

## Resumptive pronouns affect later filler-gap dependency processing

Nikhil Lakhani, University of Pennsylvania

Dustin A. Chacón, University of Minnesota

Resumptive pronouns are pronouns that serve as the tail of a filler-gap dependency. Traditionally, they are argued to be a grammatical repair device that ameliorates island violations, demonstrated by the contrast in (1).

- (1) a. \*This is the federal agent that I don't know whether \_\_\_ likes pie.  
b. This is the federal agent that I don't know whether **he** likes pie.

Experimental evidence implies that resumptive dependencies are not actually grammatical in English [1,2]. Similarly, others argue that they are strategies used by the production system to repair an earlier, ungrammatical commitment [3, 4]. However, this does not explain why resumptive pronouns appear to ameliorate island violations for the comprehender under informal inspection as in (1), or by what mechanisms they are constructed in real-time sentence comprehension (but see [5]).

In this paper, we argue that resumptive pronouns are a kind of grammatical illusion. Whereas previous experiments have contrasted sentences with resumptive pronouns in islands with sentences with gaps in the same position, we contrast sentences with resumptives in islands with sentences with a later grammatically-licensed gap. We argue that resumptive dependencies ease processing by permitting a filler-gap dependency to resolve earlier than a later gap site, by creating a filler-resumptive relation in the discourse representation [6, 7]. This creates an amelioration effect, because shorter dependencies are preferred to longer dependencies in processing, [8].

Experiment 1 was a judgment study that showed that sentences containing filler-gap dependencies with a grammatically licensed gap are preferred to sentences without a resolution site. This is true even if there is a resumptive pronoun that could serve as the tail of the dependency. This establishes that resumptive dependencies are dispreferred to grammatically licensed gaps, further supporting the claim that they are ungrammatical. Experiment 2 was a self-paced reading study investigating processing difficulty after a resumptive pronoun. We found that reading times decreased in a filled-gap region after an island if there was a potentially resumptive pronoun earlier. Thus, having seen a resumptive pronoun appears to decrease the need for a later gap site. We propose that this is because, some proportion of the time, the comprehender mistakenly resolves the dependency with the pronoun, diminishing the expectation for a later, grammatically-licensed gap site, and that this may be the source of the island amelioration effect.

**Experiment 1.** Experiment 1 tested whether participants preferred earlier resumptive dependencies to later filler-gap dependencies. Experiment 1 was an acceptability judgment task using a 1–7 scale. We used a 2×2×2 design, N = 64. We manipulated the subject clause gender to either match or mismatch the gender of the filler (Match/Mismatch), the presence of a pronoun in an island context (RP/No RP), and the presence of a later grammatically-licensed gap (Gap/No Gap). The resumptive pronoun appeared as a possessor of another NP, which is an island for extraction. The No RP conditions and the No Gap conditions contained a proper name in their respective positions. The subject gender manipulation was introduced to test whether multiple potential antecedents on the resumptive pronoun would affect the availability of the resumptive dependency, which has been shown to have an effect elsewhere [7]. We predicted that sentences with a grammatically licensed gap should be rated higher than their No Gap comparisons, even if there was a potentially resumptive pronoun earlier. However, if resumptive pronouns are grammatical, then this contrast should be partially minimized, as it would be grammatical to resolve the dependency with the pronoun, making a later gap site unnecessary.

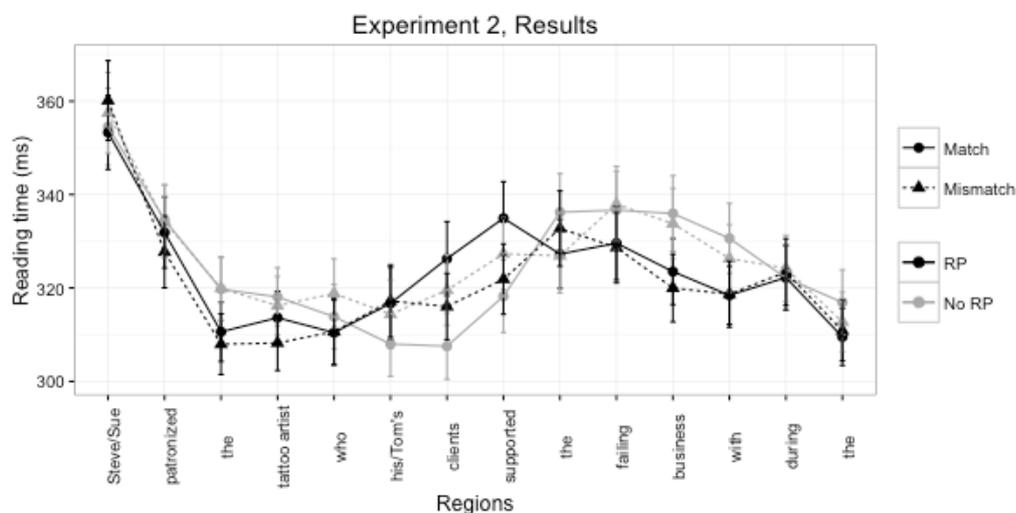
- (2) {Steve/Sue} patronized the tattoo artist  
who {his/Tom's} clients supported the failing business with {Ø/Aaron}  
during the hard times.

We found a main effect of gap ( $\beta = -0.43$ ,  $SE = 0.05$ ,  $t(1954) = -8.0$ ,  $p < 0.001$ ), and found no effect of pronoun, subject gender, or any of their interaction terms. We also performed pair-wise comparisons between each Gap/No Gap pair, and also found that there were higher ratings for Gap sentences across the board. This demonstrates that resumptive pronouns do not diminish the need for a later gap site for a filler-gap dependency.

**Experiment 2.** Experiment 2 was intended to determine whether a resumptive pronoun affected search for a later gap site. Experiment 2 was a self-paced reading task. We used a  $2 \times 2$  design,  $N = 72$ , with the same materials and manipulations as in Experiment 1, excluding the gap manipulation. All sentences contained a grammatically licit gap for the filler-gap dependency, to ensure that all sentences were grammatical. The regions of interest were the words immediately after the relative clause verb (*the failing business* in 2). These were the filled gap regions. Increased reading times in this region would imply a disruption of an active search for a gap site [9]. If resumptive pronouns have no effect on search for a gap site in real-time sentence processing, then we expected reading times to be similar in these regions between all conditions. Conversely, if resumptive pronouns diminish the expectation for a gap, we expected quicker reading times in these regions for the RP sentences.

We found that reading times were significantly reduced in the RP conditions in the last word of the filled gap region (*businesses*;  $\beta = -13.2$ ,  $SE = 6.6$ ,  $t(1764) = -2.0$ ,  $p = 0.047$ ) and the subsequent region (*with*;  $\beta = -13.7$ ,  $SE = 6.4$ ,  $t(1766) = -2.1$ ,  $p = 0.033$ ). There was no main effect of subject gender match or these two factors' interaction terms. Mean reading times are plotted in Figure 1. This shows that processing in a filled-gap region, and potentially processing at the actual resolution site, is partially facilitated by a having observed a pronoun earlier in the sentence. This is consistent with the claim that resumptive pronouns can serve as grammatically illusory tails for filler-gap dependencies in real-time processing, which may partially explain the amelioration effect observed in informal judgments, as it shortens the length of a filler-gap dependency.

**References:** [1] Alexopoulou, A. & Keller, F. 2007. Locality, cyclicity, and resumption. *Language* 83 [2] Heestand, D. et al. 2011. Resumption still does not rescue islands. *LI* 42. [3] Kroch, A. 1981. On the role of resumptive pronouns in amnestying island constraint violations. *CLS* 18. [4] Ferreira, F. & Swets, B. 2005. The production and comprehension of resumptive pronouns in relative clause "island" contexts. *Twenty-first century psycholinguistics: Four cornerstones*. [5] Keffala, B. Resumption and gaps in English relative clauses. *BLS* 37. [6] Erteschik-Shir, N. 1992. Resumptive pronouns in islands. *Island Constraints: Theory, Acquisition, and Processing*. [7], Chacón, D. 2015. *Comparative psychosyntax*. UMD PhD Thesis. [8] Sprouse, J. et al. 2012. A test of the relation between working memory capacity and syntactic island effects. *Language* 88. [9] Stowe, L. 1986. Parsing wh-constructions: evidence from on-line gap location. *LCP* 1



**Figure 1**