On the ontological status of semantic values

1. <u>Ontology</u>

1.1. *Ontological Commitment*

To be [assumed as an entity] is, purely and simply, to be [reckoned as] the value of a variable. In terms of the categories of traditional grammar, this amounts roughly to saying that to be is to be in the range of reference of a pronoun.

Quine (1948: 32 [with material added in the 1961 version]

☝ "value" ≠ "semantic value"!

1.2 *Puzzles*

• *Inscrutability of Reference*

(1) No husband is Catholic.
<=> No woman is a C-wife.

• *Elimination of bound variables*

(2) Every farmer who owns a donkey beats it
(a) $(\forall x)\ (\forall y)\ [[\mathsf{F}(x)\ \&\ \mathsf{D}(y)\ \&\ \mathsf{O}(x,y)] \rightarrow \mathsf{B}(x,y)]$
(b) $(\mathsf{F} \times \mathsf{D}) \cap \mathsf{O} \subseteq \mathsf{B}$

(3) It might be raining
(a) $(\exists w)\ [\mathsf{Epi}(w)\ \&\ \mathsf{r}(\mathrm{w})]$
(b) $\Diamond\ \mathsf{r}$

• *Compositionality*

(4) Every man loves a woman
(a) $(\forall \mathrm{x})\ [\mathsf{M}(\mathrm{x}) \rightarrow (\exists \mathrm{y})\ [\mathsf{W}(\mathrm{y})\ \&\ \mathsf{L}(\mathrm{x},\mathrm{y})]]$
(b) $(\lambda P\ (\lambda Q\ (\forall x)\ [P(x) \rightarrow Q(x)]))\ (\mathsf{M})\ (\lambda y\ (\lambda Q\ (\exists x)\ [P(x)\ \&\ Q(x)])\ (\mathsf{W})\ \mathsf{L}(x,y))$

2. <u>Model-theoretic "Semantics"</u>

2.1 *Relative Truth*

My thesis is only that there are important differences between theories of relative, and of absolute, truth, and the differences make theories of the two sorts appropriate as answers to different questions.

Donald Davidson: 'In Defense of Convention T'. *Studies in Logic and the Foundations of Mathematics* **68** (1973), 76-86 [p. 79]

2.2 *Models vs. "Small Worlds"*

(5) *Basic architecture*

$M = (D_M, W_M, F_M, \ldots)$ – where D_M, W_M are (more or less arbitrary) sets
$[[S]]_{M,w} \in \{0,1\}$ (for sentences S, $w \in W_M$)
$[[S]]_M = \{w \in W_M \mid [[S]]_{M,w} = 1\}$ (proposition)
$S_1 \Rightarrow S_2$ iff for any $M \in K$: $[[S_1]]_M \subseteq [[S_2]]_M$ (Entailment)

(6) Only John likes Mary
∴ Bill doesn't like Mary

☝ $(\exists M{\in}K)\ (\exists w{\in}W_M)\ [[\text{John}]]_{M,w} = [[\text{Bill}]]_{M,w}$

Rigidity doesn't help

- $(\forall M{\in}K)\ (\forall w, w'{\in}W_M)\ [[\text{John}]]_{M,w} = [[\text{John}]]_{M,w'}$ (= "John_M")

NOT: $(\forall M, M'{\in}K)\ (\forall w,w'{\in}W_M)\ [[\text{John}]]_{M,w} = [[\text{Bill}]]_{M',w'}$ (= John)

☝ Rigidity is variability across worlds, not models.

(7) John is not Bill
Only John likes Mary
∴ Bill doesn't like Mary

(8a) Only John likes Mary

(b) $[[(8)]]_{M,w^*} = 1$

<=> $\{p{\subseteq}W_M \mid w^*{\in}p\ \&\ p$ is of the form ^x *likes Mary*$\} = \{$^*John likes Mary*$\}$

<=> $\{p{\subseteq}W_M \mid w^*{\in}p\ \&\ (\exists x{\in}D_M)\ p = \{w{\in}W_M \mid (x,m) \in F_M(\textit{like})(w)\}\}$
$= \{\{w{\in}W_M \mid (j,m) \in F_M(\textit{like})(w)\}\}$

(9) *A very small model*

$D_{M^*} = \{j, m, b\},\ W_{M^*} = \{w_1, w_2\}$
$F_{M^*}(\textit{John}) = j;\ F_{M^*}(\textit{Mary}) = m;\ F_{M^*}(\textit{Bill}) = b$
$F_{M^*}(\textit{sleep})(w_1) = \{j, b\},\ F_{M^*}(\textit{sleep})(w_2) = \{m\}$
$F_{M^*}(\textit{like})(w_1) = \{(j,m), (b,m)\},\ F_{M^*}(\textit{like})(w_2) = \{(m,j), (m,m)\}$

- $[[\textit{like Mary}]]_{M^*,w1} = \{j, b\} = [[\textit{sleep}]]_{M^*,w1}$
- $[[\textit{like Mary}]]_{M^*,w2} = \{m\} = [[\textit{sleep}]]_{M^*,w2}$

=> $[[\textit{like Mary}]]_{M^*} = [[\textit{sleep}]]_{M^*}$

$|et| = 2^2 = |t|^{|e|} = 4$ max. # of VP extensions in M*
$|s(et)| = |et|^{|s|} = 4^2 = 16$ max. # of VP intensions in M*

w_1: $\{p{\subseteq}W_{M^*} \mid w_1{\in}p\ \&\ (\exists x{\in}D_{M^*})\ p = \{w{\in}W_{M^*} \mid (x,m) \in F_{M^*}(\textit{like})(w)\}\}$
$= \{p{\subseteq}W_{M^*} \mid w_1{\in}p\ \&\ [\ p = \{w{\in}W_{M^*} \mid (j,m) \in F_{M^*}(\textit{like})(w)\}$
or $p = \{w{\in}W_{M^*} \mid (b,m) \in F_{M^*}(\textit{like})(w)\}$
or $p = \{w{\in}W_{M^*} \mid (m,m) \in F_{M^*}(\textit{like})(w)\}\ ]\}$
$= \{p{\subseteq}W_{M^*} \mid w_1{\in}p\ \&\ [p = \{w_1\}$ or $p = \{w_1\}$ or $p = \{w_2\}]\ \}$
$= \{p{\subseteq}W_{M^*} \mid p = \{w_1\}\}$
$= \{w{\in}W_{M^*} \mid (j,m) \in F_{M^*}(\textit{like})(w)\} = \{w{\in}W_{M^*} \mid (b,m) \in F_{M^*}(\textit{like})(w)\}$

[…] our intuitions reflect facts about models more 'realistic' than the degenerate one I described. In models where ^introduce'(b,m) and ^introduce'(a,m) are different properties (for all a ≠ b), (i) and (ii) denote the same proposition. Mathematical statements are the thorniest, because their truth does not presumably vary from world to world, even in 'realistic' models.

Rooth (1985: 85f.)

☝ Small models (≠ small worlds) are no good (not realistic).
☝ Extensional variability is variability across worlds, not models.
☝ **Model-theoretic natural language semantics is not a theory of meaning.**

(10) Only John is identical to John or Mary and exactly as tall as the other.

3. Semantic Values

3.1 *External constraint: interpretability*

Some semantic values can be interpreted externally:

- propositions (pragmatics of content)
- (singular vs. multiple) reference
- i) modes of presentation + propositions [Fregean intensions]

or ii) referents and propositions [Russellian denotations]

☝ Interpretable ≠ (truly) external: Russellian descriptions
☝ **Not all extensions are interpretable**.
– e.g., determiner extensions are not

3.2 *Internal constraints*

- Compositionality
- Kupffer's constraint: translatability
- Simplicity considerations
  - i) fewer elements (Russell): no truth values
  - ii) simpler structures (Frege-Carnap): ex-/intensions all the way down

☝ **Not all intensions are interpretable**
– maybe only propositions are Larson (2002)

3.3 *Ontology revisited*

☝ Quine's criterion only applies to interpretable values.
… and not to higher-order variables in determiner translations

Remaining puzzle

- un-definability of *most*

Selected references

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