

Linear vs. Hierarchical Order in Redundant Modification - Experimental Data

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Background Contributions to conversation are generally assumed to be informative, i.e., there is a pragmatic constraint against redundancy. In the framework of Stalnaker (1978), assertive utterances update the contextual Common Ground, represented as the set of worlds compatible with what is mutually assumed for the purposes of conversation. The redundancy constraint then requires each assertion to update the Common Ground set of worlds to a proper subset. More intricate issues arise when trying to spell out how redundancy gets evaluated in complex sentences containing multiple clauses. The questions here are very much parallel to those arising for presupposition projection, since presuppositions come with the opposite requirement, that their content is entailed by (i.e., a super-set of, in sets-of-worlds terms) the Common Ground. Much recent work has considered different options for explicating the relevant notion of Local Contexts, going back to Stalnaker, which makes it possible to interpret parts of multi-clause sentences relative to a context that incorporates other parts of the same sentence (most prominently, Schlenker 2009). One fundamental question in this area is what dimensions of order are at play in constructing local contexts: are they strictly based on linear order, or does hierarchical structure have a role to play as well? This question has broad repercussions for the architecture of the semantics-pragmatics interface, as well as for foundational questions about the role of linear order in grammar. This talk presents ongoing research that explores this question by looking at redundancy effects in nominal modification. In order to tease apart effects of linear and hierarchical order, we compare left- and right-headed languages, namely English and Korean. While the intuitive judgment data reported in Ingason (2016) suggest that hierarchical order is crucial, our experimental investigation provides a more nuanced picture, suggesting that both hierarchical and linear order have an impact on the corresponding acceptability judgments.

Experiment: Materials & Design Building on Ingason (2016), we compare sentences with relative clauses containing a predicational structure whose NP either denotes a subset (*widow*) or a superset (*woman*) of the head noun:

- (1) a. John met a woman who is a widow.
b. John met a widow who is a woman.

There's a clear intuition that (1b) is degraded due to redundancy. This effect is also present in (2b), showing that it's not just a matter of the relative clause as a whole being redundant:

- (2) a. John met a woman who is a widow and a teacher.
b. John met a widow who is a woman and a teacher.

Given the syntax of English, this effect could be due to linear order (with superset noun *woman* following superset noun *widow* leading to redundancy) or hierarchical structure (with subset noun *woman* appearing as part of the relative clause structure headed by superset noun *widow* as the cause of redundancy). Right-headed languages like Korean disentangle these two dimensions of order, as Korean correlate sentences maintain the same hierarchical structure but flip the linear order:

- (3) Jin-un {kwapwu-in yeca / yeca-in kwapwu}-lul manna-ss-ta.
 Jin-TOP widow-RC woman woman-RC widow-ACC meet-PAST-DECL
 ‘Jin met a woman who is a widow / a widow who is a woman.’

We created 24 items with 4 variants crossing simple and conjunctive relative clauses and subset or superset head nouns of the relative clause in English and Korean. 108 participants (49 English speakers and 59 Korean speakers), recruited via Prolific.ac, were asked to judge the naturalness of these sentences on a scale from 1 (completely unnatural) to 7 (completely natural) in a counter-balanced design where they saw each item in one condition. In addition, there were 24 filler items. The experiment was implemented using Ibex.

Results & Discussion Fig. 1 shows mean naturalness ratings by language and condition. As expected, the English data show a clear overall pattern of degradedness for subset noun relative clause heads. This is modulated by relative clause type, with a stronger effect for simple relative clauses (1b) compared to conjunctive ones (2b). Linear mixed effect model analyses confirm a statistical interaction, as well as a main effect of subset-noun position, reflected in corresponding simple effects for both relative clause types. While the interaction indicates an independent constraint against vacuous modification (where), the simple effect in the conjunction condition crucially establishes a more localized redundancy effect.

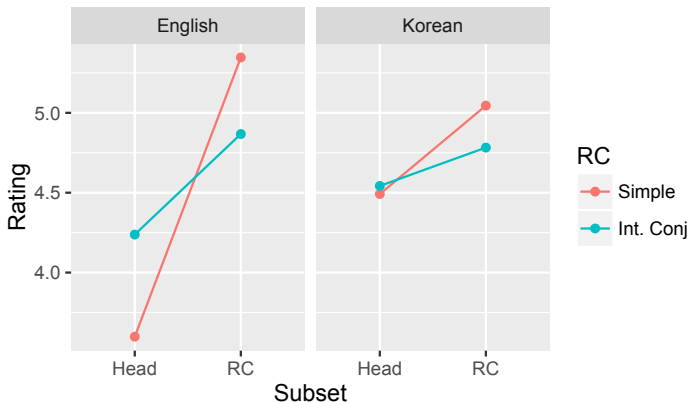


Figure 1: Mean Naturalness Ratings

Turning to Korean, we find a broadly similar picture, in that both the simple and the conjunctive relative clause conditions exhibit significant simple effects parallel to the ones for English. However, there is no significant interaction, and the degradedness for subset noun RC heads is ameliorated in comparison. Comparing the English and Korean data directly, there is a significant 3-way interaction, as well as 2-way interactions for both simple and conjunctive RC types. The 3-way interaction (and the lack of an interaction within the Korean data) suggests that vacuous modification does not have an independent effect on naturalness in Korean. The interaction for conjunctive RCs across languages suggests that while overall, hierarchical structure is the dominant factor for redundancy in modification, in line with the claims in Ingason (2016), linear order does affect the strength of the effect of redundancy, such that redundant material in a relative clause has a smaller impact when it precedes the head noun. Thus, we refine the results in Ingason (2016) by separating the effects of redundancy and vacuous modification quantitatively (at least for English) and by indicating that linear order does have a modulating effect of its own.

Conclusion & Outlook We discuss resulting questions for our theoretical understanding of redundancy in relation to different notions of Local Contexts, as well as possible future directions for extending experimental approaches to investigating the role of linear order vs. hierarchical structure for redundancy and other related phenomena.