

o OVERVIEW

- “What if” questions in discourse (“re-asking”):
 - (1) A: Is Henry coming to the party?
 B: Yes, he is.
 A: What if Isabella is there? (≈ Will he still come if Isabella is there?)
- “What if” serves to re-ask a question?
 - Immediate problems: licensed discourse-initially, and not generally licensed following questions.
 - (2) A: (out of the blue) Henry is coming over this afternoon.
 B: What if Isabella is here?
 - (3) A: Is Henry coming to the party?
 B: # What if Isabella is there?
- “what if” questions have a “suppositional” flavor – involve making temporary assumptions.
- Proposal: “what if” questions are conditional questions that are anaphoric to some salient question under discussion (QUD; Roberts 1996; Büring 2003 a.o.).
 - QUD supplies the content of the question, “if”-clause a domain restriction on that question.
 - Discourse-initiality is possible as long as there is a salient QUD that can be recovered.
 - Post-questioning restriction follows from pragmatics of such questions (which follows from pragmatics of questions in general).
- Generalizations above turn out to be even more complicated.
 - Multiple readings for several of the above examples. ⇐ different resolutions for QUD.
 - Post-questioning restriction not absolute. (Plan questions.) ⇐ pragmatics of questioning.

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- Four core uses.
- Simple asking about consequences, following declarative.
 - (4) A: Henry is coming to the party.
 B: Oh no, what if Isabella is there? ≈ What will happen if they are both there?
- Re-asking (also possible in previous ex. without “oh no”):
 - (5) A: Is Henry coming to the party?
 B: No, he’s not.
 A: What if Isabella is there? (≈ Will he come if Isabella is there?)
- Proposal response to a plan question.

- (6) A: How can we get to the airport?
 B: What if we borrow Alfonso’s car?

- Out of the blue hypothetical uses:
 - (7) What if the moon were made of cheese?
- Some things you can’t do.
- Respond to a (non-plan) question with a “what if”:
 - (8) A: Who is coming to the party?
 B: # What if Alfonso comes?
 - (9) A: Is Henry coming to the party?
 B: # What if Isabella is there?
- Use “what about if” in an out of the blue hypothetical:
 - (10) # What about if the moon were made of cheese?
- For within-speaker discourse, several of these conditions invert.
 - (11) A: Is Henry coming to the party?
 A: What if Isabella is there?
- (However, re-asking use not present.)
- Related constructions: “what about if”, “even if”, “and if”.
 - (12) (in re-asking dialogue)
 - a. What about if Isabella is there?
 - b. Even if Isabella is there?
 - c. And if Isabella is there?

2 THE STRUCTURE OF “WHAT IF” QUESTIONS

Proposal: “what if” questions are sentential idioms with a compositionally interpreted “if”-clause.

Basic facts:

- Order of “what” and the “if”-clause fixed, no intervening elements.
 - (13) * If Alfonso comes to the party, what?
 - (14) * What {only / even} if Alfonso comes to the party?
- Restriction to “what”.
 - (15) What if the moon is made of cheese?
 - (16) * Who/how/when/where/which boy if the moon is made of cheese?
- Inability of “what” to participate in normal “wh”-modification (these tests are due to Baker 1968, 1970; see also Gawron 2001; Rawlins 2008).

- (17) Who on earth is coming to the party?
- (18) Who else is coming to the party?
- (19) *What on earth if the moon is made of cheese?
- (20) *What else if the moon is made of cheese?

• When “about” present, restriction to “what” or “how”.

- (21) What / how about if we borrow Henry’s car?
- (22) *Who/when/where/which boy if we borrow Henry’s car?

• Consequence: “what” / “how” are not present with their normal meaning / properties.

• In contrast, internals of “if”-clause seem entirely normal.

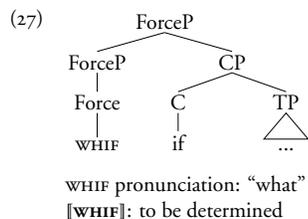
• “What if” questions unembeddable (except on quotative readings).

- (23) *Alfonso knows what if Joanna comes to the party.
- (24) Alfonso knows what would happen if Joanna comes to the party.

• Distribution of adverbs: can be modified by speaker-oriented adverbs, (maybe) by epistemic modifiers, no lower classes. (Cinque 1999; Ernst 2002)

- (25) Seriously, what if Alfonso comes to the party?
- (26) ?Maybe what if we borrow Alfonso’s car?

• Rudimentary proposal:¹



3 ANALYSIS STAGE I: THE BASICS

• Proposed analysis:

- Conditional questions (Velissaritou 2000; Isaacs and Rawlins 2008) where the question-part is supplied anaphorically.
- Isaacs & Rawlins proposal: conditional question involves an “if”-clause restricting a question operator.
- Anaphoric to a salient QUD (Roberts 1996; Büring 2003, Beaver and Clark’s 2008 “recent question”).²

¹An obvious complication is the complete unembeddability of “what if”. It is a natural assumption that ForceP should not be embeddable, but there is a long line of work challenging this on one way or another; see e.g. Krifka 1999; Haegeman 2003, 2006; McCloskey 2006; Coniglio 2007.

²Unfortunately, I will be somewhat fast and loose about what exactly can be a QUD.

• How to implement? CQs following Isaacs and Rawlins 2008.

$$(28) c + \text{“if } \phi, \psi\text{”} = (c + \text{ASSUME } \phi) + ?\psi$$

• What does ASSUME ϕ do?

- Isaacs and Rawlins 2008 following Kaufmann 2000: updates context to include information that there is a temporary restriction provided by ϕ .
- Implementation: context as a stack of context sets. ASSUME pushes temporarily restricted context set on top.
- Cf. suppositional imperatives (Isaacs 2007).
- (Database approach: context sets as *updatable views* of a larger information store.)

• What does $?\psi$ do?

- Groenendijk 1999: partitions the context into alternatives corresponding to possible answers to the question.
- Following Hamblin 1958, 1973; Karttunen 1977; Groenendijk and Stokhof 1984 among many others.
- Many ways of representing this. Groenendijk’s: context is an equivalence relation on possible worlds, connected worlds form an alternative.
- Context is “uniquisitive” if there is one maximally connected alternative.
- Questioning disconnects world pairs, asserting removes them altogether.

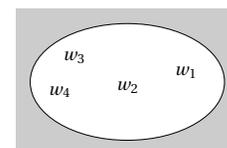
• Interpretation following an assumption?

- Updates relative only to temporarily restricted context.
- Implementation: assertions/questions operate on top context set in stack. (Slightly more complicated than this...)

• Example (from Isaacs and Rawlins 2008): 4 worlds. In worlds 1,2 only, Alfonso comes to the party. In worlds 1,3 only, Joanna leaves the party.

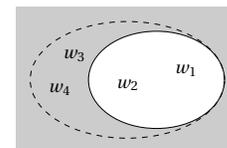
$$(29) s = \overline{s_0 : c} =$$

$s_0 :$	$\left\{ \begin{array}{cccc} \langle w_1, w_1 \rangle & \langle w_2, w_1 \rangle & \langle w_3, w_1 \rangle & \langle w_4, w_1 \rangle \\ \langle w_1, w_2 \rangle & \langle w_2, w_2 \rangle & \langle w_3, w_2 \rangle & \langle w_4, w_2 \rangle \\ \langle w_1, w_3 \rangle & \langle w_2, w_3 \rangle & \langle w_3, w_3 \rangle & \langle w_4, w_3 \rangle \\ \langle w_1, w_4 \rangle & \langle w_2, w_4 \rangle & \langle w_3, w_4 \rangle & \langle w_4, w_4 \rangle \end{array} \right\}$
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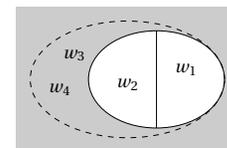
$$(30) s' = s + [\text{If } [\text{Alfonso comes to the party}]] =$$

$s'_0 :$	$\left\{ \begin{array}{cc} \langle w_1, w_1 \rangle & \langle w_2, w_1 \rangle \\ \langle w_1, w_2 \rangle & \langle w_2, w_2 \rangle \end{array} \right\}$
$s'_1 :$	c



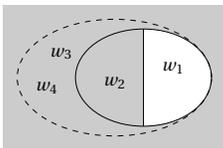
$$(31) s'' = s' + [\text{Will Joanna leave?}] =$$

$s''_0 :$	$\left\{ \begin{array}{c} \langle w_1, w_1 \rangle \\ \langle w_2, w_2 \rangle \end{array} \right\}$
$s''_1 :$	c



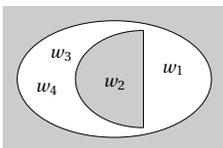
(32) $s''' = s'' + \text{Yes} =$

$s_0''' :$	$\{ \langle w_1, w_1 \rangle \}$
$s_1''' :$	$\left\{ \begin{array}{lll} \langle w_1, w_1 \rangle & \langle w_3, w_1 \rangle & \langle w_4, w_1 \rangle \\ \langle w_1, w_3 \rangle & \langle w_3, w_3 \rangle & \langle w_4, w_3 \rangle \\ \langle w_1, w_4 \rangle & \langle w_3, w_4 \rangle & \langle w_4, w_4 \rangle \end{array} \right\}$



(33) $s'''' = \text{pop}(s''') =$

$s_0'''' :$	$\left\{ \begin{array}{lll} \langle w_1, w_1 \rangle & \langle w_3, w_1 \rangle & \langle w_4, w_1 \rangle \\ \langle w_1, w_3 \rangle & \langle w_3, w_3 \rangle & \langle w_4, w_3 \rangle \\ \langle w_1, w_4 \rangle & \langle w_3, w_4 \rangle & \langle w_4, w_4 \rangle \end{array} \right\}$
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“what if” questions work the same, but question supplied by QUD.

- (34) a. $c + \text{“what if } \phi \text{”} = (c + \text{ASSUME } \phi) + \text{WHIF}$
 b. $c + \text{WHIF} = c + ?\text{QUD}_c$

- Representation of QUD_c ?

– Follow Büring 2003 in treating nodes in the D-tree as syntactic structures; QUD_c is the force-less denotation of any node along the right frontier. (Cf. Beaver and Clark’s 2008 “recent question”)

- Case 1: QUD supplied directly by prior question.

- (35) A: Is Henry coming to the party?
 B: No, he’s not.
 A: What if Isabella is there? (\approx Will he come if Isabella is there?)

- Case 2: QUD supplied by implicit QUD.

- (36) (Context: discussing the future of student funding.)
 A: The funding agency is having some trouble.
 B: Uh oh, what if we don’t get the grant? (\approx what will happen if we don’t get the grant?)

- Prediction: implicit QUD leads to underspecification.

- (37) A: (out of the blue) Henry is coming over this afternoon.
 B: What if Isabella is here?
 (38) a. (37B) \approx Will Henry come over if Isabella is there? (QUD = Will Henry come over this afternoon?)
 b. (37B) \approx What will happen if Isabella is there? (QUD = What is happening this afternoon?)

- I.e. Discourse initial assertion + “what if” sequences are just a special case where the QUD is implicit.
- Prediction: implicit QUD can determined by focus, affect reading. (SMALL CAPS = Büring’s contrastive topic, Jackendoff’s B-accent, or your preferred similar category.)

- (39) A: Do you have the meeting schedule set up yet?

- B: ALFONSO is meeting with Bill.
 B’: Alfonso is meeting with BILL.
 A: What if Isabella or Henry is around?

- (40) a. (39A) \approx Who is meeting with Bill if Isabella or Henry is around?
 b. (39A) \approx Who is Alfonso meeting with if Isabella or Henry is around?

4 ANALYSIS STAGE 2: DERIVING THE DISTRIBUTIONAL FACTS

- Problem for QUD analysis: why would “what if” questions be disallowed directly after questions?
 - Constraint requiring interlocutor to have attempted a resolution?
- Context with no proposed resolution:

- (41) A: Who is coming to the party?
 B: # What if Alfonso comes?

4.1 The problem

- Problem: non-trivial class of exceptions to such a constraint.
- Planning responses (“what if” function: propose an answer?):

- (42) A: How can we get to the airport?
 B: What if we borrow Alfonso’s car?
 (43) A: Who should we invite to the party?
 B: What if we invite Alfonso and all his friends?

- Same-speaker continuations (on a non-re-asking reading):

- (44) A: Is Henry coming to the party?
 A: What if Isabella is there?

4.2 The solution

- How to explain such exceptions? How to explain restricted readings available on such exceptions (no re-asking)?
 - Triviality constraint: “what if” question is banned just in case its contribution to the discourse state is trivial. (Perhaps constraint on questioning in general.)
 - Coherence constraint: “what if” question must cohere with prior discourse.
 - Cf. Stalnaker’s 1978 restriction on null updates.
 - How to spell this out?
- A question would lead to a trivial update if it (or some question that entails it) has already been asked, or if the issue it raises is already settled. (Groenendijk 1999)
- Re-phrasal of puzzle:
 - What is the effect of a proposed answer on the discourse state such that re-asking becomes possible?

- (45) A: Is Henry coming to the party?
 B: Yes, he is.
 A: What if Isabella is there? (\approx Will he still come if Isabella is there?)

- Key intuition: A actually rejects B's attempt at an answer, but only in a limited way.
 - Answer accepted for cases where Isabella isn't there.
 - Answer not accepted for cases where Isabella is there.
 - Implication of dialog: speaker A suggests that B did not consider the possibility of Isabella coming.
 - My name for this phenomena: "conversational backoff".
- "Defect" in common ground revealed(/publicly assumed by A): B was assuming a way of making the context precise where Isabella isn't there. A does not make this assumption.

	A's private information state	B's private information state
Worlds where Isabella is there (W_I)	present	not present
Worlds where Isabella is not there ($W_{\neg I}$)	present	present

- Net result of conversational backoff on public shared information state:
 1. For $W_{\neg I}$: worlds where Henry does not come removed.
 2. For W_I : question asked about whether he will come.
- *Key point*: conversational backoff provides a mechanism for question to be asked non-trivially.
 - Question would be trivial relative to $W_{\neg I}$ but not W_I , the worlds resulting from conversational backoff. These worlds target of conditional question.
 - Re-asking reading not possible *without* a mechanism of this type.
- Prediction: biased questions (Borkin 1971; Guerzoni 2003 a.o.) should be able to prevent triviality.
 - Prediction easiest to see on Reese's 2007 account, where biased questions are speech-act conjunctions of questions and assertions. Follows from (hopefully) any account of bias.

- (46) A: Why would anyone lift a finger to help Henry?
 B: What if he has done something nice for them?

- (47) vs.: (neutral context)
 A: Why did Alfonso help Joanna?
 B: # What if she has done something nice for him?

- Coherence/relevance constraint: in question/answer contexts, a response is licensed only if it can make some contribution toward an answer.
 - Notoriously hard to formalize / state precisely.
 - Following Büring 2003:

- (48) "I will resort to the rather vague formulation that A is an answer to Q if A shifts the probabilistic weights among the propositions denoted by Q."

- (49) A discourse contribution C is relevant in a D-tree DT if C is an answer to the QUD for C in DT.³

- Caveats: upper bounded by Quality. Various non-monotonic responses don't obey this.
- Basic idea: if planning-type QUD salient, with asked question as a sub-question, "what if" question can satisfy coherence.
- Pragmatic reasoning:
 - (50) 1. Assume speaker is obeying relevance constraint in responding to a question.
 2. Therefore they must mean to shift probability mass among possible plans.
 3. Consequence: probability mass in temporary context must be shifted towards some particular plan.
- Examples:
 - (51) A: Who should we invite?
 B: What if we invite Alfonso? (QUD could be e.g. "how can we decide who to invite?")
 - (52) A: How can we get to the airport?
 B: What if we borrow Alfonso's car?
- Planning QUD in 2nd example: Question itself.
- Planning responses/questions remain fairly mysterious!

4.3 Same-speaker discourse

Why is "what would happen" type reading licensed immediately following a question in monologues?

- (53) A: Is Alfonso coming to the party? What if Joanna is there?

- Polar questions license something like modal subordination (Roberts 1989 etc.) to the "yes" alternative in same-speaker dialogue.
 - (This is already a pretty interesting fact that I have never encountered before. Closest case: Declerck and Reed's 2001 split conditionals, i.e. supposition imperatives; Isaacs 2007)
 - Cued by "would":

A: Is Alfonso coming to the party? He *would* have a good time.

- Temporary suppression of the "no" alternative acts leaves context locally uninquisitive. Coherence relation to question entirely different.

5 CONCLUSIONS AND FURTHER PUZZLES

Recap:

- "what if" questions act as conditional questions, with the question-component supplied anaphorically by the Question Under Discussion in discourse.

³This is distinct from Büring's formulation in that it applies to both questions and answers, and is sufficient but not necessary. I assume that there are other sufficient constraints in play as well; what I need here is to allow a question to contribute to answering in this sense.

- On the conditional-question account, complicated distribution of readings of “what if” questions in discourse follows from fairly straightforward assumptions about the pragmatics of questioning.

Many remaining puzzles:

- Better understanding of planning “what if”s/
- “What about if”, “And if”, “even if”? Properties differ...
- “What about” in general?
- Languages with only “and if” type? E.g. French “et si”...
- Better understanding of conversational backoff.

Final point: Support of the best kind for QUDs: Quine’s dictum “to be is to be the valuable of a variable.”

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