

# Some questions about questions

*Questions and Answers*  
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September 20, 2009

## Goals of this section:

- This handout provides a quick overview of some of the major topics and approaches that have dominated work on questions over the years.
- This survey is not quite exhaustive in the selection of topics, and only a few main points are discussed with regard to each. But it will give us at least a rough idea of the context in which the things we are going to discuss are located.

## 1 What are questions?

### 1.1 Truth conditions

- Truth conditions are at the heart of all semanticizing in this tradition.
- However, questions do not have truth values: It does not make sense to ask whether (1a–c) are true or false, nor can they be denied, affirmed, etc.
  - (1) a. Is it raining?  
b. Who came to the party?  
c. Who read which books?
- So how do we deal with them?

### 1.2 Many questions are requests.

... as opposed to assertions. They are used to perform a different kind of speech act from the declaratives we usually deal with in (introductory) semantics. And, just like with other speech acts (promises etc.), the issue is not whether a given question is true or false, but how it affects the context and whether it succeeds or not.

- von Stechow (1991); Roberts (1996); Ginzburg (1997); Traum et al. (1999) etc. seek to incorporate an answer to this problem in their formal semantic/pragmatic accounts.
- A question is seen as a proposal to agree on an “issue” which to pursue in subsequent discourse.
- The goal is to augment the *common ground* (traditionally seen as a representation of mutual beliefs) with a representation of shared *intentions*, modeling participants’ agreement (resulting from the successful question) to jointly *resolve* the question.

- This ties in with earlier work (Carlson, 1983) on the structure of *cooperative* (as opposed to argumentative) discourse: All such discourse, it is assumed, is aimed at the resolution of explicit or implicit questions.
- This topic also has plenty of obvious connection to current concerns in natural-language processing, such as the design of software agents and natural-language interfaces, processing tools of all kinds, etc. (see Traum et al., 1999, for extensive work in this area).

### 1.3 But many questions aren't.

But speech acts and intentions are not the first thing we should be interested in.

- Even if we were only interested in interrogative speech acts, we would need to say what their *propositional content* is.
- Worse, the talk of interrogative speech acts is completely orthogonal to the problem of *embedded questions*:
  - John knows whether it is raining.
  - Mary wonders who came to the party.
  - Does Sue know who came to the party?
  - Bill told Sue who read which books.
  - Whether Freddy will come to the party depends on whether Amy does.

### 1.4 Question denotations

So the first thing we need is a *semantic* theory of (embedded and unembedded, or indirect and direct) questions.

- General idea: The meaning of a question is spelled out in terms of its *answers*: The set of sentences in (3b) somehow plays a crucial role in the analysis of (3a).

- It is raining?
- {It is raining, it is not raining}

- Hamblin (1958, 1973): The denotation of (3a) is (3b).
- Karttunen (1977): The denotation of (3a) is the true member of (3b).
- Groenendijk and Stokhof (1984 and elsewhere): (3a) is interpreted with respect to a set  $K$  of possible worlds; at each world  $w$  in  $K$ , the denotation of (3a) is the member of (3b) that is true at  $w$ .
- Similarly for (4):

- Who came to the party?
- {John came, Mary came, Bill came, John and Mary came, Mary and Bill came, ... }

- This extends fairly straightforwardly to embedded questions:

- John knows whether it is raining.
- John wonders who came to the party.
- etc.

The section on **Basics and Classics** deals with these theories in detail, including the way in which question denotations are derived compositionally from *wh*-words and the rest of the sentence, and how question-embedding verbs combine with their complements.

## 2 Context-dependence

### 2.1 Exhaustivity, mention-all vs. mention-some

- One may be tempted to interpret (6a) roughly as (6b) (where  $x$  ranges over some contextually provided domain of individuals of interest), which in turn means something like (6c).

- (6) a. John knows who came to the party.  
b. For each  $x$ , John knows whether  $x$  came to the party.  
c. For each  $x$ , if  $x$  came to the party then John knows that  $x$  came, and if  $x$  didn't come to the party then John knows that  $x$  didn't come.

- But this is a very strong interpretation. Consider the following:

- Alice, Billie and Cathy came to the party;  
Winona, Yvonne and Zelda didn't.  
John knows that Alice, Billie and Cathy came,  
but he doesn't know that the others didn't come.  
Is (6a) true in this case?
- If you said 'no', you might conclude that (6a) is equivalent to (6c). And you'd be in good company (Groenendijk and Stokhof, 1984).
- If you said 'yes', you would be advocating a weaker variant of (6c):  
For each  $x$ , if  $x$  came to the party then John knows that  $x$  came.  
And you'd be in good company (Karttunen, 1977).
- Worse: Under both interpretations, (7) is false if John simply knows of some  $x$  that  $x$  will give directions.

(7) John knows who to ask for directions around campus.

But isn't (7) true in that case?

- The above has parallels in direct questions:

- (8) a. Who came to the party?  
b. Who can we ask for directions around campus?

- We can't fix the meaning of a question once and for all along the lines of (6) or (7). Contextual factors play a major role.

### 2.2 Resolvedness

This is closely related to the previous problem. Consider (9) from Ginzburg (1995). Whether or not the question is *resolved* depends on contextual parameters.

- (9) a. (Context: Jill about to step off plane in Helsinki.)  
Flight attendant: Do you know where you are?  
Jill: Helsinki.  
b. Flight attendant: Ah ok. Jill knows where she is.

- (10) a. (Context: Jill about to step out of taxi in Helsinki.)  
Driver: Do you know where you are?  
Jill: Helsinki.  
b. Driver: Oh dear. Jill doesn't (really) know where she is.

Partial or non-exhaustive answers are often just fine, even preferred relative to exhaustive ones. This is accounted for in terms of what the question is *about* (Ginzburg, 1995) or what kind of information will be *useful* to the asker (van Rooy, 2003b). We won't have time to do into this in much detail.

### 3 Inquisitive semantics and pragmatics

#### 3.1 Inquisitive semantics

- Interrogatives appear in compounds with declaratives and with each other. For instance:
    - Conditional questions:
      - (11) a. If the weather is good, Joe will go hiking.
      - b. If the weather is good, will Joe go hiking?
      - (12) a. If you have any questions, Joe can help you.
      - b. If I have any questions, who can help me?
    - Unconditionals (can be analyzed as conditionals with interrogative antecedents, cf. ?):
      - (13) Regardless of who wins, the match will be fun.
    - Conjoined questions:
      - (14) a. Who is your father and who is your mother?
      - b. cf. Who is your father? Who is your mother?
      - c. cf. Who are your parents?
    - And more.
  - We need a semantic analysis which can handle this kind of expression. But with questions, Boolean logic is not suitable:
    - \* The syntactix must be extended with a means to represent questions.
    - \* The semantics must be extended to define the meaning of compounds containing questions.
- Inquisitive semantics does that.

#### 3.2 Inquisitive pragmatics

- Standard dynamic semantics models the changes in contexts and belief states that are brought about by the acquisition of new information.
  - But this is only a small part of what goes on in linguistic conversations. In reality, people undertake various kinds of *discourse moves* aimed at steering the conversation in a certain direction, performing non-constative speech acts, reaching common ground not only on the available information, but also on the current status and goals of the ongoing discourse.
  - Those moves are just as important in understanding what goes on in discourse, but are handled by a module of the theory (Gricean Pragmatics) that is built on top of the standard theory.
  - Can the flow of information and the management of the discourse be dealt with on equal footing? What should a representation look like which models not only people's belief states, but also the current state of the conversation? How do actions like "raising an issue" or "resolving an issue" effect the context? What does a context look like in which an issue has been raised?
- Inquisitive pragmatics seeks to give a single unified account of conversation at these different levels.

## 4 Other issues surrounding questions

### 4.1 Negative polarity items

- (15) a. Nobody has ever been to Colorado.  
b. #She has ever been to Colorado.  
c. He didn't lift a finger to help.  
d. #He lifted a finger to help.

- The best-known generalization about NPIs, due to Fauconnier and Ladusaw, is that they are licensed in *downward-entailing* contexts.
- NPIs occur in questions:

- (16) a. Has she ever been to Colorado?  
b. Did he lift a finger to help?

- *Problem:* Downward-entailingness does not explain NPI use in questions.
  - Polar questions are not downward-entailing.
  - Wh-questions are only downward entailing on their left argument (the restrictor).
  - However, the use of NPIs is in no way limited to the restrictors of Wh-questions.

We will need to get clear on logical relations (?, etc.) between questions before we can agree on this.

- What about questions is such that they allow NPIs?

And should we consider the generalization about downward-entailing contexts refuted by the fact that they do?

- What about NPIs is such that they can occur in questions?

This hints at a bigger problem with the Fauconnier/Ladusaw generalization: Shouldn't we try to *explain* the distribution of NPIs in terms of their meaning?

- What is the role of NPIs in questions?

I.e., how do questions with NPIs differ from their NPI-less counterparts? Notice in this connection that (16b) seems to convey that the speaker expects a negative answer; which is not the case in (16a).

- Kadmon and Landman (1993) seek to explain the distribution of NPIs in terms of their meaning. Krifka (1992, 1995) takes this analysis further, relating the use of NPIs to the *bias* of the question. van Rooy (2003a) gives an excellent survey and takes these ideas one step further, integrating the classical semantics of questions in a probabilistic framework in which biases and related notions can be expressed elegantly. This is related to van Rooy (2003b) in "Resolvedness and answerhood."

### 4.2 Focus and echo questions

Focus has traditionally been analyzed in a way that is similar to the semantics of questions: Each of (17a–c) is only felicitous if used to answer certain (implicit or explicit) questions.

- (17) a. John introduced **Bill** to Sue.  
b. John introduced Bill to **Sue**.  
c. John introduced **Bill** to **Sue**.

- (18) a. Who did John introduce to Sue?  
b. Who did John introduce Bill to?  
c. Who did John introduce to whom?

Roughly speaking, each sentence in (17) *presupposes* (or conventionally implicates) that its counterpart in (18) is the question under discussion. Question-answer pairs are felicitous iff they are *congruent*.

- Two major approaches to focus:
  - Alternative semantics (Rooth, 1992 and elsewhere). Akin to the semantics of questions we’ll mostly be talking about (Hamblin, 1973; Karttunen, 1977; Groenendijk and Stokhof, 1984). The presupposition is a set of propositions, differing only in the part that is focused (or questioned, in the case of questions).

(19) a. {intr(J,B,S), intr(J,C,S), intr(J,D,S), ... }  
b. {intr(J,B,S), intr(J,B,T), intr(J,B,U), ... }  
c. {intr(J,B,S), intr(J,B,T), intr(J,C,S), intro(J,C,T), ... }
  - Structured meanings (von Stechow, 1981; Krifka, 1992, etc.). More of a “syntactic” approach (in the logician’s sense of the term). Akin to the approach to questions by the same name (von Stechow and Zimmermann, 1984; von Stechow, 1991, and elsewhere). Question meanings are functions that, when applied to the meaning of the answer, yield a proposition (Krifka, 2001).

(20) a.  $\lambda x$  [ intr(J,x,S) ]  
b.  $\lambda x$  [ intr(J,B,x) ]  
c.  $\lambda x \lambda y$  [ intr(J,y,x) ]
- You might think that there is not much to choose from; however, Krifka (2001, 2004b,a) and others have argued that the structured-meaning lends itself to an empirically more adequate definition of the congruence relation; the alternative approach, it is argued, does not rule out certain types of ill-formed answers, such as the “overfocused” (21b).

- (21) a. What did Mary read?  
b. **Mary** read **Moby Dick**.

- See also (Aloni and van Rooy, 2002) for a recent attempt to combine the strengths of both approaches in a dynamic framework.

### 4.3 Quantification

- Three types of readings: *narrow-scope*, *functional*, *pair-list*.

(22) Which book did every student bring?  
a. Every student brought *Moby Dick*.  
b. Every student read *his favorite novel*.  
c. Karl brought *Moby Dick*, Sue brought *Syntactic Structures*, ...
- Pair-list are sometimes absent:

(23) Which student brought every book?  
a. Karl.  
b. #The student who wanted to discuss it.

- c. #Karl brought *Moby Dick*, Sue brought *Syntactic Structure*, Idots
- (24) Which book did most/few students bring?
- Moby Dick*.
  - The one they wanted to discuss.
  - #Karl brought *Moby Dick*, Sue brought *Syntactic Structure*, Idots

Pair-list readings are the most interesting ones. Karttunen (1977) had some trouble with the semantic derivation of these; Groenendijk and Stokhof (1984) grappled with similar problems and coped somewhat better. Krifka (2004a) proposed a solution which took up Karttunen's original proposal. A different line is taken by the "functional" approach of Engdahl (1986); Chierchia (1993).

- There's more to the topic of quantifiers in questions, though...

## 5 Quantificational Variability Effects (QVE)

(Examples from Lahiri, 2000).

- Quantificational variability in indefinites:

- (25) a. A man rarely loves his enemies.  
b. A man usually hates his enemies.  
c. A man sometimes loves his enemies.  
d. A man hates his enemies.

The interpretation of the indefinite interacts with the quantificational adverb. In (25a,b) (and less so in (25c)), the indefinite acts semantically like a variable bound by the adverbial quantifier.

- Similar effects with wh-phrases:

- (26) a. Sue mostly remembers what she got for her birthday.  
b. Bill knows, for the most part, what they serve for breakfast at Tiffany's.  
c. Mary largely realized what they serve for breakfast at Tiffany's.

Here, too, the wh-phrase interacts with the quantifier:

- (27) a. most(x)[they serve x for breakfast at Tiffany's][Bill knows that they serve x for breakfast at Tiffany's]  
b. etc.

- This phenomenon seems to be related to the mention-all / mention-some distinction.

- Two questions:

- Semantic analysis and compositional derivation of QVEs.

Notice in this connection that quantification over individuals is not always the right approach:

- (28) a. Mary knows, in part, Beethoven's fifth symphony.  
b. Mary mostly knows Beethoven's fifth symphony.

- Constraints on QVEs.

Notice in this connection that not all question-embedding verbs exhibit them:

- (29) a. Sue mostly wonders what she got for her birthday.  
b. For the most part, Bill asks what they serve for breakfast at Tiffany's.

There are also subtle effects with other verbs, which we'll talk about.

- Of particular interest is the debate between Berman (1994) and Lahiri (2000), and the question of the relationship between the **resolvedness** discussed by Ginzburg (1995) and QVEs.

## 6 And more

The above list is not exhaustive, but gives an overview of some of the most interesting issues. Covering all of them would require at least a whole semester.

## Readings

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