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QUESTIONS IN DYNAMIC SEMANTICS

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Questions in Dynamic Semantics

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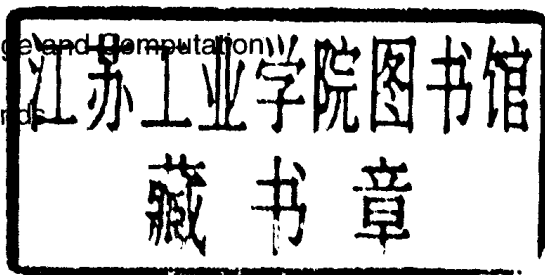
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The aim of this series is to focus upon the relationship between semantic and pragmatic theories for a variety of natural language constructions. The boundary between semantics and pragmatics can be drawn in many various ways; the relative benefits of each gave rise to a vivid theoretical dispute in the literature in the last two decades. As a side effect, this variety has given rise to a certain amount of confusion and lack of purpose in the extant publications on the topic. This series provides a forum where the confusion within existing literature can be removed and the issues raised by different positions can be discussed with a renewed sense of purpose. The editors intend the contributions to this series to take further strides towards clarity and cautious consensus.

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The Semantics and Pragmatics of Questions

PAUL DEKKER, MARIA ALONI AND ALASTAIR BUTLER

With this introduction we aim to give a sketch of the research area in which questions are studied from the perspective of a semanticist, a formal linguist interested in the notion of ‘meaning’. We start with explaining some general notions and insights in this area, and then zoom in on one of the most influential theories about questions, the partition theory of Groenendijk and Stokhof (section 1.1). In section 1.2 we concisely discuss some alternatives to the partition semantics, and some current issues in the debate about the meanings of questions, which will also pop up every now and then in the contributions to this volume. Then, in section 1.3, we have a thematic discussion of the contributions to this volume themselves, considering them one by one and in relation to each other. We end (section 1.4) with a sketch of some issues which, we think, still abide or have arisen from this volume as a whole.

1.1 General Background

1.1.1 The Notion of a Question

This volume is concerned with the formal study of questions and related topics. Questions are studied from various perspectives. From the viewpoint of a syntactician, questions are linguistic entities, sentences of a certain kind with distinctive features. They can display changes in word order, as witnessed by “Is Peter a good mathematician?” ver-

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sus “Peter is a good mathematician.”; *Wh*-expressions, like “Who”, “What”, “Where”, “How”, etc., but also “Which students”, “Which Canadians” and the like; and in spoken language, a question normally, but not invariable, comes with rising intonation, and in written language with a question mark. The syntactic and cross-linguistic analysis of such ‘interrogative’ expressions is a matter of ongoing debate.

For a semanticist, questions are the objects which are denoted by the above described type of syntactic expressions. Here the situation is similar to the (formal) study of indicative sentences. In such a study the aim is to find a domain of denotations (propositions mostly), in the form of suitable algebras which generate logical constructions (like that of conjunction, disjunction, negation) and logical relations (like entailment, synonymy and (in-)consistency). Likewise, the study of interrogatives requires one to develop a denotational domain in terms of algebras which motivate suitable constructions like the conjunction and disjunction of questions, and logical relations like that of question entailment and answerhood. Here, too, various approaches are possible and the respective benefits and deficits of these approaches is subject to ongoing discussion.

From a pragmatic perspective, questions are basically acts in a discourse or dialogue. According to, for instance, speech act theorists, simple questions come with some propositional content (their semantics), and the question act is that of asking whether the proposition is true. As will appear from this volume, however, we can also think of questions as a type of act, without disqualifying the idea that there are questions in the semantic domain. The main question then is how the two relate, a typical question about the semantics/pragmatics interface, which is one of the main threads throughout this volume.¹

From an epistemological, or if you want philosophical, perspective, questions are the things which agents can be concerned with, the questions which a person may have, also if these questions are never explicitly expressed. Judy may wonder whether or not she will be in Paris next year, and this without explicitly asking anybody. One may

¹ An approach which also can be called ‘pragmatic’ or, rather, ‘practical’, is the one adopted in the areas of Artificial Intelligence where one studies question answering systems. Here questions are really queries, and the aim is to find, define and study efficient procedures for making proper queries, and especially for answering them in an automated way. Although, clearly, the aims turn out to be very similar, the type of work reported on in this volume is purely theoretical. It seeks underlying principles of language, its meaning and use, and is not (directly) concerned with computation and efficiency. We will therefore not go into further detail about this type of computational research. See Monz (2003a) for a recent overview of relevant work.

also wonder “Who am I?”, “Does God exist?”, “What is the meaning of life?”, or “How will the stockmarket develop?”, again without posing the questions, or putting them into words. This immediately raises the question whether the objects of wonder and doubt are the same as the objects which constitute the semantic denotations of interrogatives. Do they draw from the same domain?² Maybe there are questions which one can face, but cannot put into words.³ We prefer not to settle this matter, though, but take a pragmatic (Wittgensteinian) stance on this issue, and we will henceforth talk only about questions which can be denoted by utterances, also if we talk about the objects of wonder and doubt (see Wittgenstein, 1953).

More generally, we can ask whether the four sketched perspectives on questions are concerned with different subjects, or whether they study different aspects of one and the same underlying phenomenon. Of course, the semantic study of questions most often takes the syntactic notion of an interrogative as given and as its point of departure, or, conversely, one can take interrogatives to be the syntactic means for expressing them. Furthermore, a semantic question can be taken to be raised in a discourse, and then a suitable pragmatic question is, under what circumstances is this appropriate, what are the effects of this, and what would be, under given circumstances, a (relatively) good reply. Also, it seems to be a reasonably fair assumption that questions raised in a discourse are the questions people themselves face, or wonder about. And there seems to be a case for assuming, as well, that the objects of wonder and doubt are the same as or at least very similar to the denotations of interrogative sentences. In sum, we witness at least close correspondences between the various notions of and perspectives on questions.

However, and this will become clear from various contributions to this volume, the correspondences are not always that close. It seems a ‘contemplative’ use of the indicative sentence “Peter is a good mathematician.” can be used to raise a question, while a ‘rhetorical’ use of “Is Peter a good mathematician?” typically serves to make a statement. If this is right, then we may have to re-evaluate the semantic denotations of these expressions, thereby giving up very close correspondences between either the syntactic notion of a question and a semantic one or

²Indicative sentences raise a similar issue: are the objects of knowledge and belief the same as the denotations of indicative sentences, e.g., propositions?

³It seems to be very hard to argue for this position, though. It would require one to come up with a question one can face but not express, but in order to come up with such a question it seems the question has to be stated, thereby rendering the argument vacuous.

between a semantic and a pragmatic one. It can also happen that questions asked are not really the ones people actually face, even though it can be explained that the reply to the question asked may help in answering the question faced. I can ask “Is Judy in Paris now?”, not because I am interested in her whereabouts, but because I am interested in those of John, who will always follow her. (And the reason may be that I don’t want my interlocutor to know that I am interested in John.) The reason can also be that I want to upset my interlocutor pointing his nose on the fact that Judy could be there, while he could impossibly go. Finally, it is still not excluded that the questions people face are different from the semantic denotations of interrogative expressions.

The upshot of this discussion is not to take a stand on the issue whether there is one unifying or underlying concept of a question. We mainly want to point out that something which gets described under one label (that of a question), may turn out to be different things after all. A more important moral is that, when the term “question” is used, it can be quite important to realize from which perspective it is used: does it concern something syntactic (for which we prefer to use the term “interrogative” in what follows), or some associated abstract semantic object, or some linguistic act, or an object of an epistemic attitude? A phrase like “Albert’s question” can refer to either of these, and to properly assess what is said about Albert’s question one should make the proper choice.

This volume contains contributions on questions (and related topics) from all four perspectives, although most adopt a semantic or a pragmatic perspective, or the perspective of the semantics/pragmatics interface. The notion of a question we reserve for the semantic denotation of interrogative expressions (the syntactic notion). For the pragmatic and epistemic notions of a question we try to systematically use the terms “question posed” and “question faced”, respectively.

In the remainder of this section we will proceed as follows. We start with discussing some of the classical insights in the formal study of questions and answers (subsection 1.2), and then zoom in on the partition semantics from Groenendijk and Stokhof (subsection 1.3). Next, in section 1.4, we show how the partition theory can be extended with a pragmatic component, and indeed can be motivated by it.

1.1.2 The Semantics of Questions

What is the meaning of an interrogative sentence? Maybe it is worthwhile to reconsider a similar question about indicative sentences, the answer to which is probably more widely known. While interrogative

sentences are normally used to pose questions, and imperative sentences to issue commands, indicative sentences are normally used to convey information about the world around us. What information? That the actual world or situation is like it is said to be by the indicative, in other words, that the indicative gives a true description of that world/situation. As we will see later there is more to be said about the meaning of indicatives, but if we focus on this (crucial) aspect of meaning, then we can say that a hearer understands an indicative sentence if he knows what a world or situation should be like for the sentence to be true. As Wittgenstein (*Tractatus Logico-Philosophicus*, Satz 4.024) has put it:

Einen Satz verstehen, heißt, wissen was der Fall ist, wenn er wahr ist. (To understand a proposition means to know what is the case, if it is true.)

Insights like this, the roots of which can be traced back to the work of Frege, Russell and later Tarski, have invoked the slogan "Meaning equals truth conditions", and this slogan in turn has prompted the semanticist (who aims to describe and study the meanings of sentences) to specify for every sentence of a given language under what circumstances it is or would be true.

For instance, if Muriel says, in English, "It rains." to you, she has expressed the proposition that it rains, which is the proposition true in all and only the circumstances where it rains. By asserting it she claims that the actual world or situation is like one of those, so that if she is sincere and well-informed, and you are in the same situation, you may well conclude that it rains and take your umbrella when you go out. Of course Muriel may be wrong, she may be joking, but what counts in *understanding* the meaning of an indicative sentence equals understanding under which conditions it is true. These truth conditions thus can be taken to give the meaning of an indicative sentence.

A similar story can be told about interrogative sentences, be it not in terms of truth, but in terms of answerhood. Like we said, interrogative sentences are normally used to pose questions, and the purpose of posing a question normally is to get a true answer for it. So what is a true answer? Apparently this seems to be a proposition which (i) is true of the actual situation and which (ii) answers the question. Let us first focus on the second aspect. Clearly, "John came to the party yesterday.", even if true, cannot count as an answer to the question "Did Monica ever visit Prague?" (even though sometimes it can, in pragmatically deranged situations). Proper answers are like "Yes, Monica did." and "No, Monica never did.". Apparently, the question dictates what

propositions count as an answer. In case of polar questions like the one we are facing here (also known as *Yes/No* questions), there are always two possible answers, basically “Yes.” and “No.”. However, in cases of *Wh*-questions, those with a *Wh*-phrase inside, there always are many more possible answers. Consider the question: “Who wants to join us on a trip to the beach.”. Again, “John came to the party yesterday.” does not count as a proper answer, but “Marc, Michelle and Maria want to join.” does count as an answer, as does “Nobody wants to.”. As a matter of fact, if you take the sentence frame “...want to join.” and if you fill in the dots with any list of names, you get a sentence expressing a proposition which is a possible answer. The meaning of a question can therefore be equated with a set of propositions: those that constitute an answer to the question as opposed to those that do not. And now we can come back to point (i) above. What a question solicits is not just any possible answer to the question, but *a* or *the* true answer to the question.

This time the conclusion ought to be that one knows the meaning of an interrogative sentence if one knows, given the circumstances, what counts as a true answer to that question. Since, however, this ought to be perfectly general, that is, since one should be supposed to know what would be a true answer in all possible circumstances, this means that the meaning of a question really resides in its answerhood *conditions*. Actually, this also expresses an age-old insight from Hamblin and Karttunen, and it has been taken up in one of the major semantic theories, like the partition semantics of Groenendijk and Stokhof discussed in the next subsection.

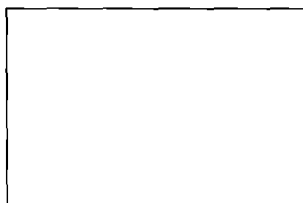
As an excursion, we want to point out that a similar strategy can be followed in the case of imperative sentences. The meanings of these sentences can be stated in terms of, not truth or answerhood conditions, but in terms of compliance conditions. One knows the meaning of an imperative, if one knows what has to be brought about in order to comply with the issued order. And like we can know the meaning (i.e. truth conditions) of an indicative sentence without knowing whether it is actually true or not, and like we can know the meaning (i.e. answerhood conditions) of an interrogative sentence without knowing what is actually the true answer, similarly we can know the meaning of an imperative (i.e. its compliance conditions) without knowing whether they will actually be satisfied. End of excursion.

So far the discussion has been fully general, apart from some illustrative examples drawn from natural language. A formal semanticist however wants more: proposals about the meanings of certain types of expressions should be such that one can in principle *prove* (or if you

want *disprove*) that certain desirable semantic consequences follow, and certain undesirable consequences don't. For this, taking a natural language, like English, as the direct object of study is undesirable because its syntactic analyses may be unclear, and it is full of ambiguities. A very general practice in formal semantics therefore consists in defining a formal language which mimics certain phenomena from natural language in an unambiguous way, make semantic proposals for this kind of language, and study the consequences of these proposals. This is not to say that such studies are no longer about natural language—ideally they are, be it indirectly. The way in which one can put the situation is that the expressions from the formal language represent the contents or meanings of expressions from natural language, be it in an unambiguous and perspicuous way. Besides, this allows one to study certain interesting aspects of meaning by themselves, without being bothered by other (interesting) aspects of meaning, which could only complicate things if studied in tandem. For instance, as one can see in this volume and in much of the literature, tense and temporal phenomena are totally abstracted away from and the focus of many papers is on a small language of predicate logic, extended with a question operator. Not because tense is irrelevant, but because the interpretation of questions (and their answers) is the prime subject of investigation here.⁴

1.1.3 The Partition Theory

In the Groenendijk and Stokhof semantics for interrogatives (see, e.g., Groenendijk and Stokhof, 1984, 1997), questions “partition logical space”. What this means can be best illustrated by means of some pictures. Logical space is a set of logical possibilities (possible worlds, possible situations or possible circumstances). We will keep on using the term ‘possibilities’ or ‘worlds’ from now on, without being committed to a particular interpretation of these terms. Logical space can be represented as follows:



⁴As, similarly, questions hardly play a role in any known semantics of the temporal system. Notice, though, that the interplay itself between questions and tense can be very interesting, but we do not know of any literature on this.

where all the points in the rectangle should be taken to constitute the possibilities. The sentences of some formal language can be evaluated on such a logical space by means of some given valuation function which tells us, for each possibility, whether the sentence is true there, or false, like in a standard (modal) predicate logical fashion. An indicative sentence like “Andrea is in Copenhagen.” (formally: Ca) is true in some possibilities and false in others. If it is asserted, the claim is that the actual world is among the Ca -worlds, the worlds in which Andrea is in Copenhagen.

Now consider the question “Is Andrea in Copenhagen?” (formally $?Ca$). This polar question has as possible answers a positive and a negative one. The possibilities in which the answer is positive can be grouped together, and the same can be done with the possibilities in which the answer is negative, and the two groups (propositional answers) have to be distinguished. This can be displayed as follows:

$\neg Ca$	Ca
-----------	------

$?Ca$

This picture indicates an interest in knowing on which side of the vertical line the actual world resides: are we in a Ca -world, one in which Andrea is in Copenhagen, on the right side of the line, or in a $\neg Ca$ -world, where she is not there, on the left of the line. The differences between worlds on the same side of the line are immaterial to this question.

We can add the question whether Bernhard is in Copenhagen, (formally: $?Cb$). This leads to a further subdivision, this time indicated by means of a horizontal line:

$\neg Ca \wedge \neg Cb$	$Ca \wedge \neg Cb$
$\neg Ca \wedge Cb$	$Ca \wedge Cb$

$?Ca$