Distance Modulates Influence of Inappropriate QPsq on Pronoun Resolution in Spanish

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Background. Pronoun resolution provides a valuable case study to explore how formally-motivated linguistic constraints interact with memory retrieval mechanisms during real-time language comprehension. Pronouns require feature-matching antecedents, but not all matching NPs are possible antecedents. In (1), the Spanish object clitic 'lo' in the relative clause can take the referential NP 'el niño' as its antecedent, but not the quantificational NP (QP) 'ningún niño' in the same position in (2) because a QP must c-command a pronoun to bind it. Previous work in English [1-3] has tested whether structurally inappropriate gender-matching QPs facilitate the processing of a pronoun when no grammatical antecedent is present in the sentence and has consistently found no evidence of interference. We test the robustness of this generalization with two online self-paced reading (SPR) studies in Spanish. Contrary to previous findings, in Experiment 1 we find that structurally inaccessible QPs exert at least some influence on the processing of clitic pronouns. In Experiment 2 we test whether the influence of the QP would be diminished with distance, as previous work has suggested that increased distance minimizes the probability of interference from structurally inappropriate QPs [6]. Surprisingly, we find that the influence of the inappropriate QP persists and is *greater* with increased distance.

(1) Las profesoras $_{RC}$[a las que <u>el niño</u>$_i$ no respeta] quieren castigar**lo**$_i$.
The teachers $_{RC}$[who the boy$_i$ does not respect] want to punish-**him**$_i$.
(2) Las profesoras $_{RC}$[a las que <u>ningún niño</u>$_i$ respeta] quieren castigar**lo**$_{*i}$.
The teachers $_{RC}$[who no boy$_i$ respects] want to punish-**him**$_{*i}$.

Design. 24 experimental items were constructed. Items for both Experiment 1 and 2 followed a 2 x 2 design manipulating the factors *NP Type* and *Match*, see Table 1. Sentences started with a plural NP, to which a relative clause (RC) was attached. *NP Type* controlled whether the subject of the RC was *referential* (*el/la*) or *quantificational* (*ningún/a*). *Match* manipulated whether the NP *matched* or *mismatched* the critical object clitic (*lo*) later in the sentence. The object clitic was attached to an infinitival verb in the main clause in Experiment 1, and in an embedded complement clause in Experiment 2.

Results (SPR). Average region-by-region RTs for both experiments can be seen in Figures 1 & 2. *Experiment 1, N=104***.** Maximal linear mixed effects models on raw RTs revealed a significant Match * NP Type Interaction (t = -2.16) at the critical region, reflecting a GMME in the *referential* conditions (diff = 45ms, t = 2.48), but not in the *quantificational* conditions (diff = 7ms, $|t| < 1$). In the spillover region, there was a main effect of Match (t = 3.58), qualified by a Match * NP Type Interaction (t = -2.15). Planned comparisons revealed a significant GMME in the *referential* conditions (diff = 67, t = 4.21), and not in the *quantificational* conditions (diff = 15, t < 1.49), although a trend towards a GMME was observed in the latter. *Experiment 2, N=94***.** At the critical region, there was only a significant main effect of Match (t = 2.10). In the spillover region a main effect of Match was significant (t = 4.96), as was a Match * NP Type interaction (t = -2.07). The interaction effect reflected a GMME in both the *referential* (diff = 57ms; t = 4.98) and *quantificational* conditions (diff = 22ms; t = 2.70).

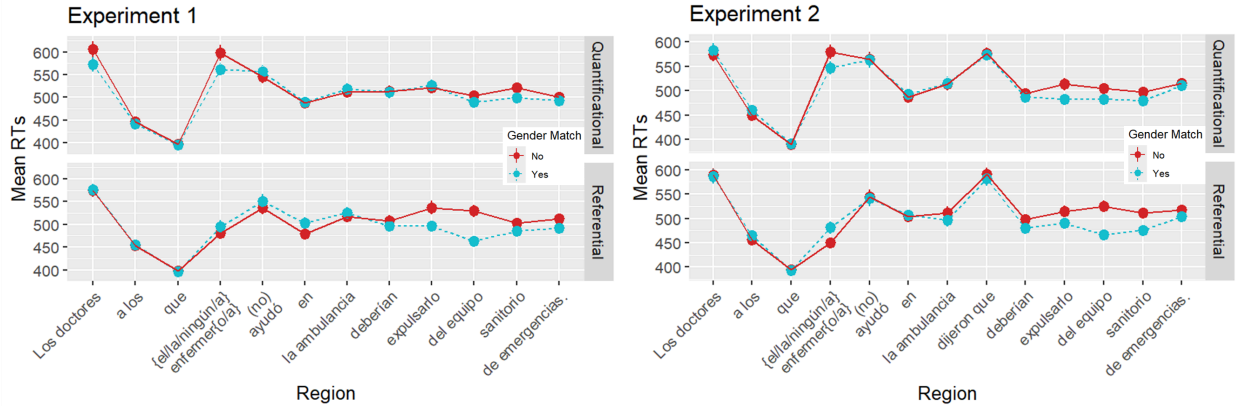
Discussion. Our results suggest that the presence of a matching QP facilitates pronoun processing in Spanish. While this may reflect misretrieval of the inappropriate QP, we offer two alternative explanations. One hypothesis is that participants occasionally misremember the QP as a referential NP, thus enabling retrieval. Another possibility is that a matching QP facilitates

the accommodation or coercion of a referential antecedent for the pronoun. We explore these three hypotheses in this presentation.

Table 1. Sample set of experimental items for Experiment 1 (top) & Experiment 2(bottom).

Experiment 1	Referential	Los doctores $_{RC}$[a los que {el/la enfermero/a} no ayudó en la ambulancia] deberían expulsar**lo** del equipo sanitario de emergencia. *The doctors$_{RC}$[who {the nurse$_{-masc/-fem}$} did not help on the ambulance] should expel **him** from the emergency medical team.*
	Quantificational	Los doctores $_{RC}$[a los que {ningún/a enfermero/a} ayudó en la ambulancia] deberían expulsar**lo** del equipo sanitario de emergencia. *The doctors$_{RC}$[who {no nurse$_{-masc/-fem}$ helped on the ambulance] should expel **him** from the emergency medical team.*
Experiment 2	Referential	Los doctores $_{RC}$[a los que {el/la enfermero/a} no ayudó en la ambulancia] dijeron *que* deberían expulsar**lo** del equipo sanitario de emergencia. *The doctors$_{RC}$[who {the nurse$_{-masc/-fem}$} did not help on the ambulance] said that they should expel **him** from the emergency medical team.*
	Quantificational	Los doctores $_{RC}$[a los que {ningún/a enfermero/a} ayudó en la ambulancia] dijeron que deberían expulsar**lo** del equipo sanitario de emergencia. *The doctors$_{RC}$[who {no nurse$_{-masc/-fem}$} helped on the ambulance] said that they should expel **him** from the emergency medical team.*

Figures 1 & 2. Average RTs by region for Experiment 1 (left) and Experiment 2 (right).



References

[1] Kush, D., Lidz, J., & Phillips, C. 2015. *JML*; [2] Cunnings, I., Patterson, C., Felser, C. 2015. *Frontiers in Psychology*; [2] Moulton, K., Han, C. 2018. *Linguistic Society of America*; [4] Sturt, P. 2003. *JML*; [5] Kazanina, N., Lau, E., Lieberman, M., Yoshida, M., & Phillips, C. 2007. *JML;* [6] Parker, D., Phillips, C. 2016. *Cognition*