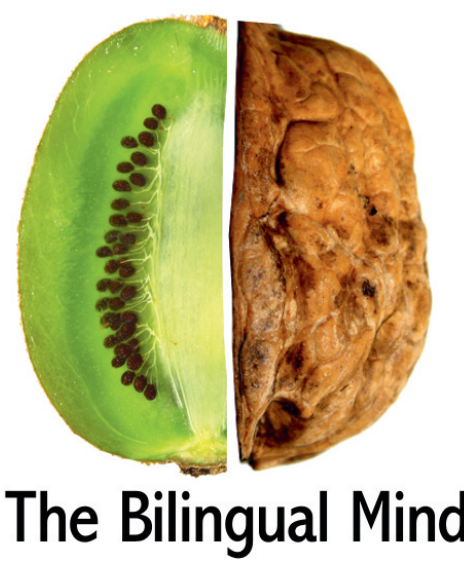


Processing Postnominal Relative Clauses in Basque: an Inquiry into the Dependency Locality Theory

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Introduction

Studies from many languages consistently report a processing advantage for subject relative clauses (SRs) over object relative clauses (ORs) (e.g. [1]). Some hypotheses argue that SRs are universally easier to process, whereas other hypotheses, such as The Dependency Locality Theory (DLT, [2]), make opposite predictions depending on the parametric values of the languages.

The DLT argues that increasing linear distance (intervening words) between filler and gap is correlated with increasing processing complexity. Accordingly, SRs are predicted to be easier than ORs in postnominal relatives, but the opposite processing preference should be expected for prenominal relatives, with ORs being processed easier. However, results from several prenominal languages such as Chinese, Japanese, and Korean reporting a SR advantage (e.g., [3], [4], [5]) cast doubts on the DLT, so it is in need of further scrutiny.

Crucially, Basque has both prenominal and postnominal relative clauses. Thus, it provides a unique opportunity to evaluate the impact of linear distance in the RC processing asymmetry, as well as to explore any possible influence of language specific factors. Recent evidence from Basque testing prenominal relative clauses has revealed an OR advantage ([6]). We report results from a self-paced reading experiment on postnominal subject and object relative clauses.

On Basque grammar

- ▷ Head-final (SOV) and free word order
- ▷ Ergative language
- ▷ Rich noun and verb morphology
- ▷ Prenominal as well as postnominal relative clauses

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Research questions

- ▷ Does word order impact on the processing of filler-gap dependencies?
- ▷ What is/are the ultimate source(s) of the subject and object relative clause processing asymmetry?

Experimental Procedure

> Participants

40 native speakers of Basque.

> Method

Word-by-word self-paced reading experiment with comprehension questions after each experimental item.

> Materials

26 experimental items (13 SR and 13 OR) + 74 fillers.

Experimental sentences were constructed using the *-ak* ending, which is ambiguous between a subject-singular and an object-plural reading. Relative clauses were ambiguous between a subject-gap or an object-gap reading until the inflected verb of the main clause was reached, in the next-to-last position.

(SR)

Ikasle-a-k₁, [_{RC} zein-a-k₁ e₁ irakasle-ak aipatu bait-ditu] lagun-ak ditu orain.
Student-sg-ERG₁, [_{RC} who-sg-ERG₁ e₁ teacher-pl mentioned COMP-has], friend-pl has now.
“The student, who mentioned the teacher, has friends now.”

(OR)

Ikasle-ak₁, [_{RC} zein-ak₁ irakasle-a-k e₁ aipatu bait-ditu] lagun-ak dira orain.
Student-pl₁, [_{RC} who1 teacher-sg-ERG e₁ mentioned COMP-has], friend-pl are now.
“The students, who the teacher mentioned, are friends now.”

Results

Postnominal SRs show a processing advantage over ORs

SRs showed shorter reading times at the critical disambiguating region (r7, $p < .05$) as well as at the subsequent region (r8, $p < .05$).

Comprehension accuracy was higher for subject relatives (SR=86%, OR=81%, $p = .012$).

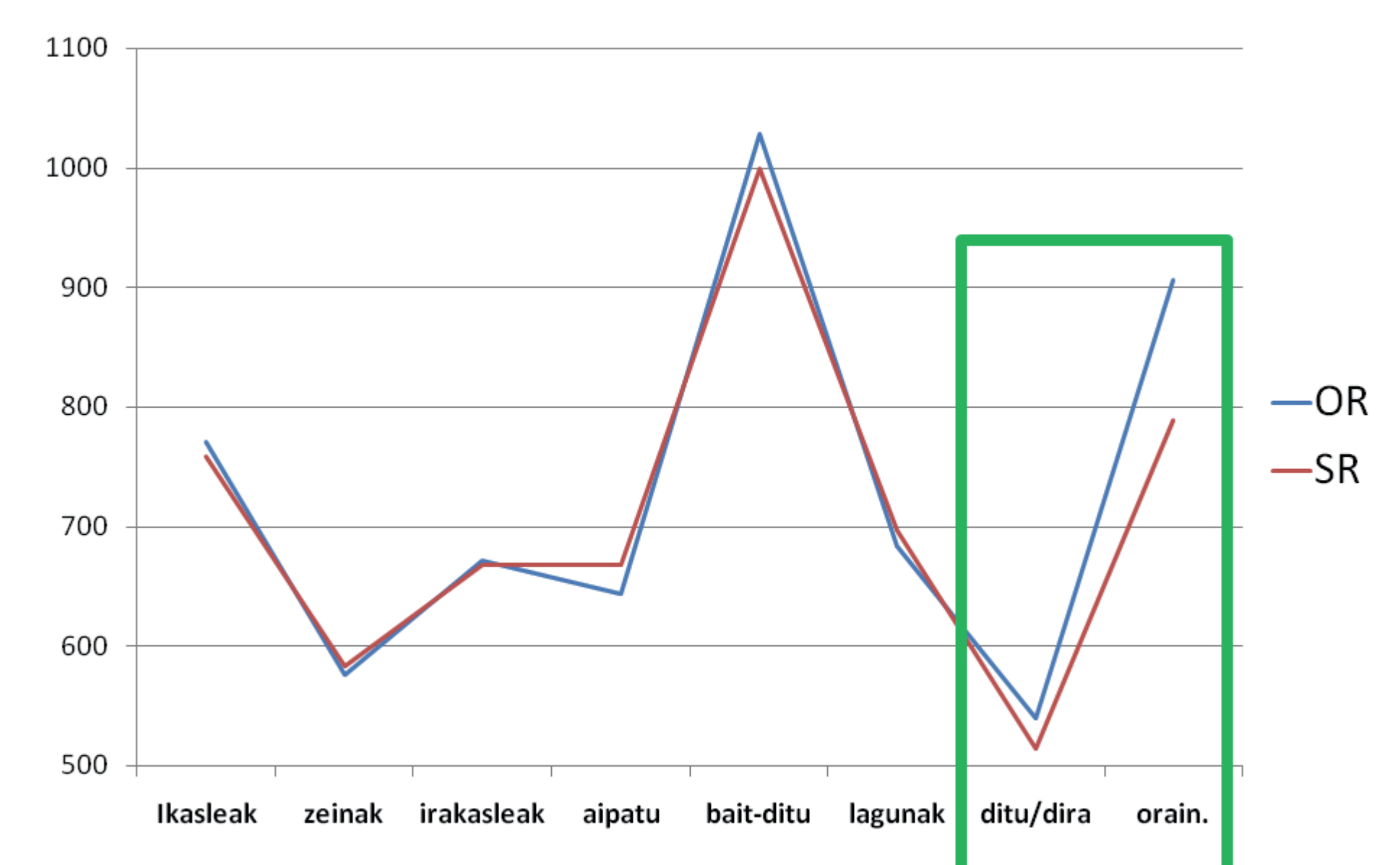


Fig.1: reading times for the different regions of the sentences containing SR and OR clauses.

Discussion & conclusions

Results show an SR advantage for postnominal relative clauses in Basque, in contrast to results from prenominal relative clauses, where an OR advantage is found. These results suggest that word order is a relevant factor when processing filler-gap dependencies. However, results from prenominal relative clauses such as Chinese, Korean and Japanese where an SR advantage is found suggest that word order is not the only

factor determining processing asymmetries in filler-gap dependencies, and that other linguistic properties are also at play.

The processing asymmetries found in Basque can be accounted for by the interplay of word order and ambiguity resolution. If sentence initial NP *-ak* is processed as subject-singular, the prenominal/postnominal effect can be naturally accounted for.

References

- [1] King, J., & Just, M. A. (1991). Individual differences in syntactic processing: The role of working memory. *Journal of Memory and Language*, 30, 580-602.
- [2] Gibson, E. (1998). Linguistic complexity: Locality of syntactic dependencies. *Cognition*, 68(1), 1-76.
- [3] Lin, C.-J. C., and Bever, T.G. (2006) [1]. Chinese is no exception: Universal subject preference of relative clause processing. Paper presented at The 19th Annual CUNY Conference on Human Sentence Processing, CUNY Graduate Center, New York, NY.
- [4] Ishizuka, T. (2005). Processing Relative Clauses in Japanese. In Okabe and Nielsen (Eds.) *Working Papers in Linguistics*, no.13, *Papers in Psycholinguistics* 2 (135-57). UCLA.
- [5] Kwon, N., Polinsky, M., and Kluender, R. (2006) Subject preference in Korean. In D. Baumer, D. Montero, and M. Scanlon (Eds.) *Proceedings of the 25th West Coast Conference on Formal Linguistics (1-14)*. Somerville, MA: Cascadia Proceedings Project.
- [6] Carreiras et al. (2010). Subject relative clauses are not universally easier to process: Evidence from Basque. *Cognition*, 115 (1), 79-92.