Processing Long-Distance Dependencies in Swedish

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Extraction from relative clauses typically yields unacceptable sentences across the majority of languages. Noun phrases involving relative clauses are therefore assumed to universally comprise syntactic "islands" for extraction. The fact that (1) is judged as acceptable in Swedish is thus unexpected, which poses a problem for both syntactic accounts (e.g., Sprouse et al. 2012) and processing accounts (e.g., Hofmeister & Sag 2010) of island effects. Our study uses an eyetracking while reading paradigm to determine whether extractions from restrictive relative clauses (RCE) (1), which purportedly do not comprise syntactic islands in Swedish, elicit similar processing costs as extractions from non-restrictive relative clauses (StrongIs) (2), which are known to be strong islands in Swedish, or if they pattern closer to sentences in which an extraction has been made from an *att*-clause (NonIs) (3). In addition, we investigated the contribution of one non-linguistic factor towards processing cost via two working memory (WM) span tasks (Ospan and Reverse Digit Span).

(1) Såna där gamla skottkärror såg jag en man som alltid tvättade på bensinmacken när…
(2) Såna där gamla skottkärror såg jag en man som förresten tvättade på bensinmacken när…
(3) Såna där gamla skottkärror såg jag att en man alltid tvättade på bensinmacken när…

We used linear mixed models to analyse four eyetracking measures (first fixation duration, gaze duration, regression path duration, and total dwell time) across two regions (embedded verb: *tvättade*; PP: *på bensinmacken*). WM-spans and the frequency by which the embedded verb is followed by the filler NP were included as predictors in the models. The primary finding at the embedded verb was that RCE and NonIs patterned faster than StrongIs across measures, with effects generally increasing as frequency increased, suggesting that RCE is processed more similarly to NonIs than StrongIs when verb/object integration first occurs, with frequency enhancing this effect. At the PP, NonIs showed facilitation over RCE in later measures, signaling that integrative processes may be more difficult for RCE than NonIs over time. In sum, we demonstrate that RCEs are easier to process than StrongIs sentences, patterning with NonIs at early stages of integration and between NonIs and StrongIs at later stages. No clear benefits for greater WM spans were found, though some benefit for higher frequency was found for some measures, suggesting that the acceptability of RCEs in Swedish is largely a grammatical phenomenon with some sensitivity to lexical factors (frequency).

Hofmeister, P., & Sag, I. A. (2010). Cognitive constraints and island effects. *Language, 86*(2), 366-415.
Sprouse, J., Wagers, M., & Phillips, C. (2012). A test of the relation between working-memory capacity and syntactic island effects. *Language, 88*(1), 82-123.