
No Response (%)	2 (1.33)	4 (8)
Inappropriate Application of Rule (%)	7 (4.67)	19 (38)
Other (%)	2 (1.33)	6 (12)

b. Definition Judgment Task

		Full Knowledge (%)	Partial Knowledge (%)	No Knowledge (%)	Total
Rule Application (n=150)	Correct Verb	62 (44.6)	72 (51.8)	5 (3.6)	139
	Errors	5 (45.45)	5 (45.45)	1 (9.1)	11
No Rule Application (n=50)	Correct Verb	9 (42.86)	12 (57.14)	0 (0.00)	21
	Errors	17 (58.62)	11 (37.93)	1 (3.45)	29