

Asymmetry in presupposition projection: the case of conjunction

Matthew Mandelkern, Jérémy Zehr, Jacopo Romoli, and Florian Schwarz

Presupposition projection is traditionally thought to be computed asymmetrically, such that only the material preceding a presupposition trigger is relevant to determining whether the presupposition projects. This is commonly illustrated with contrasts such as the one between (1a) vs. (1b).

- (1) a. Mary used to come to class and she stopped coming to class.
- b. #Mary stopped coming to class and she used to come to class.

But, as discussed by (2, 10, 11) a.o., such contrasts may (at least in part) be due to independent factors, e.g. constraints against redundancy which rule out (1b) independently, since an earlier part of the sentence entails a later part. And indeed, once we remove redundancy as in (2), where neither conjunct entails the other, the contrast disappears: both orders in (2) seem felicitous.

- (2) a. Mary used to come to class every single day and she stopped coming to class.
- b. Mary stopped coming to class and she used to come every single day.

In addition, as is well-known in the literature, it is harder to find order effects with different connectives, like *but* or *or*. For instance, it is unclear that there is any asymmetry in (3a) versus (3b).

- (3) a. Mary never came to class or she stopped coming to class.
- b. Mary stopped coming to class or she never came to class.

As (2, 10, 11) discuss, the issue of asymmetry in presupposition projection is therefore entirely open and in need of further empirical investigation. We report on two experiments, which test for incremental versus symmetric projection in conjunctions like (2) by embedding them in the antecedent of conditionals and testing the degree to which subjects endorse the presupposition as a global inference from the entire sentence. Our results provide clear experimental evidence for the existence of asymmetry in projection: presuppositions generally project when they are entailed by following material, but do so less often when the entailing material precedes them.

Experiments We ran two experiments to investigate whether projection is asymmetric, testing embedded conjunctions with factives (*happy* and *aware*) and change of state verbs (*stop* and *continue*) in the antecedent of conditionals. In order to control for presupposition suspension, we compared the target sentences to various presuppositional controls (detailed below). This approach allowed us to avoid potential confounds introduced by the use of additive particles, which were used by (2, 14) in an attempt to control for suspension (see (2, 9) for critical discussion). Critical items (5a)-(5b) varied the order of two conjuncts, one with a presupposition, and one which entailed that presupposition (we used one-way entailments to preclude confounds from redundancy as in (2b)). Exp.1 compared these to simple controls without conjunction in both non-presuppositional and presuppositional variants (4a)-(4b). Exp.2 compared them to structurally parallel variants with presupposition-less embedding verbs (6a)-(6b). Participants' task was to assess whether they would infer from the sentence at hand that Joe is in France.

- (4) CONTROLS:

- a. If Joe is in France, then Emily will call him soon.
- b. If Emily is *happy* that Joe is in France, then she will call him soon.

- (5) PRESUPPOSITIONAL:

- a. If Emily is *happy* that Joe is in France and **he is in Paris**, then she will call him soon

- b. If **Joe is in Paris** and Emily is *happy* that he is in France, then she will call him soon
- (6) NON-PRESUPPOSITIONAL:
- a. If Emily was *hoping* that Joe is in France and **he is in Paris**, then she'll call him soon
- b. If **Joe is in Paris** and Emily was *hoping* that he is in France, then she'll call him soon

Results Differences in response patterns across conditions (see Fig.1; effects significant based on logistic mixed-effect models) provide evidence for asymmetry. First, when the presupposition was in the first conjunct, the inference was endorsed as strongly as in the simple presuppositional control condition, i.e. we find no evidence of symmetric filtering via the following, presupposition-entailing conjunct. Secondly, we find a filtering effect in that the inference is endorsed less often when the presupposition-entailing conjunct precedes the presuppositional conjunct.

Interestingly, two surprising additional findings emerge in the data, which highlight the importance of experimental methods in the theory of presupposition. First, even when the presupposition in the second conjunct is entailed by the first conjunct, our participants still endorse the presuppositional inference half of the time, i.e., they respond as if the presupposition projects despite being supported by preceding material. Secondly, even non-presuppositional embedding predicates such as *was hoping that* give rise to affirmative inference responses quite frequently, and more often when the complex conjunct comes first. Crucially, however, a significant interaction between the presuppositional and non-presuppositional conditions and linear order confirms the existence of asymmetry for genuine projection, even when taking these factors into account.

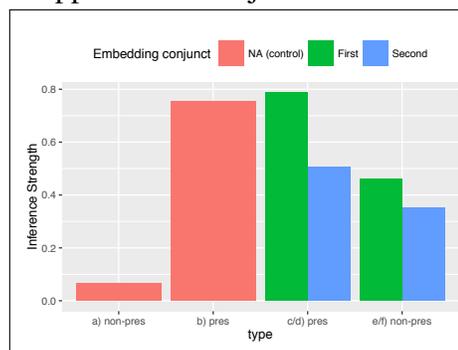


Figure 1: Inference endorsements for controls vs. embedded conjunctions with presupposition 1st vs. 2nd

Discussion The strong effect of incremental interpretation in our results is entirely expected in dynamic accounts that take incremental evaluation to be a hard-wired aspect of presupposition evaluation in complex sentences ((1, 3, 8, 10, 11) a.o.). Processing-based accounts that see asymmetry as a by-product of incremental processing such as (4, 5, 7, 12, 13) a.o. can also account for it, but they need to assume that such a strategy is either the only option altogether or at least strongly preferred to a corresponding symmetric one (of which we found no evidence in our results). The surprising projection effect for triggers in the second conjunct, on the other hand, is problematic for both approaches: once a preceding conjunct entails a later conjunct's presupposition, we expect no projection at all, on every theory of projection we know of (with the exception of theories that do not predict filtering at all for these cases, e.g. a weak Kleene trivalent theory or (6)). A possible explanation of the effect is that the entailment relation is sometimes ignored when processing the presupposition (either if one can strengthen a conditional presupposition to its consequent on syntactical grounds, or if participants sometimes fail to notice the logical relation). Subsequent work focusing on this finding should investigate the potential correlation between judgements about the relevant entailment relations and projection/filtering in constructions like the ones tested here.

Conclusion In sum, by controlling for confounds from redundancy and peculiarities of additive particles, our results provide clear evidence that asymmetries in presupposition projection exist. This finding stands in sharp contrast to a trend towards symmetric, or optionally symmetric,

presupposition projection algorithms in the recent literature, and thus provides a crucial point of empirical reference for future theoretical work.

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