Superadditivity, working memory, and island effects

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Relative clause extractions generally yield so-called island effects (degraded judgments) across languages (Ross 1967), (1). However, Swedish and the other Mainland Scandinavian languages comprise well-known exceptions to this pattern (e.g. Engdahl & Ejerhed 1982), cf. (2).

(1) *Those kind of books I know a girl that writes.

(2) Såna böcker känner jag en tjej som skriver.

The origin of island effects is under debate. Sprouse et al. (2012) found superadditive effects in judgments of island violations in English – combined effects greater than the sum of the individual costs for extraction and complexity (island structure). Because no correlation was found between participants' memory span (measured via serial recall and n-back) and the superadditive effects, they concluded that island effects must be derived from violations of syntactic constraints rather than processing limitations. In contrast, Hofmeister et al. (2014) did find a correlation between working memory span (measured via reading span) and superadditivity in a rapid serial visual representation experiment. They also found superadditive effects in fully grammatical, but hard to process sentences, suggesting that processing factors do play a role in superadditivity and hence in island effects.

In our talk, we report on the results from an acceptability judgment experiment that was designed to look for superadditive effects in judgments of relative clause extractions in Swedish and potential correlations with working memory span, in order to determine how these behave with regard to superadditivity. In the experiment, we investigated the (super)additive effect of clause type; *that*-clause (TC) vs. relative clause (RC); and extraction type (long vs. short) on acceptability ratings, and tested whether any such effects correlate with memory span, as measured via an n-back and a reading span task (Daneman & Carpenter, 1980). Our expectation was that the latter test would provide a much better marker of WM than the former.

Det var Anna som anmälde att en kille snattade såna chokladkakor i godisaffären.	TC + ShortExt
It was Anna who reported that a guy stole such chocolate bars in the candy shop	
Det var Anna som anmälde en kille som snattade såna chokladkakor i godisaffären.	RC + ShortExt
It was Anna who reported a guy who stole such chocolate bars in the candy shop	
Det var såna chokladkakor som Anna anmälde att en kille snattade i godisaffären.	TC + LongExt
It was such chocolate bars that Anna reported that a guy stole in the candy shop	
Det var såna chokladkakor som Anna anmälde en kille som snattade i godisaffären.	RC + LongExt
It was such chocolate bars that Anna reported a guy who stole in the candy shop	

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