Questions [1]

0.   Questions and pragmatics

- Why look at questions in a pragmatics class?

- "…where there are questions, there are, fortunately, also answers. And a satisfactory theory of interrogatives will have to deal with those as well". (Groenendijk and Stokhof 1984: 25)

- But questions may be successfully answered in several different ways.

1)   Who did John kiss at the party last night?

A1:	Mary	(information-independent, complete answer)
A2:	The girl from next door.	(information dependent, complete answer)
A3:	A redhead.	(partial answer)j

(Groenendijk and Stokhof 1984: 27)

2)   A: Who came to the party?
        B: James and Pete   (… and nobody else)

3)   A: Where can one buy Italian newspapers?
        B: At Harvard Square.

- G & S's take on this: what constitutes a good answer to a question cannot be determined by the semantics of the question alone. ¨Within the semantic limits set by the denotation of a question, what counts as a good answer is determined by pragmatic factors" (G & S 1982: 155)

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[1] This presentation owes a lot to Paul Hagstrom's overview article on questions (Hagstrom 2003), and to Angelika Kratzer's lecture notes for her Fall 2004 seminar. Of course, all errors are my own.

1.   The agenda for today

- Two questions about questions:

    (i)   What do questions mean? That is, what do we know when we know the meaning of a question?

    (ii)   How do we compute the meaning of questions from the meaning of their parts? (Compositionality)

- Today, we will (mostly) focus on (i): We will discuss and evaluate several proposals for question-denotations.

2.   Hamblin 1958 [2]

The challenge: how to handle questions in a truth-conditional semantics.

- Truth-conditional semantics is designed to handle statements.

- To know the meaning of a statement is to know the conditions under which it is true (its truth-conditions).

    If we know the meaning of a statement, we will be able to determine whether it is true given a particular state of affairs. This intuition can be captured by taking statements to denote propositions, constructed as (characteristic functions) of sets of possible worlds.

- But questions are not true or false!

- How can a theory that pairs sentences with their truth-conditions handle questions?

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[2] This section follows closely the presentation in Hagstrom (2003).

Hamblin to the rescue

- Hamblin (1958) takes up the challenge by investigating the relation between questions and statements.

- Three postulates:

Postulate I: An answer to a question is a statement.

Postulate II: Knowing what counts as an answer is equivalent to knowing the question.

Postulate III: The possible answers to a question are an exhaustive set of mutually exclusive possibilities.

- Postulate I: 'fragment' answers stand for whole statements.

4)   A: Who arrived?
       B: James.

       B has expressed the proposition that James arrived.

5)   A: Did James arrive?
       B: Yes.

       B has expressed the proposition that James arrived.

- Postulate II: to know the meaning of a question is to know its answerhood conditions. A question picks out a set of propositions, those that count as an answer.

- Postulate III: the possible answers are an exhaustive set (their union equals the set of all possible worlds), and are mutually exclusive (in any given world only one of the propositions in the set is true). That is, the set of possible answers is a partition of the set of possible worlds.

6)   Did James arrive?

Possible answers = {Yes (that James arrived), No (that James didn't arrive)}

Type 1 worlds   Type 2 worlds

Yes
(he
did)

No (he
didn't)
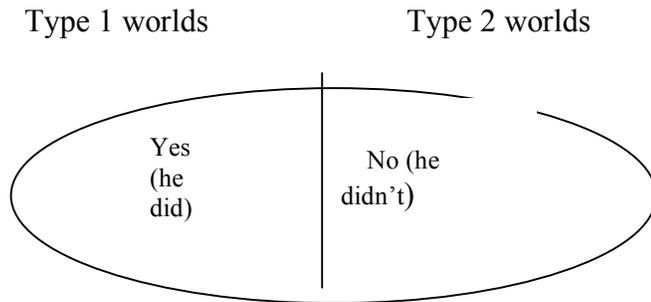
7)   Who arrived?

Suppose that Marta, Pedro and Juan are all the people there are.

Possible answers = {that only Pedro arrived, that only Marta arrived, that only Juan arrived, that only Marta and Pedro arrived, that only Juan and Marta arrived, that only Juan and Pedro arrived, that Marta, Pedro and Juan arrived, that nobody arrived}

•   So: To ask a question is to present a way of partitioning the set of possible worlds, and to request information about which cell in the partition the actual world is in.

3.   Hamblin 1973

•   Hamblin 1973 proposes a slightly different view: a question still picks out a set of propositions (its possible answers), but those propositions are not mutually exclusive.

8)   [[**Who ate?**]]^{w0} =

$\lambda p \exists x [\text{human}(x)(w_0) \ \& \ p = \lambda w \ \text{ate}(x)(w)]$

Suppose that the only people there are in the actual world are James, Pete and Sally. Then:

9) $[[$**Who ate?**$]]^{w0} = \{\lambda w \text{ ate}(James)(w), \lambda w \text{ ate}(Pete)(w), \lambda w \text{ ate}(Sally)(w)\} =$

{that James ate, that Pete ate, that Sally ate} [3]

- Goal: give a compositional semantics for questions.

  In a nutshell:

  Interrogative pronouns denote sets of individuals.

  $[[$**who**$]]^{w0} = \{x: x \text{ is a person in } w_0\} = \{Juan, Pedro, Marta…\}$

  In order to combine, e.g., $[[$**arrived**$]]^{w0}$ with $[[$**who**$]]^{w0}$, we apply the function denoted by **arrived** to each of the individuals in $[[$**who**$]]^{w0}$. So:

  $[[$**Who arrived?**$]]^{w0} = \{\lambda w \text{ arrived }(Juan)(w), \lambda w \text{ arrived }(Pedro)(w), \lambda w \text{ arrived }(Marta)(w)…\} = \{$that Juan arrived, that Pedro arrived, that Marta arrived…$\}$

4.   Karttunen 1977

- Karttunen builds on Hamblin 1973 by considering <u>embedded questions:</u>

10)   John knows <u>which of my pets ate.</u>

11)   John asked <u>whether it is raining.</u>

- The advantage of this move:

  The denotation for embedded questions must enter into the compositional calculation of truth-conditions for sentences that embed them.

  And, as Groenendijk and Stokhof (1982) note, while we lack intuitions about what kind of semantic object is to be associated with direct questions, "we do have some intuitions about the semantics of declarative sentences in which they occur embedded under such verbs as *know, tell, wonder*." (G &S 1982: 175).

  So: "What kind of semantic object we may choose to associate with *wh*-complements is restrained by various facts about the semantics of these sentences" (G & S 1982: 175).

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[3] Notation: $[[\alpha]]^{w-}$: = the extension of α in w. *That*-clauses in the metalanguage refer to propositions.

- Karttunen's proposal: embedded questions denote <u>the set of their true answers</u>.

12) $[[\textbf{which pets ate}]]^{w0} = \lambda p[p(w_0) \ \& \ \exists x[pet(x)(w_0) \ \& \ p = \lambda w \ ate(x)(w)]]$

Suppose that the actual pets are Yoli, Piti, and Moti, and the pets who actually ate are Piti and Moti. Then,

13) $[[\textbf{which pets ate}]]^{w0} = \{\lambda w \ ate(Piti)(w), \lambda w \ ate(Moti)(w)\} =$
        {that Piti ate, that Moti ate}

14) $[[\textbf{whether it is raining}]]^{w0} =$

        {that it is raining}, if it is raining in w_0
        {that it is not raining}, otherwise.

- <u>Motivation</u>: intuition that *Mary knows which pets ate* implies only that I know the true answers to the question *which pets ate?*

15)   Mary knows which of my pets ate.

        15) is true in w iff, in w, Mary believes every proposition in $[[\textbf{which of my pets ate}]]^{w}$

[Note 1: A substantial part of Karttunen's paper is devoted to derive these question-denotations compositionally. We will not talk about this today.

Note 2: What about direct questions? While Karttunen focuses on embedded questions, at the beginning of the paper he mentions previous proposals that treat matrix questions as semantically equivalent to a declarative sentence containing the corresponding indirect question embedded under a performative verb (see Aqvist, Hinttikka, Lewis and Cresswell):

(i)   (a)   Is it raining?
        (b)   Which book did Mary read?

(ii)   (a)   I ask you (to tell me) whether it is raining.
        (b)   I ask you (to tell me) whick book Mary read.

Karttunen thinks these analyses are on the right track. Thus, he rejects Hamblin's analysis of matrix questions as sets of propositions.]

5.   Groenendijk and Stokhof 1982

5.1.   Problems for Karttunen

5.1.1.   Intrusion of false beliefs

- Suppose that Yoli, Piti and Moti are my pets, and that Yoli and Piti ate, but Moti didn't.

16) $[[$**which of my pets ate**$]]^{w0}$ = {that Yoli ate, that Piti ate}

- Assume further that Laura correctly believes that Yoli and Piti ate, but mistakenly believes that Moti ate too.

17)

Yoli ate, Piti ate, Moti ate.

w0
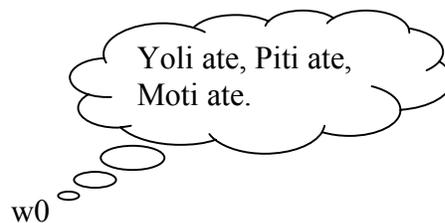
- Is the sentence in 18) true in the scenario above?

18)   Laura knows which of my pets ate.

PREDICTION: 18) is true

(Laura believes all the propositions in $[[$**which of my pets ate**$]]^{w0}$)

INTUITION: 18) is false

[problem noted by Karttunen himself]

<u>Strong vs. weak exhaustiveness:</u>

- G & S: We can distinguish different degrees of exhaustiveness of complements" Karttunen's question denotations are exhaustive "to the lowest degree". To account for the meaning of embedded questions, we need a stronger notion of exhaustiveness.

  "A weakly exhaustive answer provides a complete list, a strongly exhaustive answer contains in addition the closure condition stating 'and that's all, folks.' (G & S 1997: 1110)

5.1.2. *De dicto* and *de re* readings

- G & S: 19) has two readings.

19)   Danny knows which spies came to the party.

- Consider the following scenario (inspired by Hagstrom 2003).

  There are several spies infiltrated in the MIT Linguistics department. Their names are Zoch, Vloch and Poch. Danny hosted a departmental party last night, and two of the spies, Zoch and Vloch, attended. Danny knows exactly who came to the party, but has no idea that Zoch and Vloch are spies.

- Is 19) true in the scenario above? Yes and no…

Yes: *de re* reading

  Suppose that Agent Jones, from the FBI, knows who the spies are and wants to find out whether they came to the party. He still might ask Danny because *Danny knows which spies came to the party*, despite not knowing who the spies are.

No: *de dicto*

  The other (more natural) reading of 19) is the *de dicto* reading. There is a sense in which Danny doesn't know which spies came to the party: If you asked him directly *Which spies came to the party?* he wouldn't be able to tell you. On this reading, part of what someone when he knows which spies came to the party is which individuals (at least among the attendees) are spies.

- Karttunen only predicts the *de re* reading.

  On Karttunen's analysis, the only thing necessary for 19) to be true in the actual world is that Danny believes the propositions in {Zoch came to the party, Vloch came to the party}. The information that these individuals are spies in the actual world is not encoded in those propositions.

5.2.   G & S's proposal

20) $[[\textbf{which pets ate}]]^{w0} =$

$\lambda w[\lambda x[pet(x)(w_0)\ \&\ ate(x)(w_0)] = \lambda x[pet(x)(w)\ \&\ ate(x)(w)\ ]\ ]$

=   the <u>proposition</u> that is true in a world w iff the set of pets that ate in w is the same as the set of actual pets that ate in the actual world.

[Note: the extension of an embedded question is now a <u>proposition</u>. This gives G & S an advantage in accounting for coordination cases like *John knows that Peter has left and whether Mary has gone with him*]

21)   Mary knows which of my pets ate.

   is true in the actual world iff, in the actual world, Mary believes that the set of pets that ate is the set of pets that actually ate.

- Note that this can be considered a return to Hamblin 1958 (see Hagstrom 2003)

  For Hamblin 1958, the set of answers to **which of my pets ate***?* would be the partition {that only Yoli ate, that only Piti ate, that only Moti ate, that only Yoli and Piti ate, that only Yoli and Moti ate, that only Piti and Moti ate, that Yoli, Piti and Moti ate}

  For G & S 1982, knowing which of my pets ate amounts to knowing which cell in this partition the actual world belongs to. (G & S 1984 view questions as partitions on the set of worlds, "a perspective which is different from, though equivalent with the propositional concepts view taken in G & S (1982)" (G & S 1984: 214).

Back to the problems

- **Protection against false beliefs**   😎

  G & S's question denotation guarantees that 21) comes out false if Mary believes a false answer to the embedded question even if she also believes true ones.

- *De dicto* and *de re* **readings.**   😎

  The *de dicto* reading is accounted for in a direct manner. Knowing *which spies attended the party* amounts to knowing the extension of the set of spies who called in the actual world. This includes information about the spy-status of the attendees.

  G & S take the *de dicto* reading to be the basic one, and derive the *de re* reading by quantifying-in. I won't go into the quantifying-in mechanism here, because we are not discussing the compositional derivation of these readings. What we get is:

22) $[[\textbf{which pets ate}]]^{w0} = \lambda w \forall x [pet(x)(w_0) \rightarrow [ate(x)(w_0) \leftrightarrow ate(x)(w)]]$

5.3.   Too strong?

- Are the arguments below valid?

23)   I know who ate
       John didn't eat

       _____

       I know that John didn't eat

24)   I know who ate

       _____

       I know who didn't eat.

- This type of argument is only predicted to be valid if I know who the people are.

  "There seems to be only one type of situation in which knowing who walks may not turn out to be the same as knowing who doesn't (…). This is the type of situation in which the subject of the propositional attitude is not fully informed as to which set of individuals constitutes the domain of the discourse (…)." (G & S 1982)

  "Strong Exhaustiveness, thus, should not be confused with the requirement that an answer specify both the positive and the negative extension of a relation." (G & S 1997)

  "… the equivalence of interrogatives of the form *?xPx* and *?x¬Px* holds only if we assume that the domain from which the instances are drawn are fixed." (G & S 1997)

- This is good. Consider the following examples (due to Angelika Kratzer, class notes. Some names changed.)

25) I can tell you which students were admitted, but I can't tell you which students weren't. That's confidential information.

26) Irene has posted the list of the new students admitted to the graduate program.

  Has she informed us which students were admitted?

  Has she informed us which students were not admitted?

- In all worlds compatible with the information Irene gave us the set of admitted students is the same as the set of actually admitted students.

- Not predicted to be valid:

27) Irene informed us who was admitted.

  Spencer Hubbard was not admitted.

  _____

  Irene informed us that Spencer Hubbard was not admitted.

28)   We know who was admitted.

        Spencer Hubbard was not admitted.

        _____

        We know that Spencer Hubbard was not admitted.

•   Feymann example.

29)   Feynman knew which elementary particles had been discovered by 1978, but he
      didn't know which ones hadn't (Bromberger, p. c. to Lahiri)

      In all of Feynman's belief worlds the elementary particles discovered by 1978 are
      the same as those discovered by 1978 in the actual world.

      Feynman didn't know what the complete set of elementary particles was. Hence his
      belief worlds differed among themselves as to the complete inventory of
      elementary particles.

      And therefore, there were at least some of Feynman's belief worlds, where the not
      yet discovered elementary particles were not the same as those in the actual world.

But…

•   However, there are cases where the domain **is** fixed, and still the negative
        extension and the positive extension come out as different.

30)   (a)   It surprised me who was at the party.
        (b)   It surprised me who was not at the party

        It seems that (a) can be false and (b) true, regardless of whether the domain is fixed
        or not. Consider a situation in which everyone who was at   the   party   was
        expected to be there by the speaker, but some people who were also expected to be
        there did not show up. (Judgments?).

        (see discussion in Berman 1991, Heim 1994, Beck & Rullmann 1999).

31)   The video shows which of those animals the man fed.

32)   The video shows which of those animals the man didn't feed. (Kratzer 2005)

Alan's modification of the example:

33)   The video displays which of those animals the man fed.

34)   The video displays which of those animals the man didn't feed.

6.   A couple of ways to go

- Implement Karttunen's approach so that it can replicate G & S's results where they are needed, while at the same time maintaining access to Karttunen-sets (Heim 1994)

- Implement G & S's proposal with a semantics based on situations/events (Kratzer 2006)