




THE ASSOCIATION BETWEEN COGNITIVE AND LANGUAGE SKILLS IN CATALAN APHASIA

Io Salmons 
Helena Muntané-Sánchez 
Anna Gavarró 



INTRODUCTION

People with aphasia (PWA) often present nonverbal cognitive deficits that are argued to contribute to their linguistic impairment (e.g. Christensen et al. 2018; Choinski et al. 2020). The goal of the present study is to explore the relationship between cognitive and linguistic abilities of PWA.

More specifically, we examined whether a group of Catalan-speaking PWA presented deficits in visual and verbal short-term memory, and sentence comprehension. We also explored whether their scores on the STM and comprehension tasks were correlated.

METHODOLOGY

Participants
A total of ninety-six native speakers of Catalan with and without aphasia participated in the study.

Age (years)	Control n=84	PWA n=12
18-29	18	0
30-39	8	0
40-49	12	5
50-59	17	3
60-69	14	1
70-79	8	2
+80	7	1
Education		
Basic	18	0
Intermediate	34	5
Higher	32	7
Sex		
Female	50	7
Male	34	5

Table 1. Characteristics of participants

Instrument
The Catalan version of the *Comprehensive Aphasia Test* (Swinburn et al. 2004; Salmons et al. 2021) was administered. Here we report the results on four subtests that evaluate visual and verbal STM, and sentence comprehension.

- Visual STM: recognition task.
- Verbal STM: forward digit span task and listening sentence span task.
- Sentence comprehension: sentence-picture matching task.

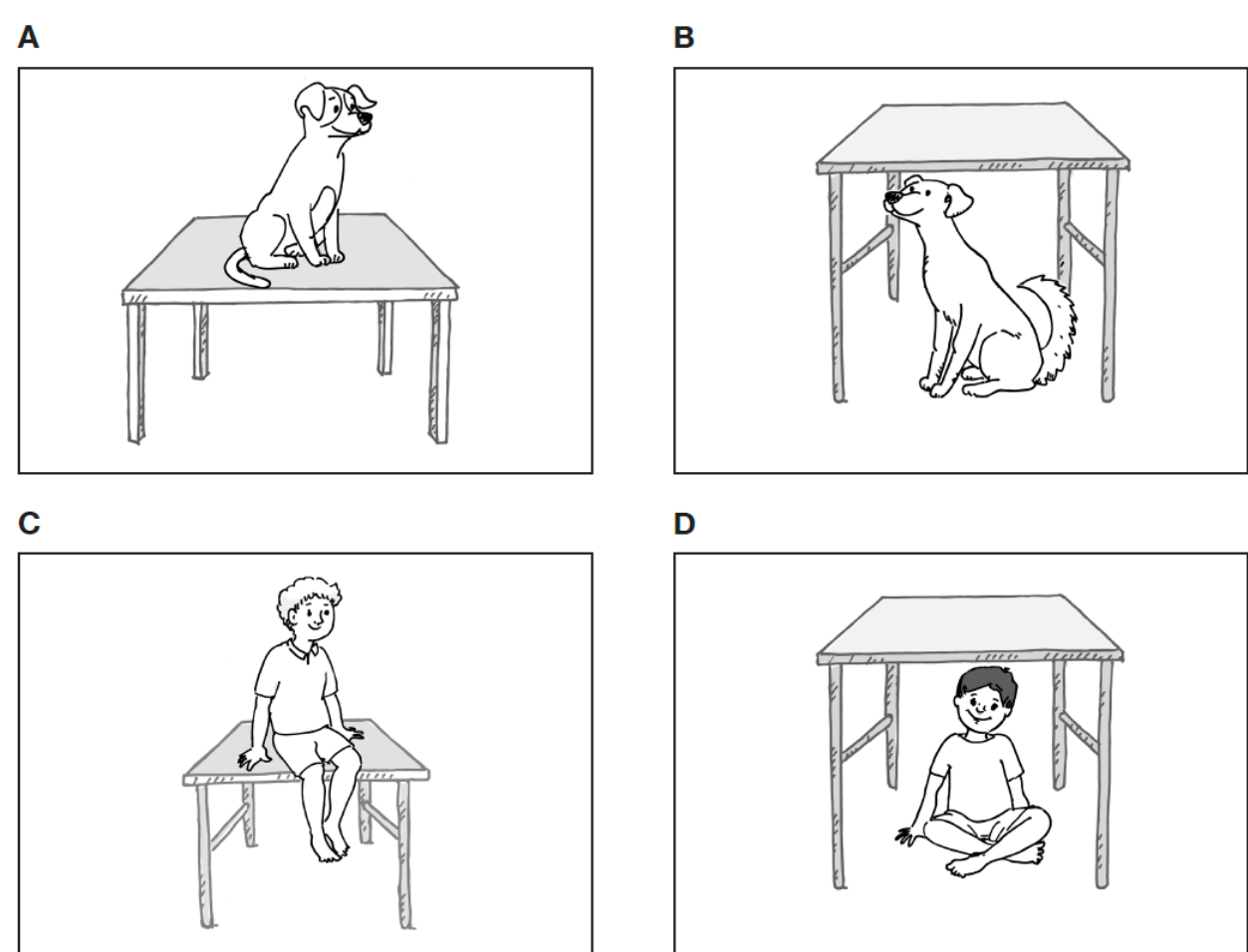


Figure 1. Pictures in the comprehension task for the item 'The boy is sitting under the table'.

RESULTS

The results of controls were at ceiling and significantly higher than the PWA's results on the four subtests. Yet, the PWA's performance on the visual STM task was very high and, in fact, 9 out of the 12 PWA scored at or above the cutoff point, which corresponded to the score that the 95% of controls exceeded. The PWA's performance on tasks that required verbal skills were very low: for example, only 2 PWA reached the cutoff score on the comprehension subtest.

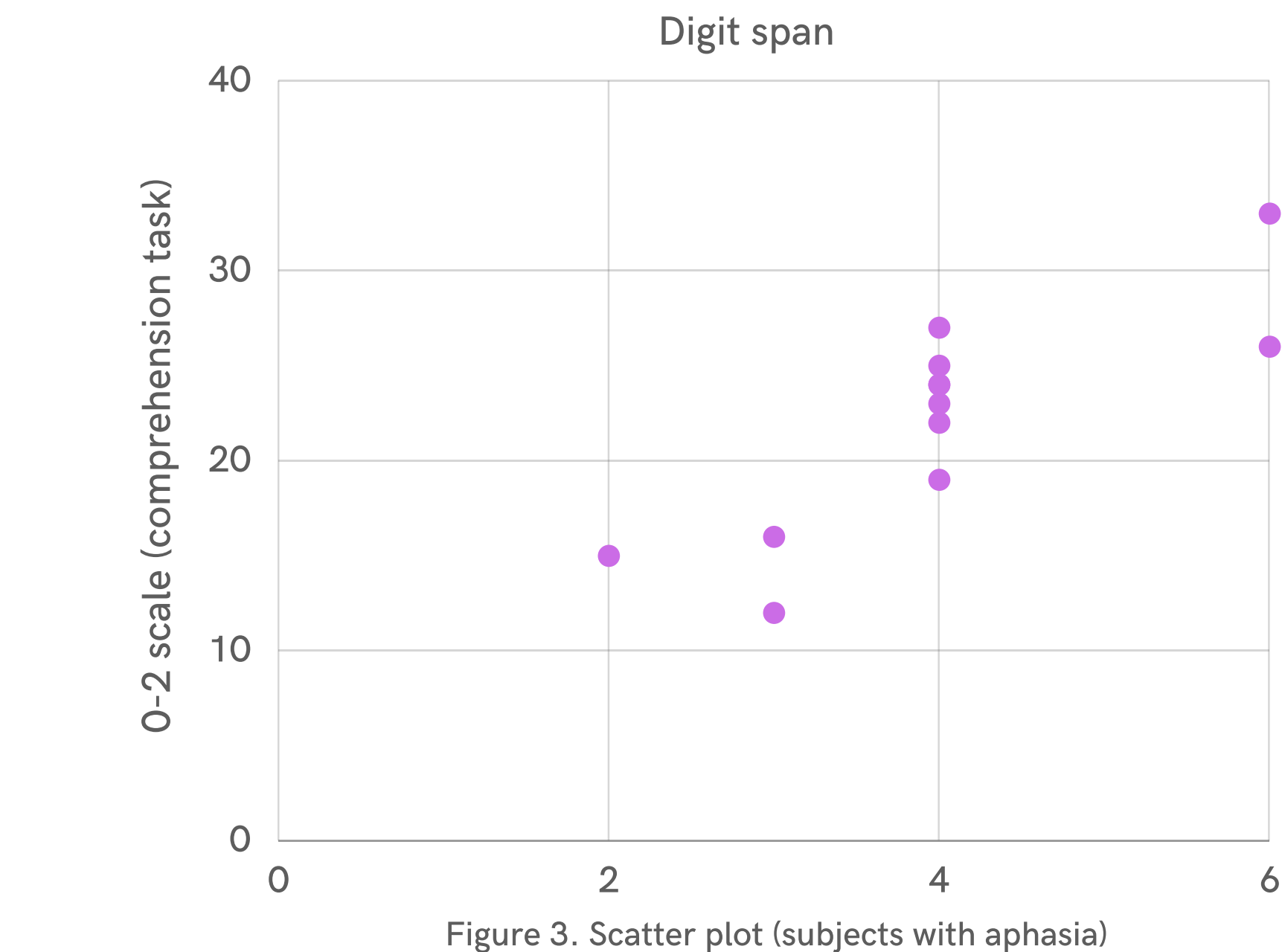
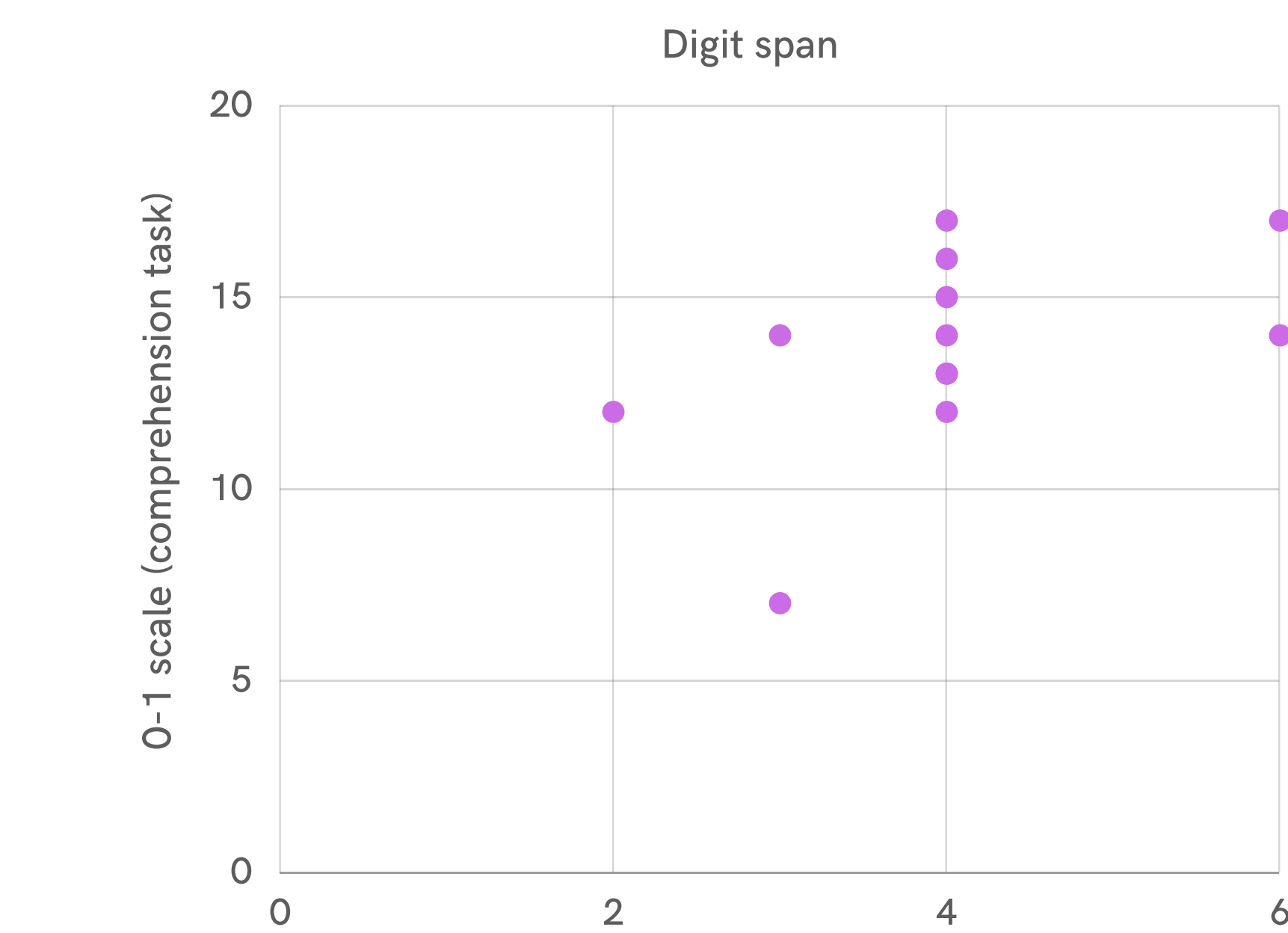
Visual STM	Maximum score	Controls mean (SD)	PWA mean (SD)
Recognition task	10	9.69 (1.15)	9.08 (1.51)
Verbal STM			
Digit span	7	5.99 (1.11)	4 (1.13)
Listening span	6	5.99 (0.11)	4.75 (1.22)
Sentence comprehension			
0-1 scale*	18	17.61 (0.68)	13.67 (2.71)
0-2 scale**	36	34.39 (1.87)	22.17 (5.83)

Table 2. Mean results by task and group.

*0 = incorrect response; 1 = correct response.
**0 = incorrect response; 1 = correct response after a 5-second delay, a self-correction or repetition of the item on request; 2 = correct responses.

CONCLUSION

The PWA's performance was significantly lower than controls on all tasks, but the magnitude of the difference was greater on subtests that required verbal skills. Our findings are in line with previous research (e.g. González et al. 2020) and suggest that PWA often present deficits in visual and verbal STM.



Significant Spearman correlation coefficients were obtained between:

- The two scores of PWA on the comprehension subtest ($r = .69$; $p = .013$).
- The digit and listening spans of PWA ($r = .62$; $p = .03$), which probably reflects the fact that both tasks measure verbal STM.
- PWA's digit spans and scores on the comprehension task based on the 0-2 scale ($r = .85$, $p < .001$; Figure 3). This scoring system is more sensitive to the processing demands of the task (Caplan & Waters 1999) and, hence, of the requirement of a greater memory load.

No significant correlations were found between any of the STM subtests and the accuracy results of the comprehension task (Figure 2). This finding suggests that despite that PWA presented deficits in STM, they were not directly associated with their difficulties in sentence comprehension.

ETHICS

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

FUNDING

This research has been supported by project FFI2017-87699_P from the Spanish Ministerio de Economía, Industria y Competitividad.

ACKNOWLEDGMENTS

Thanks to all the participants and to the Hospital de Sant Rafael, Escola de Patologia del Llenguatge de l'Hospital de Sant Pau and Grup de Suport Neuropsicològic. Thanks also to Duna Ninyerola and Mireia Sangesis for testing participants, and to Ester Boixadera for the statistical analysis.