On the semantics of *wh*-questions

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Summary: This paper motivates a new view of interrogative semantics, combining ingredients familiar from the current literature in a novel way. This proposal allows for wider empirical coverage than other theories of interrogative syntax/semantics (e.g. Cable, 2007, 2010; Cheng and Demirdache, 2010; Fox, 2012; Nicolae, 2013), being able to model a range of data not captured at the same time in previous theories, including pied-piping, superiority, presuppositions of questions, readings of multiple questions, and intervention effects in multiple questions.

Semantics: This paper develops a new semantics for questions, where:

- *Wh*-words denote Hamblin sets (cf. Beck 2006, Cable 2007; 2010), e.g. for *what*:

  (1) Ordinary semantic value: $[\![what]\!]^o$ is undefined
  Focus-semantic value: $[\![what]\!]^f = \{x_e : x \text{ is non-human}\}$

  (This theory is compatible with pied-piping as in Heck (2008) and in Cable (2010).)

- C drives syntactic movement, but plays no role in the semantics of a question. Instead, it simply passes up the denotation of its sister.

- The **?**-operator adjoins to CP. It takes a sister with a focus-semantic value consisting of a set of propositions (or a set of such sets, ...), and lifts it into the ordinary value of the question.

  (2) **The ?-operator derives question meanings:**
  $[\![\textbf{?}\ \alpha_\sigma]\!]^o = [\![\alpha_\sigma]\!]^f \qquad \sigma \in \{\langle st,t\rangle, \langle\langle st,t\rangle,t\rangle, ...\}$

This denotation for **?** is similar to ones proposed for question-clause-typing operators in Shimoyama (2001); Beck and Kim (2006), and yields Hamblin/Karttunen-style question denotations, i.e. sets of possible answers to the question. A question may contain multiple **?**-operators above each Spec,CP in the derivation, as in e.g. (3a-b) below. The availability of multiple type-flexible **?**-operators makes it possible to model the pair-list reading of the question as a family of questions (Hagstrom, 1998; Fox, 2012; Nicolae, 2013, a.o.).

The single-pair and pair-list readings of multiple questions: An important goal of the present proposal is to derive the single-pair and pair-list readings of multiple questions from a well-motivated syntax. LFs for the pair-list reading of English questions are shown in (3a-b). Following Pesetsky (2000) and others, I assume covert movement of the surface-in-situ *wh*-phrase with tucking-in (Richards, 1997) in superiority-obeying questions, but in-situ composition using focus-alternatives (Hamblin, 1973) in superiority-violating questions. In (3), each *wh*-phrase is interpreted by a different **?**-operator. This models the pair-list reading as a family of questions denotation (5c).

(3) **LFs for the *pair-list readings* of multiple questions contain *multiple* ?-operators:**

a. [? [$_{CP}$ wh_1 [? [$_{CP}$ wh_2 [C$_{+wh}$ [$_{TP}$ ... t_1 ... t_2]]]]]] Superiority-obeying

b. [? [$_{CP}$ wh_2 [? [C$_{+wh}$ [$_{TP}$ ... wh_1 ... t_2]]]]] Superiority-violating

Single-pair readings are derived from LFs that differ only in that they contain a single **?**-operator occurring above all interrogative elements. This yields a 'flat' set of possible answers (5b), yielding a single-pair interpretation of the question.

(4) **LFs for the *single-pair readings* of multiple questions contain a *single* ?-operator:**

a. [? [$_{CP}$ wh_1 [$_{CP}$ wh_2 [C$_{+wh}$ [$_{TP}$ ... t_1 ... t_2]]]]]] Superiority-obeying

b. [? [$_{CP}$ wh_2 [C$_{+wh}$ [$_{TP}$ ... wh_1 ... t_2]]]]] Superiority-violating

For a superiority-obeying multiple question as in (5a), denotations for the single-pair and pair-list readings of the question are given in (5b–c) respectively.

(5) **The single-pair and pair-list reading of a superiority-obeying question:**

a. *Which* student read *which* book?

b. A 'flat' structure with a single **?**-operator yields a single-pair reading (LF (4a)):
$\{\lambda w.\ x$ read y in $w : y \in book,\ x \in student\} \iff$
$\left\{ \begin{array}{l} \text{John read A, John read B, John read C, Mary read A,} \\ \text{Mary read B, Mary read C, Bill read A, Bill read B, Bill read C} \end{array} \right\}$

c. A nested structure with multiple **?**-operators yields a pair-list reading (LF (3a)):
$\{\{\lambda w.\ x$ read y in $w : y \in book\} :\ x \in student\} \iff$
$\left\{ \left\{ \begin{array}{l} \text{John read A} \\ \text{John read B} \\ \text{John read C} \end{array} \right\}, \left\{ \begin{array}{l} \text{Mary read A} \\ \text{Mary read B} \\ \text{Mary read C} \end{array} \right\}, \left\{ \begin{array}{l} \text{Bill read A} \\ \text{Bill read B} \\ \text{Bill read C} \end{array} \right\} \right\}$

A prediction: This proposal correctly predicts that so-called 'quiz master' questions, involving *wh*-in-situ in English, can only have single-pair readings. This is because the **?**-operator occurs in C but all *wh*s necessarily occur below C, excluding an LF as in (3a).

(6) Elvis Presley introduces *which movie star* to *which baseball team*?

Conclusion: The single-pair and pair-list readings of multiple questions are thus derived from a well-motivates syntax and from minimally different LFs, differing only in the number of **?**-operators they contain. This is not achieved in previous analyses of multiple *wh*-questions. The components of the derivation are assigned simple meanings and they are modeled after operators that have been previously proposed in the literature. The talk will give detailed derivations to show how the attested readings of English questions and their presuppositions are derived, and furthermore discuss extensions to other languages. Time permitting, the talk will also demonstrate how *intervention effects* (Beck, 2006) can be modeled within this framework.

Selected references: Beck, 2006. Intervention effects follow from focus interpretation. *NALS*. **Beck & Kim**. 2006. Intervention effects in alternative questions. *Journal of Comparative German Linguistics*. **Cable**. 2010. *The grammar of Q: Q-particles, wh-movement, and pied-piping*. **Fox**. 2012. *The semantics of questions*. Manuscript. **Hagstrom**. 1998. Decomposing questions. *Dissertation, MIT*. **Nicolae**. 2013. Any questions? *Dissertation, Harvard*. **Shimoyama**. 2001. *Wh*-constructions in Japanese. *Dissertation, UMass*.