

## Effects of Misanalysed Filler-gap Dependencies in L1 and L2 Language Comprehension

Hiroki Fujita & Ian Cunnings (University of Reading)

h.fujita@pgr.reading.ac.uk

Garden-path (GP) sentences (e.g., “While Mary dressed the baby played.”) often cause misinterpretation in native (L1) and non-native (L2) comprehension, with reanalysis being particularly difficult for L2ers [1,2,3]. Recent research suggests misinterpretation results from a failure to erase the initial interpretation (“Mary dressed the baby”) from memory rather than incomplete syntactic reanalysis [4]. While many studies have tested lingering misinterpretation in GP sentences, little is known about whether such effects occur in filler-gap dependencies that also require reanalysis. The present study addresses this issue and examines filler-gap dependencies like (1a). In (1a), “the novel” is the complement of “about” but may initially be interpreted as the theme of “read”. Thus, the correct answer to the question in (2) is “no”, but readers may incorrectly answer “yes” if the initial misinterpretation lingers. To examine whether reanalysing sentences like (1a) influences subsequent language comprehension, we conducted two experiments with 40 native English speakers and 40 upper intermediate-advanced English language learners.

Experiment 1 (Ex1) tested 12 sentences as in (1) and questions like (2). (1a) is temporarily ambiguous and requires reanalysis, while (1b) is unambiguous due to the fronted preposition (“about which”). If misinterpretation lingers, comprehension accuracy should be lower in (1a) than (1b). Experiment 2 (Ex2), conducted at least one week before Ex1, tested 24 sentences like (3) while participants’ eye-movements were monitored. The first sentences in (3a/3c) are temporarily ambiguous, while (3b/3d) are not. Longer reading times are expected after the preposition (“earlier”) in (3a/3c) than (3b/3d) due to reanalysis [6]. A continuation sentence was also manipulated. In (3a/b), the continuation sentence is consistent with the correct analysis of the first sentence (“Alan was driving near the school bus”). In (3c/d), the continuation (“Alan was driving the school bus”) is inconsistent with this correct analysis but is consistent with the initially assigned misinterpretation. Thus, if the initial misinterpretation lingers, inconsistency may be attenuated in (3c), when the continuation matches the initial (but globally incorrect) interpretation of the first sentence, compared to (3d). If similar lingering effects occur in (3a), continuation sentences may elicit longer reading times relative to (3b), as the continuation in (3a) may be misperceived as being inconsistent with the first sentence.

Comprehension accuracy rates were marginally lower for ambiguous than unambiguous sentences in Ex1. Analyses showed a main effect of ambiguity at the disambiguation region of the first sentence in regression path duration and total viewing times due to longer reading times for ambiguous than unambiguous sentences. In the continuation sentence, total viewing times showed a significant two-way interaction between ambiguity and consistency, as inconsistent sentences elicited reduced reading times for ambiguous than unambiguous sentences, showing lingering misinterpretation. At the critical region, regression path duration showed a marginal two-way interaction between consistency and group due to longer reading times for consistent than inconsistent sentences only for the L2 group, while a two-way interaction observed between consistency and group in both measures suggested that only the L1 group read inconsistent sentences more slowly than consistent sentences.

These results indicate lingering misinterpretation in sentences with filler-gap dependencies like (1/3). One potential reason for the unexpected low accuracy rates for unambiguous sentences in Ex1 may be that participants assigned the correct structure (e.g., “the girl read about the novel”), but then additionally inferred that “the girl also read the novel” when the comprehension question was asked. This may be similar to inferences that are made in GP sentences with optionally transitive verbs (e.g., “As the hunter shot the deer ran into the woods.”) [1]. Ex2 suggests that the lingering misinterpretation observed here results at least partly from a failure to erase the initially assigned interpretation.

- (1a) The boy bought the novel which the girl read very happily about last night.  
 (1b) The boy bought the novel about which the girl read very happily last night.  
 (2) Did the girl read the novel? 1. Yes 2. No
- (3a) The girl was in the school bus which Alan was driving very slowly near earlier today.  
 Alan was driving near the school bus very patiently on the road.  
 (3b) The girl was in the school bus near which Alan was driving very slowly earlier today.  
 Alan was driving near the school bus very patiently on the road.  
 (3c) The girl was in the school bus which Alan was driving very slowly near earlier today.  
 Alan was driving the school bus very patiently on the road.  
 (3d) The girl was in the school bus near which Alan was driving very slowly earlier today.  
 Alan was driving the school bus very patiently on the road.

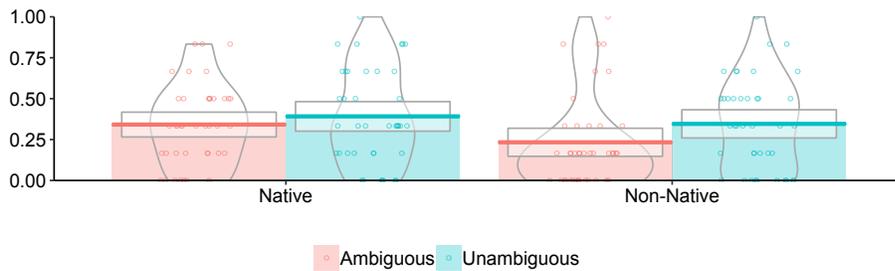


Figure 1. Proportion of correct responses in Ex1.

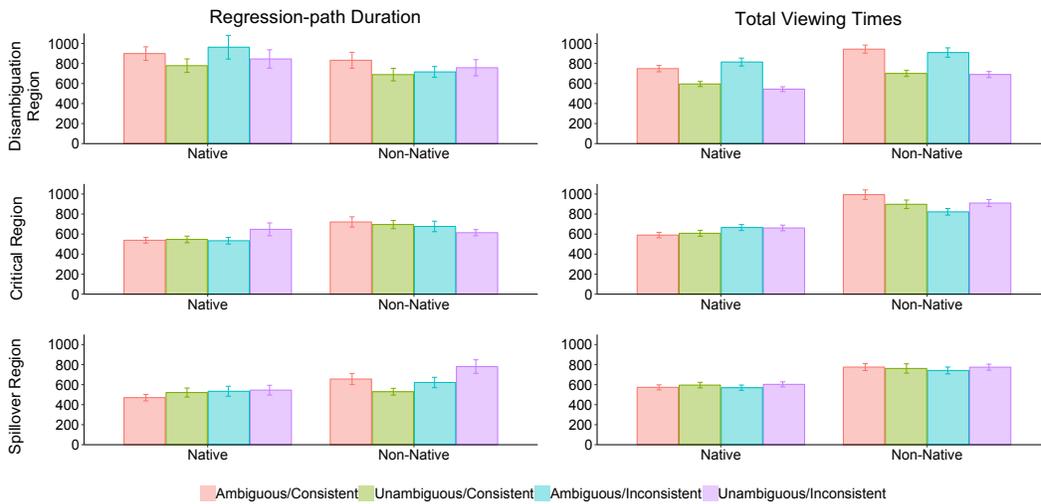


Figure 2. Reading times in Ex2. Note: Disambiguation Region = “earlier”, Critical Region = “the school bus”, Spillover Region = “very patiently on”.

## References

- [1] Christianson et al. (2001), *CP*, 42, 368–407; [2] Jacob & Felser (2016), *QJEP*, 69, 907–925; [3] Pozzan & Trueswell (2016), *BLC*, 19, 636–643 [4] Slattery et al. (2013), *JML*, 69, 104–120; [5] Stowe. (1986), *LCP*, 1, 227–245; [6] Traxler & Pickering (1996), *JML*, 35, 454–475.