

A Conflict between Filler-Gap Accounts and Incremental Processing: Evidence from Production and Parsing of Relative Clauses (RCs) in a Head-Final Language

Several studies have revealed that subject-RCs have advantage over object-RCs in head-final languages (Korean: O'Grady, 1997; Kwon et al. 2006; Chinese: Lin & Bever, 2006; Hsu et al. 2009, cf. Hsiao & Gibson, 2003), as also established in head-initial languages. These studies have suggested this asymmetry might be due to the lesser number of structural nodes between the filler and the gap (henceforth: SDH) in subject-RCs vis-à-vis object-RCs. In these languages, one issue concerns how the processor detects the gap, which precedes its filler (RC-Head). Kwon et al. (2006) and Lin & Bever (2006) found significant slowdown at the RC-Head in object-RCs compared to subject-RCs. This indicates that gap-detection relies on the filler, as in the Active-Filler Strategy, and that the subject-object asymmetry is realised at this moment. Yet, this also suggests that the parser waits until the end of the clause to interpret the structure, which contradicts with incremental processing.

We report three experiments from Turkish children and adults (N=35) to address this issue in Turkish RCs, which pattern with Korean regarding rich morphosyntax and gap location.

Object relativization in Turkish is carried by a subordinating suffix '-DIK', followed by possessive morphology agreeing with the genitive subject (1). Subject relativization is carried by '-EN' without extra morphology (2). The gap is located deeper in object-RCs vis-à-vis subject-RCs.

- (1) [NP_{RC} Gorilla-Gen [VP GAP_i kiss-DIK-3sgPoss] lion_i]]
 'The lion that the gorilla kisses'
 (2) [NP_{RC} GAP_i [VP Gorilla-Acc kiss-EN]] lion_i]
 'The lion that kisses the gorilla'

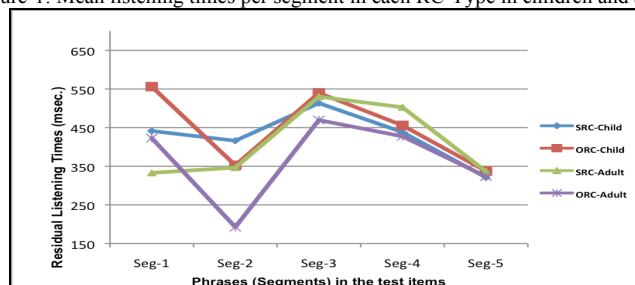
Experiment-1 (sentence-referent-matching) revealed disadvantage in object-RCs for children [F(1,35)=91.06, p<.001], which is in line with the SDH. However, this could equally be due to complex morphosyntax.

In Experiment-2 (picture-elicitation), both groups significantly avoided object-RCs [F(1,58)=22.46, p<.001], using conceptually more accessible and morphosyntactically less ambiguous structures, indicating incrementality. Furthermore, children used wrong case marking and relativizing morpheme in object-RCs, suggesting their problem cannot be confined to filler-gap dependencies.

Experiment-3 (self-paced-listening) did not yield filler-gap effects while confirming the incrementality and morphosyntactic asymmetries observed in production (Figure-1). In Segment-1, there was a slowdown at the 'NP-Gen' in object-RCs vis-à-vis the 'NP-Acc' in subject-RCs, [F(1,68)=33.97, p<.001]. Genitive is ambiguous between a possessor and an embedded subject, whereas accusative unambiguously marks the direct object. Also, 'NP-Acc' can locally attach to a verb and form a sentence whereas 'NP-Gen' is a part of a composite constituent requiring its possessive-marked head before attaching to a matrix verb, which is costly (a la Gibson, 1998). In Segment-2, listening times in object-RCs were faster than subject-RCs [F(1,68)=26.70, p<.001]. In object-RCs, this segment involves the relativized verb (V-DIK-3sgPoss), which is the head of the preceding 'NP-Gen'. Processing of the head after 'NP-Gen' seems to be highly predicted and this may have caused the facilitation in relation to subject-RCs.

We demonstrate that a processor using a bottom-up algorithm and Combinatory Categorical Grammar as described in Morgan et al. (2010) and in Vasishth & Kruijff (2001) straightforwardly captures our data, ensuring incrementality both in production and parsing.

Figure-1: Mean listening times per segment in each RC-Type in children and adults



References

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