Grammaticized resumption in sentence processing: Disrupting rather than facilitating

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Resumptive pronouns (RPs), pronouns appearing at the tail of filler-gap dependencies, have attracted much attention in the linguistic literature. Many share the intuition that their distribution (in grammaticized and intrusive RP languages alike) is associated with sentence-processing costs and that they provide a tool for facilitation of such a load, and in particular for aid in retrieving an inaccessible filler (Ariel, 1999; Erteschik-Shir, 1992; Hawkins, 1999; among others). However, much experimental data collected in recent years was found to be incompatible with the notion that RPs facilitate processing, cross-linguistically (Alexopoulou & Keller, 2007; Meltzer-Asscher et al., 2015; Polinsky et al., 2013). Previous experimental studies of grammaticized resumption in Hebrew exhibited that such pronouns disrupt processing when they are optional, due to their redundancy (Fadlon et al., 2018). In the current study we further explore whether RPs aid retrieval of the filler in Hebrew.

Experiments 1 and 2 investigate the processing of Hebrew RPs within PPs, where they are obligatory, and test interference by a non-filler antecedent in an "agreement attraction" manipulation. We exhibit that even when RPs are obligatory, the resumptive interpretation of the pronoun does not take precedence over reference to a non-filler antecedent, resulting in interference. We observed two distinct patterns of interference effects (Figure 1). In the first experiment (32 participants; 32 sets + 48 grammatical filler sentences), where a matching distractor intervened between the filler and the RP, an inhibitory effect (p = .03) was observed in grammatical sentences (i.e. slower RTs when the both the distractor and the filler matched the RP). In the second experiment (48 participants; 32 sets + 48 grammatical filler sentences), when filler-distractor order was reversed, a significant faciliatory effect (p = .01) was observed in ungrammatical sentences (i.e. faster RTs when the distractor matched the RP). This suggests that RPs always introduce ambiguity (i.e. may be interpreted as regular pronouns) and thus potentially disrupt the retrieval of the filler, rather than aid in it.

In addition, in a different experiment (160 participants; 8 sets + 24 grammatical filler sentences), we addressed the question of whether RPs aid retrieval by using center embedding sentences, in which successful retrieval routinely fails. Participants rated the complexity of sentences of four conditions manipulating (i) the distinctiveness of the φ-features on the three subject NPs and (all identical vs. all different) (ii) the occurrence of RPs. Results revealed resumption did not significantly affect comprehensibility. Furthermore, the advantage of φ-features distinctiveness was observed only in the absence of resumption (interaction p = .03, Figure 2). This suggests that RPs are unable to aid in recovering a constituent which is unavailable in working memory (in situations of high complexity). Moreover, resumption cancels out the advantages of distinct agreement, thereby decreasing the comprehensibility of the sentence. The 'missing V2' illusion (the observation that center embedding is better accepted when only two of the verbs appear, Frazier, 1985; Gibson & Thomas, 1999) can shed light on these findings. One account for this observation (Gibson & Thomas, 1999) suggests that in such cases one of the dependencies is compromised, thus concealing the processing difficulty. In a similar vein, our results can suggest that in addition to not aiding in resolving the dependencies, resumption also blocks the option to neglect one of the dependencies, leading to increased ratings of complexity.

To conclude, the results suggest that both in simple sentences and in high working memory load cases, RPs are not used to support the comprehension or parsing of long-distance dependencies in Hebrew (and possibly in other grammaticized resumption languages).

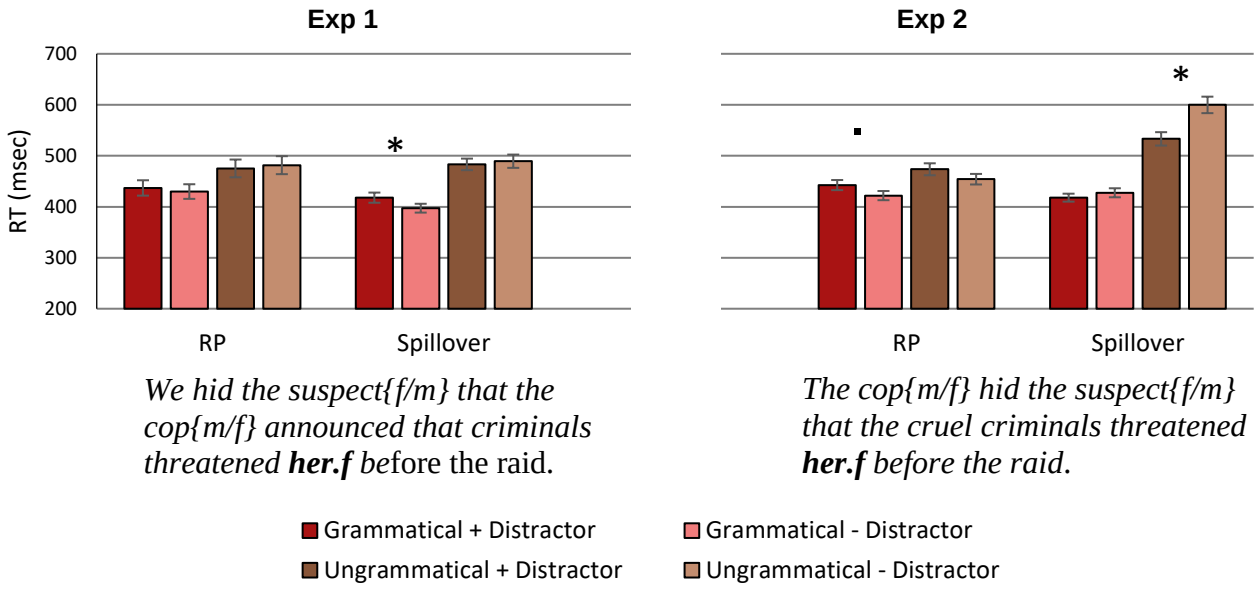
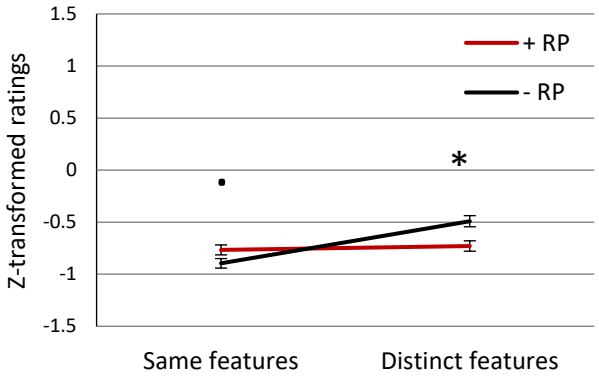


Figure 1. Materials and results of Experiments 1-2. Error bars mark +/-1 SE; * reprsernts p < .05; ▪ represents p < .10; Analysis was conducted with a linear mixed-model regression.



SAME: *The book.sg-m that the teacher.sg-m that the student.sg-m liked.sg-m {Ø/him} read.sg-m {Ø/him} disappeared.sg-m.*

DISTINCT: *The book.sg-m that the teachers.pl-m that the student.sg-f liked.sg-m {Ø/them} read.pl-m {Ø/him} disappeared.sg-m*

Figure 2. Materials and results of Experiment 3. Error bars mark +/-1 SE; * represents p < .05; ▪ represents p < .10**;** Analysis was conducted with a linear mixed-model regression.

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