In the Prime of Life: Learning of Syntactic Processing Is Intact in Older Adults

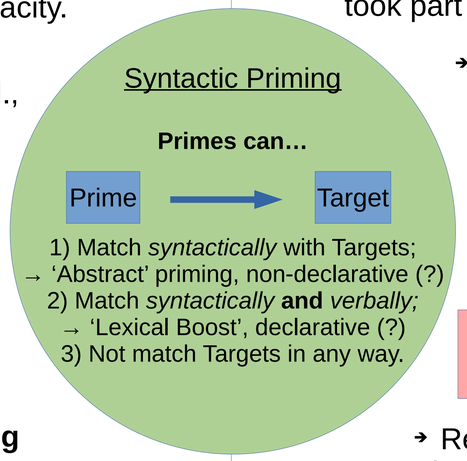
Willem S. van Boxtel & Laurel A. Lawyer

University of Essex

L+PLUS LAB

Background

- Past psycholinguistic studies with older adults → mainly *explicit* tasks, e.g. paragraph comprehension. These are naturally tied closely to Working Memory capacity.
- Scarce results from implicit tasks suggest processing *itself* may not decline (Hardy et al., 2017; Van Boxtel & Lawyer, *in press*)
- Syntactic priming could be an efficient and implicit method to test comprehension of sentences and sensitivity to syntax.
- Working with ERPs further delves beyond behavioural restrictions



→ However, **no studies of syntactic priming in comprehension with older adults**

→ And, **no ERP priming studies with older adults**

Questions & Hypotheses

1) Do older adults show syntactic comprehension priming?

2) What roles do WM and PS play in older adults' syntactic priming?

3) Can syntactic priming and ERPs offer a sensitive method of investigating language ability in later age?

H1. Abstract priming likely to be evident. Boost more likely to not show up.

H2. WM not expected to affect priming. Unknown role of PS

H3. Priming can uncover sensitive implicit processing patterns in older adults.

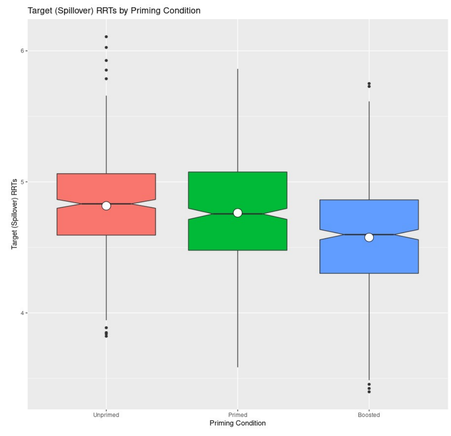
Method

- 90 trial sequences (see right)
- Participants (*n* = 18, *M*age = 69.6, SD = 4.0) took part at the University of Essex.
- Self-paced reading of Targets and Filler 2s, balanced with external pacing of Primes and Filler 1s, 3s, and 4s.
- Targeted structures: reduced relatives. For instance:

The man hounded [by the lawyer] [decided to] throw away his phone

- Reading times for By-ROI [by the lawyer] and Spillover ROI [decided to] recorded.
- ERPs recorded at by (P6 expected) and at decided (N4 expected)

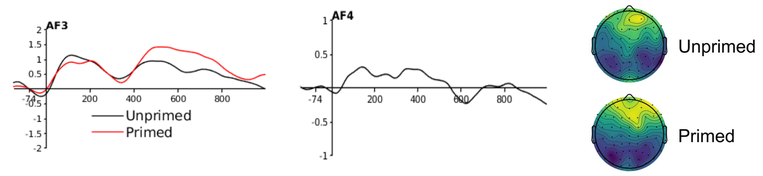
Results



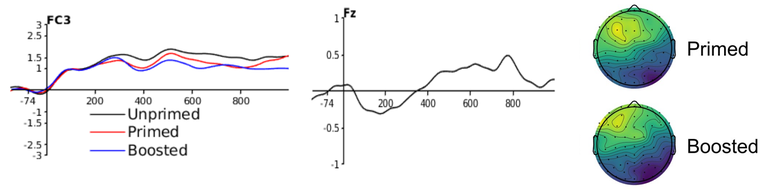
Behavioural

- Significant *abstract* priming *and* lexical boost.
  - Faster reading of primed compared to unprimed, boosted compared to primed.
- Some weak trends towards interactions with PS and WM

P6 (Difference wave primed—unprimed & scalp plot)



N4 & *Verbal* P6 (Difference wave primed—boosted)



- Strong evidence for syntactic priming in comprehension on both behavioural and ERP measures.
- Only weak evidence for impact of WM or PS on syntactic priming.
- Surprisingly long—lasting lexical boost effects. Contradicts explicit nature of effect.
  - Instead: Heyselaar et al.'s (2021) model works, or ties to *recognition* could be of interest.
- Suggests syntactic priming is a highly useful tool for uncovering implicit language behaviour in older adults!

References & Contact Details

- Hardy, S. M., Messenger, K., and Maylor, E. A. (2017). Aging and syntactic representations: Evidence of preserved syntactic priming and lexical boost. *Psychology and Aging*, 32(6):588.
- Hardy, S. M., Wheeldon, L., and Segaert, K. (2020). Structural priming is determined by global syntax rather than internal phrasal structure: Evidence from young and older adults. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 46(4):720.
- Heyselaar, E., Wheeldon, L., and Segaert, K. (2021). Structural priming is supported by different components of nondeclarative memory: Evidence from priming across the lifespan. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 47(5):820.
- Van Boxtel, W.S, and Lawyer, L.A. (*in press*). Syntactic comprehension priming and lexical boost effects in older adults. *Language, Cognition, and Neuroscience*.

Willem van Boxtel w.s.vanboxtel@essex.ac.uk University of Essex Colchester CO4 3SQ United Kingdom	Laurel Lawyer l.lawyer@essex.ac.uk University of Essex Colchester CO4 3SQ United Kingdom	L+PLUS Lab Contact Laurel Lawyer: l.lawyer@essex.ac.uk