Concealed Questions from a Crosslinguistic Perspective

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Hypothesis: There are three semantic analyses of 'concealed questions' – DP complements (CQ-DPs) of a class of verbs (CQ verbs) that can be intuitively paraphrased as an interrogative clause (1). Baker (1968)'s 'Question in Disguise' analysis (QID) holds that CQs are questions with the unpronounced materials ellipticized. In Heim (1979) and Romero (2005)'s 'Individual Concept' approach (IC), the CQ verb takes as its semantic argument an intensional object of type <s,e> or of type <s,se>. The 'Propositional Analysis' (PA), on the other hand, maintains that the CQ verb combines with a proposition or a propositional concept (Nathan 2006, Romero 2007). In this paper we argue that, from a crosslinguistic perspective, the QID analysis best captures the semantic interpretation of CQs.

(1) John knew the agenda of the meeting. (= John knew *what the agenda of the meeting was.*)

English CQs: IC and PA cannot handle English CQs to the full extent. Under IC, a CQ-DP and a wh-complement embedded under a CQ verb receive distinct semantics. Thus IC would have difficulty explaining why coordination of a CQ-DP with an overt wh-complement is grammatical (2). Even worse, nor can it explain why coordination of a CQ verb with a prototypical individual concept taking verb (*fall*, *change,* etc) clashes (3). Lastly, IC derives Heim's (1979) Ambiguity (4) by allowing the argument of the CQ verb to arise either from the extension of the embedded CQ-DP or from its intension (Romero 2005). It over-generalizes in predicting (5) to have an unattested reading B ('John knew that the question about gift whose answer Fred decided on was, for example, "What was the gift for the son?"').

(2) John knows the price of fish pods as well as where to get a fishing license.
(3) *The price of milk is known to John and fell last week. (Nathan 2006)
(4) John knows the price that Fred knows.
  a. John knows the same price that Fred knows. (**Reading A**)
  b. John knows what price Fred knows.' (**Reading B**)
(5) John knew the holiday gift that Fred had decided on.

With PA, CQs denote a set of propositions <st,t> or a propositional concept <s,st>. CQ-DPs in their strict CQ interpretation would be predicted not to be able to combine with individual concept taking verbs at all. On the other hand, CQ-DPs are predicted to be compatible with proposition taking predicates. However, (6-7) suggest that these two predictions are both invalid.

(6) John knows the price that Fred knows, which, by the way, happens to be rising.
(7) ??The price that John knows is surprising.

Acehnese CQs: Banda Acehnese (BA) is an Austronesian language spoken on the Island of Sumatra in Indonesia. The BA word for 'know', *tu-*, obligatorily combines with an interrogative element X. When *tu-X* takes a wh-complement, X is either the default *peue* 'what' or (roughly) identical to the (surface highest) wh-element in the embedded clause (8). When *tu-X* takes a CQ-DP, X shows a similar (optional) sensitivity to the set of propositions expressed by the CQ.

(8) Ibrahim geu tu-soe/tu-peue soe yang Hasan galaq.
  Ibrahim 3.Hon know-who/know-what who REL Hasan like
  'Ibrahim knows who Hasan likes.' (tense information left open in the gloss; same below)
(9) Ibrahim geu tu-dum/tu-peue yum boh-mamplam.
  Ibrahim 3.Hon know-how much/know-what price fruit-mango
  'Ibrahim knows (how much/what) the price of mango is.'
(10) Ibrahim geu tu-pat/tu-peue ibukota Aceh.
  Ibrahim 3.Hon know-where/know-what capital Aceh
  'Ibrahim knows where (or: what) the capital city of Aceh is.'

Analysis: Acehnese CQs first. IC and PA both treat wh-questions and CQs as having distinct semantics. It is not clear to me how they can capture the similarity between the optional sensitivity of *tu-X* to overt wh-complements and to CQ-DP complements. When *tu-X* embeds a proposition complement it does not show the same (optional) sensitivity (11), suggesting that CQs do not denote a proposition. In addition,

CQs in BA are not limited to identity questions – questions meaning *what Y is* or *who Y is*, as evident in (10). This runs afoul of what IC and PA would predict. QID does not face such empirical challenges.

(11) Ibrahim geu tupeue/*tusoe/*tujan Fatimah geu reubah baroe.
Ibrahim 3.Hon know-what/*-who/*-when Fatimah 3.HON fall yesterday
Ibrahim knows that Fatimah fell yesterday.'

So we endorse QID: CQs and wh-questions are interpreted via the same mechanism (12). It follows that wh-question embedding 'know' has the same semantics as CQ-DP embedding 'know', a welcome result. (13a-b) give the exhaustive and mention-some interpretation of 'know' respectively.

(12) [[the price of mango]]=[[what/how much the price of mango is]]
$= \lambda$ w. {p: p(w) & $\exists$ x [p= λ w'.PRICE-OF-MANGO(x,w')]}

(13) a. $[[\text{know}]]_{exh} = \lambda\, p_{<s,<<s,t>,t>>}\, \lambda\, x\, \lambda\, w.\, \forall\, w' \in \text{Dox}_x(w)\, [p(w') = p(w)]$ (Heim 1994)
b. $[[\text{know}]]_{some} = \lambda\, p_{<s,<<s,t>,t>>}\, \lambda\, x\, \lambda\, w.\, \exists\, p'_{<<s,t>,t>}[p' \subseteq p(w) \,\&\, \forall\, w' \in \text{Dox}_x(w)[p' \subseteq p(w')]]$

Back to English CQs, those challenges to IC and PA do not pose any problem for QID. Coordination of a CQ-DP and a wh-complement (2) is grammatical because they have the same semantics. Coordination of CQ verbs and IC-taking verbs is ungrammatical (3) because they require arguments of different types. (6) is acceptable because internal arguments of a question can be modified by a relative clause in certain contexts. (7) is ungrammatical because interrogative clauses generally are not an appropriate subject for propositional predicates like 'surprising' (e.g. *'Who came was surprising.')

Regarding Heim's Ambiguity, observe that only CQs consisting of relational nouns (like *capital* and *president*) can yield the ambiguity (4), whereas non-relational noun CQs do not when used in a parallel way (5 & 14). In the context of CQs, relational nouns differ from non-relational ones in having an unsaturated argument (Frana 2006). This argument is the syntactic complement of the associated NP of relational noun CQs, and we assume that it is introduced by a covert presupposition 'of' (or the like). Heim's Ambiguity is then between asking about the head noun and about the covert complement (15). This analysis explains the unambiguity of (5 & 14). In addition, it predicts that when the complement of the associated NP in a relational noun CQ is overtly satisfied so that a covert preposition phrase head by 'of' is no longer possible, the second reading would be unavailable. The prediction is confirmed by (16). .

(14) John knew the secret that Fred knew.
→There was a secret s.t. Fred knew what it was, and John could answer the question too.
!→There was a person such that Fred knew what his secret was; John knew who it was.

(15) a. John knew the price that Fred knew ~~[was]~~ ~~[*what*]~~.
b. John knew the price that Fred knew ~~[was]~~ ~~*[of what]*~~.

(16) John knew the European president that Fred knew.

English CQs have a distribution narrower than QID would predict: they are limited only to identity questions (17). Unlike *tu-X* in BA, there is no retrievable wh-element in English CQ verbs that can add extra semantic information. Nor can CQ-DPs add any more information to the semantic computation (Nathan 2006). So it comes as no surprise that English CQs only can have an identity interpretation.

(17) John doesn't know the directions to Paris, (but) Fred knows the capital of France.
≠ John doesn't know....., (but) Fred knows where the capital of France is.

Conclusions: With data from BA, this paper sheds new insights on the interpretation of CQs. Some alleged complications faced with the QID analysis for English CQs can be handled with plausible assumptions. Our analysis is not free of drawbacks, however. So far it has nothing to say regarding why relational nouns form CQs much more easily than non-relational nouns and why not all wh-question-taking predicates can be CQ verbs (e.g. *wonder* and *care*). We leave these questions for future research.

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