

Resumption controls the time-course of dependency formation: Evidence from Hebrew

Julie Fadlon (UCSD) & Aya Meltzer-Asscher (Tel-Aviv University); CUNY 2017



Background

Filler-gap dependencies

- Listeners anticipate gap's position prior to the arrival of disambiguating information
- Predictions about the gap site are constrained by grammar (Stowe, 1986; Traxler & Pickering, 1996; Wagers & Phillips 2009)
- Lexical activation of the filler declines after it is introduced and increases again at the gap site
- Some lexical information associated with the filler is retrieved at the end of the dependency (Love & Swinney, 1996; McElree 2000)

Resumptive pronouns (RPs) and dependency formation

- RPs are pronouns which occupy the gap position
- RPs were suggested to aid retrieval in long or complex dependencies (Alexopoulou & Keller, 2007; Erteschik-Shir, 1992; Hawkins, 1999)
- Experimental evidence failed to show consistent facilitation resulting from RPs in extra-grammatical resumption languages (Alexopoulou & Keller, 2007; Polinsky et al., 2013)

Research Question:

What are the effects of resumption on filler retrieval in Hebrew, a grammaticized resumption language?

- **Two cross-modal priming experiments probed the semantic activation of the filler throughout the processing of object relative clauses (RCs)**

Ha-'adrixalit	mi-santa monika	še-ha-baxur saxar 'ota /__	etmol	ba-liška	tasa	le-xul
The architect from Santa Monica	that-the-guy hired her /__	yesterday at-the-office	travelled	abroad		
	↑		↑	↑	↑	↑
	PosA		PosB	PosC	PosD(RP)	PosD(Gap)
Related probe: <i>binyan</i> 'building'			Unrelated probe: <i>mayim</i> 'water'			

Method

Exp. 1:

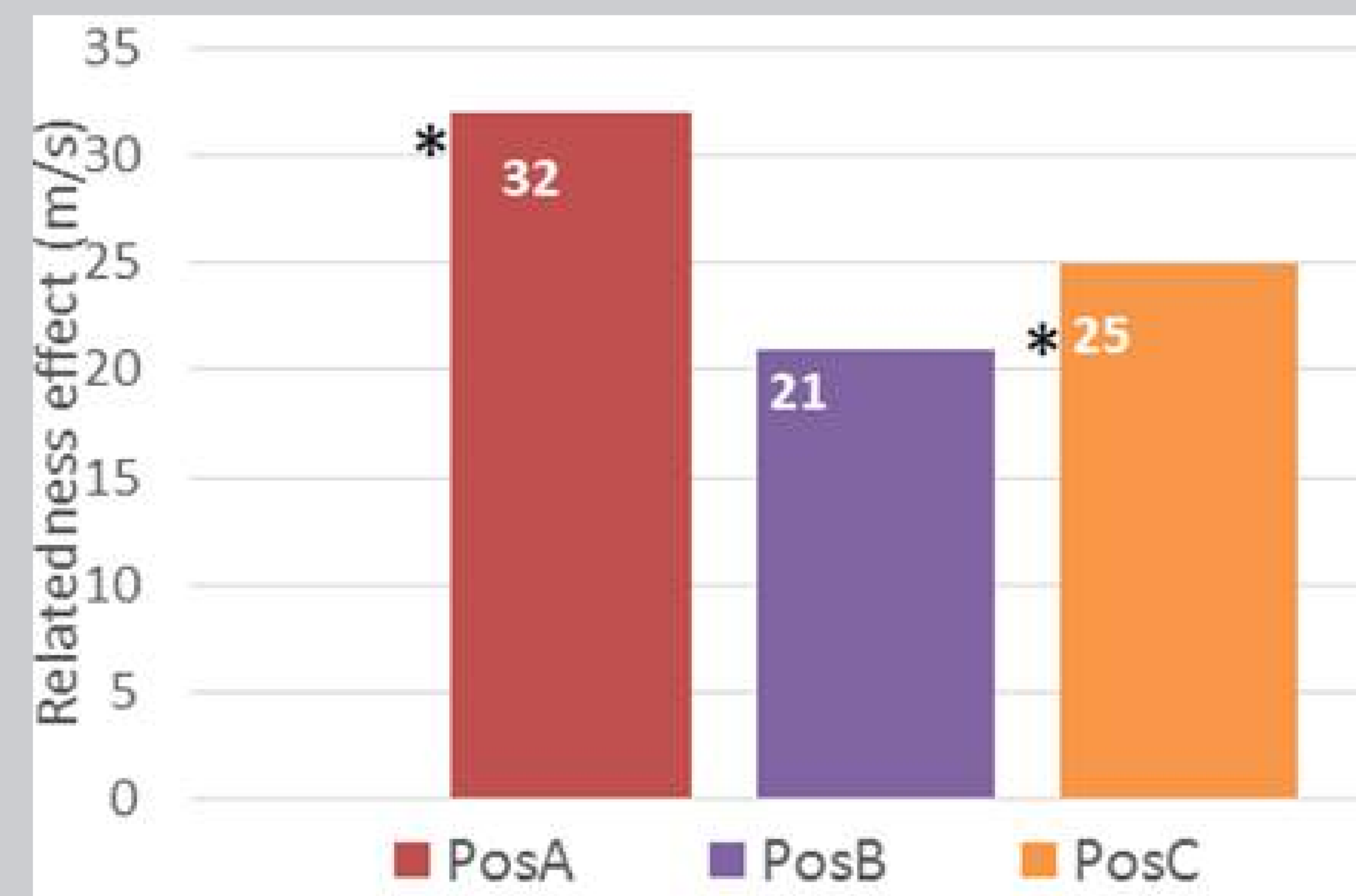
- 68 participants
- 36 experimental and 36 filler sentences
- Object RCs with gaps/RPs in relativized positions.
- RT matched lexical decision probes related/unrelated to the filler appeared on a computer screen at:
 - (1) **PosA**: the offset of the relative head
 - (2) **PosB**: 8 syllables downstream from PosA
 - (3) **PosC**: the offset of the embedded verb.

Exp. 2:

- 63 participants
- Lexical decision probes appeared at the offset of the RP (on RP trials) or at matched timings from the verb (on gap trials) (**PosD**)

RP and gap sentences **start diverging at PosC**, since task is completed while next word is played.

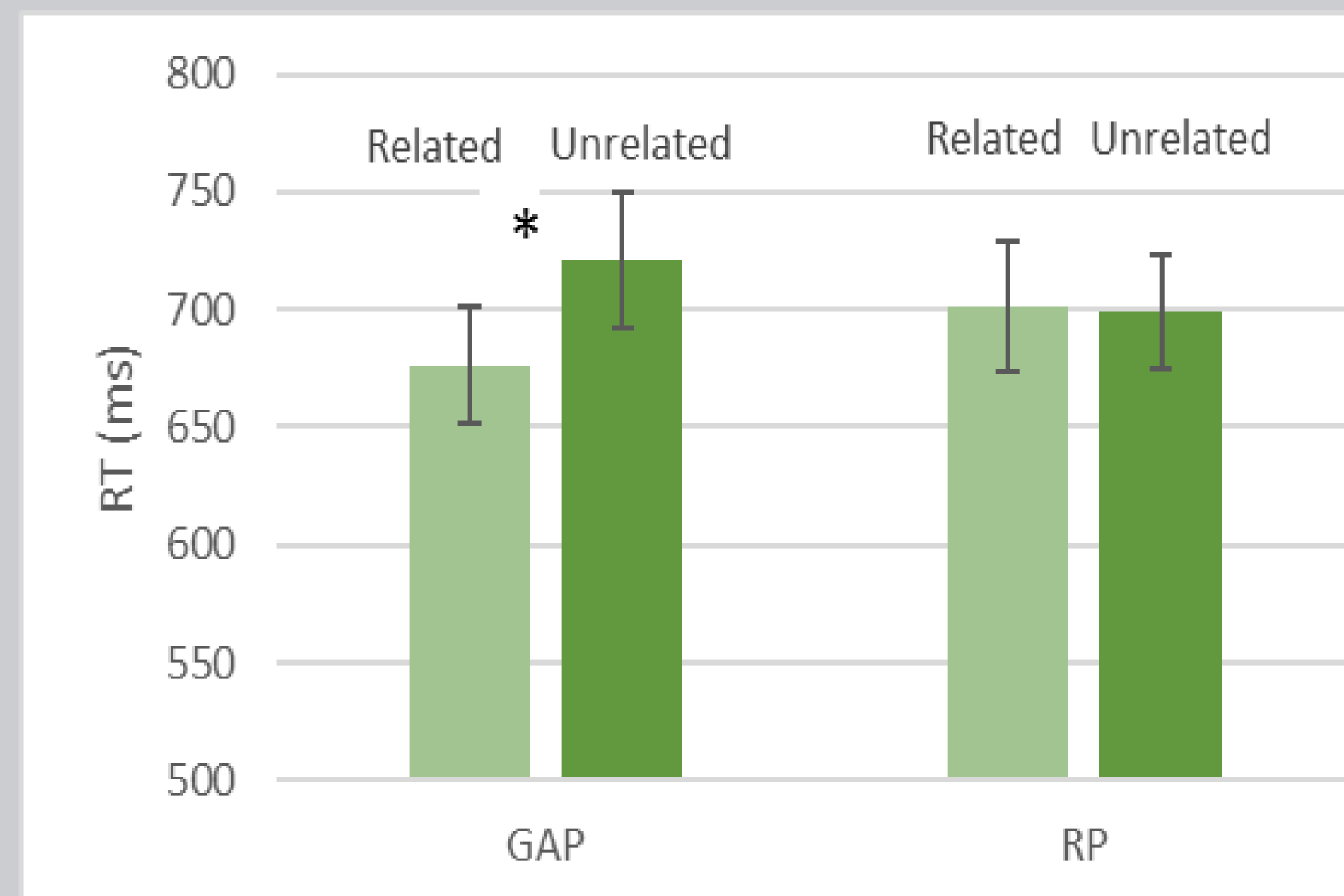
Statistical analyses: Mixed-effects linear regression



Priming by probe position, Exp. 1

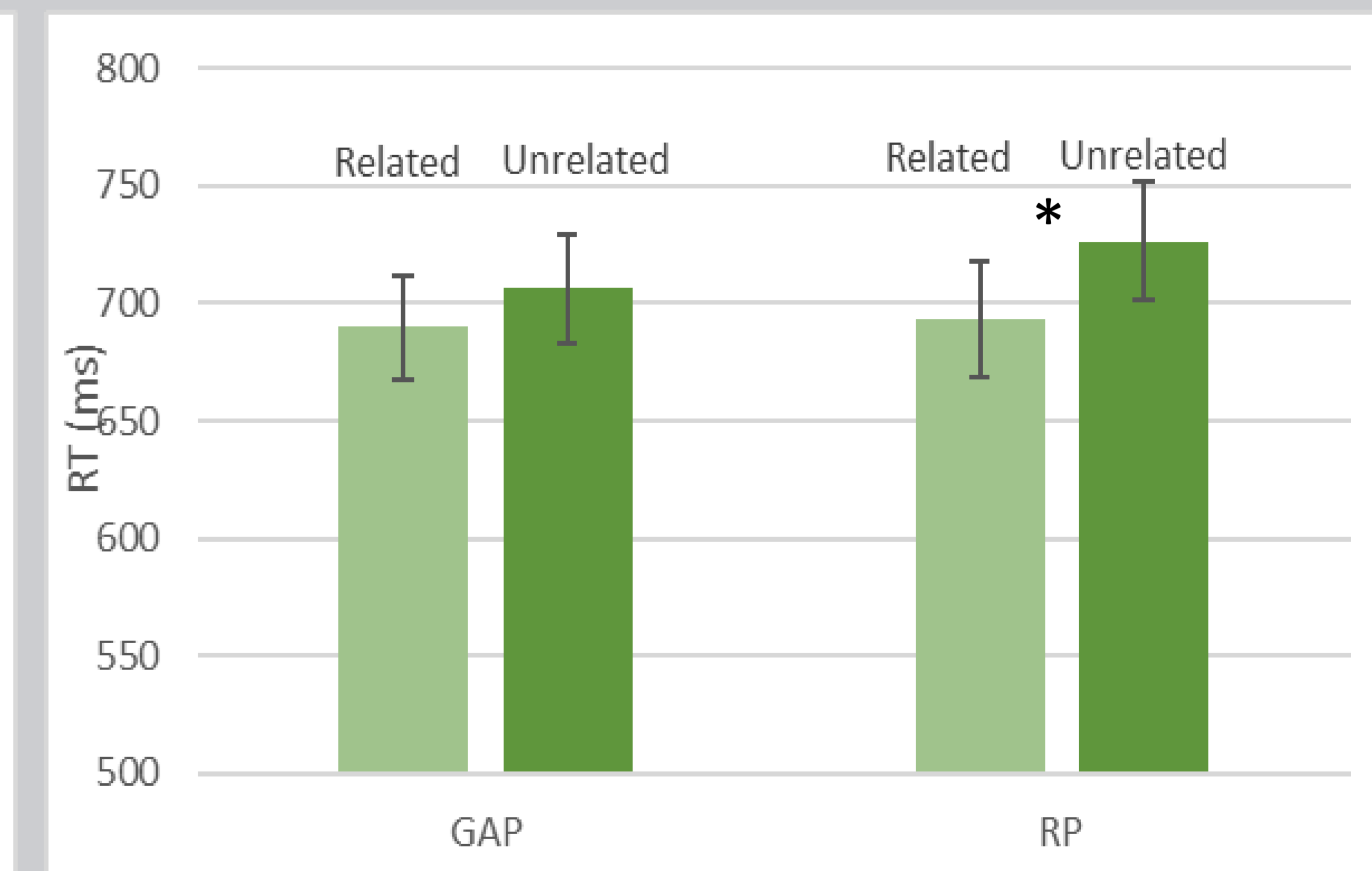
- Main effects of Position ($p < .001$), Relatedness ($p < .001$); No interaction 😊
- priming effects at **PosA** ($p = .009$) and **PosC** ($p = .01$), but not at **PosB** ($p = .1$)

→ **activation, decay and reactivation**



RT by relatedness at PosC, Exp 1

- Follow-up model, **PosC**:
- **RP** trials : no priming effect ($p = .44$)
- **gap** trials: significant priming effect ($p = .03$)



RT by relatedness at PosD, Exp 2

- Main effect of Relatedness ($p < .001$); No interaction with RP
- **RP** trials : significant priming effect ($p = .004$)
- **gap** trials: a trend towards priming ($p = .053$)

Discussion

- Occurrence of RPs controls the time course of dependency formation in Hebrew
- **Gap** trials: indication of filler retrieval at the offset of the embedded verb (PosC),
- **RP** trials: indication of filler retrieval only later, at the offset of the RP (PosD)
- no indication that RPs facilitate the retrieval of the filler
- **RPs cause a slow-down** in dependency formation?
 - Hypothesis: The dependency can be resolved without RPs → RPs are redundant → slow-down in dependency formation
 - Future research can examine the time course of dependency formation in sentences with islands, where RPs are mandatory

References:

- Alexopoulou, T. & Keller, F. (2007). Locality, cyclicity, and resumption. *Language*, 83, 110-160. Erteschik-Shir, N. (1992). Resumptive pronouns in islands. In H. Goodluck & M. Rochemont (Eds.), *Island constraints* (pp. 89-108). Springer.
- Hawkins, J. (1999). Processing complexity and filler-gap dependencies across grammars. *Language*, 75, 244-285.
- Love, T. & Swinney, D. (1996). Coreference processing and levels of analysis in object-relative constructions. *Journal of Psycholinguistic Research*, 25, 5-24.
- McElree, B. (2000). Sentence comprehension is mediated by content-addressable memory structures. *Journal of Psycholinguistic Research*, 29, 111-123.
- Polinsky, M. et al. (2013). Resumption in English. In J. Sproue & N. Hornstein (Eds.), *Experimental Syntax and Island Effects* (pp. 341-359). Cambridge University Press, Cambridge.
- Stowe, L. (1986). Parsing WH-construction. *Language and Cognitive Processes*, 1, 227-245.
- Traxler, M. & Pickering, M. (1996). Plausibility and the processing of unbounded dependencies. *Journal of Memory and Language*, 35, 454-475.
- Wagers, M. & Phillips, C. (2009). Multiple dependencies and the role of the grammar in real-time comprehension. *Journal of Linguistics*, 45, 395-433.