Interrogatives worksheet
Chris Potts, Ling 230b: Advanced semantics and pragmatics, Spring 2016
May 11

1 Model

- $W = \{w_1, w_2, w_3, w_4\}$
- $[\text{person}] = \begin{bmatrix}
w_1 & \{a, b\} \\
w_2 & \{a\} \\
w_3 & \{a\} \\
w_4 & \{b\}
\end{bmatrix}$
- $[\text{left}] = \begin{bmatrix}
w_1 & \{a\} \\
w_2 & \{a, b\} \\
w_3 & \{b\} \\
w_4 & \{a\}
\end{bmatrix}$
- $[\text{met}] = \begin{bmatrix}
w_1 & \{(a, a), (a, b)\} \\
w_2 & \{(b, a), (b, b)\} \\
w_3 & \{\} \\
w_4 & \{(a, b), (b, a)\}
\end{bmatrix}$
- $\text{Dox} = \begin{bmatrix}
\langle a, w_1 \rangle & \{w_1, w_2\} \\
\langle a, w_2 \rangle & \{w_2\} \\
\langle a, w_3 \rangle & \{w_1\} \\
\langle a, w_4 \rangle & \{w_3, w_4\}
\end{bmatrix}$
- $\langle b, w_1 \rangle & \{w_1, w_2, w_3, w_4\}$
- $\langle b, w_2 \rangle & \{w_2, w_3\}$
- $\langle b, w_3 \rangle & \{w_1, w_4\}$
- $\langle b, w_4 \rangle & \{\}$

2 Examples

(1) Who left? (No one.)

**Hamblin:**

$\lambda w \lambda p \left( \exists x \ ((\text{person } x w) \land p = (\text{left } x)) \right)$

- at $w_1$: $\{[\text{left}(a)], [\text{left}(b)]\} = \{\{w_1, w_2, w_3\}, \{w_2, w_3\}\}$
- at $w_2$: $\{[\text{left}(a)]\}$
- at $w_3$: $\{[\text{left}(a)]\}$
- at $w_4$: $\{[\text{left}(b)]\}$

**Karttunen** (as above, but further restricted to the propositions true at the world of evaluation):

$\lambda w \lambda p \left( \left( p w \right) \land \exists x \ ((\text{person } x w) \land p = (\text{left } x)) \right)$

- at $w_1$: $\{[\text{left}(a)]\}$
- at $w_2$: $\{[\text{left}(a)]\}$
- at $w_3$: $\{\}$
- at $w_4$: $\{\}$

**G&S:**

$\lambda w \lambda w' \left( \left( \lambda x \ ((\text{person } x w) \land (\text{left } x w)) \right) = \left( \lambda x \ ((\text{person } x w') \land (\text{left } x w')) \right) \right)$

- at $w_1$: $\{w_1, w_2\}$
- at $w_2$: $\{w_1, w_2\}$
- at $w_3$: $\{w_3, w_4\}$
- at $w_4$: $\{w_3, w_4\}$

These sets can be thought of as determined by set of ordered pairs of worlds that agree on the extension of 'person and left'. As you can see here, when we localize to a world $w$, we return the set of worlds that agree with $w$ in 'person and left'
(2) Who met every entity?

The calculations for this example are of the same form as for (1). The special interest of this case is that all the proposition-set theories are clearly predicting that every entity cannot scope above who. This would result in something like 'For each x, tell me who met x', rather than 'Tell me who met everyone'. For discussion of this prediction, see the Krifka paper arguing for a structured meanings approach to questions. See also


(3) \([\text{know}_H] = \lambda Q_{<s,\langle t,\rangle>} \lambda x \lambda w (\forall q \text{ in } Q(w), \text{ if } (q, w), \text{ then } \text{Dox}(x, w) \subseteq q)\]

(4) \([\text{know}_K] = \lambda Q_{<s,\langle t,\rangle>} \lambda x \lambda w (\forall q \text{ in } Q(w), \text{ Dox}(x, w) \subseteq q)\]

(5) \([\text{know}_G] = \lambda Q_{<s,\langle t,\rangle>} \lambda x \lambda w (\text{Dox}(x, w) \subseteq Q(w))\]

(6) B knows who left.

\([\text{know}_H(B, \text{who(left)})] = [\text{know}_K(B, \text{who(left)})]\]

at w1: F; \text{Dox}(B, w1) = \{w1, w2, w4\} and, of \{\text{who(left)}\}={\{w1, w2, w3\}} and \{\text{left(b)}\}={\{w2, w3\}}, only \{\text{left(a)}\} is true at w1 and \{w1, w2, w4\} \not\subseteq \{w1, w2, w3\}

at w2: T; \text{Dox}(B, w2) = \{w2, w3\}, which is a subset of \{\text{left(a)}\}={\{w1, w2, w3\}}, the only member of the question meaning

at w3: T; \text{Dox}(B, w3) = \{w1, w4\}, but the real issue is that \text{who(left)}(w3) has no (true) elements at w3 on this theory

at w4: T; \text{Dox}(B, w3) = \{\}, but the real issue is that \text{who(left)}(w4) has no (true) elements at w4 on this theory

\([\text{know}_G(B, \text{who(left)})]\]

at w1: F; \text{Dox}(B, w1) = \{w1, w2, w4\} and \text{who(left)}(w1) = \{w1, w2\} on this theory, so the subset condition is not met

at w2: F; \text{Dox}(B, w2) = \{w2, w3\} and \text{who(left)}(w2) = \{w1, w2\} on this theory, so the subset condition is not met

at w3: F; \text{Dox}(B, w3) = \{w1, w4\} and \text{who(left)}(w3) = \{w3, w4\} on this theory, so the subset condition is not met

at w4: T; \text{Dox}(B, w4) = \{\}, so the subset condition is satisfied vacuously

This example is meant to bring out that the GS partition semantics is imposing stronger conditions – it's requiring that the subject not just know who did leave, but also who didn't leave. For instance, in w2, b is undecided about whether a left. This results in falsity for the GS theory, but truth for the others because all we require is, essentially, that b knows that a left.