

Versatile anti-presuppositions in counterfactual conditionals

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The puzzle

O-marked and X-marked conditionals

- (1) a. If it **is** raining outside, then Sally **is** inside.
b. If **was** raining outside, then Sally **would be** inside.
- Semantically, (1a) and (1a) seem to convey different meanings: (1a) talks about the actual world while (1a) seems to talk about (plausible) possible worlds.
 - Morphosyntactically, (1a) uses the present indicative while (1b) uses the simple past and an extra modal auxiliary in the consequent (*woll*).
 - Following we call this *morphosyntactic* marking O-marking in the case of (1a) and X-marking in the case of (1a).
 - Other languages may use other strategies to X-mark, among which special tense, mood, aspect, or special independent markers.

The counterfactual inference

(1b) If **was** raining outside, then Sally **would be** inside.

- Roughly, (1b) implies that the closest possible worlds in which it is raining outside are such that Sally is inside.
- But it also conveys something more, namely that it is actually not raining outside. Some evidence that this is not part of the core meaning of (1b):

(2) a. It's not the case that if it was raining outside, Sally would be inside.

\rightsquigarrow Not raining.

 b. Perhaps if it was raining outside, then Sally would be inside.

\rightsquigarrow Not raining.

 c. Is it true that if it was raining outside, then Sally would be inside?

\rightsquigarrow Not raining.

 d. (1b) –Hey, wait a minute! I did not know it wasn't raining outside!

- We call this inference the counterfactual inference (CI), which arises in a majority of X-marked conditionals.

The nature of the CI

- The tests in (2) suggest that the CI is a presupposition. But why would X-marking (whose realization is variable across languages) be the trigger for such an inference? What is the role of the competing O-marked conditional? Also, why does the CI disappear in sentences like (3) – dubbed Anderson Conditionals?
- (3) If Jones had taken arsenic, he would have shown the same symptoms he is actually showing.
- In this talk, we want to better understand the source of the CI, by relating the use of X-marked conditionals to the QUD:
 - We show that the inference pattern of a conditional depends on *how* it answers a given QUD.
 - We relate this observation to a constraint stated by Heim about the use of presuppositions in answers to questions.
 - We show how this line of reasoning could apply to Anderson conditionals.

Conditionals and the QUD

- A conditional *If P then Q* can answer different kinds of questions:
 - Is “If P then Q” true?
 - Under what conditions is Q true?
 - Is P true?
 - Is Q true?
- In the talk, we focus on the last two. For instance, we assume that (1b) repeated below can answer the QUDs in (4) and (5).

(1b) If **was** raining outside, then Sally **would be** inside.

(4) Is it raining outside?

(5) Is Sally inside? (More generally: what about Sally?)

- (6) QUD: Is it raining outside?

If **was** raining outside, then Sally **would be** inside.

Conveyed answer: It is not raining outside, *because sally is not inside.*

- (7) QUD: What about Sally?

If **was** raining outside, then Sally **would be** inside.

Conveyed answer (weak): Sally would be inside if it was raining but it's not, draw your own conclusions.

Conveyed answer (strong): Sally is not inside.

- How is the answer conveyed?

The CI and the QUD

(6) A: Is it raining outside?

B: If **was** raining outside, then Sally **would be** inside.

C: Hey wait a minute! I did not know it wasn't raining outside! ✗

C: Hey wait a minute! I did not know Sally wasn't inside! ✓

(7) A: What about Sally?

B: If **was** raining outside, then Sally **would be** inside.

C: Hey wait a minute! I did not know it wasn't raining outside! ✓

C: Hey wait a minute! I did not know Sally wasn't inside! ✗

- This pattern makes sense, given the following constraint:

Heim's constraint on answering the QUD

Questions cannot be answered by an accommodated presupposition.

- But it also means that if the QUD targets the antecedent of an X-marked conditional, the answer should not be conveyed by the CI!

Overview of the analysis

- We want to argue that the CI is “versatile” in that it can target either the antecedent of the consequent of the X-marked conditional, depending on the QUD:
 - If the QUD targets the consequent, then the CI targets the antecedent (as previously assumed).
 - If the QUD targets the antecedent, then the CI is derived from the consequent (novelty).
- The proper answer to the QUD is derived *via* reasoning:
 - If the QUD was targeting the consequent, the answer is either conditionalized or presented as a strengthened *modus ponens* argument.
 - If the QUD was targeting the antecedent, the answer is provided as a *modus tollens* argument.

Some background

The CI as a presupposed implicature

- The nature of the CI is debated:
 - Implicature [Iatridou, 2000, Ippolito, 2003] : supported by the fact that it can be cancelled and reinforced in specific contexts.
 - Presupposition [von Stechow, 1998, Karawani, 2014] : supported by the classic projection tests and the *Hey, wait a minute!* test.
 - Anti-presupposition ([Leahy, 2011, Leahy, 2018], building on [Heim, 1991, Sauerland, 2003, Percus and Ueyama, 2006] a.o.): may allow to account for the mixed behavior of the CI.
- Here we want to suggest that the CI is a presupposed implicature [Bassi et al., 2021].¹

¹We realized *a posteriori* that this insight was already present in a footnote of [Bassi et al., 2021], although the focus was on testing Downward Entailing contexts.

Presupposed Implicatures [Bassi et al., 2021]

- A presupposed implicature (computed *via* the operator PEX), is just like an implicature computed *via* EXH [Fox, 2007, Chierchia et al., 2012], except that the extra inferences it creates are treated as non-at issue.
- If A denotes a (precomputed) set of excludable alternatives:

$$\begin{aligned} \text{EXH}(p, A) &= \left\{ \begin{array}{ll} \text{Presupposed :} & \\ \text{At-issue :} & p \wedge \neg A \end{array} \right\} \\ \text{PEX}(p, A) &= \left\{ \begin{array}{ll} \text{Presupposed :} & \neg A \\ \text{At-issue :} & p \end{array} \right\} \end{aligned}$$

- In conditionals, we assume the implicature resides in the comparison between X-marking (which introduces quantification over possible worlds) and O-marking (which only talks about the actual world).
- PEX inherits the ability to be inserted locally; this, plus the fact that both clauses of an X-marked conditional are X-marked, implies that both the antecedent and the consequent can be PEXed.

Back to Heim's constraint

- Recall Heim's constraint prevents questions from being answered *via* accomodation.
- The following example is taken from [Aravind et al., 2022] to illustrate this point in the general case:

(8) *Context: A is visiting a dog shelter and is particularly interested in adopting a Labrador.*

A: Can I adopt the Labrador?

a. B: Someone from NY just adopted the Lab.
No presupposition.

b. # B: It is someone from NY who just adopted the Lab.
↗ Someone adopted the Labrador.

- But what happens with inferences derived *via* PEX?

- Both the antecedent and the consequent of an O-marked conditional
- CIs in an X-marked conditional are derived by competition with the O-marked alternative.
- In that sense, the CI is an implicature at the presuppositional level.

If $P \models (Q)$ the set of closest worlds in which P holds are s.t. Q holds
 $Q(\text{the}(P)) \quad Q(p)(q)$

if p then $M \ q \ q?$ $p \Rightarrow q$ not p accomodate after antecedent \Rightarrow does
not hold in actual world and in all closest worlds where p holds q holds
 \Rightarrow could have just said $q?$ not $q?$

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