Why short form functional reading answers are not possible in multiple wh-questions

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In this paper I present a novel observation regarding the unavailability of the short form functional reading answer (SFR) to multiple wh-questions, (in contrast to their availability in wh-questions with a quantifier), and propose an account which does not appeal to ellipsis.

Puzzle (the unavailability of the SFR): Multiple wh-questions such as (1a) produce a pair-list reading (PL), as in (1b). Similarly, wh-questions with a quantifier as in (2a) produce the PL reading (2b). It has often been argued that the PL reading (2b) is not a reading in its own right but a special case of the functional reading (2c) (cf. Engdahl 1986 and Chierchia 1991). Dayal (1996, 2002) argues that the PL reading in multiple wh-questions, as in (1b), is also interpreted as a functional reading. If this is right, we can expect that the multiple wh-question in (1a) can admit a functional reading (2c) in addition to the PL reading, and this is in fact the case, as shown in (1c) (cf. Comorovski 1996). However, contrary to the case of wh-questions with a quantifier (2), there is a restriction in multiple wh-questions in terms of the kind of functional reading answer that is available; the short form functional reading answer (SFR) is not permitted in multiple wh-questions (1d).

Two Possible Approaches: (i) The short answer is not an elided form of the long answer, but an answer in its own right (which, for some reason, is incompatible with multiple wh-questions); and (ii) the short answer is an elided form of the long answer; in multiple wh-questions, ellipsis is not possible for independent reasons. Under the ellipsis analysis, the SFR in (3) is derived from the long form by eliding TP which is parallel to the TP in the antecedent (cf. Merchant 2004). In the same respect, one could argue that the SFR cannot be produced in multiple wh-questions since it can't satisfy parallelism as illustrated in (4) (cf. Merchant 2004). However, parallelism does not seem sufficient to account for the unavailability of the SFR (1c). If the ellipsis analysis is right, we predict the question (5) to admit *every philosopher his rival linguist* as an answer contrary to fact; parallelism is satisfied in (5). In addition, Jacobson (2009) raises several objections for the ellipsis analysis. For example, there is a contrast between short form and long form answers which cannot be easily accounted for under the ellipsis analysis; the modifier *namely* can occur with the short form answer but not with the long form answer: also, short form answers can have an exhaustive reading while long answers can't. I thus do not pursue the line of reasoning described in (ii), and instead argue that the SFR is an answer in its own right.

Proposal: I suggest that wh-questions can be interpreted as either a set of propositions (Karttunen 1977) or a single proposition (Groenendijk and Stokhof 1984), giving rise to long form and short form answers, respectively. Specifically, I argue that short form answers in wh-questions are derived by a Q-operator which selects two properties and requires an individual in w' which is identical to an individual in w, instead of selecting a proposition (which is the assumption for Q-operators under Karttunen's semantics of questions). Thus, there are **<u>two types of Q-operators</u>**, Q1 for long form answers and Q2 for short form answers, as in (6). For instance, under the current proposal, the wh-question (7a) can be interpreted as either (7b) or (7c). Specifically, we get the long form answer (e.g. *John left*) by replacing the trace of the wh-phrase with individuals that verify the proposition (8a). On the other hand, we get the short answer (e.g. *John*) by naming individuals in the set of those who left in the actual world (8b). I use Intensional Functional Application (IFA) following Heim and Kratzer (1998). Also, I assume that Q2's (type) requirement allows us to insert indices below the Q-operators (8b), similar to IFA which is motivated by type-theory.

Discussion: Assuming the proposed system, consider first the wh-question with a quantifier (2). I argue that the long form functional reading (LFR) is admitted by (9) assuming Chierchia (1991). However, the SFR is produced by (10a) which involves Q2 (10b). Let's turn to the multiple wh-question (1). I argue that the LFR is derived from (11) assuming Reinhart's (1997) choice function approach. As for the SFR, we need Q2 instead of Q1 just like (10a). However, unlike (10a), this application does <u>NOT</u> work. To produce the SFR, what Q2 needs to have from S1 is [$\lambda w.\lambda f.$ *every philosopher*$_x$ *likes f(linguist*$_x$*) in w*], as is the case of the wh-question with a quantifier. However, in (12a) what Q2 can get from S1, [$\lambda w.$ λx *x likes f(linguist) in w*], is a property of individuals rather than a property of functions. This results in a type mismatch. In addition to (12a), there is another possibility in (12b): to abstract over the 'f'-variable, in which case the complement of Q2 is [$\lambda w.$ $\lambda f.$ *x likes f(linguist) in w*]. However, this derivation is excluded for either of the following reasons: i) if the trace of *which philosopher* is unbound, the tree is excluded on syntactic grounds, ii) if the trace of *which philosopher* gets bound right below *which philosopher*, we get a tree like [*which philosopher* [*1* [*Q2* [*2* t_1 *likes* f_2*(linguist)*]]]. Crucially, [*1* [*Q2* [*2* t_1 *likes* f_2*(linguist)*]]] is not of the required type, <e,t>, so it cannot serve as an argument for *which philosopher* (which is an indefinite). Therefore, the output of this application, the SFR, cannot be a proper answer to the multiple wh-question. We thus derive the unavailability of the SFR to multiple wh-questions.

(1) a. Which philosopher likes which linguist?
b. John likes Mary, Bill likes Smith,… PL
c. Every philosopher likes his rival linguist. LFR
d. *His rival linguist. SFR

(2) a. Who does every philosopher like?
b. John likes Mary, Bill likes Sue,… PL
c. Every philosopher likes his rival linguist. LFR
d. His rival linguist. SFR

(3) Q: [$_{CP}$ Who1 [$_{TP}$ does every philosopher like t1]]
A: [$_{FP}$ His rival linguist1 [$_{CP}$[$_{TP}$ ~~every philosopher like t1~~]]]

(4) Q: [$_{CP}$ which philosopher1 [$_{TP}$ t1 likes which linguist]]
A: *[$_{FP}$ His rival linguist2 [$_{CP}$ [$_{TP}$ ~~every philosopher likes t2~~]]]

(5) Q: [$_{CP}$ which philosopher1, which linguist2 [$_{TP}$ t1 likes t2]]
A: *[$_{FP}$ every philosopher1, his rival linguist2 [$_{CP}$ [$_{TP}$ ~~t1 likes t2~~]]]

(6) a. [[Q1]] = λp. q=p
b. [[Q2]] = $\lambda P1 \lambda P2 \lambda w'.\ \iota x_{\sigma}[P1(w')(x) \& P2(w')(x)] = \iota x_{\sigma}[P1(w)(x) \& P2(w)(x)]$

(7) a. Who left?
b. {p: ∃x [p = 'that x left']} Long Form Answers
c. $\lambda w'.\iota x_e$[person (x, w') & x left in w'] = ιx_e[person (x, w) & x left in w] Short Form Answers

(8) a. CP1 [λp. there is an x such that x is a person and p = 'that x left']
3 CP2 [there is an x such that x is a person and q_3 = 'that x left']
who CP3 [λx. q_3 = 'that x left']
1 C' [q_3 = 'that x left']
C Q1 λp. q_3=p
S1 [λw. x left in w]
t_1 left

b. CP [$\lambda w'.\ \iota x_e$[person (x, w') & x left in w'] = ιx_e[person (x, w) & x left in w]]
who C' [$\lambda P2 \lambda w'.\ \iota x_e$[x left in w' & P2(w')(x)] = ιx_e[x left in w & P2(w)(x)]]
C Q2 → $\lambda P1\ \lambda P2 \lambda w'.\iota x_e[P1(w')(x) \& P2(w')(x)] = \iota x_e[P1(w)(x) \& P2(w)(x)]$
S1 [λw. λx. x left in w]
1 S2
t_1 left

(9) {p: ∃f [p = 'that every philosopher$_x$ likes f(x)']}

(10) a. $\lambda w'.\ \iota$f[PERSON (f, w') & [every philosopher$_x$ likes f(x) in w']] = ιf[PERSON (f, w) & [every philosopher$_x$ likes f(x) in w]]
b. [[Q2]] = [$\lambda P1 \lambda P2 \lambda w'.\ \iota f[P1(w')(f) \ \&\ P2(w')(f)] = \iota f[P1(w)(f) \& P2(w)(f)]$]

(11) {p: ∃<x,f> [CH(f) & philosopher(x) & p = x likes f(linguist)]}

(12) a.
which philosopher C'
C Q2
S1 [λw. λx. x likes f(linguist) in w]
1 S2
t_1 VP
likes f(linguist)

b.
which philosopher C'
C Q2
S1 [λw. λf. x likes f(linguist) in w]
2 S2
t_1 VP
likes f_2(linguist)

Selected References: ***Chierchia, G.*** 1991. Functional WH and Weak Crossover. In *the Proceedings of the West Coast Conference on Formal Linguistics (WCCFL 10)*, 75-90. ***Comorovski, I.*** 1996. *Interrogative phrases and the syntax-semantics interface*. Dorderecht: Kulwer Academic Publishers. ***Dayal, V.*** 2002. Single-pair vs. Multiple-pair answers: Wh in-situ and Scope. *Linguistic Inquiry* 33: 512-520 ***Groenendijk, J. and M. Stockhof.*** 1984. *Studies on the Semantics of Questions and the Pragmatics of Answers*. Doctoral dissertation, University of Amsterdam. ***Heim, I. and A. Kratzer.*** 1998. *Semantics in Generative Grammar*. Blackwell Publishing. ***Jacobson, P.*** 2009. The short answers. And what it Answers. A handout from the 16th Annual HPSG Conference. ***Karttunen, L.*** 1977. The syntax and semantics of questions. *Linguistics and Philosophy* 1-1, pp. 3-44. ***Merchant, J.*** 2004. Fragment and Ellipsis, *Linguistics and philosophy* 27: 661-738. ***Reinhart, T.*** 1997. Quantifier scope: how labor is divided between QR and choice functions. *Linguistics and Philosophy* 20:335-397