

Discourse expectations while you wait

Jet Hoek¹, Klaus von Heusinger², Hannah Rohde³

¹Centre for Language Studies, Radboud University Nijmegen, ²University of Cologne, Germany, ³School of Philosophy, Psychology & Language Sciences, The University of Edinburgh

Any discourse contains referents. Throughout a discourse, referents fluctuate in their activation levels. For instance, in a story about Lily and Morris, Lily may be the central character for one part of the discourse, while Morris is the focal point of another part. Referents' activation levels have been shown to be influenced by both structural and meaning-related factors, see [1]. Structural factors include recency: referents' activation levels drop off the longer they go unmentioned, see [2]. Meaning-related factors include comprehenders' expectations about who will be mentioned next, see [3]. In this study, we pit these factors against each other: what happens to a referent's activation when they go increasingly unmentioned (becoming less recent), but are highly expected to be picked up again for reasons of discourse coherence? To test this question, we ran two self-paced reading experiments, one in English ($N=195$) and one in German ($N=68$).

We constructed 20 short discourses with two central third-person referents, see (1). Each discourse sets up a situation where the two referents differ in their stance on something, introducing an expectation for a contrast relation. Our manipulation varies the length of the subsequent material which elaborates on the perspective of Referent 1. This material is either one sentence (short condition) or three sentences (long condition). The target sentence presents the contrasting perspective of Referent 2, always mentioning them in subject position at the beginning of the sentence. Each discourse ends with a spillover sentence. To control for the overall length of the discourse before the target sentence, the short condition contains additional content at the beginning. This ensures that the target mention of Referent 2 occurs exactly as many words into the discourse in the short as in the long condition. All items were originally created in English and then translated to German and adapted to be idiomatic German discourses with identical length between the short and long condition. The German items were pretested using a story continuation task: all items were cut off before the target sentence and presented to participants who were continued the story in a couple of sentences. The second referent was mentioned in over 90% of continuations in both conditions. This indicates that the stories set up a strong expectation for the Referent 2 to be rementioned.

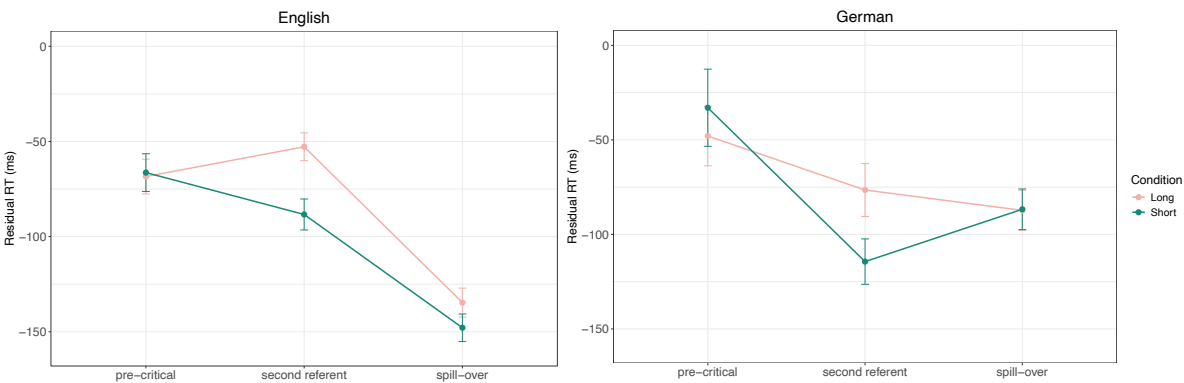
The two experiments used a moving-window self-paced reading task. Items were presented in chunks, each consisting of a couple of words. The main dependent variable was the reading time of the chunk containing Referent 2 in the target sentence (*My grandma feels* in (1)). Based on the assumption that more accessible referents are processed faster, we formulated two contrasting hypotheses: on the one hand, activation of linguistic material has been shown to decrease as a function of distance [2]. This would predict faster reading times in the short than in the long condition. Other research from the domain of syntax, however, has shown that when a linguistic element is expected to occur, greater distance can result in faster reading times – this has been labeled the *anti-locality effect* [4]. This would predict faster reading times in the long than in the short condition. In addition to the target region, we also measured reading times on the chunk of words following the target region (*you should never* in (1)) to account for any spill-over effects. Finally, we also measured reading times on the chunk preceding the target region (*ninety-year-olds wear* in (1)) to test whether in anticipation of getting to the remention of the Referent 2, participants would speed up their reading. We converted raw reading times to residual reading times to control for variation in chunk length and reading speed.

Residual reading times were analyzed using linear mixed effects models in R. Results show that in both English and German, the target region is read significantly faster in the short condition, see Figure 1. No differences between conditions were found on the pre-critical or spill-over regions in either language. These findings speak against the occurrence of an anti-locality effect at the discourse level. Instead, our results are in line with the recent study in [5], which also finds a decrease of the facilitatory effect of discourse-level expectations as a function of distance.

(1) Example item (| indicates chunk boundary):

Short:	I never understand why my friends complain about having to visit their grandparents. Mine are hilarious!		
Set-up:	My grandpa and my grandma have an ongoing argument about socks in sandals.		
	Short	Long	
	My grandpa keeps insisting that <i>no one cares about what ninety-year-olds wear.</i>	My grandpa keeps insisting that the combination makes for sensible footwear. Sandals are much easier to put on than shoes. <u>Also</u> , <i>no one cares about what ninety-year-olds wear.</i>	
Target	My grandma feels you should never stop caring about what you look like.		
Final	Next thing you know, you spend the rest of your life in your pajamas!		

Figure 1 Residual reading times (ms) in the English (left) and German (right) experiment



References:

[1] Rohde, H., & Kehler, A. (2014). Grammatical and information-structural influences on pronoun production. *Language, Cognition and Neuroscience*, 29(8), 912-927. <https://doi.org/10.1080/01690965.2013.854918>

[2] Clark, H. H., & Sengul, C. J. (1979). In search of referents for nouns and pronouns. *Memory & Cognition*, 7(1), 35-41. <https://doi.org/10.3758/BF03196932>

[3] Arnold, J. E. (1998). *Reference form and discourse patterns*. Stanford University.

[4] Levy, R. P., & Keller, F. (2013). Expectation and locality effects in German verb-final structures. *Journal of Memory and Language*, 68(2), 199-222. <https://doi.org/10.1016/j.jml.2012.02.005>

[5] Scholman, M. C., Rohde, H., & Demberg, V. (2025). On the persistence of discourse predictions: The facilitative effect of discourse markers diminishes in the presence of intervening material. *Open Mind*, 9, 576-605. https://doi.org/10.1162/opmi_a_00203