On the performance of modal objects

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Friederike Moltmann's target paper on object-based truthmaker semantics (in the following TSNL) offers a concise and well-written summary of the framework's main ideas and merits specifically for the analysis of natural language modality and attitude ascriptions. In the following, I focus on select aspects of her proposal for deontic and teleological modality as well as imperative clauses, taking into account also their behavior under disjunctions.

By introducing special modal and attitudinal objects, the framework closes a gap in standard models for natural language, which are hard-pressed to come up with suitable **meanings for intuitively 'modal' nouns** like *obligation, permission, need, belief, report* and the like. Notably, providing interpretations for nouns of this sort, taking into account speaker intuitions, philosophical insights, and the nouns' semantic and syntactic relations to other expressions of the language, leads to new semantic accounts for better studied expressions like modal verbs, illocutionary predicates, or imperative clauses. In some sense, the approach could be seen as a more radical push in the direction of where Kratzer's standard work on modals has taken us. While accessibility relations and valuation (i.e., what is true at individual worlds) are independent in classical modal logic, for Kratzer, accessibility is derived from non-modal properties of the individual worlds (the actual content of some relevant body of beliefs, laws, rules, desires, etc.). For Moltmann, modal meanings are grounded in the existence of suitable, largely abstract objects.

The ontology is enriched with objects corresponding to illocutionary acts, illocutionary products, cognitive acts, cognitive products, modal states and modal products. The resulting inventory can be used to address various problems associated with modality and attitude expressions, for instance the distinction between **weak and strong** (or 'heavy' and 'light') **permission**, a longstanding issue for classical deontic logic. Classical deontic logic and the standard Kratzerian treatment that builds on it, analyze deontic possibility as compatibility with the deontically optimal worlds (among the ones verifying the relevant circumstances). This falls short of capturing the inuitive difference between (1a), which can indeed convey the notion of compatibility, and (1b), which ascribes to Mary something more like a right or an entitlement, which, for instance, the relevant authority has to revoke explicitly and cannot simply overwrite by imposing a conflicting obligation.

(1)   a.   Mary is permitted to leave.
          b.   Mary has permission to leave.

Object-based truthmaker semantics can associate (1b) with the existence of a modal product *d* whose content is characterized by *(that) Mary leaves*; in contrast, weak permission expressses the existence of a modal state *s* that is derived from what is obligatory for Mary and is characterized as being compatible with *(that) Mary leaves*.

Like (1a), possibility **modal verbs** like *can* or *may* fail to disambiguate between weak and strong permissions. Together with their necessity counterparts *must, ought, have to, need,* etc., these have long been at the center of linguistic investigations of modality (Kratzer, 1981, 1991, 2012). Moltmann proposes to treat the combination of a modal and its prejacent as conjunctive predicates of objects. In line with Kratzer's point that one and the same lexical expression can serve for various modal flavors, these objects are not characterized as permissions, obligations, abilities or the like, but as falling under metalanguage predicates 'must', 'may', 'should',.... To capture the difference between

modal objects like an obligation for Mary to leave and a permission for her to leave, Moltmann assumes that sentences specify not only verifiers or satisfiers, but also falsifiers or violators (Fine, 2017). While the permission and the obligation are associated with the same exact satisfiers (actions of Mary leaving), only the latter is associated with falsifers in addition. The existence of falsifiers is supposed to be tracked by the felicity of satisfaction predicates like *fulfill, comply* vs. *accept, take up*. For modal verbs, the fact that *can* can truthfully apply to a permission, whereas *must* can apply to an obligation, has to be reflected in the corresponding metalanguage predicates 'can' and 'must'. The existing works do not provide much explicit discussion of the nature of these predicates and how they manage to carve out the right class of objects, but I would assume that the existence of falsifiers is a crucial ingredient of the content of necessity modals, whereas possibility modals may require their absence. In addition, it remains to be seen if a more fine-grained classification of modal objects, can shed light on strength distinctions as reflected in *should* vs. *must*, a still ill-understood area of natural language modality (von Fintel and Iatridou, 2008; Rubinstein, 2017).

To investigate such matters, it may be necessary to further sharpen our tools for understanding and detecting **negative content** (as reflected in falsifiers and violators). Truthmaker semantics and object-based truthmaker semantics rely crucially on the notion of exact verification/satisfaction (symbolized $\Vdash$) as holding between situations or actions and sentences (Fine, 2017), or between situations, actions or objects and sentences or representational objects (Moltmann, 2017, 2018a, TSNL, a.o.), respectively. A situation or an action exactly satisfies an atomic sentence iff it satisfies the sentence but does not contain anything that is not relevant to the truth or satisfaction of the sentence or object (TSNL). Fine (2018) offers the *by*-phrase test to provide evidence for what are relevant aspects (for instance, the felicity of *John opened the door by turning the doorknob*, proves the turning of the doorknob to be part of an exact verifier of John opening the door). However, little is said about the relation of exact falsification, which is also intended as primitive, but described as holding of a situation *s* and a sentence *S* 'just in case *s* is wholly relevant for the falsity (or violation) of *S*' (TSNL, p. 10). The notion of falsification underlies the interpretation of negation as in (2).

(2) $s \Vdash \neg S$ iff $s \dashv\vert S$.

I have clear intuitions neither about exact verifiers of negative sentences (be they declarative or imperative), nor about exact falsifiers of positive sentence (in contrast, it seems easy to recognize intended exact falsifiers for negative sentences like *Mary didn't open the door* once we have individuated the exact verifiers for *Mary opened the door*). Clearly, exact falsification cannot be reduced to minimal falsification, or else the empty situation might serve to falsify any sentence without containing anything 'unnecessary'. Given that falsification/violation is crucial to the nature of the modal and attitudinal objects under investigation, it would be helpful to learn more about the nature of the relation and possible tests for it. In an attempt to sharpen my intuitions, I find myself tempted to think of exact falsifiers for *S* as those objects that cannot be extended to verifiers for *S* but have no propert parts that cannot be extended to verifiers for *S* (relying on the fusion operation as defined for situations and actions, Fine 2017, TSNL) could be as given in (3):

(3)   *s* is an exact falsifier for *S* iff (i) there is no *t* such that the fusion of *s* and *t* is an exact verifier for *S*, and (ii) there is no $s' < s$ s.t. there is no *t* such that the fusion of s' and *t* is an exact verifier for *S*.

It remains to be seen if a definition along these lines could do the job,[2] or if there is a better way of understanding the concept of exact falsification (and reliably and systematically predict inferences

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[2]Kit Fine (p.c.) cautions that my suggestion works only for certain types of predicates. For instance, *He is walking* can have as an exact falsifier a situation of the person running at an interval including the utterance time, which would have proper parts that cannot be extended to an exact verifier. I find his argument instructive to understand better how exact verification and falisification are intended to relate to notions of aktionsart and grammatical aspect.

as associated with modal products of necessity, for instance). The challenge of characterizing exact verifiers for the negations of atomic sentences strikes me as reminiscent of issues arising for non-eliminative characterizations of content in general (e.g. Cooper and Ginzburg 2012).

To return to another specific application, the problem of weak vs. strong permission seems to have an analogue in the **teleological realm** (Kaufmann, 2016b). As has been observed specifically in the literature on anankastic conditionals (von Fintel and Iatridou, 2006; Werner, 2006), a possibility modal like *can* can express both a notion of compatibility with the goal (similarly to weak permission expressing compatibility with the rules), but it can also single out one way of achieving the goal (or a property describing one such way in contrast to others):

(4)   Background: I want to get on the next Amtrak to Boston.
    a.   You can still get coffee, it leaves in 45 minutes.
    b.   You can board it in New Haven.

The question is, thus, if a solution along the lines of what Moltmann specifies for weak vs. strong modals carries over to this teleological contrast.[3] Intuitively, both sentences involve a goal or intention of boarding the next Amtrak to Boston. (4a) expresses compatibility with a modal state reflecting circumstances and this goal (as Moltmann 2018a argues for teleological *must* with overt *in order to*). (4b) however conveys that one possible strategy (or way) of realizing it involves boarding in New Haven. Given that the modal object involved is characterized with *can*, we would expect it to have satisifers but no falisifers. I find it hard to motivate this independently: while not following this particular strategy will not lead to a falsification of our overall intention (it is thus a possibility in the global picture), when looking at any particular strategy itself, it would seem that strategies have violators. And, surely, if all other strategies have been eliminated, what used to be one of several options, becomes a necessity (with violators). The application of satisfaction predicates does not help either, as the ones associated with a distinction between possibility and necessity, *fulfill, comply* vs. *accept, take up* are associated with deontic modality and are hence infelictous with teleological objects (Moltmann, 2018b). *choose* or *follow* seem suitable; neither appears in existing lists of satisfaction predicates, but I would assume that they fall under predicates of realization like *realize, execute, implement* (Moltmann, t.a., p. 10). The listed ones, at least, do not seem to distinguish between possible and necessary ways or strategies. Therefore, while the framework holds a lot of promise for a unified analysis of the weak/strong distinction across different prioritizing flavors, more systematic tests on the nature of the modal objects involved would be welcome to reliably predict the choice of possibility vs. necessity modals.

Object-based truthmaker semantics also promises to shed light on **imperative clauses**, which are often understood as expressions of prioritizing modality (a.o. Lewis, 1979; Portner, 2007; Kaufmann, 2012). Explicit performatives, sentences with performative modals, and imperatives can all be used for illocutionary acts like commanding or permitting.[4] In contrast to imperatives, though, the strings associated with the former two categories seem to also lead a life in descriptive language. Thus more readily accessible to the traditional semantic tools of truth-conditions, composition, and information exchange, they are sometimes used to shed light on imperatives that resist these techniques (Kaufmann, 2020). Object-based truthmaker semantics offers radically novel possibilities to understand imperatives because it is not tied to truth-conditions in the first place. To develop an account of imperative clauses, TSNL briefly sketches a genuinely novel and potentially very illuminative understanding of the interface between semantic content and use. In several works, she recognizes the

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[3]Moltmann (2018a) (p. 259) briefly touches upon the issue comparing *It is possible to open the jar.* and *There is a possibility of opening the jar.* and argues that the latter rests on the existence of a modal object constituting 'a way'.

[4]Unmodified imperatives may carry out a sligthly different speech act ('permission-like'), which, in addition to granting permission also conveys pressure (or at least the expectation) that the addressee act on it (Aloni, 2005; Kaufmann, 2020). Adding *if you like* or a discourse particle like German *ruhig* may be required to turn the illocutionary act into a genuine permission.

similarity between explicit performatives, sentences with performative modals, and imperatives, and she suggests drawing on the rich ontology that associates a speech act of permitting, for instance, not only with this very act, but also a non-enduring illocutionary product (a *permission*), and possibly enduring modal products like a *permission* (presenting something of an entitlement for the addressee to act on) and a *commitment* (for the speaker to not obstruct or retaliate against the addressee's performing an action as specified by the permission).[5]

Moltmann (2017) specifies the core idea for the interaction of sentential meaning and use as follows: 'The semantics of sentences with a performative use of a modal will be parallel to that of sentences with a performative use of an illocutionary verb. The first requires some remarks, though, about the semantics of independent sentences. Independent sentences can be assigned the very same property of attitudinal and modal objects specifying their satisfaction conditions [...]. *With the literal use of sentence S, the property S expresses is meant to characterize the illocutionary product the speaker intends to produce with his utterance* (and thereby the performance of the relevant illocutionary act).' (p. 280, emphasis mine). All sentences are taken to express properties of attitudinal or modal objects (specifiying their exact satisfaction and falsification conditions). No difference needs to be made between imperatives and declaratives: both types of sentences express properties of modal or attitudinal objects, the only difference being that the former is taken to apply to such that are associated with satisifers and violators (actions) rather than truth- or falsemakers (situations). This distinction is reflected in the properties specific modal objects are taken to have, and it guides whether or not satisfaction predicates like *is true, is violated, is accepted* can be applied felicitously. It is not a type-theoretical distinction that would be reflected in something more like grammatical ill-formedness. But the difference in clause type as exemplified by *Be nice* in contrast to *You are nice* needs to be reflected at the level of either conventional semantics or conventions of use, so as to explain why the latter but not the former can be used to perform an assertion (and produce the illocutionary product of an assertion to be characterized by the shared content).[6] The issue is mentioned in passing ('Different types of sentences may impose certain conditions on their satisfiers (the distinction between imperatives and declaratives', Moltmann, 2018a, p. 267)[7] but has to the best of my knowledge not been elaborated on. Still, and contrary to customary assumptions, the lack of a hard and fast distinction between actions (as relevant for imperatives) and situations (as relevant for declaratives) strikes me as promising.[8] In addition to their better-studied uses as commands, requests, invitations and the like, imperatives can to some extent also be used to express wishes as exemplified in (5), and in these cases, their satisfiers appear to be situations rather than actions.[9]

(5)   a.   Enjoy the party!
       b.   Please don't have broken another vase!
       c.   Please be in there!!!

In object-based truthmaker semantics, situations as satisfiers of imperative clauses may be unexpected but should, as far as I can tell, not constitute a problem, provided a suitable bouletic modal object (a 'wish') can be identified.

It is worth noting that while 'deontic modals when used performatively make the same contribution as imperatives used under certain circumstances, namely setting up an obligation or permission

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[5]The polysemy of English *promise* as naming both an illocutionary product and a modal product is noted explicitly (e.g. Moltmann, 2018a, p. 7).

[6]English eventive sentences introduce issues with aspectual or modal marking, modulo that, *You {leave, will leave, are leaving} at 5* and *Leave at 5* exemplify the same distinction.

[7]See also Moltmann (2018b) for a classification of illocutionary products in terms of Searlian directions of fit.

[8]A strict distinction along these lines is characteristic of many other accounts that treat imperatives as denoting actions and therefore unevaluable for truth, e.g. Segerberg 1989; Mastop 2005; Barker 2010; Asher and Lascarides 2003.

[9]The conditions on when exactly imperatives can be used for wishes are surprisingly hard to pin down (Kaufmann, 2016a, for discussion). Oikonomou (2016) observes that unlike English or German, Greek does not use morphological imperatives for (well-) or absent wishes but resorts to subjunctive forms instead.

(Lemmon 1962a, Portner 2007, Kaufmann 2012)' (Moltmann, 2018a, p. 266), in Moltmann's account they do so by characterizing different objects. 'Whereas imperatives will express properties to be predicated of the *illocutionary product* produced by the sentence, the prejacent of a performative modal will express a property to be predicated of the deontic *modal product* (obligation or permission) meant to be produced by the utterance of the sentence' (Moltmann, 2018a, p. 266, emphasis mine). No further motivation is provided for this difference, but it is potentially highly interesting. By letting the prejacent of imperatives and (performative) modals specify the content of two different modal objects that share the same content, Moltmann stands a chance of reflecting the similarity of imperatives to both declaratives (as part of a clause-type paradigm) and to modals (as characterizing the content of permissions, obligations, and the like). Given the sameness in content, this aspect of the theory is somewhat hard to test, though. As it stands, the analysis seems to predict that performatively used modal verbs but not imperatives have to create enduring modal products. To test this, it might be instructive to look at the inferences supposed to hold between illocutionary predicates, modals, and imperatives. Unfortunately, the discussion of the inferences holding between illocutionary predicates, modals, and imperatives (TSNL, p. 32) remains too impressionistic for me to appreciate as an argument in favor of this specific aspect of her analysis.

Truthmaker semantics, as a framework of philosophical logic rather than natural language semantics, explicitly distinguishes between **analytic entailment** as presumed relevant for imperatives, and **classical entailment**, as involving truth in a model (Fine, 2017; Moltmann, 2018a). The notion of partial content carries over into object-based truthmaker semantics as (6) and is used in the characterization of sentential content (7).

(6)   For sets of situations (or actions) A and B, B is a *partial content* of A iff every exact truthmaker (or satisfier) of A contains an exact truthmaker (or satisfier) of B and every exact truthmaker (or satisfier) of B is contained in an exact truthmaker (or satisfier) of A. (TSNL, (14))

(7) $[S] = \lambda d[\forall s(s \Vdash d \to \exists s'(s' \Vdash S \ \& \ s' < s) \ \& \ \forall s'(s' \Vdash S \to \exists s(s \Vdash d \ \& \ s' < s)) \ \& \ (\exists s(s \dashv\| d \to \forall s(s \dashv\| S \to s \dashv\| d))$ (TSNL, (29))

(7) induces a subset relation on the set of modal (and attitudinal) objects, and I take it that either this subset relation or partial content directly can be used to recover the intended notion of analytical content (or entailment). Classical entailment is not discussed for object-based truthmaker semantics. Finally, with the linguistic turn in object-based truthmaker semantics (and especially its treatment of declarative and imperative sentences and the illocutionary products generated by their use), relying on a notion of **dynamic entailment** as derived from the changes to a contextual representation of what is permissible and obligatory suggests itself for some of the crucial cases (see Moltmann, 2018a, p. 17, for some suggestions along these lines).

Absent a worked out definition of dynamic entailment, the discussion of the inference patterns between the different types of 'performative' sentences, appears to rely on versions of analytic or classical entailment as inherited from truthmaker semantics. Moltmann writes that (8a) and (8b) are valid on the relevant reading 'because attitudinal objects may entail the existence of a modal object, sharing the same satisfaction conditions. Thus (49a) [=(8a)] and (49b) [=(8b)] are valid on the relevant reading because the command entails the existence of an obligation with the same satisfiers and violators, and the offer entails the existence of a permission with the same satisifers' (TSNL, p. 32).

(8)   a.   John asked Mary to leave.
               Mary must leave.
        b.   John offered Mary to use the house.
               Mary may use the house.

I slightly disagree with these intuitions and find both inferences valid only under the additional

premise that John has not taken back his command or permission in the meantime (on the relevant reading, which I take to be that the modal is supposed to reflect John's requirements). Given the ingredients of Moltmann's analysis, I would assume that a classical or dynamic notion of entailment that captures it correctly can be defined easily enough. If unembedded sentences are supposed to express predicates that apply to the intended illocutionary product of the utterance, with a descriptive modal, both premise and conclusion of (8a) and (8b) express properties suitable for applications to claims. While the details remain to be filled in, I assume that they will stand in the relevant relation of analytic entailment, as well. Things are, however, less clear to me when imperatives are involved. Moltmann continues to explain that 'Similarly, imperatives and performatively used modals sentences stand in inferential relations under suitable conditions. In suitable contexts, both (50a) [=(9a)] and (50b) [=(9b)] are valid:'

(9)   a.   Leave the room.
              You must leave the room.
        b.   Take an apple.
              You may take an apple.

In previous works, e.g. Portner 2007, Kaufmann 2020, these inferences are discussed as valid with descriptive, not performative modals. It is, however, not immediately obvious to me that this is predicted by Moltmann's analysis on any of the notions of entailment I considered above. The imperative should describe a set of modal objects like obligations, permissions and requests. In contrast, the descriptively modalized declarative is used in an assertion about a modal state of affairs (specifically, the existence of a certain modal object) and should thus express a predicate of claims, speculations, beliefs, and the like. The sets of modal or attitudinal objects characterized by the two sentences should thus be disjoint (even if the characterization expressed by the modalized declarative may involve existentially quantifying over modal objects as characterized by the imperative), ruling out an application of analytic entailment or classical entailment as resting on partial content. What seems to be more promising, then, is the dynamic notion that still stands to be developed in more detail. Imperatives apply to illocutionary products (and not necessarily enduring modal products): (a felicitious use of) the imperative thus guarantees the existence of an illocutionary product with the content of [*you leave the room*] or [*you take an apple*]. As these need not be enduring, it is not clear to me that they would be suitable referents for the anaphoric (or witnesses for the existentially quantified) modal object in the descriptive modal sentence. Rather than constituting a flaw, this may actually provide the desired support for Moltmann's assumption after all: in perfect analogy to the findings for (8a) and (8b), the inferences in (9a) and (9b) go through only if the consequent is evaluated immediately after the imperative utterance is completed. If, however, as suggested by Moltmann, the modal is used performatively, the notion of entailment in terms of containment seems to compare a predicate of possibly non-enduring illocutionary products with one of modal products (which may be fine, suggesting a way in which the inference could be conceived of as valid with a performatively read modal, even if this would not support the presumed difference between imperatives and performative modals). On the dynamic notion, however, both sentences should affect the context in a very similar way, namely by generating a suitable modal and/or illocutionary product. But then, on standard assumptions of dynamic entailment as the conclusion leaving the contextual representation unchanged after update with the premises (e.g. Veltman, 1996), the inference would appear to come out as invalid: rather than leaving the contextual representation unchanged, the second sentence would generate a novel modal product. While contradicting Moltmann's claim that the inferences are valid under a performative reading of the modal, I take the prediction to be in line with speaker intuitions.

To summarize, while object-based truthmaker semantics holds a lot of promise for the analysis of imperative clauses in comparison to declaratives as well as illocutionary predicates and modal verbs, more work needs to be done to motivate some of the details, and this will require specifically a more explicit discussion of the intended entailment relations.

To turn to a topic where (in)valid inferences have been discussed in more detail (Moltmann, 2018a), I would like to consider briefly what the framework predicts for **disjunctions**. The investigation of imperatives in logic, and truthmaker semantics is no exception to this, is often driven by their failure to validate inference patterns familiar from statement logic. Ross (1944) observes that imperatives, under which he subsumes performatively used necessity modals, invalidate disjunction introduction.

(10)   <u>Post the letter!</u>
        ∴ Post the letter or burn it.

Fine follows Ross's intuition that the inference can be predicted to be invalid by treating imperatives in terms of satisfaction (rather than truth). Analyzing disjunction as expressing exact satisfaction of one or the other disjunct, and entailment in terms of partial content, allows him to invalidate the inference heralded as problematic as *Ross's paradox*. A version of the solution carries over to Moltmann's treatment of imperatives as properties of modal objects. However, while she investigates a series of inferences involving conjunctive premises, explicit discussion of disjunctive premises with modals seems missing. These, however, are interesting, as both instances with one or with separate modals are known to allow for a (classically unexpected) reading that involves free choice effects (*it's up to you*), in addition to an expected reading in terms of epistemic uncertainty (*but I don't know which*).[10]

(11)   a. You may take an apple or (you may) take a pear.
        b. You should take an apple or (you should) take a pear.

Kamp (1973) points out that even performative modals, which typically invite free choice readings, do not always offer free choice, see (12) (his example). As its overall utterance can be used to grant permission, *may* is used performatively here, yet the choice is not free but delimited by the imperative to avoid the dangerous one.

(12)   You may go to Shoal Creek or to Shingle Creek, but stay away from the dangerous one.

Contrary to received wisdom, this ambiguity carries over to imperatives, as (13) exemplifies (Kaufmann, 2012, for discussion and a version of the example)

(13)   [SCENARIO: *A is looking for a letter that B wrote to a mutual friend to congratulate her on her new relationship.*]
        A: Just in case I find that letter of yours: What am I to do with it?
        B: Post it or burn it; it depends on whether they are still together.

The predictions of the framework as presented in the target article are not entirely straightforward to me. Focusing on the performative use of (11a) with two separate modals, the prediction from the analysis of (14) (ignoring falsifiers for the moment) seems to be that the modal product of the utterance (a permission) is characterized as having either the content of [*you may take an apple*] or the content of [*you may take a pear*].

(14) $s \Vdash S \text{ or } S'$ iff $s \Vdash S$ or $s \Vdash S'$

This, however, appears to capture what is going on in the more marked case of contingent permissions like Kamp's (12). The issue carries over to imperative clauses. The problem may relate also to the question of how stacked modals are analyzed, a possibility that, to the best of my knowledge has not received systematic attention in object-based truthmaker semantics.[11] To derive the free choice

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[10]Moltmann (2018a) rejects the epistemic uncertainty reading for instances of disjunctions with a single *must*.

[11]Moltmann (2018a) notes in passing that 'deontic modals cannot be stacked'. At least stackings like *must be required*

reading, one might consider applying a syntactic operation that treats the two modals as instantiations of a single operator outscoping the disjunction (Simons, 2005). A move along these lines has, however, been shown to be implausible in light of data like (15) from Alonso-Ovalle (2006), which involve two different modal expressions in the two conjuncts:

(15)   You may email us or you can reach the Business License office at 949 644-3141.

In short, more work seems to be needed to adjust object-based truthmaker semantics to disjunctions of modalized sentences and their interaction with presumed and/or overtly signalled speaker knowledge.

Finally, its treatment of **harmonic modals** strikes me as one of the most convincing contributions of object-based truthmaker semantics to natural language modality. In analogy to performative modals in the matrix context that serve to predicate the prejacent of a modal product the speaker intends to produce with the utterance, these embedded occurrences predicate their prejacent of the modal product whose production is described by the attitudinal or illocutionary predicate in the main clause.[12] While Moltmann does not consider imperatives embedded in reported speech, the analysis predicts correctly that these can only receive harmonic interpretations. Moreover, by separating out the speech act related content from the description of the satisfiers, the framework seems to be particularly apt to capture certain aspects of crosslinguistic variation in their interpretation. While the subject of an embedded second person imperative in Slovenian has to be understood as referring to the actual addressee, only the addressee of the reported context is a possible choice in Korean (Kaufmann, 2013; Stegovec and Kaufmann, 2015):

(16)   Marko   je rekel Petru,   da mu   pomagaj.
        Marko.NOM is said Peter.DAT that him.DAT help.IMP.2SG
        'Marko said to Peter that you [=*the actual addressee*] should help him.'

(17)   Ku salam-i   inho-eykey [swuni-lul   towacwu-la]-ko malhayss-ta.
        that person-NOM inho-DAT   [swuni-ACC help-IMP]-COMP said-DC
        'He told Inho that Inho [=*the addressee in the reported context*] should help Swuni.'

                                                                    (Pak et al., 2008, 170)

Provided with a suitable mechanism at the syntax-semantics interface that regulates the language specific restrictions on the embedded imperative subject, object-based truthmaker semantics can conceive of the reported utterance as one that is intended to bring into existence a modal product whose content is characterized by [*you open the door*] just as well as one that is characterized by [*(s)he opens the door*] (where *(s)he* stands for the individual the reported speech act was addressed to). In contrast, the data appear to present a challenge for accounts that tie imperatives more closely to participant related aspects of the contextual representations like ToDo-lists (Portner, 2007). My own account in terms of modalized propositions (Schwager, 2006; Kaufmann, 2012) presupposes a suitable analysis of harmonic modality.

Overall, I take this brief investigation into the performance of object-based truthmaker semantics and its novel objects to show that the framework holds a lot of promise for an analysis of prioritzing modality in natural language. I would be excited to see it pushed into some of the areas I discussed as potentially problematic or simply as posing open questions.

To do full justice to the framework, a full-fledged model specifying the relevant domain of objects

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to are amply attested on the internet and strike me as possibly problematic for the framework.

[12]Moltmann calls harmonic modals themselves 'performative', which is slightly at odds with the common (and rather loose) understanding of performative modals as used to change what is permissible in the actual context. For harmonic modals of prioritizing flavor, the extension makes sense, as their use in the reported context replicates the performative effects observed in the matrix case. The implied extension to epistemic modals is more surprising. The distinctions are intuitively related to Hacquard (2006) notion of event-dependent modality: modals anchored to the utterance event in her account can be taken to correspond to modals anchored to the events associated with illocutionary or attitudinal acts (or states) that are being described in object-based truthmaker semantics.

as well as the relevant entailment relation(s) might be desireable. As it stands, the target paper fails to point to (or provide) a systematic and explicit specification of the domain of events, attitudinal and modal objects and the relations assumed to hold between these inhabitants, oftentimes, the discussion remains at the level of what are taken to be intuitively graspable and linguistically motivated assumptions. Zimmermann (2000) points out that the role of the *model space* (that is, the existence of alternative models) as resulting from any explicit specification of a model is doubtful in its applicability to natural language semantic interpretation. Yet, a more tightly formalized specification of the enriched ontology may be needed to ensure everyone is on the same page as to what properties the working linguist or philosopher is ascribing to the illocutionary act, the illocutionary product, and the modal products associated with an utterance, as well as these objects' relations to each other. The merit of model space as reflecting the inevitable uncertainty but hence also the commitments of the working researcher is exactly the role Zimmermann (2000) accepts for it.

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