Are readers listless? Exploring the sensitivity to contextual List signals

Merel Scholman[1], Vera Demberg[1], Pim Mak[2] and Ted Sanders[2]
[1] Saarland University, Saarbrücken, Germany
[2] Universiteit Utrecht, The Netherlands

Although connectives have been at the center of research in the signaling literature, many relations are in fact signaled by a cue other than a connective (Das & Taboada, 2018). The existing research into other types of cues has mainly focused on segment-internal markers, which occur in the first argument of the relation (e.g., Implicit Causality verbs and negation words). Much less is known about the influence of cross-sentence cues on the anticipation of coherence relations. The current study aimed to extend previous research by investigating whether a global cue, located in the context, leads readers to infer a specific type of upcoming coherence relation.

The type of global cue that is investigated is an expression of quantity, such as *a few* or *several*. A wealth of studies provides evidence that expressions of quantity do not only convey quantities, but also provide subtle information that influences the kind of inferences that a comprehender makes (see, e.g., Moxey & Sanford, 2000). In the current study, it is assumed that when such expressions are located in the context, they can signal upcoming List relations. Consider Example (1).

(1) The woman experienced several unfortunate events last night.

A logical continuation of this passage would be a specification of the unfortunate events, for example: *She got wine thrown at her by her dining companion, and the heel of her Jimmy Choo's broke*. Providing only one instance of an event could render the story incomplete, because the context evoked several instances. The current study presents the first investigation into whether expressions of quantity presented in the context lead comprehenders to generate List relations.

Given that comprehenders can generate predictions of upcoming relations based on local cues, it is hypothesized that they are also sensitive to such global cues. However, the degree of sensitivity to such a cue is likely to vary between individuals. Variability in cognitive processes (e.g., working memory capacity) and in factors such as language experience leads to individual differences in how language is processed and comprehended (Boudeweyn, 2015). Quantity expressions located in the context are not restrictive cues, and therefore it is hypothesized that not all readers will be equally sensitive to it. Hence, the study therefore had two main objectives: (1) to investigate whether comprehenders are sensitive to a global list signal in the context, and (2) to examine whether this sensitivity is modulated by individual reader characteristics.

163 native English-speaking participants (range 25–35 years; mean age 30 years; 83 female), registered as 'participants' on the crowdsourcing platform Prolific, took part in this task. 63 participants had completed higher education and 100 participants had completed high school or had no formal qualifications. The participants were presented with 20 two-sentence stories such as the one in Example (2) and were asked to complete these stories with one or two sentences. In the list signal condition, the first sentence, referred to as the context sentence, contained an expression of quantity (e.g., *a few, several*). In the control condition, the context sentence described the place or situation the referent was in.

(2) *List* The woman experienced several unfortunate events last night. She got wine thrown at her by her dining companion.
Control The woman went out for dinner last night. She got wine thrown at her by her dining companion.

To account for individual reader characteristics, several individual difference measures were

included in the current study. The measures that were included target domain-general cognitive abilities (verbal and non-verbal working memory) as well as reading experience (print exposure and reading habits). Verbal working memory was measured using an automated version of the reading span test (Waters et al., 1987), and non-verbal working memory was measured using an automated operation span test (cf. von der Malsburg & Vasishth, 2013). Participants' linguistic experience was measured using an automated Author Recognition Test (cf. Acheson et al., 2008): participants were presented with a list of 130 potential author names (65 real author names, 65 foils), and asked to indicate which names they recognize. Finally, reading habits were measured using a reading habits survey, focusing on reading frequency and number of books read in the past 12 months (cf. Scales & Rhee, 2001). These four tests are argued to target different components of cognitive and linguistic capacities, which allowed for an exploration of whether cognitive and linguistic processes underlie comprehenders' sensitivity to global relational cues.

The results showed that participants provided significantly more list continuations in the list condition (35% of all continuations) than in the control condition (1% of continuations) ($\beta = 6.31$; $SE = .87$; $z = 7.24$; $p < .001$). This indicates that the contextual list signal influenced inference generation by leading participants to provide continuations that function as arguments of a list relation. However, the list signal was not strong enough to elicit 100% list continuations. The frequency of list continuations per participant ranged between 0% and 100%. This suggests that there was variability in participants' sensitivity to the list signal. An exploration of the relationship between the sensitivity to the contextual list signal and each of the individual difference variables revealed an effect of Author Recognition ($\beta = -0.83$; $SE = .15$; $z = -5.49$; $p < .01$): participants who recognized more author names also provided more list continuations. No other individual difference measures were found to be significant predictors of continuation type.

In sum, the current study revealed that comprehenders can be sensitive to a global, contextual list signals, and that participants with more linguistic experience are more sensitive to the contextual signal than those with less linguistic experience. These results extend prior signaling research by showing that contextual signals influence participants' coherence relation inference generation. The influence of context on the anticipation and interpretation of coherence relations deserves more consideration. Future research can focus on identifying other types of relational cues that occur outside of the relation, and how often contextual signals occur. Further, the results of the current study emphasize the importance of individual reader characteristics when it comes to coherence relation inferences. The possibility of individual differences in coherence relation generation, interpretation and processing deserves more attention in future research efforts.

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