




WORD FLUENCY AND OBJECT NAMING IN APHASIA AND COGNITIVE IMPAIRMENT

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GOALS

Word fluency (WF) and picture naming tasks have been shown to be sensitive to different neuropathologies (Pekkala et al. 2013; Thiele et al. 2016; Faroqui-Shah & Milman 2017). Both rest on lexical retrieval, but WF is also a measure of executive function (and attention).

The goal of this study is to examine the WF and naming performance of people with aphasia (PWA) and with cognitive impairment (PWCi), and to investigate whether their production skills on these two tasks are associated. We investigated error rate for the two populations, as well as error type.

METHODOLOGY

Participants

All the participants were bilingual speakers of Catalan and Spanish, though Catalan was their first language.

- 87 control subjects without brain damage: mean of 51.1 years-old, 51 women and 36 men, 3 left-handed.
- 18 PWA: mean of 63.3 years-old, 9 women and 9 men, all right-handed.
- 3 PWCi: mean of 75 years-old, 3 men, all right-handed.



Figure 1. Item in the picture naming task for the word *orella* 'ear'.

Instrument

We administered the Catalan version of the *Comprehensive Aphasia Test* (Swinburn et al. 2004; Salmons et al. 2021). Here we report the results from the two tasks that involved the production of nouns:

Word fluency task

The participants were asked to name as many animals as possible in one minute. The total score was the number of animals that they were able to name in Catalan. We also took into account the type of errors (repetitions, productions in Spanish or other languages).

Picture naming task

The participants were asked to name 24 objects depicted in pictures (Figure 1). Linguistic and psychological variables such as the length, frequency and imageability of the words were controlled for.

RESULTS

The mean results of controls were higher than the PWA and PWCi's results on both subtests (Table 1), which reflects the problems of lexical retrieval in the latter groups. A great intersubject variability was observed across all groups, especially in the word fluency task. In fact, the age significantly correlated with the number of productions in the WF task in the control group (Spearman $r = -0.41$, $p = .0001$).

	Max.	Control	PWA	PWCi
Word fluency	-	20.5	5.7	1.4
Naming	24	23.8	16.9	16

Table 1. Mean results by task and group.

The Spearman analysis revealed that there were no significant correlations between the number of correct productions in the WF and naming subtests in the PWA ($r = 0.38$, $p = 0.12$; Figure 2) and PWCi ($r = -0.87$, $p = 0.34$) groups. This reflects the fact that, despite the fact that these two tasks evaluate naming skills and lexical retrieval, they also measure other aspects of nonverbal cognition. In particular, WF tasks also evaluate executive function and attention. Our findings therefore suggest that these two tasks are rather complementary tests of cognitive impairment.

CONCLUSION

The results showed that the participants with aphasia and with cognitive impairment presented difficulties in word retrieval both in the word fluency and picture naming tasks. Yet, the number of intrusions of Spanish words reflects deficits in executive function as well.

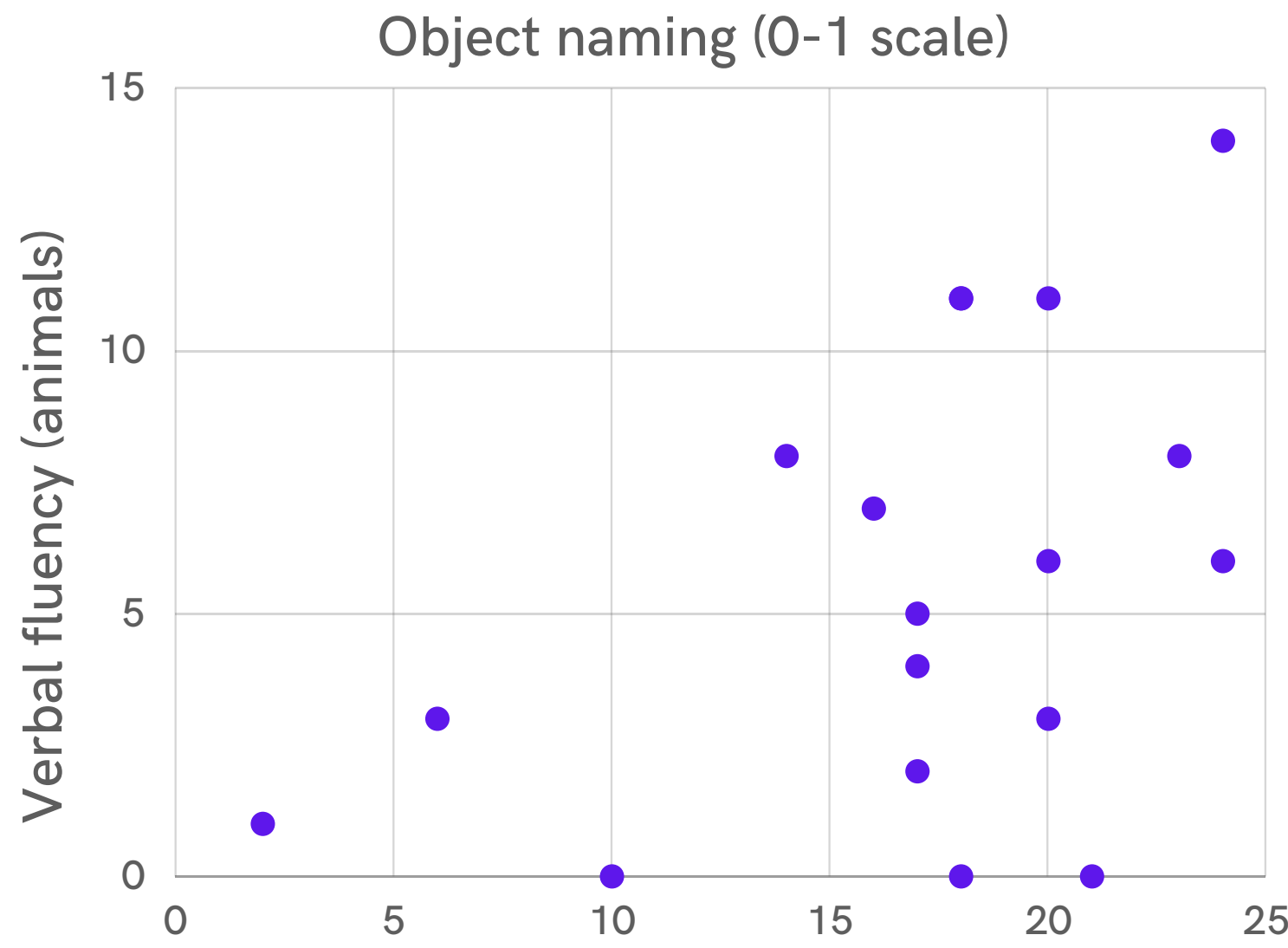


Figure 2. Relationship between the VF and naming tasks (PWA).

The error rates of PWA and PWCi reached a 42.3% and 80%, respectively, of the total productions in the WF task while incorrect responses only constituted a 4.6% of the total productions by control subjects. Most errors involved productions in Spanish (Figure 3).

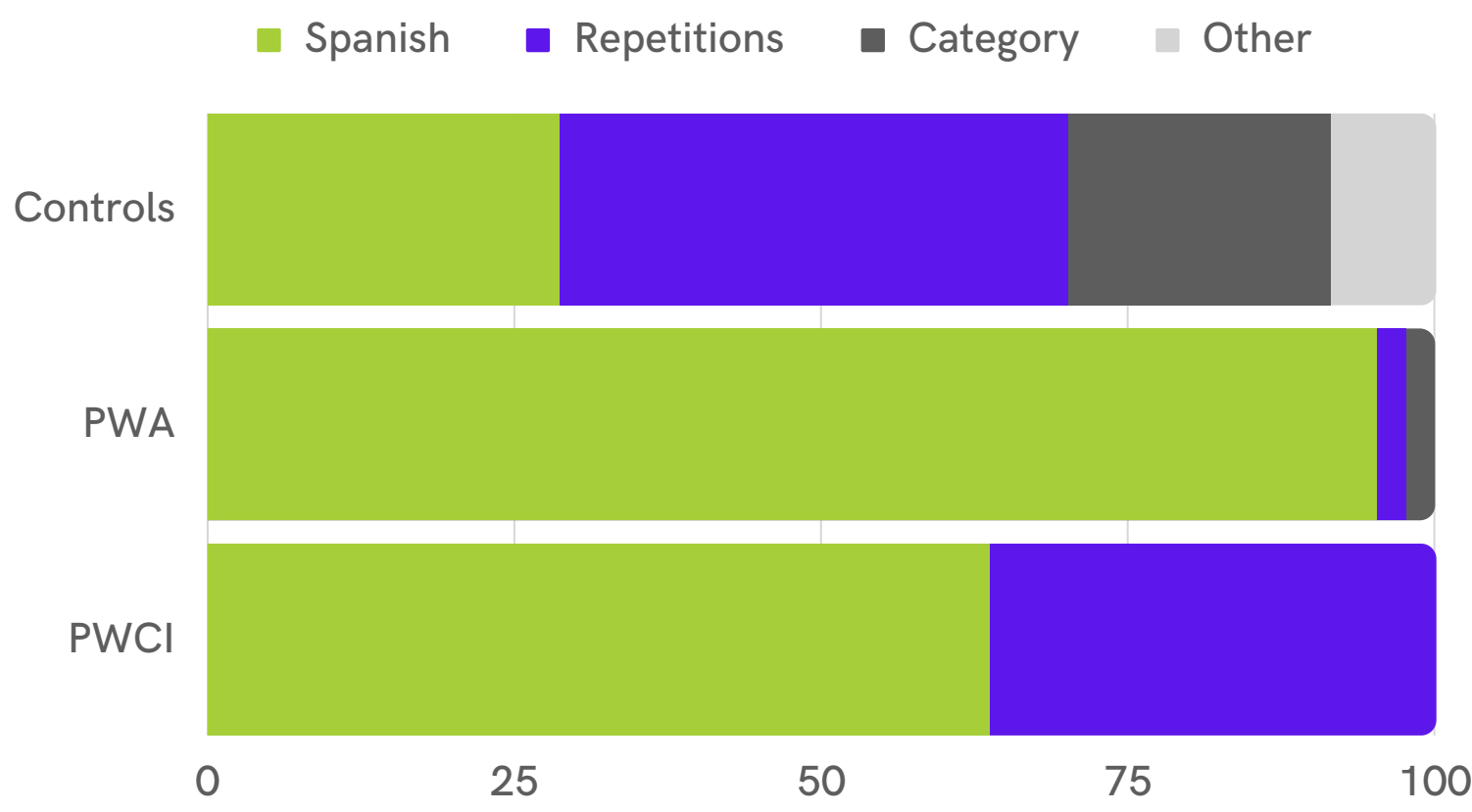


Figure 3. Percentages of error types in the VF task.

On the other hand, most of the errors produced in the object naming task (Table 2) by PWA and PWCi involved different types of paraphasias, words in Spanish and no responses.

Error type	Control	PWA	PWCi
Spanish	4	30	4
Paraphasias	2	42	8
Circumlocution	0	0	6
Perseverance	0	4	0
Neologisms	0	6	0
No response	4	40	6
Other	0	2	6

Table 2. Number and type of errors in the naming task.

ETHICS

The study was approved by the UAB Ethics Committee (CEEAH 5656).

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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>
- Swinburn, K., Porter, G. and Howard, D. (2004). *The Comprehensive Aphasia Test*. Psychology Press.