On the Licensing and Interpretation of In-situ *Wh*-Phrases

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In an early effort to pursue the Minimalist Program, Tanya Reinhart argued convincingly that (certain occurrences of) *wh*-phrases that do not undergo overt *wh*-movement remain *in situ* at LF (see e.g. Reinhart 1994). The conceptually most appealing assumption deriving from this argument is that *in-situ wh*-phrases need not be licensed by an interrogative complementizer ($C^{[+Q]}$) at all (for a more nuanced view, see Pesetsky 2000). With respect to the semantic component, this assumption presupposes two things: **(A)** a way to interpret *wh*-phrases *in situ* and **(B)** a way to distinguish *in-situ wh*-phrases from semantically cognate non-*wh* phrases. Problematically, the approaches that provide (A) do not give a satisfactory account of (B). In Reinhart (1994), Kratzer & Shimoyama (2002), and Beck (2006), *in-situ wh*-phrases receive the same interpretation as indefinite, indeterminate, and focused phrases, respectively. Hence, without (B), these are turned into question constituents. Now, what these approaches (explicitly or implicitly) assume wrt. (B) is selective binding. That is, they use coindexation to guarantee that the operator denoted by $C^{[+Q]}$ affects only variables introduced by *wh*-phrase denotations. However, this has severe syntactic implications: To induce the appropriate coindexation, it must either be assumed that *in-situ wh*-phrases enter into an Agree relation with $C^{[+Q]}$, or (just as problematic) that semantically cognate non-*wh* phrases Agree with a functional head below $C^{[+Q]}$ (see Kratzer 2006). Hence, it seems that Reinhart's *wh-in-situ* argument does not translate into an argument for radically simplifying the syntax of *wh*-questions.

I will present an interrogative semantics that provides (A) and (B) without using coindexation. The starting point of my analysis is two typological trends concerning the form of question words (in addition to their *wh*-feature): **(i)** Question words are identical or derivationally related to indefinites (Haspelmath 1997) and **(ii)** they show the formal signs of focus (É. Kiss 1995). This is exemplified in (1): The Lakhota word *táku* is an indefinite pronoun (see 1a); when focused (represented by [+F]), it functions as a question word (see 1b). To account for (part of) property (i), I assume that *wh*-words are denotationally equal to (non-*wh*) indefinites. More specifically, I assume that e.g. *táku* denotes the dynamic existential GQ shown in (2a) (for a dynamic type logic, see Muskens 1996). Furthermore, let us provisionally assume that $C^{[+Q]}$ has the denotation shown in (2b), where '$\leftrightarrow$' is the dynamic biconditional operator. These assumptions yield a dynamic-semantic variant of the partition theory of questions (Groenendijk & Stokhof 1982). That is, it can be shown that the equivalence in (3) holds in dynamic logics (Haida 2005). This preliminary analysis suffers from the same problem as the three accounts mentioned above: certain "unwanted" items are turned into question words. To solve this problem, property (ii) is taken into account. By considering the structure and answerhood conditions of simple and multiple *wh*-questions, it can be shown that the [+F] feature borne by question words denotes an exhaustification operator, the operator in (4) (cf. Szabolcsi 1994). By the σ-operator (Link 1983), (4) presupposes the existence of a maximal sum of entities satisfying the predicate argument of the quantifier it is applied to. Hence, the focused *wh*-word *táku* not only asserts that the predicate in its nuclear scope contains an element, it also presupposes that it does (see 5). Consequently, the extension of the TP of (1b) is true at every index i at which it is defined (see 6b). In contrast to this, the extension of the TP of (1a) is true at some indices and false at others (see 6a). Crucially, this semantic difference can be probed by the operator denoted by $C^{[+Q]}$: A variable bound by a dynamic existential quantifier remains accessible from the outside (Dekker 1993). Hence, it is possible to determine if a proposition p is necessarily true (where defined) for all valuations of a variable ν existentially bound in p. This is what the operator $\Box_\nu$ in the denotation of $C^{[+Q]}$ does with respect to the intension of its TP complement (see 7). Correspondingly, the dynamic biconditional operator can be restricted to variables ν introduced by focused indefinites (again, see 7; note that the second conjunct accounts for non-question words). This means that we derive the correct interpretations from the LF structures shown in (8). Note that no coindexation is used to derive this result.

The *wh*-feature gains an additional, non-syntactic role: It serves to signal the compatibility of an indefinite with the exhaustification operator. Thus, we can rule out that focused non-*wh* indefinites can function as question words. In addition to deriving the correct interpretation for (1a,b), it is possible to derive different scope readings of *in-situ wh*-phrases (see 9) without using (non-accidental) coindexation. This means that we now have at hand an interrogative semantics which allows us to assume that *in-situ wh*-phrases need not be syntactically licensed by $C^{[+Q]}$. This result is achieved by taking into account empirical phenomena only partially recognized by the preceding accounts.

Data

(1) (*Lakhota*, cf. Van Valin 1993, p.98)

a. šúka ki táku yaxtáka he
dog the something/what bit Q
(i) 'Did the dog bite something?'
(ii) *'What did the dog bite?'

b. šúka ki táku$^{[+F]}$ yaxtáka he
dog the something/what bit Q
(i) *'Did the dog bite something?'
(ii) 'What did the dog bite?'

(2) a. $[\![\ \textit{táku}\ ]\!]^i = \lambda P.\exists u.P(i)(u)$ b. $[\![\ \mathrm{C}^{[+\mathrm{Q}]}{}_{\text{preliminary}}\ ]\!]^i = \lambda p\lambda j(p(i) \leftrightarrow p(j))$

(3) $\exists x_1 \ldots \exists x_n.\Phi \leftrightarrow \exists x_1 \ldots \exists x_n.\Psi$ iff $\lambda x_1 \ldots \lambda x_n.\Phi = \lambda x_1 \ldots \lambda x_n.\Psi$

(4) $[\![+\mathrm{F}\ ]\!]^i = \lambda\mathcal{Q}\lambda P.\mathcal{Q}(i)(\lambda i\lambda\nu'(\nu' = \sigma\nu.P(i)(\nu)))$

(5) $[\![\ \textit{táku}^{[+\mathrm{F}]}\ ]\!]^i = [\![+\mathrm{F}\ ]\!]^i(\lambda i.[\![\ \textit{táku}\ ]\!]^i) = \lambda P.\exists u(u = \sigma\nu.P(i)(\nu))$

(6) a. $[\![\ [_{\mathrm{TP}}\ [\text{ the dog }]\ [_{\mathrm{VP}}\ \textit{táku}\ \text{ bit }]]\ ]\!]^i = \exists u.\text{bite}'(i)(\text{the\_dog}', u)$
b. $[\![\ [_{\mathrm{TP}}\ [\text{ the dog }]\ [_{\mathrm{VP}}\ \textit{táku}^{[+\mathrm{F}]}\ \text{bit }]]\ ]\!]^i = \exists u(u = \sigma\nu.\text{bite}'(i)(\text{the\_dog}', \nu))$

(7) $[\![\ \mathrm{C}^{[+\mathrm{Q}]}\ ]\!]^i = \lambda p\lambda j(\forall\nu(\Box_\nu p \rightarrow (p(i) \overset{\nu}{\leftrightarrow} p(j))) \wedge (p(i)\ \textbf{is true} \leftrightarrow p(j)\ \textbf{is true}))$

(8) a. $\lambda i.[\![\ [_{\mathrm{CP}}\ \mathrm{C}^{[+\mathrm{Q}]}\ [_{\mathrm{TP}}\ [\text{ the dog }]\ [_{\mathrm{VP}}\ \textit{táku}\ \text{ bit }]]]\ ]\!]^i =$ 'Did the dog bite something?'
b. $\lambda i.[\![\ [_{\mathrm{CP}}\ \mathrm{C}^{[+\mathrm{Q}]}\ [_{\mathrm{TP}}\ [\text{ the dog }]\ [_{\mathrm{VP}}\ \textit{táku}^{[+\mathrm{F}]}\ \text{bit }]]\ ]\!]^i =$ 'What did the dog bite?'

(9) Who knows who bought what?

a. 'For which x does it hold that x knows for which y and z, y bought z?
b. 'For which x and z does it hold that x knows for which y, y bought z?

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