XIV. Sentence types

66. Questions

Abstract

Questioning is a basic type of speech act essential for human communication, and questions form a distinct sentence type in every language. The article first gives a survey of different uses of questions, as speech acts and as embedded clauses. It then lists the various types of questions and characterizes the notion of congruent answer. It gives an introduction to the principal semantic approaches to questions, including the functional approach, the proposition set approach and the partitional approach, and discusses how question meanings can be constructed from given syntactic structures. The last section takes up a number of supplementary topics, like the relation between indefinite NPs and interrogative pronouns, the nature of question-embedding predicates, biased questions and focus within questions, and the role of questions in structuring discourse.

> *There are four ways of answering questions. Which four? There are questions that should be answered categorically. There are questions that should be answered with an analytical answer, defining or redefining the terms. There are questions that should be answered with a counter-question. There are questions that should be put aside.*
>
> (Pañha Sutta, translated from the Pali by Thanissaro Bhikkhu)

1. Questions as speech acts and as semantic objects

We will be concerned with the most pedestrian type of questions here that the Enlightened One mentioned, the questions that should be answered categorically by *yes* or *no*, *this* or *that*. Yet even then questions are a highly interesting linguistic phenomenon that continues to inspire developments in syntax, semantics, and pragmatics.

In the classification of speech acts by Searle (1975), questions form a subtype of directives, one of the major five classes, together with commands and requests. This is because questions try to make the addressee do something, namely, provide a particular piece of information. While this is certainly the prototypical function of questions, one should be aware that not every request for information is expressed by a question – consider, e.g., commands like *Tell me the time!* Also, an assertion like *You want coffee* whose truth value is only known by the addressee may be used to express a question; if not true, the

addressee can be expected to reject it. It has been claimed that Yélî Dnye, a Papuan language, does not distinguish between assertions and polar (yes-no) questions at all (cf. Mitterer & Stivers 2006).

On the other hand, not every sentence with question form expresses a request for information. There are exam questions like *Rome was founded when?* in which the questioner knows the answer but wants to check the ability of the addressee to supply it. There are rhetorical questions like *Did you ever lift a finger to help me?*, which amounts to a strong assertion that you never lifted a finger to help me. There are reflective questions that do not oblige the addressee to answer but express the speaker's interest in an issue, such as German *Ob es wohl regnen wird?*, lit. 'whether it will rain?' There are deliberative questions that do not ask for facts but inquire what should be done, as in *What should I do?*, and whose answers, consequently, are directives, e.g., *Read this article!* There are questions that express conditions, as in *Are you easily tired? XYZ will help you.* Questions are also used to seek confirmation in cases in which the speaker is not sure, as in question tags, cf. *He will come, won't he?*, or to utter commands, as in *Could you open the window?* And there are embedded questions (sometimes called "indirect questions") like *Bill knows who will come*, which do not express information requests either.

Nevertheless, the various uses of unembedded or root questions can be reduced to one basic pragmatic function, namely, expressing lack of information of a specified type. We will see how the wide variety of question uses can be derived from this core meaning. Embedded questions, on the other hand, do not imply lack of information. Yet there are properties that questions as speech acts and questions as constituents of clauses have in common.

Stenius (1967) has argued that utterances used to perform speech acts like assertions, commands, and questions can be partitioned into a sentence radical denoting a semantic object, like a proposition, and a sentence mood indicator or illocutionary operator that turns this semantic object into a communicative act. While Stenius considered only simple yes/no-questions, which may have the same sentence radical as assertions, we can assume that the sentence radical of questions in general is a proposition that is partly unspecified. Such open propositions can be used to perform speech acts that express that the speaker lacks information, as specified by the gaps in the sentence radical. For example, the question *Who will come?* contains a sentence radical COME(x), where "x" identifies the information lacking. Either this incomplete semantic form is understood in itself as requesting completion, or it is combined with an illocutionary operator QUEST that formally expresses a request to the addressee to specify the lacking pieces of information in such a way that the resulting closed proposition is true. Embedded questions, as in *Bill knows who will come*, presumably contain the sentence radical only, as in KNOW(COME(x))(BILL), which says that Bill knows for which entities the sentence radical COME(x) will lead to a true proposition. That is, root questions and embedded questions are both built on interrogative sentence radicals:

(1) *Who will come?*
     QUEST(*COME(x)*)

(2) *Bill knows who will come.*
     ASSERT(KNOW(*COME(x)*)(BILL)).

The semantics of questions deals with the interrogative sentence radicals that occur in root questions or as dependent clauses; the pragmatics of questions is concerned with the various roles that questions serve in communication. While the main focus of this article is on semantics, the meaning of interrogative sentence radicals, we also have to consider different uses of questions, as the proposed semantics should ultimately lead to an explanation of how questions function in communication. As questions often request answers, the linguistic form of answers will also constrain possible theories of questions, and hence, interrogative sentence radicals. The semantics of interrogative sentence radicals should furthermore provide for an explanation of the distribution of embedded questions – which predicates allow for indirect questions, and why.

2. Types of questions

We can distinguish three types of interrogative sentence radicals, and correspondingly, of questions, according to the type of the lacking information: constituent questions, polarity questions and alternative questions.

2.1. Constituent questions

Constituent questions create an open proposition by leaving parts of the description of the proposition unspecified. Languages apply interrogative pro-forms for this purpose. In English, these pro-forms have an initial *wh-* (going back to Indo-European $^+k^w$); hence terms like "*wh*-questions" or "*wh*-pronoun". A better term might be "completion question", reflecting the German term *Ergänzungsfrage.*

In English, constituents that can be questioned include all arguments and adjuncts that are part of the description of a proposition:

(3) a. *What did John read?*
     b. *Who read this book?*
     c. *When did John read this book?*
     d. *Where did John read this book?*
     e. *Why did John read this book?*

Questioning a constituent that includes the finite verb requires a higher-order verb, as in *What did John do?*. But there are languages that have interrogative pro-verbs; e.g., Kiribati (Austronesian) has seven pro-verbs expressing meanings like 'to do what', 'to be where', or 'to do how':

(4) *Kam   na   aera?*
     you.PL FUT do.what
     'What will you do?'

It is also possible to question subconstituents, as e.g., [*Whose book*] *did John read?* Again there are differences between languages. English lacks a way to question ordinals, which German has:

(5) *Den wie-viel-t-en Geburtstag feiert Maria?*
     lit. 'The how-many-th birthday does Maria celebrate?'

It has been suggested (Gil 2001) that only open-class items can be questioned; this excludes pro-forms for prepositions or determiners (other than number words). There are languages with a very small inventory of question constituents, like Asháninca (Arawakan, Peru) with possibly a single such constituent that is further specified by various light verbs (cf. Cysouw 2007). It should be mentioned that constituent questions can also be expressed without any interrogative pro-form (cf. Gretsch 2000) (rising intonation is crucial).

(6) *Sie sind geboren am _?*
     you are born   at _
     'When are you born?'

Constituents that are not part of the descriptive sentence radical cannot be questioned. This holds, in particular, for constructions that specify the nature of the speech act, but also for constituents expressing speaker attitudes, as the initial adverbials in the following examples:

(7) a.   Frankly, *I don't like you.*
     b.   Luckily, *the train was late.*

Languages differ not only in the types of interrogative pro-forms, but also in where they are realized within a sentence. While many place them sentence-initally, as in English, many others leave them *in situ* (cf. Dryer 2005a). Some languages move interrogative pro-forms into a dedicated focus position, such as the preverbal position in Hungarian (cf. Szabolcsi 1981), or to a postverbal position in Western Bade (Chadic; cf. Tuller 1992), which corresponds to the preferred focus position in these languages. Many exhibit both strategies: English allows for in situ in echo questions, which request the repetition of linguistic material that was not understood properly or about which the speaker is incredulous, and in exam questions. In general, in situ interrogative pro-forms appear to be marked intonationally (indicated by accent):

(8) a.   *You are leaving whén?*
     b.   *Napoleon died whích year?*

It is possible to use more than one interrogative pro-form per clause, resulting in so-called "multiple questions". In English, only one pro-form undergoes movement, the others remain in situ and are accented. In Slavic languages and in Romanian, all interrogative pro-forms can move (cf. Comorovski 1996). In the following examples, movement is indicated by coindexed traces.

(9) *Who will* t$_1$ *read what?*

(10) *Cine$_1$ ce$_2$ [t$_1$ ti-a   spus t$_2$]*
     who what you-AUX told
     'Who has told you what?'

We will see that there are at least two subtypes of multiple questions, "matching" questions that are supposed to be answered by more than one answer, and non-matching questions for which there is no such restriction.

Movement of interrogative pro-forms is restricted by syntactic island constraints, (cf. 11). Ungrammaticality can be avoided by the in situ strategy (cf. 12) or by moving the whole syntactic island (so-called pied piping, cf. 13).

(11) *[Which author]$_1$ did Bill read [a book by t$_1$]?

(12) *Bill read [a book by which author]?*

(13) [*A book by which author*] *did John read?*

Answers to such questions do not consist just of the *which*-phrase, but must correspond to the syntactic island. For example, (12) and (13) cannot be answered by *Jane Austen*, but need more complex phrases like *a book by Jane Austen*. Such data have led to the idea that even in situ structures like (12) involve syntactic movement, at the level of logical form (cf. Nishigauchi 1990; von Stechow 1996).

Constituent questions also occur in embedded structures:

(14) *John knows what Bill will read.*

(15) *John knows who will read what.*

The syntactic structure of embedded questions often differs from root questions. In English root questions, there must be a verbal head preceding the subject (cf. 16), which must be an auxiliary – different from German (cf. 17). When questioning the subject itself, this requirement does not obtain, arguably because the subject itself has already undergone movement, and the verbal head precedes the subject trace (cf. 18):

(16) *What will / does Bill read?*

(17) **What reads Bill? / Was liest Bill?*

(18) *Who$_i$ read t$_i$ 'War and Peace'?*

In questions embedded by verbs like *know,* the requirement that the verbal head precedes the subject does not obtain:

(19) *John knows what Bill will read. / *what will Bill read.*

(20) *John weiß, was Bill liest. / *was liest Bill.*

This suggests that the filling of a pre-subject position by a verbal head is a feature of root clauses. If we assume, as suggested in (1/2), that verbs like *know* embed the sentence radical of a question, whereas root questions arise by applying the illocutionary operator QUEST, we can assume that it is the QUEST operator that triggers movement of the wh-expression and the pre-subject verbal head requirement (cf. Baker 1968 for ideas along these lines).

Just as with constituent questions, there is a way to form questions without a pre-subject verbal head, by modulating a sentence with indicative word order by a strong final rise (cf. Gunlogson 2003). Again similar to constituent questions, polarity questions marked in this way cannot be embedded by verbs like *know*.

(29) *Bill read 'War and Peace'?*

(30) **John knows Bill read 'War and Peace'?*

The strategy of marking polarity questions by interrogative word order is typologically rare but happens to be widespread in European languages, in particular in Germanic languages (cf. Siemund 2001; Dryer 2005b). The second strategy, rising intonation, is very frequent, but not universal; for example, it is reported to be non-existent in Quechua, Greenlandic and Yelí Dnye (isolate, Rossel Island, Papua New Guinea).

Another way of marking polarity questions is by question particles. They often occur at the periphery of the sentence, e.g., sentence-finally as in Japanese (31), or sentence-initially in Swahili (32).

(31) *kono hon wa   omoshiroi desu ka*
     this   book TOP interesting COP   Q
     'Is this book interesting?'

(32) *je, a-li-kwenda shule-ni?*
     Q   3SG-PST-go school-LOC
     'Did (s)he go to school?'

Peripheral realization is to be expected for illocutionary operators, which take the whole sentence radical in their scope. But we find question particles also in other positions, e.g., preverbally in Georgian and cliticized to the first constituent in Latin:

(33) *čai xom ginda?*
     tea Q   you.want
     'Do you want tea?'

(34) *Puer-ne bonus est?*
     boy-Q   good is
     'Is the boy good?'

Many languages have question-specific modal particles, which are not obligatory and often express additional meaning components, like a bias towards a positive or negative answer. For example, in German the particle *denn* expresses expectation of a negative answer.

Another type of marking is by verbal morphology, as in Greenlandic:

(35) *Iga-va.*
     cook-INTER.3SG,
     'Do you cook?'

no overt movement of a question constituent, they appear syntactically as a subtype of polarity questions, yet the meaning they express is similar to constituent questions.

3. Answers to questions

3.1. The question/answer relation and the semantics of questions

In their prototypical use, questions are requests for answers. Consequently, any theory of questions will have to take into account the discourse relation between question and answer. As we have seen in the motto of this article, the Pañha Sutta already used this very relation to classify questions. In more recent times, this research strategy was attractive because answers are assertions, and there are well-developed semantic theories of assertions.

Now, naturalistic reactions to questions come in a wide variety, including *I don't know* or *Go and ask someone else*, or by various strategies of telling more, less, or something different than what a speaker has asked for. Such reactions are important for the pragmatics of the questions/answer-relation. The answers that are of particular interest for the semantics of questions are so-called "congruent" answers (cf. von Stechow 1990).

(47) Q: *Who will go where tomorrow?*
　　　A1: *Fritz will drive to Potsdam tomorrow.*
　　　A2: *Fritz will go to Potsdam tomorrow.*
　　　A3: *Fritz will go to the townhall of Potsdam tomorrow.*
　　　A4: *Fritz will go somewhere tomorrow.*

Among the three reaction to Q's question, the congruent answers are A2 and A3; they satisfy the informational need expressed by the question, depending on the granularity level of the conversational background of the question in specifying the person and place variable. In contrast, A1 gives more information than is required, and A4 gives less information, as it does not specify the place variable. As stated, the semantics of questions is formulated in terms of possible congruent answers like the following (assuming the granularity level requires cities):

(48) *Fritz will go to Potsdam tomorrow.*
　　　Fritz will go to Berlin tomorrow.
　　　Franz will go to Potsdam tomorrow.
　　　Franz will go to Berlin tomorrow.
　　　...

But is it justified to give assertions this privileged role in semantics? Perhaps we can develop a semantics for assertions in terms of a semantics for questions, instead of the other way round? In fact, in the current setup, which distinguishes between the meaning of sentence radicals and speech acts, we do neither. Rather, both questions and assertions are based on sentence radicals, where the sentence radical of an assertion that is a congruent answer specifies the open parameters of the sentence radical of the question:

(49) QUEST [x will go to y tomorrow]
     ASSERT [fritz will go to potsdam tomorrow]

The relation between QUEST and ASSERT belongs to pragmatics; an utterance based on QUEST expresses an informational need, a request to specify information of a particular type, and a congruent answer based on ASSERT satisfies this information need. The systematic relation between the sentence radical [x will go to y tomorrow] and the sentence radical [fritz will go to potsdam tomorrow] belongs to semantics, and in the section on modeling question meanings we will discuss various ways how this relation can be captured.

3.2. Marking answer congruence

Often, a fully specified sentence radical can answer more than just one question. For example, the assertion *Fritz will go to Potsdam tomorrow* is a congruent answer to at least the following questions:

(50) a. *What happened?*
     b. *What will happen tomorrow?*
     c. *What will Fritz do tomorrow?*
     d. *Where will Fritz go tomorrow?*
     e. *When will Fritz go to Potsdam?*
     f. *Who will go to Potsdam tomorrow?*
     g. *Who will go where tomorrow?*
     h. *Who will go where when?*

But notice that the answer indicates the type of question by its focus. We understand focus here as a feature of syntax that has repercussions in semantic interpretation and in phonological realization, as expressed by sentence accent. The importance of sentence accent in answering questions was first observed by Paul (1880). In the following, focus is indicated by an F subscript, and sentence accent by accented letters. Notice that the realization of (51a–d) is the same, an instance of focus ambiguity.

(51) a. $[Fritz\ will\ go\ to\ Pótsdam\ tomorrow]_F$
     b. $[Fritz\ will\ go\ to\ Pótsdam]_F\ tomorrow.$
     c. $Fritz\ will\ [go\ to\ Pótsdam]_F\ tomorrow.$
     d. $Fritz\ will\ go\ [to\ Pótsdam]_F\ tomorrow.$
     e. $Fritz\ will\ go\ to\ Potsdam\ [tomórrow]_F.$
     f. $[Frítz]_F\ will\ go\ to\ Potsdam\ tomorrow.$
     g. $[Frítz]_F\ will\ go\ to\ [Pótsdam]_F\ tomorrow.$
     h. $[Frítz]_F\ will\ go\ to\ [Pótsdam]_F\ [tomórrow]_F$

While the truth conditions of all the answers in (51) are the same, they differ in signaling which question they answer. Focus is thought to indicate alternative meanings; focus in answers indicates that the alternatives are all congruent possible answers to the question. It should be added that languages do not generally mark question/answer coherence by

focus. For example, Zerbian (2006) points out that Northern Sotho (Bantu) lacks focus marking except for subjects.

Most of the answers in (51) have a pedantic ring to them as they rephrase much of the material of the question. In real life, speakers tend to omit parts that are present in the question and give elliptical answers, also called "term answers":

(52) b. *Fritz will go to Pótsdam.*
     c. *Go to Pótsdam.*
     d. *To Pótsdam.*
     e. *Tomórrow.*
     f. *Frítz.*
     g. *Frítz, to Pótsdam.*

Parts belonging to the focus obviously cannot be elided. Hence elliptical answers provide a test to determine the focus of non-elliptical answers: If an elliptical paraphrase of a focused sentence necessarily contains some constituent α then α must be part of the focus.

4. Modeling question meanings

4.1. Preliminaries

In this section we will turn to the ways in which the meaning of interrogative sentence radicals, the sentences that embed them, and the questions that are formed with them, can be represented in model-theoretic, truth-conditional semantics. There are three established approaches, which will be called the functional representation, the proposition set representation, and the partition representation. We will also discuss an approach recently developed, Inquisitive Semantics.

In the development of these representation frameworks, embedded questions have played an important role, as they are constituents of indicative sentences, and indicatives can be investigated in familiar truth-conditional theories. In particular, semantic theories of questions have tried to reconstruct logical inference patterns like the following:

(53) *John knows what Bill read.*
     Bill read 'War and Peace'.
     Hence: *John knows that Bill read 'War and Peace'.*

But notice that this inference holds only under a total (exhaustive) understanding of the embedded question, which is not always the most natural one. For example, from *John knows where one can buy a Chinese newspaper in Berlin* and *One can buy a Chinese newspaper in the Asia Shop at Potsdamer Straße* it does not follow that *John knows that one can buy a Chinese newspaper in the Asia Shop at Potsdamer Straße*, as the first sentence may be considered true already if John knows some place or other where one can buy a Chinese newspaper.

For root questions, it is crucial to consider congruent answers to questions (see above). We find elliptical or term answers and non-elliptical answers, where the focus of the answer corresponds to the interrogative pro-form of the question.