Analyzing Exhaustivity

Uegaki 2015 Chapter 3

Oct 27, Presentation for Semantics of Questions, Yuyin He

1. Introduction

1.1. Three Kinds of Exhaustivity: Weakly Exhaustive, Intermediately Exhaustive, Strongly Exhaustive

(1) John reported who came. [Situation: Ann and Bill came, but Chris didn’t.]
   WE ‘John reported that Ann and Bill came.’
   IE ‘John reported that Ann and Bill came, but it is not the case that he reported that Chris came.’
   SE ‘John reported that Ann and Bill came but Chris didn’t.’

1.2. Which Predicate Allows Which Readings

1.2.1. Cognitive attitude predicates and communication predicates: know, predict, report etc.

(2) (i) John knows which students came.
    ⇒ (ii) John knows which students didn’t come. (SE)

(3) John knows/reported which students came.
    (Judgement: True under a, False under b.)
   a. Situation A: Ann and Bill came, but Chris didn’t. John believes/reported that Ann and Bill came, but he is unopinionated about/didn’t report anything about whether Chris came. (IE)
   b. Situation B: Ann and Bill came, but Chris didn’t. John believes/reported that Ann, Bill and Chris came. (*WE)

1.2.2. Emotive factives: surprise, be happy etc.

(4) [Situation: Among Ann, Bill and Chris, John expected that everyone would come. In fact, Ann and Bill came but Chris didn’t.]
   a. It surprised John which students came. (Judgment: False,*SE)
   b. It surprised John which students didn’t come. (Judgement: True, WE)

(5) IE reading for (4b)
    • John was surprised that ¬C,
    • it is not the case that he would be surprised if ¬A were the case, and
    • it is not the case that he would be surprised if ¬B were the case.
Table 1: Summary of attested readings

<table>
<thead>
<tr>
<th></th>
<th>WE</th>
<th>IE</th>
<th>SE</th>
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</thead>
<tbody>
<tr>
<td>Cognitive/communication</td>
<td>*</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Emotive factives (‘literal’)</td>
<td>✓</td>
<td>*</td>
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1.3. Main Proposal

i. WE as a baseline interpretation

ii. IE via matrix exhaustification

   – IE is derived if the embedding predicate is upward monotonic. (Cognitive/communication)
   – Vacuous if the embedding predicate is non-monotonic. (Emotive predicates)

iii. SE derived from IE, via neg-raising.

2. WE as a Baseline Interpretation

- Interrogative Complements: Set of propositions

- WE reading: Applying answerhood operator Ans to the question denotation. Returns the conjunction of all the true members of the input question denotations.

\[
\text{Ans}^w = \lambda Q_{\leq t,k} \lambda w'. \forall p \in Q[p(w) \rightarrow p(w')]\\
\]

(6) \[\text{Ans}^w = \lambda Q_{\leq t,k} \lambda w'. \forall p \in Q[p(w) \rightarrow p(w')]
\]

(7) John reported who came.

(8) \[\text{Ans}[\text{which students will come}]^w = A \land B
\]

3. IE via Matrix Exhaustification

3.1. Exhaustification operator at the matrix: X

(9) \[X[\text{John predicts} \text{Ans [which students will come]})]

- X as a quantifier binding the world argument of Ans

- Similar to only. Returns the conjunction of \( \varphi \) and the negation of alternatives to \( \varphi \) that are strictly stronger than \( \varphi \).

\[
\text{Ans}^w = A \land B
\]

(10) \[X \varphi \iff [\varphi]^w \land \forall p \in [\varphi]^\mathcal{A} [p \subset [\varphi]^w \rightarrow \neg p(w)]
\]

(11) \[\text{Ans}[\text{which students will come}]^w = A \land B
\]

(12) \[\text{Ans}[\text{which students will come}]^\mathcal{A} = \{A, B, C, A \land B, B \land C, C \land A, A \land B \land C\}
\]

(13) \[[X[\text{John predicts} \text{Ans [which students will come]})]^w = 1 \text{ iff predict}(j, A \land B, w) \land \neg \text{predict}(j, A \land B \land C, w)
\]

(14) \[[X[\text{John predicts} \text{Ans [which students will come]})]^w = 1 \text{ iff predict}(j, A \land B, w) \land \neg \text{predict}(j, C, w)
\]
3.2. X and the Monotonicity property of embedding predicates

- Non-monotonic: X is vacuous

  (16) For any p, p’ such that p \neq p’, \llbracket \alpha \rrbracket(p) \neq \llbracket \alpha \rrbracket(p’) and \llbracket \alpha \rrbracket(p’) \neq \llbracket \alpha \rrbracket(p)

(17) John would be surprised if Ann and Bill come to the party.

(18) John would be surprised if Ann comes to the party.

- Upward Monotonicity: X is non-vacuous

  (19) John {knows/predicted/told me} that Ann and Bill would come.

4. SE, Excluded-middle assumption and Neg-raising

4.1. Neg-raising: The Derivation of Narrow Scope Negation Interpretation

(20) John doesn’t think that Ann came.

(i) The wide-scope negation interpretation: It is not the case that John thinks that Ann came.

(ii) Excluded-middle assumption: John thinks that Ann came, or John thinks that Ann didn’t come.

(i)&(ii) John thinks that Ann didn’t come.

(=The ‘neg-raising’ interpretation)

- Neg-raising predicates trigger Excluded-middle presupposition: the subject’s relevant attitude is determinate for each answer of the relevant question.
• **SOFT PRESUPPOSITION**: presuppositions that can be suspended easily in a context that entails the speaker’s ignorance about whether the presupposition holds: factive predicates such as *know, discover etc.* aspectual verbs such as *stop, start etc.*

  * win, presuppose ‘to participate’

(21) a. Bill won the marathon.
    b. Bill didn’t win the marathon.
    c. If Bill won the marathon, he will celebrate tonight.
    \*⇒ Bill participated in the marathon.

(22) I don’t know whether Bill ended up participating in the Marathon yesterday, but if he won, he is certainly celebrating right now.

4.2. **SE Reading via Excluded-middle Assumption**

(23) [Situation: Ann and Bill came, but Chris didn’t.]
    X [John predicted which students came].
    (i) IE: John predicted that Ann and Bill came and it is not the case that he predicted that Chris came.
    (ii) Excluded-middle assumption: John had determined predications about whether Ann came, whether Bill came and whether Chris came.
    (i)&(ii) John predicted that Ann and Bill came and he predicted that Chris didn’t come. (=SE)

(24) [X John guesses which students will come] =
    guess(A∧B)(j)∧¬guess(A∧B∧C)(j)

(25) Presuppose: guess(x,A∧B,w)∨guess(x, [A∧B],w) ∧ guess(x,A∧B∧C,w)∨guess(x,[A∧B∧C],w)

(26) [X John guesses which students will come] =1
    iff guess (j,A∧B,w)∧¬guess(j,A∧B∧C,w)∧(25)
    iff guess (j,A∧B,w)∧guess(j, [A∧B∧C],w)
    iff guess (j,A∧B,w)∧guess(j, [A∧B∧C],w)

• Some question-embedded predicates trigger the excluded-middle soft presupposition, and the IE reading can be strengthened into SE readings by this presupposition.

• SE readings are parasitic on IE readings

• Cognitive/communication (monotonic) predicates allow IE readings, also allow SE readings.

• Emotive (non-monotonic) predicates disallow IE readings, hence disallow SE readings.

• Experimental Evidence: Participants take longer time to access SE readings than IE readings. (Cremers and Chemla, to appear)

5. **Summary**

• WE as a baseline interpretation

• IE via matrix exhaustification operator X
  – IE is derived if the embedded predicate is upward monotonic. (Cognitive/communication)
  – X is vacuous if the embedded predicate is non-monotonic. (Emotive predicates)

• SE derived from IE, via excluded-middle assumption similar with neg-raising.