Maximal Informativity Considerations, Singular Wh-Questions and Alternative Questions – An argument for using Karttunen denotations

Follow up: More on exhaustivity

(1) a. Who came?
   b. Peter came
   c. Mary did not come

We now use Karttunen’s notion of complete answer.

(2) $Op(1-a)(\neg(1-b)) = \text{‘That Peter came’ is the complete answer = Mary came and nobody else did.}$

(3) $Op(1-a)(\neg(1-c)) = \text{‘That Mary did not come’ is the complete answer = The contradiction}$

So we can predict why ‘positive’ partial answers such as (1-b) gives rise to an exhaustivity but ‘negative’ partial answers such as (1-c) cannot: applying $Op$ to them results in a contradiction, and therefore speakers do not assume that it is present. Or, in a more pragmatically oriented approach, we can say that speakers, by default, assume that the answer that they get is the complete answer, unless this is obviously not the case.\footnote{An account along these lines require that we have a weak notion of complete answer, and also that negative information is not part of a complete answer. If this is on the right track, it provides an argument for the view that the theory of questions must make reference to Karttunen’s notion of complete answer (even if it also has to make reference to the stronger, Partition Semantics-based notion).}

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(4) There are children in a room
   a. Which child is yours?
   b. Wait a minute, no child in this room is mine!
   c. Wait a minute, several children in this room are mine!

\footnote{This approach is too simple-minded; note that an answer such as ‘Peter or Mary came’ also cannot be the complete answer to (1-a); however, such an answer can give rise to an exhaustivity effect, i.e. licenses the inference nobody came besides Peter and Mary, and also that only one of them did. See, among others, Spector (2003, 2007); van Rooij and Schulz (2004).}
(4-a) triggers the inference that one, and exactly one of the children are mine. Let us assume that this inference is a kind of presupposition.

(5) does trigger the inference that I have at least one child, but no inference that I have only one.

(5) Same context

a. Which children are yours?
b. Wait a minute, no child in this room is mine.
c. #Wait a minute, several children in this room are mine.

1.1 The presupposition of singular and plural definite descriptions

(6) The horse in the room is sick
(7) The horses in the room are sick

Both (6) and (7) trigger the presupposition that there is at least one horse in the room. (6) furthermore presupposes that there is not more than one horse in the room. This uniqueness presupposition could be encoded in the singular entry of the$_{sg}$. But it would be better to derive it using only one lexical entry for the, by using only things that we need to assume anyway about the singular/plural distinction in nouns.

Link’s (2003) insight:

1. The domain of individuals is structures by a part-whole relation; it contains both atomic and plural individuals. A set of individuals S is said to include a maximal member if it includes an element m such that every other element e in S is a part of m.

2. Meaning of THE: ||THE NP|| presupposes that ||NP|| includes a maximal member, and denotes that maximal member.

3. Denotation of singular NPs: the denotation of a singular NP includes only atomic individuals.

4. Denotation of plural NPs: the denotation of a plural NP includes all the individuals whose atomic parts belong to the denotation of the corresponding NP.

Illustration

Suppose now that there is more than one horse. For instance: ||HORSE$_{sg}|| = \{a, b, c\}. Then:

- ||HORSES$_{pl}|| = \{a, b, c, a \oplus b, a \oplus c, b \oplus c, a \oplus b \oplus c\}
- ||THE HORSES$_{pl}|| = a \oplus b \oplus c
- ||THE HORSE$_{sg}|| = MAX(||HORSE$_{sg}||) = #

Only if the denotation of HORSE$_{sg}$ is a singleton will ||THE HORSE$_{sg}|| be defined. ~The uniqueness presupposition is derived.

1.2 Dayal’s (1996) on singular vs. plural which-questions

1.2.1 Dayal’s assumptions

1. The denotation of a question in a world w is its Karttunen denotation.

2. Dayal (implicitly) uses a modified notion of complete answer, to the effect that the complete answer to a question is no longer certain to exist: the complete answer to a question Q in w must belong to the denotation of Q(w).
3. Equivalently: The complete answer to $Q$ in $w$, if there is one, is the (unique) member of $Q(w)$ which logically entails every member of $Q(w)$

4. **Maximal Informativity Principle**: any question presupposes that it has a complete answer. This might be a ‘pragmatic’ presupposition: a rational speaker will ask someone a question is she thinks that he will be able to pick out a member of the question’s denotation in a non arbitrary way. As a result, for a question to be felicitous, it must be the case that in every world compatible with the common ground, the question has a complete answer, i.e. a true answer that entails all the true answers.

1.2.2 Consequences

Consider again:

(8) a. Which child in this room is French?
   b. For which $x \in \text{CHILD}_{sg}$, $x$ is French?

Suppose that in a world $w$ several children in this room are French, call them a, b and c. Then the denotation of $\text{CHILD}_{sg}$ in $w$ is $\{a, b, c\}$. Then the $Q(w) = \{\text{That a is French}, \text{That b is French}, \text{That c is French}\}$. No member of this set entails any other one, and so the Maximal Informativity Fails (i.e. common knowledge must exclude that we be in such a world). Only if the denotation of the question is a singleton will there be a complete answer.

In contrast with this, consider:

(9) a. Which children in this room are French
   b. For which $X \in \text{CHILDREN}_{pl}$, $X$ is French?

In the same situation, the denotation of $\text{CHILDREN}_{pl}$ is $\{a, b, c, a \oplus b, a \oplus c, b \oplus c, a \oplus b \oplus c\}$. So we have: $Q(w) = \{\text{That a is French}, \ldots, \text{That b \oplus c is French}, \text{That a \oplus b \oplus c is French}\}$

1.2.3 Is this account possible if we start with Partition Semantics

It seems not. For the account requires that we associate with a question a set of propositions which does not necessarily contains a maximally informative element. Partition Semantics does not give us a set of begin with, and also no principled way of constructing the appropriate sets. As above, if Dayal (1996) is on the right track, it provides an argument for using Karttunen denotations.

2 Alternative Questions

2.1 The exclusivity inference triggered by alternative questions . . .

(10) Does Jack have a brother or (does he have) a sister? $\leadsto$ (if pronounced with a default, 'falling' intonation (??)) Jack has a brother or a sister and does not have both a brother and a sister.

How come?

(11) ?(p or q)

Groenendijk and Stokhof’s (1982) proposal is that the equivalence relation for (12) is the following:

(12) $w_1 \approx w_2$ if and only if $p(w_1) = p(w_2)$ and $q(w_1) = q(w_2)$

This gives us a partition with four cells ($\neg p \land \neg q$, $p \land \neg q$, $q \land \neg p$, $p \land q$). There is no principled way to make a distinction between these cells.
2.2 ... is a consequence of The Maximal Informativity Principle (Danny Fox, p.c.)

(13) ?(p or q)

Assume that p and q are logically independent. Suppose that in w both p and q are true. Then (13)(w) = \{p, q\}. No member of this set entails the other. So the only worlds in which there is a complete answer to (13) are worlds in which one and exactly one of the two propositions is true. Hence the Maximal Infomativity Principle induces the presupposition that one and only one of the two propositions is true.

- Special case: p ⇒ q (or the other way around)

(14) #Is Jack French or European?

In this case, the possible denotations (14) are the following:

a – \{ That Jack is French, That Jack is European \}

b – \{ That Jack is European \}

c – ∅

(Impossible denotation: \{ That Jack is French \})

So there is a complete answer in the a-case and in the b-case, and the question is predicted to presuppose that we are in one of these two cases. In other words, the question presupposes that Jack is European.

Assume the following modification of the principle:

(15) Maximal Informativity Principle (Revised Version):

a. A question presupposes that there exists a proposition φ in its denotation such that φ entails all the members of its denotations and φ is not itself common knowledge, i.e. is contextually informative.

b. A question is felicitous only if the common ground is such that in every world w of the common ground, there is an answer which is true in w but is not true in every world of the common ground, and which furthermore entails all the answers that are true in w.

Given this, (14) can simply not meet the Maximal Informativity Principle:

Suppose that the MIP is satisfied for (14) relatively to a certain common ground G. We already know that in every world of G, Jack is european. Hence That Jack is European cannot be contextually informative, and therefore cannot now count as a complete answer. Hence no world in G can correspond to the b-case. But then all the worlds of G correspond to the a-case. Therefore, in all the worlds of the common ground, the denotation of the question is as in a (namely, is \{ That Jack is French, That Jack is European \}). But then again, there can be no complete answer, since both members of this set are now common knowledge. Hence it is impossible for (14) to meet the MIP.

References


