On the utility of conditional answers

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Conditional answers

- Conditional statements may be answers to conditional questions:

(1) If Alfonso comes to the party, will Joanna leave? (Isaacs and Rawlins, 2008)
If he comes, Joanna will leave.

- But in fact, conditionals can be answers to any type of question:

(2) a. Will John come to the party? [polar question]
If he finishes his work, he will.
If he finishes his work, **yes**.

b. Do you want coffee or tea? [alternative question]
If it is freshly made, I would like coffee.
If it is freshly made, **coffee**.

c. What will John cook for dinner? [*wh*-question]
If he managed to buy parmesan cheese, he will make pasta.
If he managed to buy parmesan cheese, **pasta**.

These answers crucially involve **partial knowledge**.

- The consequent can take the form of a fragment answer, suggesting that these are conditional speech acts, not conditional propositions.

Research questions

– When do speakers choose for a conditional answer, rather than an ignorant answer ('I don't know'/'Maybe')?
– If multiple conditional answers are possible, how do they choose between them?
– in other words: What is the **utility** of a conditional answer?

Conditional perfection and exhaustivity

- **Conditional perfection** (see e.g. van Canegem-Ardijns and van Belle (2008) for an overview) is the pragmatic strengthening of a conditional to a biconditional:

(3) If John finishes his work in time, he will come to the party.
$\rightsquigarrow$ if John does not finish his work in time, he will not come to the party

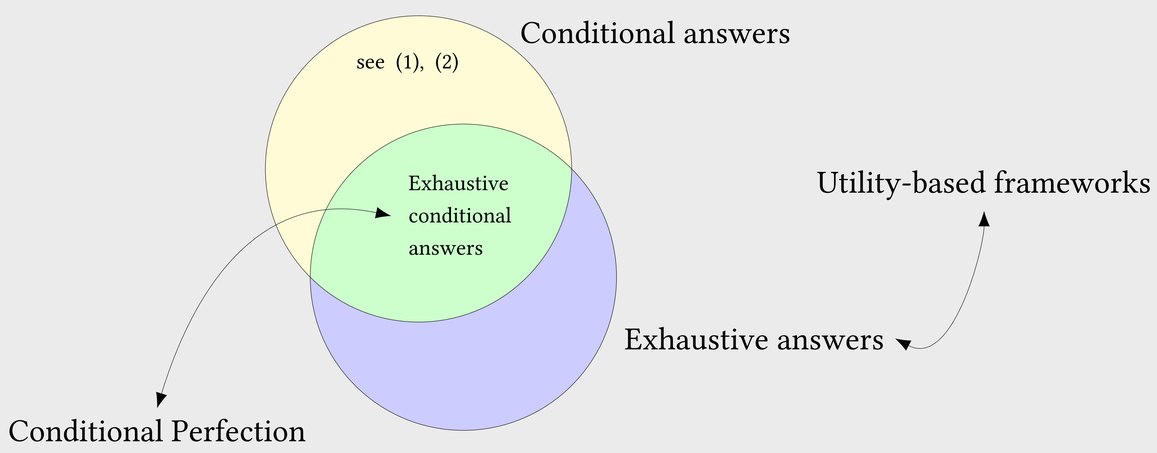
- Recent views suggest that perfection happens when a conditional answer is interpreted **exhaustively** (see e.g. von Fintel, 2001; Herburger, 2015).

(4) [implicit QUD: When will you succeed?]
If you work hard you will succeed. (Herburger, 2015)
Exhaustification: ⟨…and only if you work hard you will succeed⟩

- Various authors have claimed that if there are additional ways in which the consequent can be realized, conditional perfection is cancelled (Lilje, 1972; von Fintel, 2001, a.m.o).

(5) *Generalization* (Tellings, 2016)
A conditional 'if p, q' is not perfected in case additional alternative conditions p_i are salient for q ('if p_i, then q').

- Recent experimental work (Cariani and Rips, ms.) suggests that this is not enough – the exhaustive answer must furthermore be "in the respondent's interest".
- In unrelated work on exhaustive answers, it has been proposed that whether an answer is interpreted as **mention-some** or **mention-all** depends on "human concerns" underlying the asking of the question (van Rooij, 2004), which can be modeled in terms of the *decision problem* the speaker is trying to solve.



Larger goal of the project: develop a theory of the utility of conditional answers, in order to better understand the use of conditional utterances in conversation, as well as the phenomenon of conditional perfection.

Conditionals licensed in a special epistemic situation

- A conditional 'if p, then q' is licensed as an answer to $?q$ in the following epistemic situation: $\neg K_B ?p \wedge K_B K_A ?p$.

(6) [Alice calls to the IT help desk]
A: Did I install my printer correctly?
B: If there is a printer icon on the desktop, you installed it correctly.

- The conditional answer is similar to the following exchange:

(7) [Alice calls to the IT help desk]
A: Did I install my printer correctly?
B_1: Is there a printer icon on the desktop?
A: Yes.
B_2: Then you installed it correctly.

- The pragmatic condition of Addressee Competence for B asking $?p$ to A is fulfilled.
- B entertains two possible types of knowledge states for A: S_1 such that $S_1 \models p$, and S_2 such that $S_2 \models \neg p$. If A is in S_1, the conditional answer solves A's query $?q$ (by MP). If A is in S_2, and the conditional answer is perfected, the query is also solved.
- Formalization: add B's **representations of potential epistemic states** of A to a discourse model like that of Farkas and Bruce (2010).

Conditional dependency as relevance

- In the absence of the situation above, a conditional answer can still be licensed: an answer like in (2a) (*If John finishes his work, he will come to the party*) can be felicitous even if B knows that A does not know anything about the truth value of p.
- Uttering a conditional statement felicitously requires a **dependency** between antecedent and consequent (taken from van Rooij and Schulz, 2019):

$$\Delta^* P_p^q := \frac{P(q|p) - P(q|\neg p)}{1 - P(q|\neg p)} \quad \text{should be high.}$$

- It is learning this conditional dependency that makes the conditional answer relevant.

Utilities

- Utility-based framework: compare answers by measuring their *utility* with respect to the *decision problem* that A tries to solve (van Rooij, 2004; Benz & van Rooij, 2007). The decision problem contains a set of actions with associated utilities: $U(a, w)$ is the utility of action a in world w. On the basis of U, a notion of *utility value* (UV) of an utterance can be defined (various ways to do this have been proposed).
- Computing the utility value of a material conditional does not work:

	w,c	w,¬c	¬w,c	¬w, ¬c
	w_1	w_2	w_3	w_4
a_1: buy more drinks	5	-3	5	-3
a_2: do nothing	-5	0	-5	0

(w = finish work, c = come to party)

Table 1: Example utility function for (2a)

Expected utility of a_1 on learning $p \supset q$: $\text{EU}(a_1|p \supset q) = \sum_w P(w|p \supset q) \cdot U(a_1, w) = \frac{7}{3}$.
This is the same expected utility as for $[\![p \vee q]\!] = \{w_1, w_2, w_3\}$.
Then $\text{UV}(p \supset q) = \text{UV}(p \vee q)$.

- Alice's U-function is only sensitive as to whether q (come to party), not as to whether p (finish work): the dependency between the two is what the conditional answer conveys. So, uttering a conditional leads to the utility function to change.
- This view requires a **dynamic** theory of utilities.

Conclusions

- Conditionals can be answers to any type of question in the case of partial knowledge.
- They are conditional speech acts, and therefore a theory of the utility of conditional answers requires a dynamic component in which updating with a conditional is a two-step procedure.

References

References can be found in the handout.

I thank Stefan Kaufmann and Robert van Rooij for discussion. The views presented here are mine.