HOW GOOD A CUE IS A RESUMPTIVE PRONOUN? PROCESSING RELATIVE CLAUSES IN SLOVENIAN

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Background Processing relative clauses (RCs), in particular, temporary storage and integration of the RC head received substantial attention in the literature in connection with issues related to working memory and processing complexity. A major finding in this domain is that object relative clauses (ORC) require a greater processing effort than subject relative clauses (SRC) in SVO languages. In some languages ORCs require *resumptive pronouns/ clitics* (RP), whose role in the time course of processing ORCs is not yet well understood. Since an RP dubs a subset of the grammatical features of the stored ORC head, it could conceivably carry a facilitating role during the retrieval and integration of that head (e.g., preventing a rapid decay of its memory trace) thus lessening or even nullifying the ORC/SRC processing asymmetry mentioned above. A recent study comparing processing of ORCs with and without an RP in Hebrew did not find a facilitating effect of RP during filler retrieval [2]. However, in Hebrew the RP usually *follows* the verb, which may defuse this effect. In this regard, Slovenian presents an interesting case, as the RP occupies the second position in Slovenian ORCs (after the complementizer) but always *before* the integration site (cf. (2)). Thus its early occurrence could conceivably facilitate the filler retrieval in Slovenian ORCs.

This study We explore the time course of processing Slovenian RCs and the role of RP. Participants (adult native speakers of Slovenian, **Exp1**: N=37; **Exp2**: N=33, **Exp3**: N=35) read the sentences in the self-paced mode, followed by a comprehension question after each sentence. In **Exp.1** we ask whether the basic SRC/ORC processing asymmetry obtains in Slovenian, despite the presence of an RP. The type of RC was manipulated in two conditions (1)-(2). Materials included 16 target items per condition and 32 filler sentences followed by comprehension questions. Results: The RC verb was read longer in ORCs compared to SRCs, and postverbal NPs were read longer than preverbal NPs (Figure 1). Both observations are likely to reflect integration effects, suggesting that the presence of RP does not cancel the standard subject/object processing asymmetry. In **Exp. 2**, we ask whether this asymmetry depends on the structural position of the RC within the sentence. We manipulated RC type and structural position (center-embedded, right-peripheral), across four conditions ((3)-(6)). Materials included 24 sets of target items and 32 filler sentences. Results: similarly to Exp.1, a stable SRC/ORC asymmetry was observed at the RC verb as well as between the postverbal vs. preverbal NPs, independently of the structural position of RC in the sentence. The main clause predicate was read slower in sentences with center-embedded RCs compared to those with right-peripheral RCs, in accordance of predictions of metric-based theories of integration cost (e.g. [3]). Questions following ORCs took somewhat longer to answer than those following SRCs. At the same time, all RCs were read slower in the right-peripheral position than in the center-embedded position, and questions following right-peripheral RCs were answered significantly less accurately than those following center-embedded RCs. We attribute the greater complexity associated with the right-peripheral position to availability of a competitive parse based on a pseudo-relative structures [4]. In **Exp.3**, we adopt the basic tenets of the activation and cue-based retrieval theories maintaining that retrieval is more difficult and error-prone when the preceding context contains elements featurally similar to the retrieval target [1], and we investigate how the feature structure of an RC head and its corresponding RP may affect retrieval of the RC head with the ORC subject as a featural intervenor. Materials: by manipulating values for number and gender features between the RP and the ORC subject we created a continuum of feature matching ranging from non-matching to matching of both features, across four conditions (Table 1). 6 sentence sets were created per condition, for the total of 24 target sets, plus 32 fillers. Results: the integration effect at the RC verb was significantly greater in the condition with two matching features than in the other three conditions (with zero or one matching features). This suggests that an RP also does not cancel the intervention effect caused by featural similarity, but that a single non-matching feature may be sufficient to alleviate the effect.

(1) Motorist, ki   je prezrl   taksista   na odstavnem pasu, je zavil desno.
    Driver   which is overlooked taxi-driver on shoulder   lane, is turned right
    "The driver who overlooked the taxi-driver on the shoulder lane, turned right"
(2) Motorist, ki   **ga**   je taksist   prezrl   na odstavnem pasu, je zavil desno.
    Driver   which him is taxi-driver overlooked on shoulder   lane, is turned right
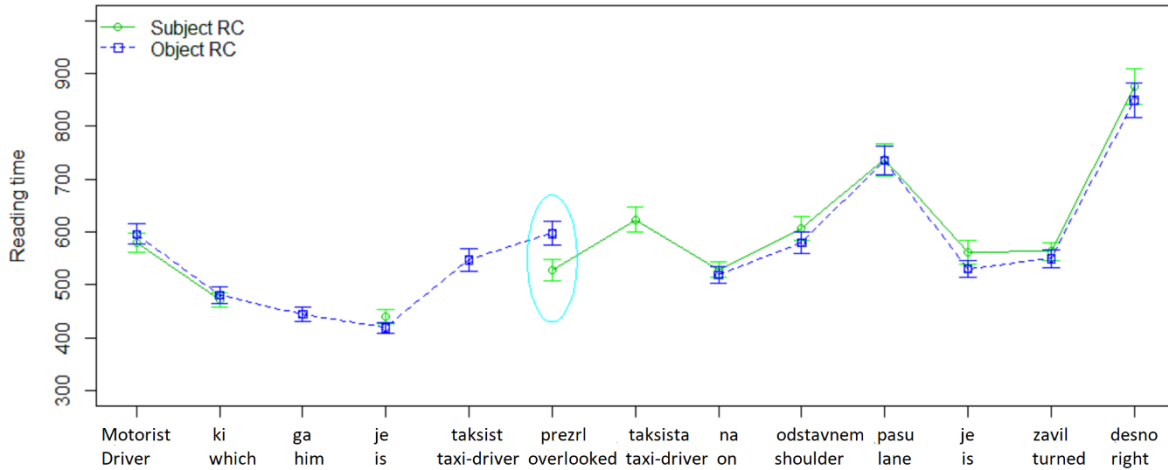   "The driver who the taxi-driver overlooked on the shoulder lane, turned right"

Figure 1. Time course of self-paced reading of Slovenian SRC and ORC.

(3) Policist,   ki   je oviral   motorista na odstavnem pasu, je prezrl taksista.   [Subject, CE]
    Policeman which is obstructed driver   on shoulder   lane is overlooked taxi-driver
    "The policeman, who obstructed the driver on the shoulder lane overlooked the taxi driver"
(4) Policist   je prezrl   taksista, ki   je oviral motorista na odstavnem pasu.   [Subject, RP]
    Policeman is overlooked taxi-driver which is obstructed driver on shoulder lane
    "The policeman, who obstructed the driver on the shoulder lane overlooked the taxi driver"
(5) Policist,   ki   ga   je motorist oviral na odstavnem pasu, je prezrl taksista.   [Object, CE]
    Policeman which him is driver   obstructed on shoulder lane is overlooked taxi-driver
    "The policeman whom the driver obstructed on the shoulder lane overlooked the taxi driver"
(6) Policist   je prezrl taksista,   ki ga je motorist oviral na odstavnem pasu.   [Object, RP]
    Policeman is overlooked taxi-driver which him is driver obstructed on shoulder lane
    "The policeman overlooked the taxi driver whom the driver obstructed on the shoulder lane"

main-Subj + *ki*	Aux	RP	Aux	RC-subj.	RC-verb	Aux	main-Verb	main-obj	MATCH RP & RC-subj.
Policist, ki Policeman-**m.sg**,		ga **him**	je is	motorist driver-**m.sg**	oviral obstructed	ie is	prezrl overlooked	taksista taxi-driver	+num,+gen
Policist, ki Policeman-**m.sg**,		ga **him**	je is	motoristka driver-**f.sg.**	ovirala obstructed	ie is	prezrl overlooked	taksista taxi-driver	+num,-gen
Policist, ki Policeman-**m.sg**,	so are	ga **him**		motoristi drivers-**m.pl.**	ovirali obstructed	ie is	prezrl overlooked	taksista taxi-driver	-num,+gen
Policist, ki Policeman-**m.sg**,	so are	ga **him**		motoristki drivers-**f.pl.**	ovirale obstructed	ie is	prezrl overlooked	taksista taxi-driver	-num,-gen
"The policeman whom the driver(s) obstructed on the shoulder lane overlooked the taxi-driver"									

Table 1. Four conditions across number and gender values of the RP and the ORC subject;

References

[1] Lewis RL, Vasishth S. Cognitive science. 2005;29: 375–419. [2] Fadlon J, Meltzer-Asscher A. CUNY 2017. [3] Gibson E. In: Miyashita Y, Marantz A, O'Neil W, editors. Image, language, brain. pp. 95–126. [4] Grillo N, Costa J. Cognition. 2014;133: 156–187.

Language Information

Slovenian (Slovene) belongs to the Western subgroup of the South Slavic languages. It is spoken in Slovenia (ca. 2 million speakers) and adjacent enclaves in Austria, Italy and Hungary. As many other Slavic languages, standard Slovenian features a relative freedom of word order, lack of definite and indefinite articles, and a rich system of morphological feature exponence. In the nominal domain, the latter includes morphological cases (nominative, accusative, genitive, dative, locative and instrumental), grammatical number (singular, dual, plural), grammatical gender (feminine, masculine, neuter) and animacy. In the verbal domain, Slovenian has a rich system of marking verbal aspect, among other properties. Relative clauses are introduced either by a morphologically invariant complementizer *ki* "*which*" or, alternatively, by the relative pronoun *kateri* which inflects for case and morphological phi-features. Slovenian also features a system of pronominal clitics (unstressed pronouns) along with the strong pronouns. Slovenian clitics are second position clitics, as they follow the first syntactic constituent in their clause. In object relative clauses with complementizer *ki*, a resumptive clitic must dub the head of the relative clause.

References

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