Incremental presupposition evaluation in disjunction
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1. Aims. There are clear cases where presupposition projection in complex sentences is sensitive to the linear order of the sentence’s component clauses (conjunction, Stalnaker 1974). Based on these, theories have been proposed which include an incremental component to presupposition evaluation, implicitly or explicitly linking presupposition evaluation to left-to-right processing (cf. Chemla & Schlenker 2012, Schlenker 2008). This approach predicts left-to-right asymmetries to be observable across sentential connectives. Disjunction is a well-known counter-example, e.g. from Schlenker, after Partee:

(1) a. Either there is no bathroom, or the bathroom is well-hidden.
   b. Either the bathroom is well-hidden, or there is no bathroom.

The presupposition that there is a bathroom fails to project when entailed by the negation of the other disjunct, independent of the linear order of the disjuncts. The contribution of this paper is to show that disjunction nevertheless does show linear order asymmetries consistent with incremental presupposition evaluation. (i) We argue, following e.g. Gazdar (1979), that there is a confound in (1) which interferes with the presupposition projecting out of either disjunct; (ii) that when the confound is resolved, disjunction is projectively asymmetric; and (iii) that even with the confound in place, an incremental model predicts in examples like (1) traces of asymmetry, which we observe experimentally.

2. Confound in (1), mutual entailment leading to paradoxical felicity conditions. Observe that the negation of the disjunct not containing the presupposition trigger entails the triggered presupposition in (1), and the triggered presupposition entails the negation of the non-triggering disjunct; they are equivalent. This equivalence leads to paradoxical felicity conditions on the use of the disjunction, if the presupposition projects. By Gricean reasoning, a disjunction is infelicitous if either disjunct is known to the speaker to be false. If the presupposition projected, a supportive context in which the presupposition is satisfied would have to entail the presupposition. However, because of the aforementioned equivalence, a context which entails the presupposition also entails the falsity of the non-triggering disjunct, in violation of the Gricean constraint. The paradox resolves if the presupposition does not have to be satisfied, i.e. if the presupposition does not project globally and is instead added to the at issue content (local accommodation). On this view, then, projection of the presupposition is suppressed in both (1a) and (1b) in order to allow the disjunction to be felicitous.

3. Resolving the confound: asymmetric entailment. Building on data in Schlenker (2008), we consider disjunctions where the negation of one disjunct entails the presupposition triggered in the other disjunct, but not vice versa. Because entailment is asymmetric, a supportive context which entails the presupposition need not entail the falsity of the non-triggering disjunct. The presupposition can project, and the Gricean constraint still be respected. Incremental theories predict asymmetric projection for these cases. Examples in Schlenker (2008), e.g. (2), are difficult to evaluate:

(2) a. Either Mary doesn’t play the violin, or her instrument is well hidden.
   b. Either Mary’s instrument is well hidden, or she doesn’t play the violin.

(2a), and to a lesser extent (2b), lends itself to a reading where instrument is construed as anaphoric to violin, in which case the presupposition is effectively that Mary has a violin; the negation of the non-triggering disjunct and the presupposition then mutually entail, and the Gricean constraint suppresses projection. Schlenker reports that (2b) is more likely to be presuppositional than (2a) — but this could follow from an anaphoric reading being more likely in (2a). Our examples control for this by avoiding anaphoric readings:

(3) Suppose that everyone who uses drugs begins at a particular age, different for each drug: anyone who uses cocaine begins using cocaine at age 15; anyone who uses any other drugs (regardless of whether or not they have already used cocaine) begins using those drugs later, after age 20. About John:
   a. Either John has never smoked cocaine, or he was 15 when he first used illicit substances.
   b. Either John was 15 when he first used illicit substances, or he has never smoked cocaine.

Our intuition, replicated with 5 informants: (3a) and (b) can both give an inference that John has used some illicit substance, but the inference is more robust in (3b); (3b) is less compatible (without marked prosody) with the possibility that John did not use any illicit substance. This is supportive of the presupposition asymmetrically projecting out of the first disjunct, (3b), but not the second, (3a).

Asymmetry in (3) follows from an incremental model of presupposition evaluation, provided that there is a procedure to update the local context for one disjunct with the negation of the other disjunct, also
executed incrementally. After the first disjunct (d1) is encountered, the local context for the second disjunct (d2) is incremented with the negation of d1. A presupposition triggered in d2 is evaluated at the point that the trigger is encountered, after local context update has taken place. If the negation of d1 entails the presupposition, the presupposition will be trivially satisfied in its local context, independent of the global context. The presupposition places no constraints on the global context, i.e. does not project. d2 comes too late to affect the local context for evaluation of a presupposition triggered in d1, so a presupposition in d1 is evaluated relative to just the global context, and hence does project.

4. Experiment: More evidence for incrementality. (3) is consistent with a model which integrates context update and presupposition evaluation with left-to-right parsing – but, there are other ways to analyze the data. E.g. an asymmetric projection rule could be hard encoded as a lexical property of or. The goal is to find additional evidence for incrementality. We return to confounded disjunctions, e.g. (1), show that even with the Gricean constraint symmetrically suppressing projection, an incremental approach predicts asymmetries, and experimentally test for those asymmetries.

Consider the interplay between incremental presupposition evaluation and the Gricean constraint in trigger-first order, (1b). On a left-to-right parse, the trigger in d1 is encountered before d2, and is evaluated as soon as it is encountered. Without having seen d2, the parser has no way to know that the negation of d2 will be equivalent to the presupposition, so no way to know that globally accommodating the presupposition will lead to a Gricean constraint violation. He acts on the presupposition without concern for the Gricean constraint: he globally accommodates it. Later in the parse, when the second disjunct is encountered, the parser becomes aware of the violation of the Gricean constraint, and revises global accommodation to local accommodation. There ends up being no global presupposition, but there is (ultimately revised) global accommodation at an earlier stage in the parse. In trigger-second order, with the local context for d2 incremented with the negation of d1, the presupposition is trivially satisfied in its local context, so no global accommodation occurs. Predicted asymmetry: there is a stage in the parse at which the presupposition is globally accommodated in trigger-first, but not trigger-second order.

We experimentally test for global accommodation. We construct 12 disjunctions in analogy to (1), and for each, construct two minimally different contexts, one in which the presupposition is established as likely to hold (4a), and one in which the presupposition is established as unlikely to hold (4b).

(4) a. LIKELY: John goes to the doctor to be tested for a very common disease. The test comes back negative. We conclude: ✓(5a), ✓(5b). // b. UNLIKELY: John goes to the doctor to be tested for a very rare disease. The test comes back negative. We conclude: ✓(5a), ?!(5b).

(5) a. Either John never had the disease, or he recovered from it.
   b. Either John recovered from the disease, or he never had it.

We present participants with either the likely or unlikely context from a given item in a Latin Square design, followed by the target disjunction for the item in both orders. The task is binary decision: participants select which order sounds to them more natural in context. The likelihood manipulation interacts with the ease of global accommodation: in an unlikely context, the participant is biased to expect that the presupposition does not hold, so when the disjunction seems to carry the presupposition, this is dissonant with the participant’s expectation; the participant may feel that if the presupposition is to be common ground, it is appropriately controversial that it should be submitted as at-issue content, rather than presupposed. The felicity of a disjunction requiring global accommodation will accordantly degrade. If trigger-first order involves global accommodation and trigger-second order does not, this means that the felicity of trigger-first order will degrade relative to trigger-second order in unlikely contexts. In the binary decision task, taking the likely condition as a baseline, we predict a greater likelihood for participants to choose trigger-second order as more natural than trigger-first order in the unlikely condition. This is borne out (see plot, 64 pts): in likely contexts, participants are equally likely to choose trigger-first order as trigger-second order; in unlikely contexts, trigger-second order is preferred to trigger-first order. Mixed model analysis with item and participant as random effects confirms a significant effect of condition on preferred order, $\text{lzl} = 2.68$. Even in examples like (1), there are observable traces of linear order asymmetry – exactly as predicted by incremental approaches.”