PLING228 Semantics Research Seminar

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1 Percus on *De Re* Predicates

Extensional approach to mixed readings:

(1) John believes that someone in the room is guilty.

(2) $\forall w \in \text{Dox}(j, w_0) \exists x(R(x, w_0) \wedge G(x, w))$ (de re-de dicto)

There should be three other readings of the sentence (with the same scope relation).

(3) a. $\forall w \in \text{Dox}(j, w_0) \exists x(R(x, w) \wedge G(x, w))$ (de dicto-de dicto)
b. $\forall w \in \text{Dox}(j, w_0) \exists x(R(x, w) \wedge G(x, w_0))$ (de dicto-de re)
c. $\forall w \in \text{Dox}(j, w_0) \exists x(R(x, w_0) \wedge G(x, w_0))$ (de re-de re)

Percus argues that the latter two readings do not exist in English.

1.1 Percus' Example

Percus uses the following example to make this point.

(4) Mary thinks that my brother is Canadian.

- The de re-de dicto reading is possible.

  (5) $\forall w \in \text{Dox}(m, w_0) \exists! x(B(x, w_0) \wedge C(x, w))$ (de re-de dicto)

  This reading (and no other reading) is true in the following scenario.

  (6) My brother's name is Allon. Suppose Mary thinks Allon is not my brother but she also thinks that Allon is Canadian. (Percus 2000:197)

- The de dicto-de dicto reading is also available (unsurprisingly).

  (7) $\forall w \in \text{Dox}(m, w_0) \exists! x(B(x, w) \wedge C(x, w))$ (de dicto-de dicto)

  This reading (and no other reading) is true in the following scenario.

  (8) I don't have a brother, but Mary thinks I have a Canadian brother.

- Percus claims that the de dicto-de re reading is absent.

  (9) $\forall w \in \text{Dox}(m, w_0) \exists! x(B(x, w) \wedge C(x, w_0))$ (de dicto-de re)

  This reading should be true in the following scenario, but we don't judge the sentence to be true.

  (10) Mary thinks that Pierre (the Canadian) is my brother and naturally concludes—since she knows that *I* am American—that Pierre too is American.

  (Percus 2000:200)

- In fn.18, Percus argues that the de re-de re reading is ruled out on independent grounds.

  (11) $\forall w \in \text{Dox}(m, w_0) \exists! x(B(x, w_0) \wedge C(x, w_0))$ (de re-de re)

  The truth of this reading does not depend on Mary's belief. It's true iff my actual brother is Canadian. Obviously this reading does not exist. Percus assumes that vacuous quantification is prohibited.

Bottom line: In English the main predicate of a sentence has to be relative to the closest intensional operator (if there's one), i.e. can only be de dicto.

2 *De Re* Predicates Do Exist

But predicate *can* be *de re*.

(12) (Where's John's new girlfriend from?)
(I don't know, but) Mary thinks she is Canadian.

(13) We know that John's Canadian, but Mary doesn't. We know that John has a new girlfriend. Mary comes to believe that John's girlfriend is from the same country as John.

The *de dicto* reading of the predicate makes the sentence *false* (for Mary, both John and his girlfriend might be from Canada, USA, UK, etc.). So it seems that predicates can be *de re* after all.

The *de re* reading of *is Canadian* is not a belief about the *extension* of this predicate in the actual world. So it does not mean:

(14) Mary thinks of the actual Canadians that John's girlfriend is one of them.

So we cannot represent the *de re* meaning as (15), in terms of the extension of the predicate *is Canadian* in the actual world.

(15) $\forall w \in \text{Dox}(m, w_0) \exists! x(G(x, w) \wedge C(x, w_0))$

The point is that Percus is right in that predicates cannot be extensionally *de re*. But they allow a different type of *de re* reading. The extensional approach seems to be inadequate for these readings.

3 Schwager on Mixed Readings

Schwager (2011:399) makes a similar point with the following example.

(16) Mary is looking at the Burj Dubai, which has 191 floors and is currently the highest building in the world.[1] Also, no other building has more floors. Mary doesn't know this. She also doesn't know how many floors Burj Dubai has. She thinks, 'Wow I want to buy a building that's even one floor higher!'

(17) Mary wants to buy a building with 192 floors.

Since there's no particular building that Mary wants to buy, the indefinite has a narrow scope. The *de dicto* reading is false. So this is a mixed reading.

Crucially, however, it's not a belief about the extension of the NP, because the extension is empty! So the following analysis is inadequate.

(18) a. $\forall w \in \text{Bul}(m, w_0) \exists x(\text{Buy}(m, x, w) \wedge \text{192F-Bldg}(x, w_0))$
b. For the buildings that actually have 192 floors, Mary wants to buy one of them.

You might wonder that it's a de re reading of the number 192. But consider the following.

(19) The reporter wants to interview someone who broke the curfew.
(Schwager 2011:401)

(20) The reporter wants to talk to someone who was out after 6 pm. Unbeknownst to the reporter, the curfew started at 6 pm and nobody broke it.

Again, the extension of the restrictor is null in the actual world, so the extensional approach has a problem.

(21) a. $\forall w \in \text{Bul}(m, w_0) \exists x(\text{Talk}(m, x, w) \wedge \text{BrokeCurfew}(x, w_0))$
b. For the people who actually broke the curfew, Mary wants to talk to one of them.

So the extensional approach (and its 'equivalent' formulations in terms of operators) seems to be problematic. Analogous problems arise with the quantifying-in approaches.

(22) $\exists Y(\forall x(Y(x) \Leftrightarrow \text{BrokeCurfew}(x) \wedge \Box \exists x(Y(x) \wedge B(m, x))))$

(23) $\exists \mathcal{Q}(\forall X(\mathcal{Q}(X) \Leftrightarrow \text{someone-who-broke-the-curfew}(X)) \wedge \Box \mathcal{Q}(\lambda x.B(m, x)))$

[1] It's now called Burj Khalifa.

4 Acquaintance with Intensions

The problem of these examples stems from the fact that we are referring to the extensions. We can analyze them by making use of acquaintance relations with intensions (Cresswell & von Stechow 1982, Sharvit 1998, Schwager 2011).

Recall Kaplan's analysis of the Ortcutt example.

(24) Ralph thinks that Ortcutt is a spy.

(25) $\exists \alpha(R(\alpha, \text{Ortcutt}, \text{Ralph}) \wedge \text{Ralph believes } \ulcorner \alpha \text{ is a spy} \urcorner)$
a. α denotes Ortcutt in w_0;
b. α is a name of Ortcutt for Ralph; and
c. α is sufficiently vivid.

Ralph is acquainted with Ortcutt under the guise/representation α (e.g. 'the man in a brown hat').

If we apply this analysis to the *de re* predicate:

(26) Mary thinks she's Canadian.

(27) $\exists \alpha(R(\alpha, P, \text{Mary}) \wedge \text{Mary believes } \ulcorner \text{John's girlfriend is } \alpha \urcorner)$
a. α denotes P in w_0;
b. α is a name of P for Mary; and
c. α is sufficiently vivid.

P here should not be the extension of the predicate (i.e. the actual Canadians), but it should be its intension, the property of being Canadian. With $P = \lambda w.\lambda x.C(x, w)]$,

(28) a. α denotes $[\lambda w.\lambda x.C(x, w)]$ in w_0;
b. α is a name of $[\lambda w.\lambda x.C(x, w)]$ for Mary; and
c. α is sufficiently vivid.

This would mean that Mary is acquainted with the property of being Canadian under the guise/representation α, where α is something like 'the property of coming from the same country as John'.

Similarly for Schwager's example:

(29) Mary wants to buy a building with 192 floors.

(30) $\exists \alpha(R(\alpha, [\lambda w.\lambda x.\text{192F-Bldg}(x, w)], \text{Mary}) \wedge \text{Mary hopes } \ulcorner \text{I buy a } \alpha \urcorner)$
a. α denotes $[\lambda w.\lambda x.\text{192F-Bldg}(x, w)]$ in w_0;
b. α is a name of $[\lambda w.\lambda x.\text{192F-Bldg}(x, w)]$ for Mary; and
c. α is sufficiently vivid.

α is 'the property of being a building that's one floor higher than Burj Dubai'.

5 Sharvit on Acquaintance with Individual Concepts

One might wonder if the Ortcutt example should be analyzed with an intension too. In this case the intension is the individual concept λw.Ortcutt.

(31) $\exists\alpha(R(\alpha, [\lambda w.\text{Ortcutt}], \text{Ralph}) \wedge \text{Ralph believes } \ulcorner\alpha \text{ is a spy}\urcorner)$
- a. α denotes $[\lambda w.\text{Ortcutt}]$ in w_0;
- b. α is a name of $[\lambda w.\text{Ortcutt}]$ for Ralph; and
- c. α is sufficiently vivid.

α is 'the man in a brown hat that I saw'.

Sharvit (1998) gives an example that seems to require such an analysis:

(32) John: Mary looks too happy these days. It seems to me that she has a lover. I don't know who he is, I have never seen him, but I think her lover is a fool. Bill: John believes that Smith's murderer is a fool. (Sharvit 1998:235)

(33) Bill knows that Smith has been murdered and believes that Smith's murder is Mary's lover. John doesn't know Smith has been murdered.

According to the Kaplanian analysis with the extension of *Smith's murderer*:

(34) $\exists\alpha(R(\alpha, \text{Smith's murderer}, \text{John}) \wedge \text{John believes } \ulcorner\alpha \text{ is a fool}\urcorner)$
- a. α denotes Smith's murderer in w_0;
- b. α is a name of Smith's murderer for John; and
- c. α is sufficiently vivid.

In the above context, α would be something like 'Mary's lover', but John is not acquainted with him, so (34b) doesn't hold.

Sharvit (1998) proposes to use the individual concept, instead.

(35) $\exists\alpha(R(\alpha, [\lambda w.\text{Smith's murderer in } w], \text{John}) \wedge \text{John believes } \ulcorner\alpha \text{ is a fool}\urcorner)$
- a. α denotes $[\lambda w.\text{Smith's murderer in } w]$ in w_0;
- b. α is a name of $[\lambda w.\text{Smith's murderer in } w]$ for John; and
- c. α is sufficiently vivid.

Then, maybe we should always refer to intensions (*de sensu*), and never to extensions (*de re*).

6 'De Sensu' Compositionally

How do we derive *de sensu* readings in a compositional fashion? There are two ways.

6.1 De Sensu Movement Approach

The basic meaning of *think*:

(36) $[\![\text{thinks}_1]\!] = \lambda p_{(st)}.\lambda x.\lambda w.\{ w' \mid p(w') = 1 \} \subseteq \text{Dox}(x, w)$

This only accounts for the *de dicto* reading. The embedded clause denotes a proposition p, e.g.

(37) a. $[\![\text{that Ortcutt is a spy}]\!] = \lambda w.spy(\text{Ortcutt}, w)$
- b. $[\![\text{thinks that Ortcutt is a spy}]\!]$
  $= \lambda x.\lambda w.\{ w' \mid [\![\text{that Ortcutt is a spy}]\!](w') = 1 \} \subseteq \text{Dox}(x, w)$
  $= \lambda x.\{ w' \mid spy(\text{Ortcutt}, w') \} \subseteq \text{Dox}(x, w)$
- c. $[\![\text{John thinks that Ortcutt is a spy}]\!]$
  $= \lambda w.\{ w' \mid spy(\text{Ortcutt}, w') \} \subseteq \text{Dox}(j, w)$

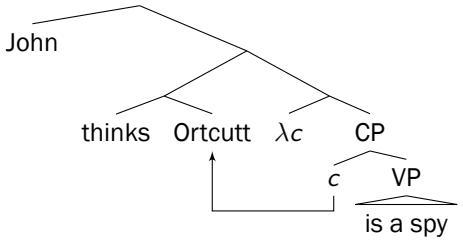
To derive the *de re* reading, *think* needs to be able to access the *de re* phrase and introduce an acquaintance relation:

(38) $$[\![\text{thinks}_{(se)}]\!] = \lambda c_{(se)}.\lambda P_{(se,st)}.\lambda x.\lambda w.\exists\xi \left(\begin{array}{l} R(\xi, c, x, w) \wedge \\ \{ w' \mid P(\xi)(w') = 1 \} \subseteq \text{Dox}(x, w) \end{array} \right)$$

ξ is an individual concept and R embodies the Kaplanian acquaintance relation (at the individual concept level):

(39) $R(\xi, c, x, w) \Leftrightarrow (\xi(w) = c(w) \wedge \forall w'(\text{Dox}(x, w') \rightarrow \xi(w') = c(w)) \wedge \text{vivid}(\xi, w)))$

The first two arguments of *think* are created in syntax (cf. *de re* movement; Cresswell & von Stechow 1982):



For *de sensu* predicates, we need a different type:

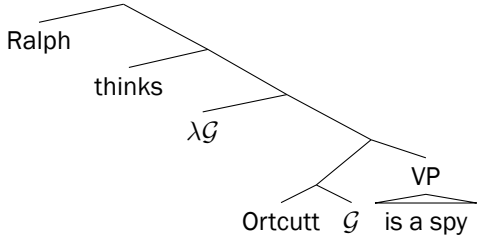
(40) $$[\![\text{thinks}_{(s(et))}]\!] = \lambda\mathcal{F}_{(s(et))}.\lambda P_{(s(et),st)}.\lambda x.\lambda w.\exists\xi \left(\begin{array}{l} R(\xi, \mathcal{F}, x, w) \wedge \\ \{ w' \mid P(\xi)(w') = 1 \} \subseteq \text{Dox}(x, w) \end{array} \right)$$

6.2 Concept Generator Approach

Another way is to use Concept Generators (cf. Percus & Sauerland 2003). Concept Generators are generalizations of Kaplanian acquaintance relations:

(41) $\mathcal{G}$ is a (acquaintance-based) Concept Generator for x in w (written $\mathcal{G}_x^w$) iff $\forall r \in \text{dom}(\mathcal{G})(R(\mathcal{G}(r), r, x, w))$

The idea is that a concept generator $\mathcal{G}$ takes an intension and returns a different intension that satisfies the Kaplanian acquaintance relation.



The meaning of *think* existentially quantifiers over Concept Generators.

(42) $[\![\text{thinks}]\!] = \lambda\mathcal{P}.\lambda x.\lambda w.\exists\mathcal{G}_x^w(\{\, w' \mid \mathcal{P}(\mathcal{G}, w') = 1 \,\} \subseteq \text{Dox}(x, w)$

6.3 Negation Problem

Under both approaches, negation will be too strong.

(43) Ralph does not think that Ortcutt is a spy.

This will be predicted to be *false* in Quine's scenario, contrary to fact.

Recall that we do want an existential quantifier:

(44) Everyone thinks that Ortcutt is a spy.

Maybe we want to treat the existential statement as a presupposition, but you will need a solution to the 'Binding Problem'.

References

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