

Presuppositions project asymmetrically, *unless* they don't

Overview. The theory of presuppositions aims to predict and explain how presuppositions project or are filtered in different environments. Early theories derived this behavior by stipulating projection properties on a connective-by-connective basis (Karttunen 1974, Heim 1983, a.o.). But this is explanatorily unsatisfying (Soames 1989, Schlenker 2008 a.o.). More recent work tries to derive projection properties from the truth-conditions of connectives together with global facts about language processing (Schlenker 2008 a.o.). In particular, *asymmetries* in projection are explained on this approach by the sequential nature of linguistic processing. A striking prediction of this kind of approach is that since asymmetries are due to a global feature of the linguistic system, asymmetry will be a uniform feature of projection across different connectives. Existing experimental literature, however, has found differential (a)symmetries across connectives. Only left-to-right filtering appears possible across conjunction (e.g., (1a) vs (1b); see Mandelkern et al. 2020). By contrast, disjunction exhibits right-to-left filtering as well (e.g., (1c) vs (1d); see Kalomoiros 2023).

- (1) a. Mary studied in Tokyo, and John studied in Japan too.
- b. #John studied in Japan too, and Mary studied in Tokyo.
- c. Mary didn't study in Japan, or John studied in Japan too.
- d. John studied in Japan too, or Mary didn't study in Japan.

We contribute to this debate by testing order effects for presuppositions triggered under 'unless'. We present an experiment showing that *unless*-sentences exhibit costless symmetry: that is, both left-to-right and right-to-left filtering are equally possible for 'unless'. These results extend the empirical picture for theories of presupposition, and, given existing findings about conjunction, extend the challenge for processing-based accounts of presupposition.

Experiment. We adapted the acceptability paradigm from Mandelkern et al., 2020. Critical items consisted of two conditions differing in Order: PsFirst, with initial Unless-clauses containing a presupposition (based on either *too*, *again*, or the prefix *re-*), and a consequent whose negation strictly entailed that presupposition; and PsSecond, identical but with reversed clause-order, (2a-b). (This contrasts with the only prior relevant experimental study on *unless* by Chemla & Schlenker 2012, who compared presuppositions in the antecedent of *unless*-clauses with those in the consequent.) Both were presented in *Explicit Ignorance* (EI) contexts (Simons 2001), that explicitly leave open whether the presupposition holds. If the presupposition projects, it should conflict with this ignorance, leading to decreased acceptability (which should not arise if filtering is available).

Importantly, our design employed consequents whose negation strictly entails the presupposition of the antecedent, to rule out potential symmetry effects due to *cancellation/local accommodation* (Gazdar 1979, Heim 1983); e.g., (1d) could be seen as triggering local accommodation to avoid a presupposition settling the truth of the other disjunct (Hirsch & Hackl 2014). In our stimuli, the presupposition of the antecedent is compatible with the consequent to rule out a parallel possibility in *unless*-sentences. Minimally varied non-presuppositional controls provided a baseline for potential Order effects independent of presuppositions: NoPsFirst and NoPsSecond, identical to corresponding critical items but with presupposition triggers removed, also shown in EI contexts for maximal comparability (2c-d). There were also additional controls, namely *unless* sentences with a presupposition in the antecedent, and an unrelated consequent that didn't allow for filtering, (3) (SimplePs). These appeared in EI and Support (S) contexts. The former requires local accommodation to prevent the presupposition from clashing with the context. The latter directly supported the presupposition in the context, with no recourse to local accommodation needed. The difference in acceptability between EI-SimplePs vs S-SimplePs thus acts as a baseline for the cost of local accommodation.

Methods. 200 participants were recruited. They saw relevant contexts paired with a sentence, and were asked to evaluate the sentence's naturalness on a 7-point scale.

Predictions. Processing accounts predict **PsFirst to be less acceptable than PsSecond**, going beyond potential Order-effects in NoPs controls and **resulting in an interaction between Order and Ps**. They may allow for symmetric filtering at a cost (reflected in decreased acceptability)

relative to left-to-right filtering; but this cost should be less than the cost for local accommodation, predicting the following: we can categorize the EIPsFirst and EISimplePsFirst conditions as exhibiting NoPriorS(upport) (they do not involve preceding material supporting their presupposition); conversely, EIPsSecond and SSimplePsFirst exhibit PriorS(upport). Then, the effect on acceptability of switching from PriorS to NoPriorS should be greater in the SimplePs cases, than in the PsFirst/Second cases; thus, a **(No)PriorS × Simplicity interaction is predicted**.

Results. We find no difference between PsFirst vs. PsSecond ($p = 0.56$), and no Order×Ps interaction ($p = 0.8$), (Fig 2); we do find a (No)PriorS×SIMPL interaction ($p < 0.01$) (Fig 3). We used a Bayesian analysis to assess credence in the null Order×Ps interaction (using the Mandelkern et al. conjunction interaction (see Fig 1) as our priors). We find extreme evidence in favour of the null interaction model ($BF_{10} < 0.01$) (Jeffreys 1939).

Discussion. To account for our data, one could stipulate that the filtering profile of *unless* is symmetric (essentially making filtering part of the lexical entry). But this is clearly not explanatory (Soames 1989, Schlenker 2009 a.o.). More satisfactorily, if we can treat *unless* as more parallel to disjunction (i.e. *Unless A, B ≈ A or B*), as a first approximation, we could account for the results via theories that predict symmetric disjunction (George 2008, Kalomoiros 2023), but other theoretical moves should be explored as well.

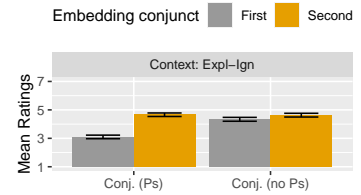


Figure 1: Mandelkern et al. Order×Ps interaction

- (2) **EI Context:** John and Mary are siblings and want to study abroad. Options include Tokyo and Kyoto in Japan, or Beijing and Shanghai in China. Mary is interested in studying in Japan: she would go to Kyoto on her own, but she doesn't want to go to an enormous city like Tokyo, unless John also comes with her to Japan (if not to Tokyo, then at least to Kyoto). I don't know what they ended up deciding so ***I have no idea whether Mary is currently studying in Tokyo or whether she even decided to go to Japan.*** However, given the above, I know that:

- | | |
|---|------------|
| a. Unless John is studying in Japan too, Mary is not studying in Tokyo. | PsFirst |
| b. Mary is not studying in Tokyo, unless John is studying in Japan too. | PsSecond |
| c. Unless John is studying in Japan, Mary is not studying in Tokyo. | NoPsFirst |
| d. Mary is not studying in Tokyo, unless John is studying in Japan. | NoPsSecond |

- (3) **EI/S Context:** John and Mary are siblings and are trying to figure out whether to study abroad or not. Options for studying abroad are China or Japan. Mary has a preference for Japan over China, but at the same time she will be unhappy if she's studying abroad and John isn't with her. I don't know what either of them have decided so ***I have no idea whether Mary is studying in Japan./ I know that in the end Mary went to Japan, but I have no idea what John did.*** However, given the above, I know that:

- | | |
|---|----------|
| a. Unless John is studying in Japan too, Mary is unhappy. | SimplePs |
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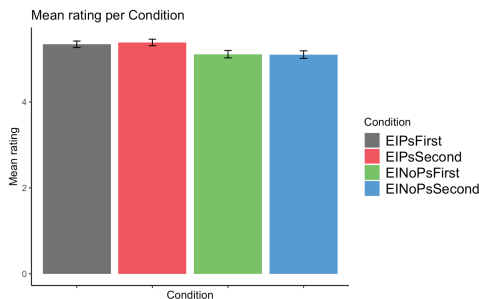


Figure 2: Order × Ps

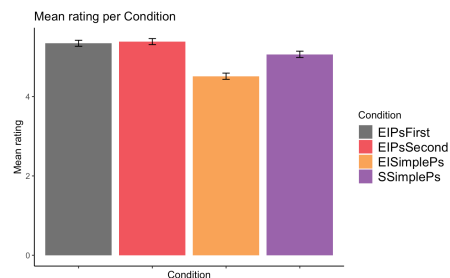


Figure 3: (No)PriorS × Simplicity