## Cross-clausal dependencies in Serbian: An experimental study

Lohninger et al. (2022) develop a fine-grained typology of cross-clausal dependencies (CCD). At one end of their continuum is Prolepsis (Pr), which involves an Ā-dependency between a proleptic object base-generated in the matrix clause and a coreferent in the embedded clause (1) (Salzmann 2006, 2017). Copy Raising (CR; Rogers 1971; Potsdam and Runner 2001; Landau 2011) is a construction where the complement clause, introduced by the relator preposition such as English *like*, mandatorily contains the pronominal "copy" of the matrix subject (2). CR is structurally similar to Pr, featuring no cross-clausal movement (Potsdam and Runner 2001; Asudeh 2002; Den Dikken 2017).

- (1) I know of  $Mary_i$  that she<sub>i</sub> is a good student.
- (2) Richard<sub>i</sub> seems like  $he_i$  is in trouble.

On the opposite side of Lohninger et al. 2022's continuum is hyperraising (HR; Ura 1994), standardly defined as A-movement from a finite complement clause into the matrix clause (3). HR challenges some central components of the standard theory of movement and locality, such as Chomsky (2001)'s Activity Condition, and the Phase Impenetrability Condition (Chomsky 2000) (see also Carstens 2011; Wurmbrand 2019; Halpert 2019; Lohninger et al. 2022; Zyman 2023, a.o.).

(3) {Os meninos}<sub>i</sub> parece**m** que \_\_i fizeram a tarefa. the boys seem. 3PL that do.PST.3PL the homework

'The boys seem to have done the homework.' (Brazilian Portuguese)[Nunes 2008, ex. (31c)]

Given these challenges, attempts have been made to reanalyze HR as a non-movement configuration. Den Dikken (2017) proposes that both CR and HR involve a predication relation between a DP base-generated in the matrix clause and a bound variable in the lower clause. This predication relation is mediated by the relator head, which takes the CP containing the bindee as its complement, and the binder as its specifier (4).

(4)  $[_{RP} DP_i [RELATOR [_{CP} C [_{TP} pro_i ... ]]]]$ 

Serbian displays two constructions involving nonmovement CCD—Pr (5; Bošković 2009) and CR (6;

Ilić 2015). This paper documents a case of HR to subject (7), available for a subset of Serbian speakers. This allows for a direct within-language comparison of CR and HR—notably absent from previous work on CCD—which makes Serbian, at least those Serbian speakers who allow both CR and HR, an ideal test case for den Dikken (2017)'s unified non-movement account of CR and HR.

- (5) Rekli su za njega<sub>i</sub> da \_\_i zna francuski. said.M.PL are.3PL for him that know.PRS.3SG French
  'They said of him<sub>i</sub> that he<sub>i</sub> speaks French.' [Bošković 2009, ex. (36)]
- (6) Oni<sub>*i*</sub> deluju kao da  $\__i$  znaju sve odgovore. they seem.PRS.3PL like that know.PRS.3PL all answers 'They seem like they know all the answers.'
- (7) Oni<sub>*i*</sub> deluju da \_*i* znaju sve odgovore. they seem.PRS.3PL that know.PRS.3PL all answers 'They seem to know all he answers.'

To examine the syntactic properties of Serbian CCD (5–7), I conducted two rating experiments with native Serbian speakers. Participants (N=835 in Experiment 1, N=52 in Experiment 2) were asked to rate the acceptability of Serbian sentences on a five-point Likert scale. In both experiments, the target sentences were designed to fit the  $2\times3$  factorial design. Two factors were manipulated: **1.** CONSTRUCTION TYPE (HR vs. CR in Experiment 1; HR vs. Pr in Experiment 2), and **2.** the position of the tail of the dependency, yielding three CONDITIONS: a. baseline (no violation of movement constraints; subject-to-subject dependency as in 6–7), b. island-violating (coreferent located in the complex NP island in the embedded clause), and c. A-minimality-violating (coreferent in the embedded object position—in A-movement configurations, the

raised DP should only be able to correspond to the highest argument of the embedded clause; Zyman 2017; Lohninger et al. 2022). In both experiments, statistical analysis was limited to data from participants who rated both baseline sentences as "almost acceptable" or higher—who accept both constructions under consideration, which left data from 519 participants (62% of the overall cohort) in Experiment 1, and from 25 participants (48% of the whole cohort) in Experiment 2. The rationale behind this was that sensitivity to movement constraints cannot be tested in speakers who reject the construction across the board.



Figure 1: Proportion of grammaticality judgments (vertical axis) by Condition (horizontal axis) and Construction (faceting category) in Experiment 1 (left) and Experiment 2 (right).

The experimental results were statistically analyzed using mixed-effects ordinal regression, implemented with the ordinal R package (Christensen 2023). The models included rating as the dependent variable, with construction type, condition, and their interaction as fixed predictors, and a random intercept by participant. The interaction between construction type and condition served as an indicator of HR's sensitivity to movement constraints relative to CR/Pr.

HR showed a greater acceptability decline in non-baseline conditions than both reference constructions across both experiments (see Figure 1). In EXPERIMENT 1, HR was more negatively impacted by island violations than CR, as indicated by a significant *negative* interaction effect between HR and the island-violating condition ( $\beta$ =-.6, p<.01). HR was also more negatively affected by A-minimality violations than CR, as shown by a significant *negative* interaction effect on rating between HR and the A-minimality-violating condition( $\beta$ =-.1.39, p=.000). EXPERIMENT 2 found a similar contrast between HR and Pr. Significant *positive* interaction effects on rating were found between Pr and the island-violating condition ( $\beta$ =4.57, p=.000), and between Pr and the A-minimality-violating condition ( $\beta$ =1.75, p<.05). These positive interaction effects suggest that the decline in acceptability in non-baseline conditions was significantly smaller for Pr compared to HR. These results constitute evidence that HR involves cross-clausal movement, while CR and Pr do not. HR showed a substantial acceptability decline as a result of island and A-minimality violations, while CR and Pr do not.

The paper informs syntactic theory by demonstrating that HR is structurally distinct from CR, contrary to den Dikken (2017)'s unified account. HR is an A-movement configuration, highly sensitive to island and A-minimality effects (Zyman 2017; Wurmbrand 2019). CR was found to be generally insensitive to movement inhibitors, which adds to the existing cross-linguistic evidence for the non-movement analysis of CR (Potsdam and Runner 2001; Den Dikken 2017). In addition, the study situates CR in the broader typology of CCD, supplementing Lohninger et al. (2022)'s typological survey.