Nonverbal and verbal cognition in Catalan-speaking individuals with aphasia

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Introduction

People with aphasia (PWA) often present nonverbal cognitive impairments (Fonseca et al. 2016; Wall et al. 2017; González et al. 2020, among others). Yet, the relationship between verbal and nonverbal deficits in aphasia remains a controversial issue (Christensen et al. 2018; Choinski et al. 2020).

Goals

The aim of the present study is to test the nonverbal and verbal cognitive skills of Catalan-speaking healthy subjects and PWA, and to explore whether there is an association between the deficits that PWA present in language and nonverbal cognition.

Methodology

The Catalan version of the *Comprehensive Aphasia Test* (Swinburn et al. 2004; Salmons et al. 2021) was administered to native speakers of Catalan:

- 87 healthy participants (51 women, mean age of 51 years old).
- 16 subjects with different types of aphasia (59 women, mean age of 62.9 years old).

Here we report the results from seven subtests out of 27 that evaluate different aspects of language –such as naming, repetition of words and comprehension of sentences– and nonverbal cognition –such as attention, executive function and short-term memory (STM).

Results

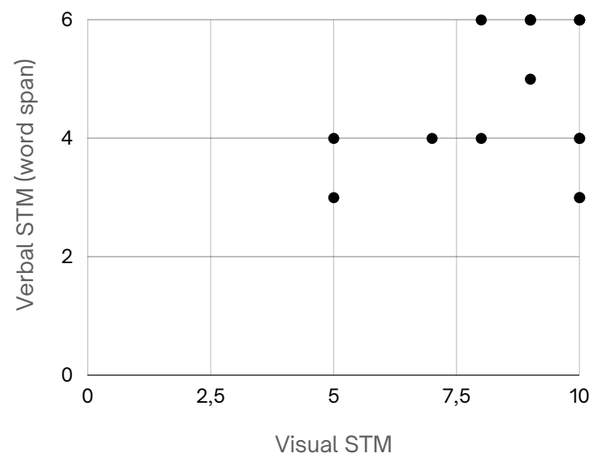
The results of control subjects were at ceiling, whereas the PWA's performance was lower in all tasks. The PWA presented greater intersubject variability than the controls.

Table 1. Mean correct responses by group and task.

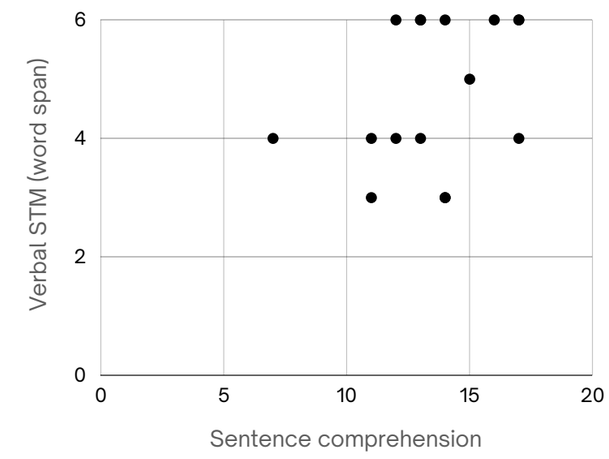
SUBTEST	Maximum score	Controls mean (SD)	PWA mean (SD)
Visual STM	10	9.7 (1.13)	8.7 (1.7)
Semantic memory	10	9.8 (0.56)	9.2 (1.2)
Verbal fluency	-	20.5 (6.1)	5.7 (4.5)
Verbal STM (digit span)	7	6 (1.11)	4 (1.2)
Verbal STM (word span)	6	5.99 (0.11)	4.8 (1.2)
Word repetition	19	19 (0.2)	16.9 (3.2)
Object naming	24	23.8 (0.6)	16.6 (6.1)
Sentence comprehension	18	17.6 (0.67)	13.5 (2.66)

The PWA's performance was especially low on subtests that required verbal skills (verbal fluency, verbal STM, word repetition, sentence comprehension and object naming). The heterogeneous presence of nonverbal cognitive deficits in PWA has been observed in previously literature. These deficits may be less consistently observed since they may be dependent on other factors such as the lesion size (Lee and Pyun 2014; Marinelli et al. 2019). The results of PWA on nonverbal and verbal measures do not seem to be associated. For example, their mean performance on the visual STM subtest did not correlate with their digit (r=-0.12, p=0.65) and word spans (Graph 1).

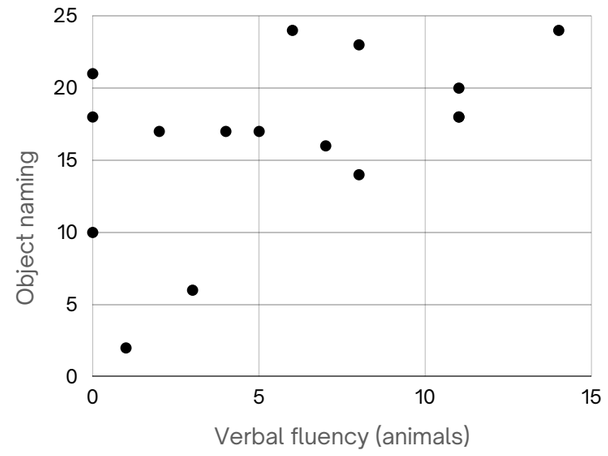
Graph 1. Relationship between the scores of PWA in the visual STM and word span subtests (r=0.11, p=0.67).



Graph 2. Relationship between the scores of PWA in the sentence comprehension and word span subtests (r=0.33, p=0.2).



Graph 3. Relationship between the scores of PWA in the naming and verbal fluency subtests (r=0.43, p=0.09).



Conclusion

Our findings show that PWA often present verbal and nonverbal cognitive deficits that are not always associated. These results emphasize the need to assess PWA comprehensively.

Selected references

Salmons, I.,Rofes, A. and Gavarró, A. (2021). *Prova integral d'afàsia. Llibre d'ítems.* Servei de Publicacions de la UAB. Available at https://ddd.uab.cat/record/250143
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Acknowledgments

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