completeness and mention-some, basic puzzle

- some questions appear to be fully answered by partial answers – they admit of MENTION-SOME (MS) readings.
- explaining which and why, within a general theory of question semantics and answerhood

context 1: Nathan needs help w/ a tricky lambda.
context 2: Nathan assessing the students' experience.

Suppose Ruoying and Tim can do it.

(1) Who can convert this lambda?
Ruoying. / Ruoying can. [complete in c1, not in c2]

(2) Nathan (now) knows who can convert this lambda.
[true in c1, not in c2]

[Xiang, 2022] : MS answers have falling tone, like other complete answers ("MA") not rising tone that marks incompleteness.

Do all questions allow mention-some readings (in right context)?

(3) a. Who smokes?
    b. Who can I get a cigarette from?

Recent (Boston) lit. argues for two routes:

- true mention-some, licensed by ‘can’ in (b).
- fake mention-some (a), via
  domain restriction [Fox, 2018], or parasitically [Xiang, 2022]

arguments: higher MS rates w/ modal [Xiang and Cremers, 2017];
Fox’s contrast?

(4) a. Everyone knows who smokes. cf. Fox (44)
    b. Everyone knows who Daniel can get a cigarette from.

more below on data/predictions regarding contexts for true MS

Fox 2018's theory of mention-some

- (true) MS/MA ("Mention All") reduced to an independent ambiguity,
- using a single, weaker notion of answerhood than normally assumed.
- crucially, the ind. ambiguity is argued/assumed to constrainted

Fox's starting point: [Dayal, 1996] on answerhood

- a **Q**uestion denotes a Hamblin set, which merges w/ Ans
- Ans presupposes that Q contains a true member (answer) that entails all other true ones (Max), and returns it if so

(5) a. Ans [$_Q$ wh came]

b. $[\![\texttt{Ans}_w]\!] =$
$\lambda Q_{st,t} : \exists p \in Q[Max_w(Q)(p)]\ .\ \iota p[Max_w(Q)(p)]$

c. $Max_w(Q)(p)$ iff $\begin{cases} p \in Q \\ w \in p \\ \forall q \in Q[w \in q \rightarrow p \subseteq q] \end{cases}$ [1]

[1](Fox writes Max$_{inf}$ for maximally informative, I suppress for space/define slightly different for transparency but result is same)

consequences of Dayal's obligatory Ans

- existential presupposition for all questions (at least one Hamblin answer true)
- uniqeness for singular *which* questions (given Hamblin answer space as below)

(6) a. $[_Q$ Which boy came$]$
b. $\{\lambda w'.\ x$ came in $w' \mid x$ is an atomic boy in $D\ \}$

e.g. in D with 2 boys A and B we have that $[\![\mathtt{Q}]\!]$ is a set of two propositions $\{a, b\}$.

Since neither entails the other, Ans_w undefined in w where both true. $\Rightarrow$ presupposition is that only one true $=$ only one boy came

(7) a. [$_Q$ Who came]
b. $\{\lambda w'.\ x$ came in $w' \mid x$ is sum of atomic people in $D\ \}$

e.g. in D with 2 perople A and B we have that $[\![\texttt{Q}]\!]$ is a set of two propositions $\{a, b, a+b\}$.

Since $a+b$ entails both a and b, Q has a max. inf. true answer in any w where some p in Q is true.

$\Rightarrow$ presupposition is merely existential (someone came)

(8) [$_Q$ Which boys came]

further motivations come from degree questions (Fox & Hackl)

(9) a. How did he drive?
b. *How fast did he not drive?
c. How fast was he not allowed to drive

Since Ans gives a proposition it also yields embedding under verbs like *know* that otherwise take a proposition.

(10) x knows Ans Q

What about "rogative" verbs like *ask*? We can recover the Hamblin set from $[\![\mathtt{Ans}_w\ \mathtt{Q}]\!]$. Exercise: define an operator to do that, that also retains the presupposition of Ans.

Back to mention-some

mention-some can't be derived with Dayal's Ans, which has to give a single prop. Suppose they sell cigs at M&S and Tesco in $w*$

(11) a. Ans [where can Daniel buy cigarettes?]
b. $\{\lambda w'.$ D can buy cigs at x in $w' \mid x$ is a place in $D\}$
c. $\{\Diamond m, \Diamond r, \Diamond(m+t)\}$

Then Ans_{w*} is $\Diamond(m+t)$ (that it's possible to buy cigs at both places) since this entails $\Diamond m$ and $\Diamond t$.

The latter are predicted to only be partial answers.

What about positing a weaker variant for MS (cf. Fox 2013)?

(12) a. ans $[_Q$ wh came$]$ LF for MS reading

b. $[\![\texttt{ans}_w]\!] =$
$\lambda Q_{st,t} : \exists p \in Q[max_w(Q)(p)].[\lambda p.max_w(Q)(p)]$

c. $max_w(Q)(p)$ iff $\begin{cases} p \in Q \\ w \in p \\ \neg\exists q \in Q[w \in q \rightarrow q \subseteq p] \end{cases}$

little ans only requires at least one true p in Q that nothing else entails, and returns the set of any such p.

This does not yield MS for (11a) in $w*$ but does in w where both of $\{\Diamond w, \Diamond t\}$, it returns that set.

If it's assumed that providing one member suffices (+Covert $\exists$ for *know* etc., see Fox), this seems to derive the MS reading.

Problems: probably undergenerates, definitely overgenerates MS.

Fox observes we can re-conceptualise (derive?) Dayal's presupposition as a constraint on resolvability w/ the Hamblin set.

Roughly: Q can only be used if every potential assignment of truth values to the p in Q that has not been ruled out, could be ruled in by learning of some p in Q that it's the only true one.

(13) Who completed the exercise? (MA)
Ruoying. / Ruoying did. complete
$\rightsquigarrow \neg p$, $\forall p \in Q$ not entailed by r.

- If it has not been ruled out that each p is false, then there's (trivially) no p that will rule this possibility in.
  $\Rightarrow$ existential presupposition
- For a sing. *which* Q (6), if it has not also been ruled out that a and b are both true, there's no p that will rule it in.
  $\Rightarrow$ uniqueness presupposition

more formally

define that p is the only true prop. in Q in w

(14) $\text{Exh}(Q, p, w) = T$ iff $\begin{cases} w \in p \\ \forall p' \in Q(w \in p' \rightarrow p \subseteq q) \end{cases}$

note that in any w where $\text{Exh}(Q, p, w) = T$ for some $p \in Q$

1. there must be (i) some $p \in Q$ that is true
2. there cannot be two logically independent propositions that are true.

Thus Fox observes we can restate Dayal's Ans equivalently as

(15) $[\![\texttt{ANS}_w]\!] =$
$\lambda Q_{st,t} : \exists p \in Q[Exh(Q, p, w) = T].[\iota p \in Q[Exh(Q, p, w) = T]$

nb.: ANS_w returns a true Hamblin answer, **not** its exhaustification.
Discussion: why does this give the maximally inf. such answer (when defined)?

Fox offers two motivations for his restatement of Dayal.

One: (he argues) that further constraints on questions can be derived as constraints on the relation between (the partition of C by) Q and the exhautifications of its Hamblin answers.

Two: he proposes that ANS, with refinements to Exh and other assumptions, can derives MS readings (without overgenerating).

Mention-some via higher type quantification

[Spector, 2008] argues that disjunctions can be complete answers in some cases.

(16) What are you required to read for this class?
Fox 2018 or Xiang 2022.
/ You're required to reading Fox 2018 or Xiang 2022.

This can be complete answer, in a situation in which you (only) must read one of the 2 papers, your choice: *required* > *or*

To derive this, it won't do to quantify over (sums of) individual books: there is no book x such that you are required to read x.

Spector proposes this to reflect a reading where the *wh* expression rangers over (specific) quantifiers (ett) rather than individuals (e).

(17) Wh restrictor$^{\uparrow}$ $\lambda Q_{et,t}$ are you required Q λx PRO to read x

(18) $\{p : \exists Q \in R^{\uparrow}[p =$
$\lambda w'.$ it's required in w' that $Q(\lambda x.$ you read $x)]\}$

$R^{\uparrow}$ = the boolean closure of the Montagovian lifts to ett of the individuals (e) in the restrictor R (e.g. things, for 'what')

The lift of e.g. john (e) is the GQ J that such that J(P_{et}) iff P(john)

we also the conjunctive GQ J&P such that J&P(Q) iff Q(john) and Q(paul).

and the **disjunctive** GQ JvP such that J&P(Q) iff Q(john) or Q(paul)

On the high type reading, the question denotation will thus be a set of propositions including the following, and =to it if there are just the two papers in D)

$\lambda w'$. it's required in w' that you read Fox 2018
$\lambda w'$. it's required in w' that you read Xiang 2022
$\lambda w'$. it's required in w' that you read Fox 2018 and you read Xiang 2022
$\lambda w'$. it's required in w' that you read Fox 2018 or you read Xiang 2022

The bottom proposition is maximally informative in a world where you're only required to read a book, no specific one, and thus can count as a complete answer / be returned by the ANS

In the case of a 'can' question, which allows MS, the higher type reading doesn't (so far) buy anything new

(19) Where can Daniel get cigarettes.

$\lambda w'$. in w' D can get cigs at M	$\Diamond m$
$\lambda w'$. in w' D can get cigs at T	$\Diamond t$
$\lambda w'$. in w' D can get cigs at M and T	$\Diamond(m \wedge t)$
$\lambda w'$. in w' D can get cigs at M or T	$\Diamond(m \vee t)$

Although we get a different set of propositions than w/ the low type reading, it actually gives rise to the same partition.

Notice that the bottom prop couldn't be the output of Ans since it's weaker than *both* of the top two.

On the other hand, notice that

(20) Daniel can get cigarettes at M or T.

does seem to be a complete answer: it conveys that $\Diamond I1$ and $\Diamond I2$. (FC)

It is a puzzle independently (and much written about) why it can mean this, even when not presented as an answer.

Fox's theory is that $\Diamond I1$ and $\Diamond I2$ are scalar implicatures of (20), but that scalar implicatures are (more than) what we thought they were.

(21) ALTernatives for (20): *D can get cigarettes at M, D can get cigarettes at T, D can get cigarettes at M and T*

(22) SIs of (20) given above ALTs:

a. negate each Alt a to s such that not(a and s) does not entail any other Alt a'. (IE)

b. any other alternative (II)

Basically, the idea is you negate everything you can without arbitrarily including something else. And then *in*clude the rest.

Neither of the first two alts is innocently excludable (IE), so they end up being included as positive implicatures $\Rightarrow$ *FC*

(23) EXH(ALT$_s$, s, w) = T iff

p is true in w

each $p' \in$ IE is F in w

and each $p'' \in$ ALT$_s$ and $\notin IE$ is T in w

Fox leverage's this plus the the answer space for the high type reading to derive MS.

A first step is to replace Exh with EXH in Ans, the alts being the propositions in Q (the alternatives Hamblin answers to p)

(24) $[\![\texttt{Ans}_w]\!] =$
$\lambda Q_{st,t} : \exists p \in Q[EXH(Q,p,w) = T].[\iota p \in Q[EXH(Q,p,w) = T]$

This makes $\Diamond(l1 \vee l2)$ the (direct), complete answer on the high type reading in w' s.t. $\Diamond l1$ and $\Diamond l2$ are T, and $\Diamond(l1 \wedge l2)$ is F.

(Fox suggests latter can be 'pruned' from Q when applying Exh)

This seems like a good result but of course doesn't give MS. To get MS Fox weakens Ans.

(25)

$[\![\mathtt{ANS}_w]\!] =$

$$\lambda Q_{st,t} : \exists p \in Q[EXH(Q,p,w) = T].\left[\lambda p'.\ \begin{array}{l} p' \in Q \\ w \in p' \\ p' \subseteq [\iota p \in Q[EXH(Q,p,w) = T] \end{array}\right]$$

This returns the set of $p' \in Q$ that entail the $p \in Q$ whose EXHaustification is the complete answer.

for (11a) ANS$w' = \{\Diamond m,\ \Diamond t,\ \Diamond(m \vee t)\}$

Low type reading works as before – they key is that the (semantically) weak disjunctive answer is missing.

Unlike ans, ANS does not yield MS for singular *which*:

(26) Which store sells cigs?
(26) Which store can I get cigs at?*

The propositions in such a Q are logically independent – {m, t}, $\{\Diamond m, \Diamond t\}$ – so there can only be one true one that entails the one whose EXH is true. So we get uniqueness like Dayal.

*given that singular which does not allow higher type reading, which Fox argues

(27) Which paper are you required to read for this class?
Fox 2018 or Xiang 2022. *req $>$ or

[Hirsch and Schwarz, 2020]

Propose that 'which' itself presupposes uniqueness (qua max. inf)

With this, weak ans from above will allow MS with 'can' but not in (26) (and without assumptions about functional readings.)

However, they claim that MS readings are actually possible with $\Diamond$ and they predict them via reconstructions of 'which' below the modal

(55) $\left\{ \begin{array}{l} \lambda w : \exists! y\ [\text{letter}(y)(w) \wedge \text{miss}(y)(w)].\ \text{letter}(a)(w) \wedge \text{miss}(a)(w), \\ \lambda w : \exists! y\ [\text{letter}(y)(w) \wedge \text{miss}(y)(w)].\ \text{letter}(b)(w) \wedge \text{miss}(b)(w), \\ \ldots \end{array} \right\}$

With two letters missing in form, the uniqueness presupposition from *which* fails

with the Hamblin set for the LF with *which* taking scope under *could*, in (58).

(57) Which letter could we add to make a word?

(58) $\left\{ \begin{array}{l} \lambda w : \Diamond_w \exists! y\ [\text{letter}(y) \wedge \text{add}(y)]\ .\ \Diamond_w(\text{letter}(a) \wedge \text{add}(a)), \\ \lambda w : \Diamond_w \exists! y\ [\text{letter}(y) \wedge \text{add}(y)]\ .\ \Diamond_w(\text{letter}(b) \wedge \text{add}(b)), \\ \ldots \end{array} \right\}$

Generalisations and further data

Are H&S right about this data point? / ‘not both’ inference

Fox’s prediction no: MS unless FC w/ ‘or’

Mention several

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