

Prediction and ungrammaticality detection: Young versus old adults.

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Prediction is a fundamental part for efficient language comprehension [1], but we know little about how it evolves throughout the lifespan. During aging, predictability is influenced by two cognitive competing forces: *crystallized abilities*, that is, language experience, and *fluid abilities*, such as working memory capacity (WMC) and processing speed [2]. Consequently, older adults benefit of increased language exposure whilst are faced with the decline of their fluid abilities. How does age modulate predictability? Does aging influence ungrammaticality detection? The eye-movement reading patterns of 24 young (23.1 (3.7)) and 27 senior (62.2 (4.2)) native Spanish speakers were recorded to investigate the interaction between language experience and cognitive decline in lexical prediction and morphosyntactic processing. Participants read sentences with a Verb+Clitic manipulating semantic predictability (high-cloze vs. low-cloze verbs) and grammaticality (grammatical vs. ungrammatical object-clitic gender agreement). If prediction is mostly influenced by (Hypothesis 1), older adults should make more accurate predictions than younger adults. By contrast, if predictability is mainly constrained by cognitive factors (Hypothesis 2), older adults should generate weaker predictions. Additionally, we explore whether (and how) aging modulates ungrammaticality detection. Four regions of interest (*Subject, Object-antecedent, V+Clitic, Spillover*) were analyzed. Results reveal predictability and grammaticality effects for both groups at the Verb+Clitic region, with larger *Total Fixations* and more *Regressions* for low-cloze than high-cloze verbs and ungrammatical than grammatical sentences. Age group did not modulate predictability. By contrast, group modulated grammaticality in most measures (*First Fixations, Fixation Durations, Total Fixations, Total Visits* and *Probability of Regressions*), revealing larger fixations and more regressions to the Object-antecedent and Subject regions in ungrammatical than grammatical sentences only for older adults. This suggests that only older adults performed backward-going for mismatch-checking. There is no evidence that semantic prediction is modulated by age, but a distinct pattern of ungrammaticality detection arises as a function of age increase.

Keywords: predictability, eye-tracker, healthy aging, agreement processing, working memory.

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[2] Chemairou, S. (2016). "Prediction in aging language processing." (PhD Dissertation), University of Iowa.