

Truthmaker Semantics with ‘Lacks’ as Modal Objects

Truthmaker semantics is based on the idea that the meaning of a sentence or more generally content bearer does not consist of a set of entire worlds, but in situations, actions or other entities fully relevant for the truth or satisfaction of the content bearer (Fine 2017). In my previous work (Moltmann 2018, 2024), I developed a semantics of attitude reports and modal sentences (‘object-based truthmaker semantics’) which is centered on modal and attitudinal objects as entities that act as bearers of truthmaking (or satisfaction) conditions. Attitudinal objects are entities like beliefs, claim, intentions, desires, promises; modal objects include needs, obligations, permissions, abilities, essences, and offers. Modal verbs (and modal adjectives or nouns) on that view are predicates of (existentially quantified) modal objects and the prejacant, clausal complement or clausal subject will act as a predicate of the described modal object. By distinguishing modal objects of necessity and of possibility with their different truthmaking conditions, modal sentences of both forces will get the same logical form, as below:

- (1) a. John must be at home
b. $\exists e(\text{must}(e) \ \& \ [\text{John leave}](e))$
(2) a. John may be at home.
b. $\exists e(\text{may}(e) \ \& \ [\text{John leave}](e))$

One assumption when carrying over truthmaker semantics to modal (and attitudinal) objects is that only modal (and attitudinal) objects of necessity have falsifier or violators, whereas modal (and attitudinal) objects of possibility have only truthmakers or satisfiers. A single property expressed by a sentence (prejacant) of modal (and attitudinal) objects takes care of the two cases, namely:

- (3) $[S] = \lambda d[\text{pos}(d) = \text{pos}(S) \ \& \ (\text{neg}(d) \neq \emptyset \rightarrow \text{neg}(d) = \text{neg}(S))]$

Here $\text{pos}(X)$ is the positive extension of X (its truthmakers / satisfiers) and $\text{neg}(X)$ its negative extension (falsifiers / violators). That is, a modal object of which a sentence S holds shares its satisfiers with S and if it has violators, it shares its violators with S . Being able to provide such a single meaning of sentences as predicates of content bearers is a significant advantage of truthmaker semantics, since no single meaning of that sort is available in possible-worlds semantics.

An important motivation for object-based truthmaker semantics is the way it converges with an emerging general interest in ‘localized modality’: modal truths, to a great extent, are grounded in particular conditions often pertaining to particular entities or actions, rather than be just relations among possible worlds. This is the spirit of essence-based approach to metaphysical necessity (Fine 1994) as well as the potentiality-based approach to modality (Vetter 2015).

In this talk, I will extend object-based truthmaker semantics of modal to certain intensional transitive verbs, foremost what I call completion-related verbs of absence, such a *lack* and *be missing*. *Lack* and *be missing* at first sight look like negations of the predicates *have*, given the apparent equivalences in (4a) and (4b) and (5a) and (5b):

- (4) a. The house does not have a door
b. The house lacks a door.
(5) a. John does not have a sister.
b. John lacks a sister.

However, unlike negated have-sentences, completion-related predicates of absence come with a modal force of weak necessity, entailing corresponding *should*-sentences such as (6a, b):

- (6) a. The house should have a door.
b. John should have a sister.

I propose an analysis of *lack*-sentences based on an ontology of ‘lacks’ as modal objects. This is motivated by equivalences such as between (7a) and (7b):

- (7) a. John lacks understanding
b. John has a lack of understanding.

That is, the verb *lack* will be analysed as ‘have a lack’. Moreover, the analysis will involve the notion of a conceptual whole, a complex of possible entities connected in certain ways that need not itself be manifested in an object (in (4b) the conceptual whole is ‘the house with a door’, which is a whole that is manifested by objects; in (5b), the complex of ‘John with a sister’, which is a whole that is not manifested by an object. More precisely, I propose an ontology of two sorts of lacks. The first sort, $lack_1$, is a modal object that can be satisfied by completing parts of an incomplete realization of a particular conceptual whole. Such a modal object is for example the house’s lack of a door, which is characterized in terms of its satisfaction conditions below:

(8) Satisfaction conditions for ‘the house’s lack of a door’

For a conceptual whole C such that the house is an incomplete actual manifestation of C , the house’s lack e of a door, based on C , is satisfied iff for any possible entity y such that for the actual (partial) manifestation x of C , the composition of x and y is a complete manifestation of C : there is an entity z , $door(z)$ such that z is part of y .

The second lack, $lack_2$, is a modal object that has truthmaking conditions, being able to be satisfied by situations of the completed whole ‘having’ the missing parts. That is, the houses’ lack e of a door satisfiable by an entity containing a door x will be mapped onto a lack e' satisfiable by situations s in which the house has x .

(9) Mapping object-related lacks e to corresponding situation-related lacks e'

For the house’s lack e of a door:

for any x , such that $house(y)$ and $y < x$, x satisfies e' iff for the situation s that is the house’s having x , $s \Vdash e'$.

The inference in (10) will then be accounted for based on the logical form of the premise in (11a) and the conclusion in (11b), based on the two kinds of lack e and e' .

(10) The house lacks a door.

The house should have a door.

- (11) a. $\exists e(\text{HAVE}(e, \text{house}) \ \& \ [lack_1 \text{ of a door}](e))$
b. $\exists e'(\text{should}(e') \ \& \ [the \ house \ have \ a \ door](e'))$

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