1. Introduction

- **Mention-some (MS) versus mention-all (MA):**
  - MA-questions: A complete answer to (1) has to specify all the attendants in the considered domain: “MA answers” like (1a). If an answer is not MA, it has to be accompanied by an ignorance inference (1b-c).

  (1) Who came to the party yesterday?
  
  (w: only John and Mary came to the party.)
  
  a. John and Mary. Complete (MA)
  
  b. John. But I’m not sure if anyone else did. Partial
  
  c. JOHN did ... Partial

  L H* L-H%

  - MS-questions: the ◇-question (2) admits an answer naming some possible chair: “MS answers” like (2a). (2a) doesn’t have to carry an ignorance mark (cf. (1b-c)).

  (2) Who can chair the committee?
  
  (w: only John and Mary can chair the committee; one chair only)
  
  a. John. MS
  
  b. John and Mary. Conjunctive MA
  
  c. John or Mary. Disjunctive MA

- **Complexities from number marking:**
  - A singular question (with or without ◇) requires uniqueness; MS is unavailable.

  (3) a. Which professor can chair the committee? # I know that several professors can.
  
  b. Which professors can chair the committee? √ I know that several professors can.
  
  c. Who can chair the committee? √ I know that several professors can.

  - A plural ◇-question rejects an MS answer that names only an atomic individual.

  (4) (The committee should have multiple members but only one chair.)
  
  a. John knows which professors can form the committee. (OKMS, OKMA)
    
    √ For some group of professors X s.t. X together can form the committee, J knows that X together can form the committee.
    
    √ For every group of professors X, if X together can form the committee, J knows that X together can form the committee.
  
  b. John knows which professors can chair the committee. (♯MS, OKMA)
    
    × For some professor x s.t. x can chair the committee, J knows that x can chair the committee.
    
    √ For every professor x, if x can chair the committee, J knows that x can chair the committee.

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1 I am very grateful to Gennaro Chierchia, Danny Fox, and the reviewers of Amsterdam Colloquium for helpful comments. I am also thankful to Patrick Elliott, Jon Gajewski, Martin Hackl, Andreas Haida, Irene Heim, Jim Huang, Manfred Krifka, Clemens Mayr, Andreea Nicolae, Floris Roelofsen, Uli Sauerland, Roger Schwarzschild, Anna Szabolcsi, Satoshi Tomiyoka, Wataru Uegaki, and the audiences at MIT, ZAS, UCL, QiD 2015, and NELS 46 for their comments on earlier versions of this paper.
2. Previous studies

2.1. Dayal (1996)

2.1.1. Uniqueness: the strongest true answer exists

- \( \text{Ans}_D(Q)(w) \) returns the strongest true answer and presupposes its existence. The strongest true answer is the true answer that entails all the true answers.

\[
\text{Ans}_D(Q)(w) = \exists p[w \in p \in Q \land \forall p'[w \in p' \in Q \rightarrow p \subseteq p']].
\]

(6) (w: among the professors, only John and Mary came to the party.)

a. Which professors came to the party?
\[
Q = \{\text{came}'(x) : x \in \#\text{professor}'\}
\]
\[
Q_w = \{\text{came}'(j), \text{came}'(m), \text{came}'(j \oplus m)\}
\]
\[
\text{Ans}_D(Q)(w) = \text{came}'(j \oplus m)
\]

b. Which professor came to the party?
\[
Q = \{\text{came}'(x) : x \in \text{professor}'\}
\]
\[
Q_w = \{\text{came}'(j), \text{came}'(m)\}
\]
\[
\text{Ans}_D(Q)(w) \text{ is undefined}
\]

\( \Rightarrow \) A question primarily has only one good answer, i.e. the strongest true answer.

- The presupposition of \( \text{Ans}_D \) captures the uniqueness requirement of singular questions: plural terms denote atomic and sum individuals, but singular terms only range over atomic domains (Link 1983).

2.1.2. MS answers are partial answers

- Dayal (in prep): MS answers are partial answers that are sufficient for the goal behind the question.

(See also Groenendijk & Stokhof (1984), van Rooij (2004), van Rooij & Schulz (2006), a.o.)

- Problems with a pragmatic account of MS:
  - Unlike MS answers, intermediate answers must be ignorance-marked.

(7) Who can chair the committee?
(w: only John, Mary, and Sue can chair the committee; one chair only)

a. John. MS
b. John and/or Mary. # (I’m not sure who else can.) Intermediate
c. John, Mary, and/or Sue. MA

- Interpretations of indirect questions show that good answers are always “mention-one” (8a) or “mention-all” (8b). But a conversational goal could also be “mention-three”, for instance; a pragmatic account would predict the “mention-three” reading (8c) to be acceptable under this goal.

(8) (Context: the dean wants to meet three chair candidates to discuss plans for the committee.)
John knows who can chair the committee.

a. For some individual \( x \) s.t. \( x \) can chair, John knows that \( x \) can chair. \( \sqrt{\} \)
b. For every individual \( x \) s.t. \( x \) can chair, John knows that \( x \) can chair. \( \sqrt{\} \)
c. For some three individuals \( xyz \) s.t. \( xyz \) each can chair, John knows that \( xyz \) each can chair. \( \times \)

2. Closing the quantificational domain of the \( wh \)-item under sum does not guarantee the existence of the strongest true answer. In (1), “\( ab \) and \( cd \) each formed a team” \( \neq \) “\( abcd \) together formed a team”. To avoid overly predicting a presupposition failure, Dayal should include the conjunctive proposition \( \text{form}'(a \oplus b) \land \text{form}'(c \oplus d) \) as a possible answer. See more details in Appendix II.

(1) Who formed a team? # \( Q_w : \{\text{form}'(a \oplus b), \text{form}'(c \oplus d)\} \)
2.2. Fox (2013): MS answers are maximally informative true answers

- Fox (2013) proposes a weaker answerhood-operator to capture MS grammatically.

\[ \text{Ans}_F(Q)(w) = \{p : w \in p \in Q \land \forall q[w \in q \rightarrow q \not\subseteq p]\} = \text{MaxI}(Q,w) \]  

(Initial version)

\[ \text{MaxI}(\alpha,\tau, \delta) = \{\alpha \in \alpha \land \forall \beta[\beta \in \alpha \rightarrow \beta \not\subseteq \alpha]\} \]

⇒ A question admits MS iff it can have multiple MaxI true answers;
iff its answer space is not closed under conjunction.

- A basic *wh*-question can have only one MaxI true answer:

(11) Who came to the party last night?
\(Q_w = \{\text{came'(j), came'(m), came'(j+ m)}\} \)

b. \(\text{Ans}_F(Q)(w) = \{\text{came'(j+ m)}\} \)

MA √

- The *wh*-trace \(X\) has as a phrase-mate distributor \(\text{Each}\). The MS/MA ambiguity of a \(\diamond\)-question comes from the scope ambiguity of \([X \text{Each}]:\) when \(\diamond > [X \text{Each}],\) the answer space is not closed under conjunction, and it is possible to have multiple MaxI true answers.

(12) Who can chair the committee?
\([X \text{Each}] > \diamond\)

a. \(Q = \{\text{Each}(X)(\lambda x.\diamond \text{chair'}(x)): X \in \text{*person'}\} = \{\forall y \in \text{Atom}(X)[\diamond \text{chair'}(y)] : X \in \text{*person'}\} \)

ii. \(Q_w = \{\diamond \text{chair'}(j), \diamond \text{chair'}(m), \diamond \text{chair'}(j) \wedge \diamond \text{chair'}(m)\} \)

iii. \(\text{Ans}_F(Q)(w) = \{\diamond \text{chair'}(j) \wedge \diamond \text{chair'}(m)\} \)

MA √

b. \(\diamond > [X \text{Each}]\)

i. \(Q = \{\diamond \text{Each}(X)(\lambda x.\text{chair'}(x)): X \in \text{*person'}\} = \{\diamond \forall y \in \text{Atom}(X)[\text{chair'}(y)] : X \in \text{*person'}\} \)

ii. \(Q_w = \{\diamond \text{chair'}(j), \diamond \text{chair'}(m)\} \)

iii. \(\text{Ans}_F(Q)(w) = \{\diamond \text{chair'}(j), \diamond \text{chair'}(m)\} \)

MS √

- **Problem**: the non-presuppositional \(\text{Ans}_F\) in (9) cannot capture the uniqueness requirement of singular questions: both the true answers in (13a) are MaxI; thus Fox predicts that (13) is an MS question.

(13) Which professor came to the party last night?
\(Q = \{\text{came'(j), came'(m)}\} \)

b. \(\text{Ans}_F(Q)(w) = \{\text{came'(j), came'(m)}\} \)

MS ×

- Fox accounts for uniqueness based on higher-order disjunctive answers and the notion of *innocent exclusionability*. See Appendix I for this account and its problems.

<table>
<thead>
<tr>
<th>The dilemma between uniqueness and MS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dayal (1996):</td>
</tr>
<tr>
<td>if two answers are true but their conjunction is not a possible answer, this question is undefined.</td>
</tr>
<tr>
<td>Fox (2013):</td>
</tr>
<tr>
<td>if two answers are true but their conjunction is not a possible answer, this question takes MS.</td>
</tr>
</tbody>
</table>
3. My Analysis

3.1. Overview

- I adopt Fox’s (2013) account of MS, and weaken Dayal’s (1996) account of uniqueness: the presupposition of $\text{Ans}_D$ only needs to be satisfied by some answer space that is “similar enough” to the actual answer space.

- In a $\Diamond$-question, the answer space generated under MS and the one generated under MA are similar enough. Thus, a $\Diamond$-question is defined as long as the answer space generated under MA has a strongest true answer.

3.2. Similar answer spaces

- Two answer spaces are similar enough iff they (i) yield the same partition (à la Groenendijk & Stokhof 1984), and (ii) use the same set of short answers.

\[
Q_{str} \cong Q'_{str} \iff \\
\forall w \forall w' [(Q_w = Q_{w'}) \leftrightarrow (Q'_w = Q'_{w'})] \\
[\text{Karttunen set: } Q_w = \{p : w \in p \in Q\}]
\]

(For any two possible worlds $w$ and $w'$, $Q$ yields the same Karttunen set in $w$ and $w'$ iff $Q'$ yields the same Karttunen set in $w$ and $w'$.)

- $\text{SA}(Q) = \text{SA}(Q')$

(3) and $Q'$ use the same set of possible short answers.)

\begin{itemize}
  \item Basic plural questions:
  \end{itemize}

- the answers spaces of (15a-d) are all similar enough.

\begin{table}[!h]
\centering
\begin{tabular}{|c|c|c|c|}
\hline
\textbf{a.} Which professors came? & \textbf{b.} Which professors didn’t come? & \textbf{c.} Only which professors came? & \textbf{d.} Only which professors didn’t come? \\
\hline
$w : Q_w = \emptyset$ & $w : Q_w = \{\neg C(j), \neg C(m), \neg C(j \land m)\}$ & $w : Q_w = \emptyset$ & $w : Q_w = \emptyset$ \\
$w : Q_w = \{C(j)\}$ & $w : Q_w = \emptyset$ & $w : Q_w = \emptyset$ & $w : Q_w = \emptyset$ \\
$w : Q_w = \{C(m)\}$ & $w : Q_w = \emptyset$ & $w : Q_w = \emptyset$ & $w : Q_w = \emptyset$ \\
$w : Q_w = \{C(j), C(m), C(j \land m)\}$ & $w : Q_w = \emptyset$ & $w : Q_w = \emptyset$ & $w : Q_w = \emptyset$ \\
\hline
\end{tabular}
\caption{Partition for (15a-d)}
\end{table}

\begin{itemize}
  \item Basic singular questions:
  \end{itemize}

- (16a) $\cong$ (16b)
- (16a-b) $\not\cong$ (16c-d): they yield different partitions;
- (16a-b) $\not\cong$ (15a-d): they use different sets of short answers.

\begin{table}[!h]
\centering
\begin{tabular}{|c|c|c|c|}
\hline
\textbf{a.} Which professor came? & \textbf{b.} Which professor didn’t come? & \textbf{c.} Only which professor came? & \textbf{d.} Only which professor didn’t come? \\
\hline
$w : Q_w = \emptyset$ & $w : Q_w = \{\neg C(j), \neg C(m)\}$ & $w : Q_w = \emptyset$ & $w : Q_w = \emptyset$ \\
$w : Q_w = \{C(j)\}$ & $w : Q_w = \emptyset$ & $w : Q_w = \emptyset$ & $w : Q_w = \emptyset$ \\
$w : Q_w = \{C(m)\}$ & $w : Q_w = \emptyset$ & $w : Q_w = \emptyset$ & $w : Q_w = \emptyset$ \\
$w : Q_w = \{C(j), C(m)\}$ & $w : Q_w = \emptyset$ & $w : Q_w = \emptyset$ & $w : Q_w = \emptyset$ \\
\hline
\end{tabular}
\caption{Partition for (16a-d)}
\end{table}

\footnote{For now, it is enough to say that short answers are items in the quantificational domain of the $wh$-item.
3.3. Solving the dilemma between MS and uniqueness

- **ANS\(_X\)(Q(w))** presupposes that \(Q\) has a similar answer space \(Q'\) s.t. \(Q'\) has a strongest true member in \(w\). When defined, **ANS\(_X\)(Q(w))** returns the set of MaxI true answers.

\[
\text{(17)} \quad \text{Ans}_X(Q)(w) = \exists Q' \approx Q[\exists p \in Q' \forall q \in Q'[p \sqsubseteq q]]. \text{MaxI}(Q_w)
\]

- In a basic \(\Diamond\)-question, the answer space generated under MS and the one generated under MA are similar enough: (18a–b) \(\cong\) (18b). Thus, since the latter answer space is closed under conjunction, a basic \(\Diamond\)-question is always defined, no matter whether it takes an MS or an MA reading.

\[
\text{(18)} \quad \text{Who can chair the committee?}
\]

\[w : Q_w = \emptyset\]
\[w : Q_w = \{\Diamond C(j)\}\]
\[w : Q_w = \{\Diamond C(m)\}\]
\[w : Q_w = \{\Diamond C(j), \Diamond C(m)\}\]
\[w : Q_w = \{\Diamond C(j), \Diamond C(m), \Diamond C(j+m)\}\]

**Table 2. Partition yielded by \(Q^{\text{MS}}\)**

\[w : Q_w = \emptyset\]
\[w : Q_w = \{\Diamond C(j)\}\]
\[w : Q_w = \{\Diamond C(m)\}\]
\[w : Q_w = \{\Diamond C(j), \Diamond C(m)\}\]
\[w : Q_w = \{\Diamond C(j), \Diamond C(m), \Diamond C(j+m)\}\]

**Table 3. Partition yielded by \(Q^{\text{MA}}\)**

- In contrast, a singular \(\Diamond\)-question requires uniqueness because the answer space generated under MA is not closed under conjunction.\(^4\)

\[
\text{(19)} \quad \text{Which person can chair the committee?}
\]

\[w : Q_w = \emptyset\]
\[w : Q_w = \{\Diamond C(j)\}\]
\[w : Q_w = \{\Diamond C(m)\}\]
\[w : Q_w = \{\Diamond C(j), \Diamond C(m)\}\]

**Table 4. Partition yielded by \(Q^{\text{MS}}\)**

\[w : Q_w = \emptyset\]
\[w : Q_w = \{\Diamond C(j)\}\]
\[w : Q_w = \{\Diamond C(m)\}\]
\[w : Q_w = \{\Diamond C(j), \Diamond C(m)\}\]

**Table 5. Partition yielded by \(Q^{\text{MA}}\)**

\(^4\) Here I only consider conjunctive MA answers. See Xiang (2015) and Appendix IV for discussions on disjunctive MA answers.

\(^5\) See appendix II and III for questions with a collective predicate and cases allowing multiple events in a single world.

\(^6\) (18a–b) \(\not\equiv\) (19a–b). They use different sets of short answers and yield different partitions: the possible worlds where j+m co-chairing is allowed and the worlds where j+m co-chairing is disallowed are in different cells in the partition of (18a–b), while in the same cell in the partition of (19a–b).
3.4. Anti-presuppositions of plural questions

- Recall that a plural question rejects an MS answer that names only a singularity:

  (20) (The committee should have multiple members but only one chair)
  a. Which professors can form the committee? (OK MS, OK MA)
  b. Which professors can chair the committee? (# MS, OK MA)

- Sauerland et al. (2005) use the principle of Maximize Presupposition (MP) to analyze plurality implicatures.

  (21) Principle of MP (Heim 1991)
  Out of two sentences which are presuppositional alternatives and which are contextually equivalent, the one with the stronger presuppositions must be used if its presuppositions are met in the context.

  Sauerland et al. argue that singulars are more presuppositional than plurals, and thus that plural-morphemes implicate an “anti-presupposition”: the singular counterpart is undefined.

- I propose that the plural-morpheme on the wh-complement implicates an anti-presupposition: the corresponding singular question is undefined.

  Further, in spirit of question-answer congruence, I propose that a proper answer of a plural question needs to entail the anti-presupposition.

  (22) A proposition $p$ properly answers $Q_{pl}$ in $w$ iff
  a. $p \in \text{Ans}_X(Q_{pl})(w)$;
  b. $p \subseteq \lambda w. \text{Ans}_X(Q_{sg})(w)$ is undefined.

  - (20a) rejects MS: its MS answers name only singulars; therefore they do not entail the anti-presupposition that the singular question ‘which professor can chair the committee’ is undefined.
  - (20b) admits MS: its MS answers name plurals; therefore they do entail the anti-presupposition that the singular question ‘which professor can form the committee’ is undefined.

4. Conclusions

- I offer a hybrid approach to address the dilemma between MS and uniqueness:

  (23) \begin{align*}
  \text{Ans}_X(Q)(w) &= \exists Q' \cong Q[\exists p \in Q'_w \forall q \in Q'_w[p \subseteq q]]. \text{MaxI}(Q_w) \\
  &= \exists Q' \cong Q[\text{Ans}_D(Q')(w) \text{ is defined}]. \text{Ans}_F(Q)(w)
  \end{align*}

  1. The presupposition of Ans$_D$ (Dayal 1996) only needs to be satisfied by some answer space that is similar enough to the actual answer space. Two answer spaces are similar enough iff they yield the same partition and use the same set of short answers.
  - In a basic $\Diamond$-question, the answer spaces generated under MS and under MA are similar enough. In particular, the one generated under MA is closed under conjunction, which therefore supports the presupposition of Ans$_D$; thus a basic $\Diamond$-question is always defined.
  - A singular question does not have a similar answer space that is closed under conjunction; thus it requires uniqueness.

  2. When the presupposition is satisfied, the question admits MS iff the actual answer space is not closed under conjunction (as Fox 2013).

- I argue that the restriction on the distribution of MS in plural questions comes from the anti-presupposition of plural marking.
Appendix I: Fox’s (2013) account of uniqueness and its problems

- Observing the problem in (13), Fox (2013) adds the following two assumptions to his initial proposal.

**Assumption 1:** Add higher-order disjunctive and conjunctive answers to the answer space.

In (24-25), an elided disjunctive answer can completely answer a □-question. (Spector 2007, 2008) But, under a singular □-question (26), a disjunctive answer can only take an ignorance reading.

Thus, singular wh-phrases live on a set of atomic individuals, while bare wh-words and plural wh- phrases live on either a set of individuals or a set of conjunctions and disjunctions.

(24)  
   a. What does John have to read?  
      b. Syntax or MP.
         i. John either has to read S or has to read MP.  
         ii. John can read S or MP, and he has to read one of them.

(25)  
   a. Which books does John have to read?  
   b. The French books or the English books.
      (\(^{\text{ok}}\) or > have to; \(^{\text{ok}}\) have to > or)

(26)  
   a. Which book does John have to read?  
   b. Syntax or MP.
      (\(^{\text{ok}}\) or > have to; \(^{\#}\) have to > or)

**Assumption 2:** \(\text{Ans}_F(Q)(w)\) presupposes the existence of a possible answer whose innocently exclusive (IE)-exhaustification is true in \(w\).

(27)  
\[\text{Ans}_F(Q)(w) = \exists p \in Q \left[ w \in \text{IE-Exh}(p, Q) \right]. \text{MaxI}(Q_w)\]

Traditional exhaustification (28) negates all the non-weaker alternatives (see Chierchia et al. 2012). While IE-exhaustification (29) negates only innocently (I)-excludable alternatives (Fox 2007).

(28)  
\[O(p, Q) = p \land \forall q \in \text{NW}(p, Q)[\neg q], \text{where } \text{NW}(p, Q) = \{q : q \in Q \land p \nsubseteq q\}\]

(29)  
   a. IE-Exh\(p, Q\) = \(p \land \forall q \in \text{IE excl}(p, Q)[\neg q]\)
   b. IE excl\(p, Q\) = \(\{q : q \in Q \land \neg \exists q' \in \text{NW}(p, Q)[p \land \neg q \rightarrow q']\}\)

(An alternative \(q\) is I-excludable to \(p\) iff \(p \land \neg q\) is consistent with negating any other non-weaker alternatives of \(p\).)

- **Accounting for uniqueness:**

(30)  
\((w:\) the committee can and can only be chaired by either John or Mary.)

   a. Which professor can chair the committee?
   \[Q_w = \{\Diamond \text{chair}'(j), \Diamond \text{chair}'(m)\} \quad \text{Ans}_F(Q)(w) \text{ is undefined}\]

   b. Who can chair the committee?
   \[Q_w = \{\Diamond \text{chair}'(j), \Diamond \text{chair}'(m), \Diamond \text{chair}'(j \lor m)\} \quad \text{Ans}_F(Q)(w) = \{\Diamond \text{chair}'(j), \Diamond \text{chair}'(m)\}\]

   - (30a) has no answer whose IE-exhaustification is true: IE-Exh\(\Diamond \text{chair}'(j)\) \(\Rightarrow \neg \Diamond \text{chair}'(m)\).
   - In (30b), IE-Exh\(\Diamond \text{chair}'(j \lor m)\) is true, because the individual true answers are not I-Excludable to the disjunctive true answer: \(\Diamond \text{chair}'(j \lor m) \land \neg \Diamond \text{chair}'(j) \land \neg \Diamond \text{chair}'(m) = \bot\)

- **Challenges from quantified questions**

The presupposition of \(\text{Ans}_F\) is too strong to rule in individual MS readings of \(\forall\)-questions.

(31)  
"Where can everyone get gas?"

   a. tell me one of the places where everyone can get gas;  
      Individual MS
   b. for each individual, tell me one of the places where he can get gas.  
      Pair-list MS
Appendix II: Higher-order conjunctive answers

Fox (2013) uses a covert distributor

I assume that bare

This problem extends to other quantified questions:

If the wh-item takes a QR within IP before moving to the spec of the interrogative CP, it leaves a higher-order trace $\pi$ that contributes the conjunctive and disjunctive closures.

(32) Where can everyone get gas?

(w: everyone can get gas from station A, and everyone can get gas from station B. But both A and B have very limited stock, and thus it is impossible that everyone gets gas)

a. $Q = \{\forall y \in man'[\Diamond get-gas'(y,x)] : x \in *place'\}$

b. $Q_w = \{\forall y \in man'[\Diamond get-gas'(y,a)]$

\begin{align*}
\forall y \in man'[\Diamond get-gas'(y,a)] & \\
\forall y \in man'[\Diamond get-gas'(y,b)] & \\
\forall y \in man'[\Diamond get-gas'(y,a \lor b)]
\end{align*}

c. Ans$_F(Q)(w)$ is undefined

Uniqueness $\times$

(32) has no answer whose IE-exhaustification is true: the true individual answers are innocently excludable to the true disjunctive answer; IE-exhaustifying the disjunctive answer negates the individual answers.

IE-Exh[$\forall y \in man'[\Diamond get-gas'(y,a \lor b)] \Rightarrow \forall y \in man'[\Diamond get-gas'(y,a)]$

\Rightarrow \forall y \in man'[\Diamond get-gas'(y,b)]

(some but not all of the people can get gas from A, the others can get gas from B)

• This problem extends to other quantified questions:

(33) a. Where can half of your friends get gas?

b. Where can two of your friends get gas?

c. Where can most of your friends get gas?

Appendix II: Higher-order conjunctive answers

Fox (2013) uses a covert distributor each to capture distributivity. But with a collective predicate, (34) needs conjunctive answers like $form'(a \oplus b) \land form'(c \oplus d)$; this answer can be derived from $form'(a \oplus b \land c \oplus d)$, but not from each$(a \oplus b \oplus c \oplus d)(form')$.

(34) Who formed a team?

Only plural and num-neutral wh-questions can take conjunctive answers of this sort.

(35) a. I know which boys/who formed a team. $\sqrt{ab}$ formed one, and $cd$ formed one.

b. I know which four boys formed a team. $#\; ab$ formed one, and $cd$ formed one.

• I assume that bare wh-words and plural wh-phrases live on a set $\text{Int} \ast P$, which consists of not only atomics and sums but also conjunctions and disjunctions. conjunction and disjunction are defined à la meet and join in Inquisitive Semantics (Ciardelli & Roelofsen 2014)

(36) a. $^\ast\text{professor'} = [a,b,a \oplus b]$,

b. $\text{Int} \ast^\ast\text{professor'} = [a,b,a \oplus b,a \lor b,a \land b,a \lor (a \oplus b),a \lor b \lor (a \oplus b),...,a \lor (a \land b),a \land (a \lor b),...].$

(37) a. $\alpha_\tau \land \beta_\tau = \{ (P_{(\tau,_{st}),w}) : P_w(\alpha) \cap \{ (P_{(\tau,_{st}),w}) : P_w(\beta) = \lambda P_{(\tau,_{st}),\lambda w}.P_w(\alpha) \land P_w(\beta) \}$

b. $\alpha_\tau \lor \beta_\tau = \{ (P_{(\tau,_{st}),w}) : P_w(\alpha) \cup \{ (P_{(\tau,_{st}),w}) : P_w(\beta) = \lambda P_{(\tau,_{st}),\lambda w}.P_w(\alpha) \lor P_w(\beta) \}$

• If the wh-item takes a QR within IP before moving to the spec of the interrogative CP, it leaves a higher-order trace $\pi$ that contributes the conjunctive and disjunctive closures.

(38) Who formed a team?

a. $Q = \{\pi(\lambda x.load'(x)) : \pi \in \text{Int} \ast \text{person}\'}$

b. $Q_w = \{form'(a \oplus b),form'(c \oplus d),form'(a \oplus b) \lor form'(c \oplus d),form'(a \oplus b) \land form'(c \oplus d)\}$

c. Ans$_X(Q)(w) = \{form'(a \oplus b) \land form'(c \oplus d)\}$
Appendix III: Local exhaustifications and modal base restrictions

- **Puzzle**: (39b), which is intuitively a good MS answer (cf. 39a), is asymmetrically entailed by (39c).

  (39) Who can serve on the committee?
  
  (w: the committee can be made up of either Gennaro+Danny, or Gennaro+Danny+Jim)
  
  a. # Gennaro. \[\Box \text{serve}'(g)\]
  
  b. √ Gennaro and Danny. \[\Box (\text{serve}'(g) \land \text{serve}'(d))\] or \[\Box (\text{serve}'(g \oplus d))\]
  
  c. √ Gennaro, Danny, and Jim. \[\Box (\text{serve}'(g) \land \text{serve}'(d) \land \text{serve}'(j))\] or \[\Box (\text{serve}'(g \oplus d \oplus j))\]

  **Assumptions:**
  - The conversational goal restricts the modal base of a teleological modal, as in (40).
    (40) \[M = \{ w: \text{there is a group of individuals } X \text{ s.t. } X \text{ form the committee in } w \}\]
  - The root modal can embeds an \(O\)-operator associated with the \(wh\)-trace; \(O\) creates a non-monotonic environment w.r.t. the \(wh\)-trace.

  **Consequences:**
  - (39a) is false. \[\Box_w M \Box \text{serve}'(g)\] means “among the accessible world to \(w\) where some \(X\) forms the committee, there is a world \(w'\) s.t. only \(g\) serves on the committee in \(w'\).”
  - Both (39b-c) are MaxI true answers, because \[\Box M \Box \text{serve}'(g \oplus d \oplus j) \not\Rightarrow \Box M \Box \text{serve}'(g \oplus d)\]

Appendix IV: Disjunctive MA answers

- Disjunctive MA answers of \(\Box\)-questions are generated via an \(O_{\text{dou}}\)-operator:

  (41)  
  a. \[O_{\text{dou}}(p, Q) = p \land \forall q \in \text{Sub}(p, Q)[\neg O(q)]\]
  
  b. \[\text{Sub}(p, Q) = Q - \text{IEcl}(p) - \{p\}\]

  With \(O_{\text{dou}}\), the disjunctive answer equals to the conjunction of the individual answers:

  \[\Box \text{f}(a) \land \Box \text{f}(b) \Rightarrow \Box_{\text{dou}} \Box \text{f}(a \lor b)\]

  Fig. 5: MS (without \(O_{\text{dou}}\))

  \[\Box_{\text{dou}} \Box \text{f}(a) \land \Box_{\text{dou}} \Box \text{f}(b)\]

  Fig. 6: MA (with \(O_{\text{dou}}\))

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<tr>
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- See more details in Xiang (2015).
References


