

Eye tracking agreement processing and attraction effects in the aging brain: A subject-verb agreement comprehension study in Spanish

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Crystalized and *fluid* abilities are two key factors that affect predictability and ungrammaticality detection in both young (YAs) and older adults (OAs) [1]. In previous work, we showed that compared to YAs, OAs had greater difficulties at processing ungrammatical sentences [2]. However, it is unclear whether these results were due to a prevalence of the crystalized abilities and a risky reading strategy (hypothesis 1) or to the prevalence of fluid abilities and a more cautious reading strategy (hypothesis 2). To arbitrate between these hypotheses, we will use an agreement attraction paradigm and manipulate subject-verb agreement computation to test: (a) whether OAs are more susceptible to agreement attraction than YAs; (b) whether cognitive abilities influence agreement computation during reading in Spanish. The eye-movement patterns of 40 YAs (18–34 years) and 40 OAs (>60 years) healthy Spanish speakers will be recorded while reading sentences containing attractor nouns that either match or mismatch the subject's number and are either grammatical or ungrammatical (Figure 1), and all the sentences have a plural verb as a critical region. We will also measure participants' working memory capacity, executive control, and print exposure [3]. Based on previous studies [4], if age modulates agreement processing (hypothesis 1), we expect that OAs should show stronger agreement attraction effects than YAs. If age modulates the influence of cognitive abilities during agreement processing (hypothesis 2), cognitive abilities should modulate agreement processing and attraction effects more for OAs as compared to YAs.

References

- [1]Harada et al., *Clin Geriatr Med*, 2013.
[2]Cano-Sánchez, V. et al., *AmLaP*, 2021.
[3]Just, M. A., & Carpenter, P.A., *J. Exp. Psychol.*, 1992.
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(i) Grammatical-Mismatch (Plural subject-Singular attractor-Plural verb; PSP):

Los pasteles_{PL} con el dibujo_{SG} nunca ganaron_{PL} un premio de repostería debido a la calidad de la masa.

(ii) Grammatical-Match (SPP):

Los pasteles_{PL} con los dibujos_{PL} nunca ganaron_{PL} un premio de repostería debido a la calidad de la masa.

(iii) Ungrammatical-Match (SSP):

**El pastel_{SG} con el dibujo_{SG} nunca ganaron_{PL} un premio de repostería debido a la calidad de la masa.*

(iv) Ungrammatical-Mismatch (SPP):

**El pastel_{SG} con los dibujos_{PL} nunca ganaron_{PL} un premio de repostería debido a la calidad de la masa.*

The cake(s)_{MASC.SING./PL} with the design(S)_{MASC.SING./PL}. never won_{V*PL} a price bakery due to quality dough.

Gloss: The cake with the designs never won a bakery price due to its dough quality.

Figure 1. Sample sentences of an item in the four experimental conditions resulting from the manipulation of the attractor number (singular vs. plural) and grammaticality (grammatical vs. ungrammatical sentences). The 2 elements involved in the attraction relation are highlighted in black across all conditions, and the 2 ROIs (verb and spillover) that will be analysed are framed in squares across all conditions.