Information Structure and Interrogativity

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In my talk, I will argue that under certain syntactic conditions (feature matching and locality) the focus-presupposition structure of an interrogative clause has to be taken into account to arrive at an adequate expression of its answerhood conditions: If the syntactic conditions are met, what has to be answered is not the question that is given by the "ordinary" semantics of the interrogative, but rather the question expressed by the (prosodically induced) presupposition of the clause. If information structure is taken into account, several interpretations that are problematic for the interrogative semantics of Groenendijk & Stokhof (1982),(1990) can be explained, e.g. (i) the alternative-question interpretation of certain 0-place interrogatives, (ii) the existence and uniqueness presupposition of singular 1-place interrogatives (cf. Higginbotham & May (1981), Dayal (1996)), and (iii) the exhaustivity and uniqueness presupposition of 2-place interrogatives (cf. Comorovski (1996), Dayal (1996)).

Inititial evidence for the above claim is provided by the answerhood conditions of the (0-place constituent) question (1-Q_1) in which the disjunctive term *Tee oder Kaffee* is pronounced with a rise-fall contour. As Manfred Krifka has pointed out, (Q_1) has the same answerhood conditions as the 1-place constituent question (Q_2) that is appositively modified by *Tee oder Kaffee*. That is, (Q_1) cannot be answered as a yes/no question (see A_1), but has to be answered with (A_2).

(1) Q_1: Hat Hans /Tee oder Kaffee\ getrunken?
has Hans tea or coffee drunk
'Did John drink /tea or coffee\?'
Q_2: Was hat Hans getrunken, Tee oder Kaffee?
what has Hans drunk tea or coffee
'What did John drink, tea or coffee?'
A_1#{ja — nein}
yes no
A_2: {Tee — Kaffee}
tea coffee

Again following a suggestion by Manfred Krifka, I take the rise-fall contour of *Tee oder Kaffee* in (1-Q_1) to be indicative of the focus status of this phrase. In the spirit of Rooth (1992), the focus of a clause is then analyzed as an exhaustive answer to the question expressed by its presupposition. That is, by mediation of its focus-presupposition structure the question expressed by (1-Q_1) is *What did Hans drink?*, the possible answers being restricted by the proposition that Hans drank either tea or coffee.

Technically, my proposal is based on the interrogative semantics of Groenendijk & Stokhof (1990), which I assume to not only provide for the semantics of an interrogative clause, but also for an adequate expression of its focus-presupposition structure. The presupposition α'_p of an interrogative α is derived from the f-meaning

$\alpha'/\xi/$ of α in the way defined in (2). (The f-meaning $\alpha'/\xi/$ of a clause α is the meaning resulting from translating the focus of α as the variable ξ which is of the same type as the meaning of the phrase in focus. In (2), a restriction $\mathcal{C}$ is imposed on ξ that will not be specified explicitly apart from ad hoc stipulations.)

(2) $\lambda i_1 \lambda i_2(\lambda\xi\lceil\mathcal{C}\rceil\lambda j(\alpha'/\xi/(i_1)(j)) = \lambda\xi\lceil\mathcal{C}\rceil\lambda j(\alpha'/\xi/(i_2)(j)))$

This is illustrated with the interrogative in (3). The f-meaning of this interrogative is given in (a) and its presupposition in (b), which can be shown to be identical to (c). On the assumption that $\mathcal{C}(\mathcal{P})$ iff for all $P, i : \mathcal{P}(i)(P)$ is a function of $P(i)$, (c) is identical to (d), which is the meaning of *What did John drink?*.

(3) Hat Hans [Tee oder Kaffee]$_F$ getrunken? (=: α)

a. $\lambda i\lambda j(\mathcal{P}(i)(\lambda i\lambda x.\text{drink}(i)(\mathtt{h}, x)) \leftrightarrow \mathcal{P}(j)(\lambda i\lambda x.\text{drink}(i)(\mathtt{h}, x)))$ (= $\alpha'/\mathcal{P}/$)

b. $\lambda i_1\lambda i_2(\lambda\mathcal{P}\lceil\mathcal{C}\rceil\lambda j(\mathcal{P}(i_1)(\lambda i\lambda x.\text{drink}(i)(\mathtt{h}, x)) \leftrightarrow \mathcal{P}(j)(\lambda i\lambda x.\text{drink}(i)(\mathtt{h}, x))) = \lambda\mathcal{P}\lceil\mathcal{C}\rceil\lambda j(\mathcal{P}(i_2)(\lambda i\lambda x.\text{drink}(i)(\mathtt{h}, x)) \leftrightarrow \mathcal{P}(j)(\lambda i\lambda x.\text{drink}(i)(\mathtt{h}, x))))$ (= α'_p)

c. $\lambda i\lambda j(\lambda\mathcal{P}\lceil\mathcal{C}\rceil.\mathcal{P}(i)(\lambda i\lambda x.\text{drink}(i)(\mathtt{h}, x)) = \lambda\mathcal{P}\lceil\mathcal{C}\rceil.\mathcal{P}(j)(\lambda i\lambda x.\text{drink}(i)(\mathtt{h}, x)))$

d. $\lambda i\lambda j(\lambda x.\text{drink}(i)(\mathtt{h}, x) = \lambda x.\text{drink}(j)(\mathtt{h}, x))$

The propositional concept α'_p is the so-called propositional question interpretation of the presupposition of α. In order to be able to treat the focus of α as an exhaustive answer to the question that is specified by α'_p, the categorial intepretation α'_c of this question has to be defined. As can be seen in (4), α'_c is derived from the f-meaning of α too.

(4) $\lambda\xi\lceil\mathcal{C}\rceil\partial a(\alpha'/\xi/(a)(j))$

In the definition of the categorial interpretation α'_c in (4), it is made use of a presupposition operator $\partial_{\langle s,\langle t,t\rangle\rangle}$ that has the properties in (5), $\partial_{\langle t,t\rangle}$ being the unary presupposition operator of Beaver (1992). ($[\![\partial\phi]\!]$ is true iff $[\![\phi]\!]$ is true and undefined otherwise. That is, my analysis is framed within a three-valued type theory, namely a variant of Muskens (1989)'s TY_2^3.)

(5) a. $[\![\partial i(\phi(i) \leftrightarrow \psi(j))]\!] = [\![(\partial\phi(i)) \leftrightarrow \psi(j)]\!]$

b. $[\![\partial i(\lambda\xi.\phi(i) = \lambda\xi.\psi(j))]\!] = [\![\lambda\xi(\partial\phi(i)) = \lambda\xi.\psi(j)]\!]$

The categorial interpretation α'_c of the presupposition of α in (3) is given in (6).

(6) $\lambda\mathcal{P}\lceil\mathcal{C}\rceil(\partial\mathcal{P}(a)(\lambda i\lambda x.\text{drink}(i)(\mathtt{h}, x)) \leftrightarrow \mathcal{P}(j)(\lambda i\lambda x.\text{drink}(i)(\mathtt{h}, x)))$

The exhaustive answer to α'_p (see (7c)) that is provided by the focus of α results from applying α'_c to the exhaustivization of the phrase in focus (see (7b)).

(7) Tee oder Kaffee (=: β)

a. $\lambda i\lambda P(P(i)(\mathtt{t}) \vee P(i)(\mathtt{c}))$ (= β')

b. $\lambda i\lambda P.\forall x((P(i)(x) \leftrightarrow x = \mathtt{t}) \vee (P(i)(x) \leftrightarrow x = \mathtt{c}))$ (= $\text{EXH}(\beta')$)

c. $(\partial\forall x((\text{drink}(a)(\mathtt{h}, x) \leftrightarrow x = \mathtt{t}) \vee (\text{drink}(a)(\mathtt{h}, x) \leftrightarrow x = \mathtt{c}))) \leftrightarrow \forall x((\text{drink}(j)(\mathtt{h}, x) \leftrightarrow x = \mathtt{t}) \vee (\text{drink}(j)(\mathtt{h}, x) \leftrightarrow x = \mathtt{c}))$ (= $\alpha'_c(\text{EXH}(\beta'))$)

The formula in (7c) is true or false iff the presupposition is met that Hans drank either tea or coffee at index a. That is, if this presupposition is met $\lambda j.\alpha'_c(\text{EXH}(\beta'))$ is the proposition that Hans drank either tea or coffee. For this case, the answerhood condition for an interrogative α with focus β can be defined as in (8). (I/R is the partition that is induced by the eqivalence relation R on the set of indices I. $J/(I/R)$ is the set of propositions $P \in I/R$ compatible with the proposition J.)

(8) A proposition P is a (complete) answer to the interrogative α with focus β iff $P \in \lambda j.\alpha'_c(\text{EXH}(\beta'))/(I/\alpha'_p)$.

It can then be demonstrated that according to the analysis outlined above (9a) has an existence and uniqueness presupposition (Hans read one and only one book) and that (9b) presupposes that every student read one and only one book (i.e. exhaustivity and uniqueness is being presupposed) if two additional assumptions are made: (i) a fronted *wh*-phrase in focus is interpreted in its base position and (ii) a *wh*-phrase in focus is interpreted categorematically as an existential GQ.

(9) a. [Which book]$_F$ did John read?
b. Which Student read [which book]$_F$?

As for the syntactic conditions that constrain the impact of information structure on the interpretation of an interrogative, it can be observed that a formal property of the phrase in focus (±wh) has to match a property of the interrogative C that is reflected by the syntactic difference between *wh*- and yes/no interrogatives (±EPP) (see (10) and (11); (10-A) is an over-informative answer).

(10) Q: Wer hat /Tee oder Kaffee\ getrunken?
Who has tea or coffee drunk
'Who drank tea or coffee?'
A: #Hans hat Tee getrunken und Franz Kaffee
'Hans drank tea and Franz coffee'

(11) *Hat Hans [welches Buch]$_F$ gelesen?

Furthermore, although the association between a disjunctive term marked by a rise-fall contour and an interrogative C can be non-local (see (12)) this relation is island sensitive (see (13) for an adjunct island).

(12) Q: Glaubt Maria, dass Hans /Tee oder Kaffee\ getrunken hat?
Believes Maria that Hans tea or coffee drunk has
'Does Maria believe that Hans drank /tea or coffee\?'
A: #Maria {glaubt — glaubt nicht}, dass Hans Tee oder Kaffee getrunken hat
'Maria {believes — does not believe} that Hans drank tea or coffee'

(13) Q: Ist Maria aufgesprungen, als /Hans oder Franz\ eingetroffen ist?
is Maria up-jumped when Hans or Franz arrived is
'Did Maria jump up when /Hans or Franz\ arrived?'
A: #Maria ist aufgesprungen, als Hans eingetroffen ist
'Maria jumped up when Hans arrived'

This is remarkable since in general the association with focus is insensitive to islands (cf. Chomsky (1977)). E.g., the sentence in (14) is interpreted as expressing that the speaker does not know of any person other than Hans that Maria jumped up when that person entered the room.

(14) Ich weiß nur, dass Maria aufgesprungen ist, als HANS eingetroffen ist
'I know only that Maria jumped up when when HANS arrived'

The syntactic conditions will be explained in the system of Chomsky (1998),(1999) on the assumption the association of interrogative C with a focus is contingent on *Agree*.

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