Different structural boundaries have different effects on dependency resolution

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Cue-based retrieval [1] operations in sentence processing are thought to be bounded to the context relevant to the dependency at hand, e.g., the current clause [2] or sentence [3], or the most relevant prosodic or discourse unit [4-7]. Such a context-sensitive retrieval mechanism is expected under general models of memory [8]. Recent evidence for bounded retrieval has come from the claim that (prosodic- and discourse-independent) appositive relative clauses (ARCs) contribute less interference than more integrated RCs, yielding faster retrieval operations in the matrix [4-7, 9], perhaps because ARC material is not part of the relevant linguistic context [4]. Given evidence that ARC effects do not generalize to other discourse boundaries [10], in the current study, we test the role of prosodic boundaries in delimiting contexts, by comparing retrieval dynamics in sentences with *not only-but also* (NOBA) vs. *and also* (AA) constructions (1) in English. These constructions offer a minimal pair with identical syntactic and information-structural properties [11-12], differing only in an obligatory prosodic boundary between coordinates in NOBA but not AA. If simple prosodic boundaries trigger contextual delineation in memory, we should expect that the NOBA boundary sets its first coordinate apart much like ARC content, with consequences for retrieval.

We consider two types of context-specific retrieval mechanisms. One option is the *Visibility* hypothesis, that content in the current linguistic context is most accessible to processing operations, cf. work on the relative inaccessibility of content in other prosodic phrases [13] or clauses [2,14]. But content with more boundaries has also been associated with more durable and navigable memory representations [15]. Thus we also consider the *Partition* hypothesis: structural divisions serve as distinguishing contextual cues that partition the search space for retrieval operations, such that boundaries can support easier memory access. Only Partition explains the established finding that ARCs facilitate retrieval (2a): content interferes less when isolated (in C2). Conversely, Visibility makes the prediction that retrieving a target in a previous context (C1 or C2) should be harder. [9] find that this is never the case for ARCs: even retrieval of content from C2 (2b) is no more difficult than from an undifferentiated C1. We test whether Partition-like effects extend to non-discourse-independent, segmented constructions like NOBA. Like [9], we probe ease of dependency resolution using noun phrase ellipsis (NPE), a dependency which in part needs access to a syntactic representation [16, cf. 17].

In an **A-Maze task** [18-19] crossing Structure (NOBA, AA) x Dependency (+/-NPE), 44 subjects (planned N = 48) read 48 sentences (1). In the critical +NPE conditions, participants encountered an NPE site following a numeral, cued by a preposition. Response latencies were measured on the critical region (bolded) directly following the NPE site and two spillover regions (underlined). Under Visibility (3a), we expected an interaction such that NPE is associated with greater costs in NOBA, as retrieval across a prosodic boundary should be costly. Under Partition (3b), we expected reduced costs in NOBA, as segmentation should facilitate retrieval.

Results are in Fig./Table 1 [20]. NPE resolution is no faster in NOBA than in AA, failing to support the claim that prosodic boundaries affect retrieval dynamics [cf. 21]. While in [9], ARC boundaries facilitated retrieval in line with Partition, here the NOBA boundary did not. Construction-specific factors must be driving this difference. An interaction does emerge in the spillover, albeit without a main effect of NPE, indicating some difficulty for cross-NOBA ellipsis beyond a pure effect on retrieval. For instance, in both NOBA and AA, comprehenders may need to revise the focus structure of the first clause [22] to successfully resolve the NPE. This revision would be harder in NOBA vs. AA if comprehenders make stronger incremental commitments in the presence of (a) focus particles (e.g. *not only*) or (b) prosodic boundaries [13]. In an ongoing follow-up, we are revisiting ARCs using the current design to more directly compare across constructions. In all, the current results and [9] suggest that a theory of context-sensitive retrieval cannot treat all boundaries the same; that is, the way in which the retrieval mechanism interacts with contextual partitions must be sensitive to more fine-grained linguistic properties of the structure at large.

(1) Example item set

NOBA	-NPE	Imala trusted not only the inventor with fifty gizmos, but also the one with three gizmos **after** <u>the collaboration</u> last winter.
	+NPE	Imala trusted not only the inventor with fifty gizmos, but also the one with three (__) **after** <u>the collaboration</u> last winter.
AA	-NPE	Imala trusted the inventor with fifty gizmos and also the one with three gizmos **after** <u>the collaboration</u> last winter.
	+NPE	Imala trusted the inventor with fifty gizmos and also the one with three (__) **after** <u>the collaboration</u> last winter.

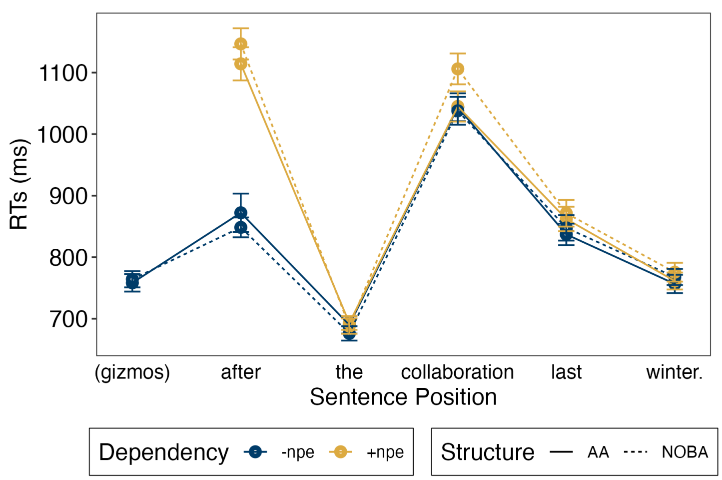
(2) Hypothetical context boundaries in previous experiments

(a) Structures in [4-7]		
complex condition		simple condition
[... TARGET ...]$_{C1}$ [... x y z ...]$_{C2}$ [... PROBE ...]$_{C3}$	vs.	[... TARGET ... ... x y z ... ... PROBE ...]$_{C1}$

(b) Structures in [9] and here		
complex condition		simple condition
[... TARGET ...]$_{C1}$ [... PROBE ...]$_{C2}$	vs.	[... TARGET ... ... PROBE ...]$_{C1}$

(3) Comparing predictions

(a) *Visibility*	Contextual divisions hinder retrieval (Structure x NPE > 0)
(b) *Partition*	Contextual divisions facilitate retrieval (Structure x NPE < 0)



Effect	β	σ	95% CrI
Critical *(after)*			
Intercept	6.82	0.03	(6.77, 6.87)
Struct (NOBA)	0.02	0.02	(-0.02, 0.06)
NPE (+)	0.25	0.02	(0.20, 0.30)
Str x NPE	0.03	0.04	(-0.05, 0.11)
Spill 2 *(collab.)*			
Intercept	6.89	0.03	(6.83, 6.95)
Struct (NOBA)	0.02	0.02	(-0.02, 0.05)
NPE (+)	0.02	0.02	(-0.02, 0.05)
Str x NPE	0.06	0.03	(-0.01, 0.12)

Figure 1: Mean RTs by condition, by word. Error bars are ±SE. **Table 1**: `brms` fits for two regions. Sum-coded (+).

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