Accepted for the 20th Amsterdam Colloquium, December 16-18, 2015

**A Predicativist Semantics of Modals based on Modal Objects**

Friederike Moltmann

CNRS-IHPST and NYU

This talk will outline a novel ‘predicativist’ semantics of modals by focusing not on possible worlds and quantifiers ranging over them, but on what I will call modal objects and their satisfaction conditions. On this view, modal verbs take modal objects as their implicit (Davidsonian) argument and the subject or complement clause or prejacent of the modal acts as a predicate characterizing the modal objects in terms of its satisfiers (truthmakers) and possibly violators (falsifiers). For that purpose, the semantic account will make use of a development of Fine’s (2012, 2014, to appear) recent truthmaker semantics with its central notion of exact truthmaking ╟ and its notion (exact) false-making ╢, allowing exact truthmaking (satisfaction) and false-making (violation) to also hold between an action or situation and a modal object. The semantics will assign the same logical form to sentences with modals of necessity and sentences with modals of possibility, as below:

(1) a. John must help. b. ∃e(must(e) & pred([*John help*])(e))

(2) a. John may leave the house. b. ∃e(may(e) & pred([*John leave the house*])(e))

Here ‘pred([S])’ is the derived predicative meaning of the sentence S (see below).

‘Modal objects’ are entities like needs, possibilities, necessities, and abilities. A special class of modal objects is modal products, the abstract artifacts resulting generally from illocutionary acts. They include obligations, permissions, invitations, and offers. Modal objects are generally described by nominalizations of modal verbs or adjectives, but on the predicativist semantics, they play the same role in the semantics of modal verbs that lack nominalizations, such as modal auxiliaries. Moreover, modal objects are not as such dependent on nominalizations of modal predicates, rather they are entirely on a par with laws, rules, options, abilities about which we have intuitions quite independently of particular terms or predicates. Laws share with modal products their ability of having satisfaction conditions and of enduring past the act of establishing them. Modal objects are not states or events. The most important characteristic distinguishing them from the latter is that they have satisfaction (or manifestation) conditions. John’s obligation to leave may be satisfied or fulfilled (by John’s leaving), John may show his ability to type by typing etc., but not so for John’s being obliged or John’s being able to type.

Linguistic support for the analysis in (1b, 2b) comes from the fact that modal predicates often alternate with complex predicates of the sort light verb – nominalization of a modal verb. Thus, the verb *need* in English alternates with the complex predicate *have the need*, and in fact some languages have only the complex predicate (French *avoir besoin,* Italian *avere bisogno)*). It has actually been argued that English *need* is derived from *have need* (Kayne / Harves 2012). The predicativist semantics assigns a semantic value to *the need for John to work* straightforwardly:

(3) ιd[need(d) & pred([*John to work*])(d)]

On Fine’s (2012, 2014, to appear) truthmaker semantics, a sentence S has as its meaning a pair consisting of a set of (exact) truthmakers (situations or actions wholly relevant for the truth of S) and a set of exact falsemakers (or violators). Besides the standard truthmaking conditions, Fine posits the condition below on the truthmaking of negative sentences:

(4) s ╟ *not* S iff s ╢ S.

I imperatives will denote a pair consisting of a set of actions complying with the imperative and a set of actions contravening the imperative (Fine, to appear).

On the present approach, the relation of exact satisfaction and violation will also be a relation between situations or actions and modal objects. A central idea of the predicativist semantics will be that modals of necessity and modals of possibility will not lead to different logical forms, as on the standard view of modals. Rather modal objects of necessity and modal objects of possibility differ in whether they have violators. Modal objects of necessity have both satisfiers and violators, but modal objects of possibility have only satisfiers and lack violators. This is particularly intuitive for deontic modal products. An obligation can be satisfied by actions and it can be violated by actions. By contrast, a permission, an invitation, or an offer only sets up options: actions of satisfying or ‘taking up’ the permission, invitation, or offer. An ability is a modal object of possibility and has only satisfiers, namely activities manifesting the ability. The denotation of a clausal subject or complement (or a prejacent) can then be given as a property of (modal) objects as below, where pos(S) is the set of verifiers of S and neg(S) the set of falsifiers of S:

(4) pred([S]) = λd[∀s(s ╟ d 🡪 s ∈ pos(S)) & ∀s(s ╢ d 🡪 s ∈ neg(S))]

(4) is suited to characterize both modal objects of necessity (the second conjuncts applying non-vacuously) and modal objects of possibility (the second conjunct applying vacuously).

The duality of modals of necessity and of possibility is straightforwardly accounted for once the existential quantifiers in (1b, 2b) are allowed to quantify over a contextually highly restricted domain. Suppose the domain contains just one relevant modal object, the obligation for John to help. Then *John is obliged to help* implies *John is not permitted not to help* because the modal object of obligation just is not a modal object that has only satisfiers, namely actions of John’s not helping. Similarly, if there is just one relevant modal object of the permission for John to leave the house, *John is allowed to leave the* house implies *John is not obliged not to leave the house* because then the modal object of John’s permission is not a modal object that has as satisfiers actions of not leaving the house and as violators actions of leaving the house. The contextual restriction also takes care of Kratzer’s (1977) insight that modals generally have a highly context-dependent interpretation.

The account can be extended suitably to other modals; for example a modal object for epistemic *must* maybe ‘generated’ by a piece of evidence by assigning it situations supported by the evidence as satisfiers and situations excluded by the evidence as falsifiers.

The predicativist semantics of modals has further applications. One of them is to modal concord:

(5) a. John must obligatorily sign the form. b. John could possibly have left the house.

Given the predicativist semantics of modals, *must* and *obligatorily* in (5a) and *could* and *possibly* in (5b) can apply to the very same modal object, rather than each introducing an existential quantifier ranging over modal objects

The predicativist semantics also applies well to performative uses of modals (*You can use the house!,* uttered by someone with the authority to give permission). A performative use of a modal applies to the modal product the speaker intends to produce with his directive speech act. A ‘harmonic’ modal as in (6a) can then be identified as a performative use of a modal in an embedded context. This leads to the meaning of the embedded sentence in (6b), which will apply to the modal product produced by the described illocutionary act, as in (6c):

(6) a. John offered that Mary could use the house.

b. pred [Mary could use the house]) = λd(could(Mary, d) & pred([*Mary use the house*](d))

c. ∃e(offer(e, John) & pred([*Mary use the house*](modal-product(e)))

The predicativist semantics of modals finally is able to account for semantic connections between attitude verbs and modals without forcing attitude verbs into modal operators, namely by recognizing that the attitudinal objects described by attitude verbs (e.g. beliefs, decisions, requests, promises) may share satisfiers and violators with modal objects.