On the ontological status of semantic values

1. Ontology
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.

<div align="right">Quine (1948: 32 [with material added in the 1961 version]</div>

☞   "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) $(\forall x)\ (\forall y)\ [[F(x)\ \&\ D(y)\ \&\ O(x,y)]\ ->\ B(x,y]$
(b) $(F \times D) \cap O \subseteq B$

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

• *Compositionality*
(4) Every man loves a woman
(a) $(\forall x)\ [M(x)\ ->\ (\exists y)\ [W(y)\ \&\ L(x,y)]]$
(b) $(\lambda P\ (\lambda Q\ (\forall x)\ [P(x)\ ->\ Q(x)]))\ (M)\ (\lambda y\ (\lambda Q\ (\exists x)\ [P(x)\ \&\ Q(x)])\ (W)\ L(x,y))$

2. Model-theoretic "Semantics"
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.

<div align="right">Donald Davidson: 'In Defense of Convention T'. Studies in Logic and the Foundations of Mathematics 68</div>
<div align="right">(1973), 76-86 [p. 79]</div>

2.2   *Models vs. "Small Worlds"*
(5) *Basic architecture*
$M = (D_M, W_M, F_M,...)$ – 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)
$S_1 => S_2$ iff for any $M \in K$: $[[S_1]]_M \subseteq [[S_2]]_M$ (Entailment)

(6) <u>Only John likes Mary</u>
∴ Bill doesn't like Mary

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

Rigidity doesn't help
• $(\forall M \in K)\ (\forall w, w' \in W_M)\ [[John]]_{M,w} = [[John]]_{M,w'}\ (= \text{"John}_M\text{"})$
NOT: $(\forall M, M' \in K)\ (\forall w, w' \in W_M)\ [[John]]_{M,w} = [[Bill]]_{M',w'}\ (= John)$

☞ Rigidity is variability across worlds, not models.

(7) John is not Bill
  <u>Only John likes Mary</u>
∴ 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 $\wedge x\ likes\ Mary\}$
<=> $\{p \subseteq W_M \mid w \in p\ \&\ (\exists x \in D_M)\ p = \{w \in W_M \mid (x,m) \in F_M(like)(w)\}\}$

(9) *A very small model*
$D_{M*} = \{j, m, b\}$, $W_{M*} = \{w_1, w_2\}$
$F_{M*}(John) = j$; $F_{M*}(Mary) = m$; $F_{M*}(Bill) = b$
$F_{M*}(sleep)(w_1) = \{j, b\}$, $F_{M*}(sleep)(w_2) = \{m\}$
$F_{M*}(like)(w_1) = \{(j,m), (b,m)\}$, $F_{M*}(like)(w_2) = \{(m,j), (m,m)\}$

• $[[like\ Mary]]_{M*,w1} = \{j, b\} = [[sleep]]_{M*,w1}$
• $[[like\ Mary]]_{M*,w2} = \{m\} = [[sleep]]_{M*,w2}$
=> $[[like\ Mary]]_{M*} = [[sleep]]_{M*}$

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

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

[…] 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.

<div align="right">Rooth (1985: 85f.)</div>

☞   Small <u>models</u> (≠ 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.   <u>Semantic Values</u>
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*

<u>*Selected references*</u>
Davidson, Donald: 'In Defense of Convention T'. *Studies in Logic and the Foundations of
        Mathematics* **68** (1973), 76–86.
Kaplan, David: 'How to Russell a Frege-Church'. *Journal of Philosophy* **72** (1975), 716–729.
Larson, Richard: 'The Grammar of Intensionality'. In: G. Preyer & G. Peter (eds.), *Logical
        Form and Language*. Oxford 2002. 228–262.
Rooth, Mats: *Association with Focus*. UMass dissertation 1985.
Quine, Willard V.: 'On What There Is'. *Review of Metaphysics* **2** (1948), 21–38.
–: (1961): 'On What There Is'. In: Quine, *From a Logical Point of View*. New York.
Zimmermann, Thomas Ede: 'Model-theoretic semantics'. In: C. Maienborn *et al.* (eds.),
        Semantics. An International Handbook of Natural Language Meaning. Berlin 2011.
        762–801.
–: 'Equivalence of Semantic Theories '. In: R. Schantz (ed.), *Prospects for Meaning*. Berlin
        2012. 629–649.