

Real-time processing of relative clauses in heritage speakers of Greek in Germany

Long distance dependencies such as relative clauses (RCs) are vulnerable in heritage grammars (e.g. Montrul 2008). Results of previous studies are still inconclusive, as some studies show that heritage speakers (HSs) are sensitive to higher and more salient positions in the structure, and less sensitive to case morphology than monolingually raised speakers, others show that the processing of object relative clauses (ORs) may or may not actually cause extra difficulty to HSs (O'Grady, Lee and Choo, 2001; Polinsky, 2011; Sánchez-Walker, 2013). Studies on the processing of RCs in children also have contradictory results. Although heritage children (h-children) have been shown to have native-like comprehension but not native-like production of RCs (Jia & Paradis 2016), non-native performance in comprehension has also been shown (Kidd, Chan & Chiu, 2015). This study aims to contribute to a better understanding of h-children and heritage adults' (h-adults) parsing strategies in the real-time processing of RCs in heritage Greek in contact with German.

In Greek, RCs are post-nominal and there are two types of relativizers, the complementizer *pu* ("that") and the relative pronoun *o opios* ("who"), which is inflected for gender, number and case and agrees with the NP that it modifies. Importantly, the investigation of the online processing of RCs in heritage Greek in contact with German is particularly interesting because Greek and German native speakers do not seem to adopt the same strategies when processing RCs in real time. In German, which is a verb final and V2 language with a relative flexibility of non-verbal constituents and rich morphological marking, predictive processing is the main parsing strategy in native speakers' processing of complex structures (Konieczny 2000, Konieczny & Döring 2003). Greek is also a language with rich morphological marking but in contrast to German, it is a free word order language. Previous research has shown that native speakers of Greek in line with native speakers of Russian and Hungarian adopt a combination of predictive and memory limitation parsing strategies in RC processing (Levy, Fedorenko & Gibson 2013, Kovács & Vasisht 2013, Katsika & Allen 2014).

We conducted a self-paced listening task in Greek in which we manipulated the type of RC (subject vs. object), and the RC internal word order (canonical vs. scrambled). RCs were introduced with the complementizer *pu* ('that'). In total there were four conditions (see examples 1a-1d). Sentences were presented in a segment-by-segment fashion, and in the end of each sentence participants judged the grammaticality of the sentence by pressing one of two buttons. We have up to now recorded online listening times and grammaticality judgments from 18 11- to 13-year-old children and 7 adults (data collection in process).

The statistical analysis of the listening times (LTs) on the RC verb segment showed faster LTs for ORs than SRs in h-children and adults (marginal significance for adults due to lack of power). This contrasts the previous finding of faster processing for SRs in monolingually raised Greek speakers (Katsika 2014). In addition, h-children's LTs correlated with age. The younger the children the "shallower" they seemed to process RCs, a fact possibly linked to evidence that RCs are not fully mastered until adolescence (MacWhinney & Pléh 1988). Importantly, the significant OR effect in both groups of HSs stems from h-adult and h-children's processing nominative preverbal NPs faster than accusative ones (1c vs. 1b), a pattern that contrasts with monolingually raised speakers, and may constitute evidence of cross-linguistic influence from German.

Examples

- 1a. O majiras-NOM pu **esprokse** ton servitoro-ACC ekapse to fajito. (SR, canonical)
1b. O majiras-NOM pu ton servitoro-ACC **esprokse** ekapse to fajito. (SR, scrambled)
“The cook that pushed the waiter burned the food”
1c. O majiras-NOM pu o servitoros-NOM **esprokse** ekapse to fajito. (OR, canonical)
1d. O majiras-NOM pu **esprokse** o servitoros-NOM ekapse to fajito. (OR, scrambled)
“The cook that the waiter pushed burned the food”

Figures

Figure 1. Listening times (in ms) in heritage adults.

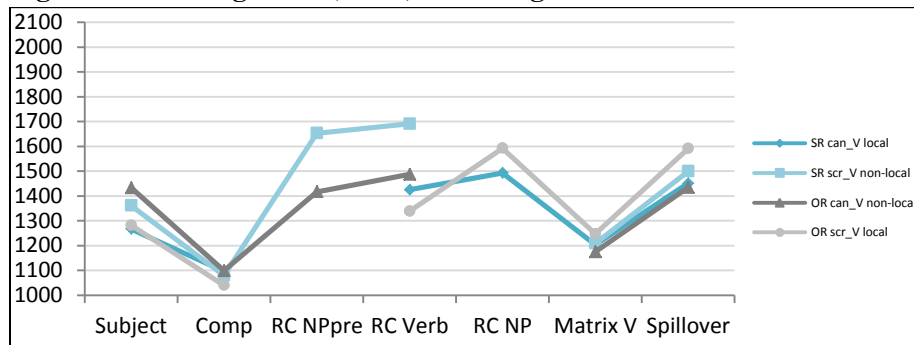
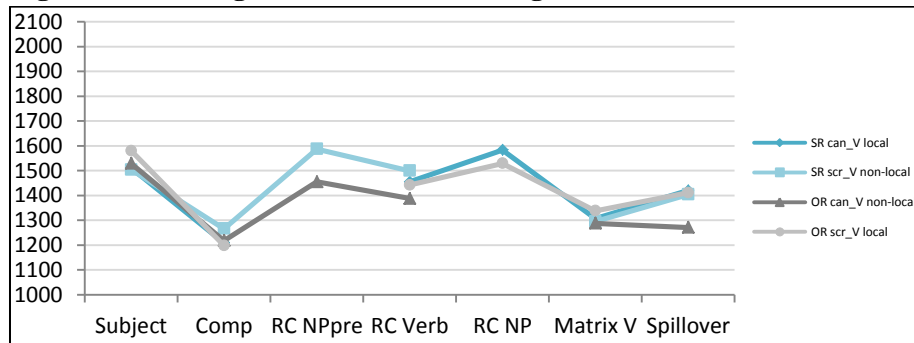


Figure 2. Listening times (in ms) in heritage children.



References

- Jia, R. & Paradis, J. (2016). The acquisition of relative clauses by Mandarin heritage language children. *Linguistic Approaches to Bilingualism*, 10(2), 153–183.
- Katsika, K., Allen, S.E. (2014). Processing subject and object relative clauses in a flexible word order language: evidence from Greek. στο: Kotzoglou, G., K. Nikolou, E. Karantzola, K. Frantzi, I. Galantomos, M. Georgalidou, V. Kourti-Kazoulis, Ch. Papadopoulou & E. Vlachou (Επιμ.), *Selected papers of the 11th International Conference of Greek Linguistics*, Rhodes: Department of Mediterranean Studies, University of the Aegean, σελ. 715-726.
- Kidd, E., Chen, A., & Chiu, J. (2015). Cross-linguistic influence in simultaneous Cantonese – English bilingual children’s comprehension of relative clauses. *Bilingualism: Language and Cognition*, 18, 438–452.
- Konieczny, L., & Döring, P. (2003). Anticipation of clause-final heads: evidence from eye-tracking and SRNs. In *Proceedings of ICCS/ASCS*.
- Konieczny, L. (2000). Locality and parsing complexity. *Journal of Psycholinguistic Research* 29 (6): 627-645.
- Kovács, N., & Vasishth, S. (2013). The processing of relative clauses in Hungarian. In Cheryl Frenck-Mestre, F-Xavier Alario, Noël Nguyen, Philippe Blache, and Christine Meunier (eds), *Proceedings of the Conference on Architectures and Mechanisms for Language Processing*, 13. Aix-Marseille Université, Marseille.
- Levy, R., Fedorenko, E., & Gibson, E. (2013). The syntactic complexity of Russian relative clauses. *Journal of Memory and Language* 69: 461-95.
- MacWhinney, B., & Pléh, C. (1988). The processing of restrictive relative clauses in Hungarian. *Cognition*, 29: 95-141.
- Montrul, S. (2008). *Incomplete Acquisition in Bilingualism. Re-examining the Age Factor*. Amsterdam: John Benjamins.
- O’Grady, W, M. Lee, & M. Choo. (2000). The acquisition of relative clauses in Korean as a second language. *The Korean Language in America*, 5, 345–356.
- Polinsky, M. (2018). *Heritage Languages and their Speakers*. Cambridge: Cambridge University Press.
- Sanchez-Walker, N. (2013). ‘Comprehension of subject and object relative clauses in Spanish heritage speakers and L2 learners of Spanish’, Qualifying doctoral paper, University of Illinois at Urbana-Champaign.