

Number mismatches in the processing of object relative clauses:
Does featural Relativized Minimality operate in L2?

Object relative clauses (ORCs), as in (1a), are known to cause difficulties in L1 acquisition (e.g., Adani et al. 2010) and adult processing (e.g. Gordon et al. 2001). Friedmann et al. (2009) account for this in terms of Relativized Minimality (RM) (Rizzi 1990): the subject of the relative clause intervenes between the head noun (the object) and its source position, potentially making interpretation harder, in contrast to subject relative clauses (SRCs); compare (1a) and (1b). In addition, Friedmann et al. propose featural RM, whereby a mismatch between features on the head and the intervenor may make processing easier. In (2), the mismatch involves the number feature (singular versus plural).

- (1) a. The hippo that the rhino is washing _ has climbed onto the stool. (ORC)
b. The hippo that is washing the rhino has climbed onto the stool. (SRC)

- (2) The hippo that the rhinos are washing _ has climbed onto the stool. (ORC, mismatch)

The mismatch effect in L2 has recently been investigated in RCs and other structures. When the mismatch involves different kinds of NPs, as in (3), results show that L2ers are faster on mismatched items (Cunnings & Fujita 2023; Owerdieck & Hopp 2023), similar to the results originally reported for adult native speakers (Gordon et al. 2001).

- (3) The hippo that John is washing _ has climbed onto the stool. (NP/name mismatch)

However, no mismatch advantage has been found for number (Franciotti & Martohardjono 2022; Owerdieck & Hopp 2023; Xia et al. 2022). One possible explanation relates to the stimuli. L1 studies (with children and adults) have used centre-embedded RCs, as in (1) and (3), whereas studies on L2 English have used sentence-final RCs; see (4). Sentence-final RCs may be relatively easy for adult L2ers, such that a mismatch conveys no advantage; stronger effects might emerge in the case of centre-embedding. In addition, the simple present/past verbs used in L2 research (see (4)) may make mismatches less obvious.

- (4) I see the hippo that the rhinos wash/washed.

We investigate the effects of centre-embedding and verb form on L2 processing of RCs. We hypothesize that L2ers will be sensitive to number mismatches involving centre-embedded RCs when the verbs (in the progressive) also clearly indicate number. We anticipate that L2ers with a number-marked L1 will show greater sensitivity to number mismatches than L2ers whose L1 lacks number marking. Participants so far are Mandarin speakers (n = 30) (no L1 number marking), Spanish speakers (n = 17) (L1 has number), and native English controls (n = 35).

A self-paced reading task was administered, in order to determine whether mismatched ORCs take longer to process than SRCs or than matched ORCs. There were 8 sets of 4 sentences manipulating RC type (subject/object) and intervenor type (\pm singular), plus 8 distractor sets. Sentences were presented in segments, each sentence followed by a set of 4 pictures to choose from, in order to determine participants' interpretations (see example in Figure 1). Reading times (RTs) were measured by segment and for the entire sentence. RTs were analyzed with linear mixed-effects regressions, accuracy with a logistic mixed-effects regression.

Results show that L2ers are generally accurate in interpreting matched and mismatched SRCs and ORCs. As far as RTs are concerned, ORCs were slower than SRCs, but there was no statistical mismatch advantage for any group, either at the relevant segment or as a whole, contrary to our hypothesis. See Figure 2.

In conclusion, even with centre-embedded RCs and more informative verbs, feature mismatches do not appear to convey a processing advantage, regardless of L1. This is true of the native speakers as well as the L2ers. We speculate as to whether it is number alone, or other features as well, that fail to show featural RM effects in English.

Figure 1. Sample stimulus

The athlete/who/the sailors/were pushing/was wearing/a gold uniform/.

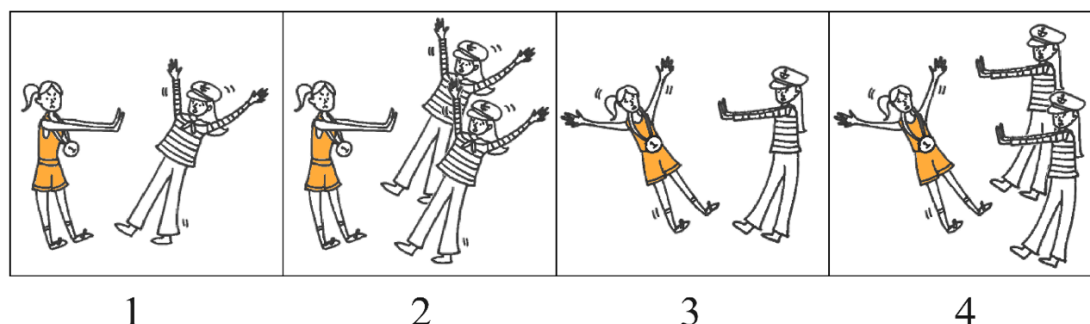
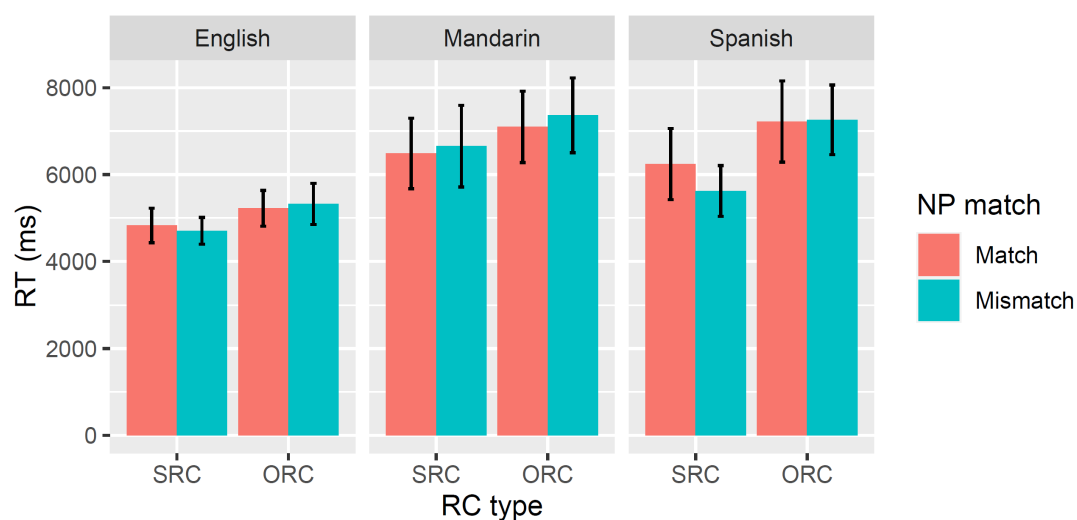


Figure 2. Total RTs by group, RC type and match



References

- Adani, F., Forgiarini, M., Guasti, M. T. & van der Lely, H. 2010. Grammatical feature dissimilarities make relative clauses easier. *Lingua* 120: 2148–2166.
- Cunnings, I. & Fujita, H. 2023. Similarity-based interference and relative clauses in second language processing. *Second Language Research* 39: 539–563.
- Franciotti, P. & Martohardjono, G. 2022. On the processing of filler gap dependencies in L2 Italian: a self-paced reading study. Poster presented at GASLA 16, Trondheim, Norway, May 2022.
- Friedmann, N., Belletti, A. & Rizzi, L. 2009. Relativized relatives: Types of intervention in the acquisition of A-bar dependencies. *Lingua* 119: 67–88.
- Gordon, P., Hendrick, R. & Johnson, M. 2001. Memory interference during language processing. *Journal of Experimental Psychology: Learning, Memory and Cognition* 27: 1411–1423.
- Öwerdieck, D. & Hopp, H. 2023. Grammatical features in L1 German – L2 English sentence processing. Paper presented at EUROSOLA 32, Birmingham, UK, August 2023.
- Rizzi, L. Relativized minimality. MIT press.
- Xia, V.Y., White, L. & Guzzo, N. B. 2022. Intervention in relative clauses: Effects of relativized minimality on L2 representation and processing. *Second Language Research* 38: 347–372.