Salient signals:
Quantifier semantics and multimodal cues as predictors of discourse relations

Merel C.J. Scholman, Ted J.M. Sanders
Utrecht University
m.c.j.scholman@uu.nl

Background Discourse coherence is structured not only by explicit connectives and cue phrases such as *because* or *as a result*, but also by subtler lexical and structural cues. While cue phrases have been widely studied as signals of coherence relations [e.g., 1, 2], less is known about whether other linguistic elements guide expectations about discourse structure. This work examines quantifiers such as *several* or *multiple* as potential cues to an upcoming list or additive relation, testing whether they influence how readers anticipate discourse continuation. We combine behavioral and computational evidence to assess the extent to which such cues influence coherence processing.

Findings Across five behavioral studies, we compare offline and online measures of comprehension. In an offline continuation task (Exp. 1, $n = 163$), participants read a short context containing an indefinite quantifier and the first element of a potential list (see Example 1; in the continuation task, the item stopped after 'his childhood.'; in the self-paced reading and listening studies, the additional sentences were presented in full). Participants completed the prompt to reveal their discourse expectations. Participants often produced list-like continuations following quantifiers (Fig. 1, first panel), though this effect was modulated by individual linguistic experience. To test whether these patterns extend beyond human comprehension, we compared the continuation data with outputs from LLaMA 3, treating the model as an exploratory benchmark for discourse-level cue sensitivity. The model produced continuation patterns broadly similar to human responses, suggesting that the model, like human readers, can exploit quantifier semantics to guide discourse expectations.
In self-paced reading (Exp. 2, $n = 80$; Exp. 3, $n = 60$), quantifiers did not reliably reduce reading times on list-continuing regions, suggesting that such cues were not salient enough to affect online processing. When quantifiers were visually highlighted, reading times showed a localized facilitation effect (Exp. 4, $n = 60$; Fig. 2). A self-paced listening replication (Exp. 5, $n = 80$) tested whether prosodic emphasis on the quantifier (stressed, unstressed, or absent) would similarly facilitate processing of subsequent list-continuing material, but no such effect was observed, indicating that prosodic salience alone may be insufficient to trigger the same expectation.

Implications Together, the studies indicate that quantifiers can contribute to discourse coherence, but their influence depends on cue salience and reader-specific factors. The contrast between visual and prosodic manipulations highlights the need to examine how lexical and perceptual factors jointly inform discourse expectations. More generally, the findings support a view of discourse comprehension in which multiple cues interact to guide coherence construction. Models of discourse coherence should therefore incorporate a broader range of such cues and account for individual variability in how they are used.

(1) a. *List-signal condition:* The singer had written **several** songs during a summer holiday. He wrote a song about his childhood.

b. *Control condition:* The singer went on a songwriting retreat over the summer. He wrote a song about his childhood.

Continuation in both conditions for SPR and SPL: [He also]$_{target}$ [composed one]$_{spill}$ about his girlfriend. The songs were released a month ago and have already reached the charts.

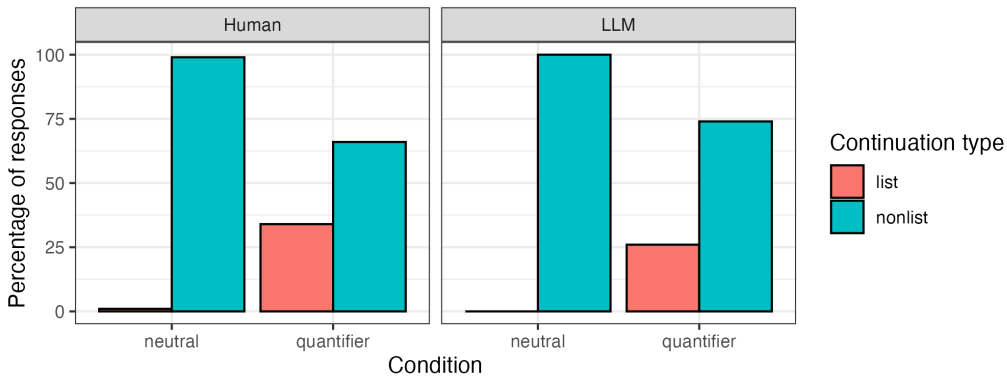

Figure 1: Percentage of continuation types per condition and experiment (Exp. 1a: human participants; Exp. 1b: LLaMA3).

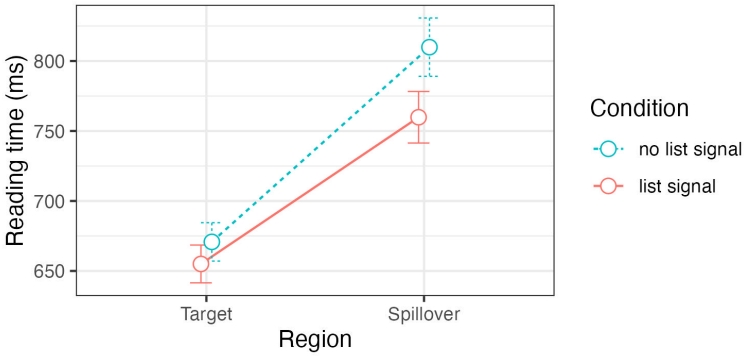

Figure 2: Mean reading times and error bars (SE) per region and condition, Exp. 4.

References

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