Trouble with Attitudes and the Future

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1. Introduction

This paper investigates existing proposals for the apparent correlation between modal flavour and temporal orientation, through the lens of attitude verbs. Work thus far has focussed on modal auxiliaries, but attitude verbs with modal-quantificational analyses can shed new light on understanding the temporal orientation of modals elements. Landau (2000) notes that complements of partial control attitude verbs are interpreted as non-simultaneous with the evaluation time of the attitude verb itself. These partial control attitude verbs can either back-shift or future-shift their complements. In this paper, I focus on future-shifters, which allow their morphologically non-future complements to be interpreted as holding at a future time. Both *hope* and *want* are examples of future-shifters.

(1) a. Aakash hopes to win the championship.
     b. Aakash hopes he wins the championship.
     c. Sam wants to defeat the dragon.

In the above examples, the winning of the championship or the defeating of the dragon take place after the hoping and wanting respectively, despite the lack future morphology in the complements. As examples (1a) and (1b) show, these future-shifted complements may be finite or non-finite. Due to some syntactc restriction, English *want* happens to not allow finite complements. These future-shifted complements are true futures, not planned futurates like the one below.

(2) The next Haverhill train leaves at 6:43 tomorrow.

Following Copley (2002) and references therein, a futurate makes a present tense claim about the existence of a plan or schedule. As such, predicates that are not plannable or controllable are unsuitable as futurates.

(3) a. * Aakash wins the championship tomorrow.
     b. * Sam defeats the dragon tomorrow.

Since defeating dragons is a tricky business and society frowns upon fixing matches, they are considered unplannable, and thus neither predicate in (3) is suitable as a futurate. But the same predicates are felicitous under *hope* and *want* as in (1), indicating that they are true futures rather than planned futurates.

In this paper, I will evaluate and reflect on a proposal, according to which the temporal orientation of a modal element is predictable from its modal base. The temporal orientation of a modal element is the time at which its complement is evaluated. The temporal perspective of a modal element is the time at which the modal claim itself is evaluated. This terminology is taken from Condoravdi (2002).

I will call the proposal that future-shifting ability is predictable from the modal base of a verb the Temporal Orientation from Modal Base (TOMB) generalisation. In applying this proposal to *hope*, *want*, and the Dutch verb *denken* 'think', we will see that one half of the generalisation fails to hold.

Thus, I argue that TOMB should be buried (or rather modified).[1] I discuss suitable modifications to the generalisation that retain the desirable predictions about modal auxiliaries without making incorrect predictions about temporal orientation of attitude verbs. While the link between partial control predicates and temporal shifters in undoubtedly robust as illustrated by Pearson (2016), it remains for future research to determine the exact source of these temporal shifts in the complements of attitude verbs.

The remainder of this paper is organised as follows. In section 2, I discuss the temporal interpretation of non-finite complements. Section 3 sets up the arguments for the Temporal Orientation from Modal Base generalisation. Sections 4, 5, and 6, illustrates the evidence against the generalisation from *hope*, *want*, and *denken* respectively. Section 7 discusses the implications of data discussed and ways to retain useful insights from the generalisation while avoiding extraneous predictions. Section 8 concludes with a summary of the state of affairs, and a discussion of the next steps to be taken in the search for futurity.

2. The temporal interpretation of non-finite clauses

Since all three verbs considered in this paper can take non-finite complements, the first task at hand it to determine what temporal interpretation of non-finite clauses should be. Abusch (2004) investigates specifically the non-finite complements of raising-to-passive verbs. There are two types: those that future-shift, which Abusch calls F-verbs after *forecast*, and those that do not, which Abusch calls B-verbs after *believe*.

(4) a. Paul is believed to be in the lead (*tomorrow). [B-verb]
     b. Paul is expected to be in the lead (tomorrow). [F-verb]

The complement of a B-verb is evaluated as holding at the same time as the verb itself. Thus, using the temporal adverbial *tomorrow* is ungrammatical with the B-verb *believe*, as in (4a). Conversely, the complement of an F-verb is evaluated as holding at a time after the matrix verb, and thus *tomorrow* is permissible in the complement of *expect*, as in (4b). A list of the two kinds of verbs is given below.

Table 1: Raising-to-passive verbs from Abusch (2004:3)

B-verbs	F-verbs
asserted	anticipated
believed	expected
claimed	forecast
confessed	intended
known	meant
reported	planned
said	predicted
thought	projected

The complements of B-verbs hold at the evaluation time of the B-verb, but the complements of F-verbs have a more variable temporal interpretation. While they can be future-shifted, not all F-verbs require this. Some F-verbs like *predict* optionally have future-shifted complements, but can be interpreted with simultaneous complements as well. Certain other F-verbs like *promise*, however, only allow future-shifted complements.

(5) a.   Tim is predicted to be in Toronto both now and next week.
     b. * Tim promises to be in Toronto both now and next week.

Given this range of data, the temporal interpretation of non-finite clauses must be compatible with its two uses. When used with a B-verb, it must have a relative present meaning, being evaluated at the same time as the verb. When used with an F-verb, it must be shiftable, so that it can (but need not) be interpreted at a time later than the verb.

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[1] Extra thanks to Sabine Iatridou for suggesting this pun.

In order to capture this variability, there are two possible analyses we could adopt about the meaning of non-finite complements:

I. All non-finite clauses have the meaning of a relative present (Ogihara, 1996).

II. Some non-finite clauses have a morphologically null future in them (Wurmbrand, 2006).

If the first option is chosen, then all non-finite clauses will be interpreted as occurring at the time that their embedding verb passes down to them. F-verbs would need to involve future-shifting semantics in their lexical entries, or select for a future operator which in turn would select for a non-finite complement. If the second option is chosen, then selectional restrictions will be needed in the lexical entries for the verbs. F-verbs are allowed to select future-shifted infinitival complements, while B-verbs are not. The two options correspond to locating the futurity in the attitude verb, or in the complement.

Following Katz (2001), I take it to be ideal if all non-finite clauses have a uniform interpretation in all contexts, and that attitude verbs combine with their complements in a uniform manner in all cases. So I will adopt option I, and assume that non-finite complements have a relative present meaning. Furthermore, the distinction between B-verbs and F-verbs will be located in their lexical semantics, not the selection of a future operator that would mediate the relationship between the verb and the complement. In this way, difference between B-verbs and F-verbs is reduced to some (hopefully predictable) property that manifests as a difference in lexical semantics. The future-shifting ability of F-verbs, and the lack of shifting ability of B-verbs, should arise from the semantics of the verbs themselves.

Now that we have established the temporal interpretation of non-finite clauses as relative presents, we can turn to determining the source of future-shifts in F-verbs. In the next section, we will consider the arguments that the temporal orientation of a modal element (i.e. whether or not it future-shifts its complement) is predictable from the modal base it quantifies over.

3. Modal flavour and futurity

The analysis from Abusch (2004) seems to get the facts right, but is descriptive, rather than explanatory. Given an attitude verb, we cannot predict whether it will future-shift its complement or not. However, the B-verbs do share one particular property which Werner (2006), Lekakou & Nilsen (2008), an Klecha (2016), among others, want to link to their inability to future-shift: they involve non-root modality. Following a long-standing tradition, modality is partitioned into two types: root and non-root. Root modals quantify over circumstantial modal bases, with ordering sources that distinguish between deontic and metaphysical uses. Non-root modals quantify over doxastic modal bases, with ordering sources distinguishing between doxastic and epistemic uses. As per Klecha (2016), an epistemic modal quantifies over a restricted doxastic modal base, which consists of worlds that are compatible with the attitude holders true beliefs. Thus the ordering source ranks highest those worlds compatible with true beliefs. Modal auxiliaries in English are unspecified as to what kind of modal base they take - this is contextually determined (Kratzer, 2012). However, we see a correlation with temporal orientation and modal flavour. Consider the examples below.

(6)   a. Renuka must have won the game yesterday (non-root, epistemic).
      b. Renuka must win the game tomorrow (root, deontic).

The epistemic use of *must* in (6a) is licensed by a *have*-perfect, which causes it to have a past orientation. Conversely, the absence of the perfect signals a non-past orientation, and a deontic use of *must* as in (6b).[2] This correlation between modal flavour and temporality is not limited to English, but seems cross-

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[2]   Constructions like the one below might appear to be deontic modals with a past orientation, but they are not.

(1)   You should have done the dishes yesterday.

As per Condoravdi (2002), this is a modal with a past perspective and future orientation. The obligation held at a past time, but the doing of the dishes was to take place after the time the obligation held. Thus this means *You had an obligation until the end of yesterday to do the dishes yesterday.*

linguistically robust. Bengali *hɔbe* and Modern Greek *prepi* also can be epistemic when past or present, but are necessarily deontic when they have a complement that is interpreted in the future.

(7) Bengali

  a. *(oke)   jete   hɔbe*
    (3SG.DAT) leave.INF happen.FUT

    ✓S/he is obliged to leave.
    *It follows from evidence that s/he will leave.

  b. *(o)   gɛche   hɔbe*
    (3SG) leave.PFV.PRES happen.FUT

    ✓It follows from evidence that s/he left.
    *S/he was obliged to leave.

In Bengali, the infinitive embedded under a verb is interpreted as future-shifted. Thus in (7a), the modal element is interpreted as deontic, complying with the generalisation that epistemic modals are incompatible with future orientation. The present perfective is used in Bengali in place of the past.[3] The past orientation of the modal in (7b) is incompatible with a deontic reading, and thus it is only has the epistemic use. Greek patterns similarly.

(8) Greek (Lekakou & Nilsen, 2008:4)

  a. *prepi na fevji*
    must SUBJ leave.3SG.IMPF.NONPAST

    ✓It follows from evidence that he is leaving/leaves habitually
    ✓He is obliged to leave.

  b. *prepi na fiji*
    must SUBJ leave.3SG.PFV.NONPAST

    ✓He is obliged to leave.
    *It follows from evidence that he will leave.

In Greek, the imperfective aspect is used for both progressives and habituals. The use of *prepi* in (8a) is compatible with both epistemic and deontic uses, since the non-past tense is compatible with a future-oriented deontic or a present-oriented epistemic. On the other hand, a perfective non-past under the subjunctive marker *na* is obligatorily interpreted as a future, and so is only compatible with a deontic interpretation of *prepi* as in (8b). Thus it seems to be the case that non-root modals have a past or present orientation, while root modals have a future orientation. Both Lekakou & Nilsen (2008) and Werner (2006) pursue distinct lines of reasoning that lead them to the same conclusions for why this must be the case. Their work arguing that root modals have a future orientation and non-root modals have a non-future orientation is summarised in the subsequent sections.

Certain assumptions are common to both works, and thus are summarised briefly before considering each account individually. The structure of modal bases is assumed by both Werner and Lekakou and Nilsen to consist not of worlds, but of sets of worlds called courses of history. A course of history consists of all the worlds which agree with each other up to t_p (the temporal perspective of the modal), and then diverge thereafter. They further assume that a circumstantial modal base is totally realistic, meaning that it consists only of worlds in which all the circumstances agree with the circumstances in the real world up to t_p. Thus, a circumstantial modal base consists of only one course of history that is totally realistic. Beyond t_p, the worlds in the course of history may diverge as to whether a proposition holds or not, but before and at t_p, they all agree.

3.1. Werner's reasoning

Werner (2006) proposes two principles that govern the temporal orientation of modals. The first is an extension of the Diversity condition, as proposed by Condoravdi (2002). Condoravdi proposes this

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[3] The simple past is generally interpreted as an immediate past, and the perfective present a past unspecified for how far back the eventuality occurred.

condition to apply only to existential non-root modals (she considers metaphysical and epistemic to both be non-root), but both Werner extends this to all modal forces of all flavours, renaming it the Disparity principle.

(9)   Disparity principle (adapted from Werner, 2006:240)
      The modal base for a modal that embeds a clause φ must contain worlds where φ is true, as well as worlds where φ is false.[4]

The second is called the Non-disparity principle.

(10)   Non-disparity principle (Werner, 2006:248)
       A proposition must make no distinction between speech-time branching worlds.

The Non-disparity principle seems to simply say "when making modal claims with a present perspective, do not talk about the future". This is because Werner (2006) adopts a branching futures model of worlds in the form of courses of history. Any modal claim made about the future with a temporal perspective of utterance time will be making a distinction between speech-time branching worlds, and thus disobey the Non-disparity condition.

When making a non-root modal claim, it is possible to satisfy both Disparity and Non-disparity. Disparity can be satisfied regardless of the temporal orientation of the modal, but Non-disparity will require the modal claim to be about the past or the present. Thus, Werner (2006) argues that non-root modal claims cannot be future-oriented.

When making a root modal claim, the two principles run afoul of one another. Since Werner (2006) assumes the modal base for a root modal is totally realistic and circumstantial, there is only one single course of history in the modal base, as noted earlier. This one course of history agrees with the utterance world about the truth and falsity of every proposition up to t_p, the temporal perspective of the modal. Disparity wants a claim to be made about the future, since the modal base is not disparate with respect to any proposition before t_p. However, Non-disparity wants a claim to be made about the past or present. Werner (2006) proposes that in case of conflict, Disparity wins out over Non-disparity. Thus a root modal claim will always be future-oriented in order to satisfy Disparity, at the cost of violating Non-disparity.

Together, Werner's Disparity and Non-disparity principles predict that root modals will be future-oriented to satisfy Disparity, and non-root modals will be past or present-oriented to satisfy both principles.

3.2. Lekakou and Nilsen's reasoning

Lekakou & Nilsen (2008) do not propose any special principles to predict the temporal orientation of modals. Rather, they rely on assumptions about the structure of the modal base itself to derive the predictions. In addition to the common assumptions shared with Werner (2006), (that modal bases consist of courses of history and circumstantial modal bases are totally realistic), they also assume that ordering sources can only target the highest level element within an ordering source. Since a circumstantial modal base has a single course of history in it, the ordering source can target individual worlds. However an epistemic modal has multiple courses of history in it, and thus ordering sources can only rank entire courses of history, not the individual worlds in them.

While Lekakou & Nilsen (2008) cite Condoravdi (2002) for the Diversity condition, they apply the condition to modals of all strengths and flavours, so what they actually use is Werner's (2006) Disparity principle, repeated below.

(11)   Disparity principle (adapted from Werner, 2006:240)
       The modal base for a modal that embeds a clause φ must contain worlds where φ is true, as well as worlds where φ is false.

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[4] This principle requires a non-empty ordering source for epistemic *must*, which contra von Fintel and Gillies (2010) makes *must* a weak modal. See their work for an alternative analysis of *must*.

When making a root modal claim, the modal base is circumstantial and totally realistic, thus it consists only of one course of history. This course of history contains all the worlds that agree with one another up to t_p, and diverge thereafter. Suppose we attempt to make a root modal claim with a present past tense complement: *it is obligatory that q*. In this case t_p is utterance time, and thus the modal base consists of a course of history where every world agrees on the truth or falsity of every proposition evaluated at a time up to and including now. But since q is such a proposition, its truth or falsity is already settled by the circumstantial modal base, and thus such an utterance would not satisfy Disparity. Thus root modal claims must have a future orientation in order to satisfy Disparity.

With non-root modal claims, the reasoning proceeds as follows. Suppose we want to make the future-oriented epistemic claim *must q*, where q is a future eventuality. The modal base consists of courses of history compatible with our knowledge up to utterance time. There are two possibilities: either our current evidence entails q or it does not. If our current evidence entails q, then this means every world in every course of history in our modal base is such that q occurs in that world. But then Disparity will not be satisfied. If our current evidence does not entail q, Lekakou & Nilsen (2008) argue this means there must be at least one world in each course of history such that q does not occur in that world. Since ordering sources can only rank courses of history in an epistemic modal base, even the most stereotypical courses of history will each contain a world where q does not happen. But then, the universal claim is not true, since it is not the case that q occurs in every best world compatible with our evidence. Thus, a universal force epistemic modal claim about the future either does not satisfy Disparity, or is simply false. Hence, epistemic modals cannot be future-oriented.

3.3. Futurity from the modal base

Although Werner (2006) and Lekakou & Nilsen (2008) use different lines of reasoning, they both arrive at the same conclusion. I name this result the Temporal Orientation from Modal Base generalisation.

(12)   Temporal Orientation from Modal Base (TOMB) generalisation

    i.   Universal force non-root modals cannot be future-oriented.

    ii.   Root modals must be future-oriented.

Werner (2006) derives (i.) from the Non-disparity principle, while Lekakou & Nilsen (2008) derive it from assumptions about the structure of the modal base. (ii.) is derived from the Disparity principle by both Werner (2006) and Lekakou & Nilsen (2008).

The generalisation as stated above was built on reasoning about modal auxiliaries. However, since attitude verbs are often given a modal-quantificational analysis, it stands to reason that some attitude verbs would have a past orientation, and some would have a future orientation, depending on the flavour of modality involved. Klecha (2016) adopts this position and concludes that whether an attitude verb can future-shift its complement dependent directly on what kind of modal base it quantifies over and the force of the quantifier involved. Thus, the Temporal Orientation from Modal Base generalisation can be used to predict which attitude verbs are future-shifters.

It is through the lens of attitude verbs that I will evaluate the Temporal Orientation from Modal Base generalisation. I will show that the predictions made are not correct, and thus argue that the generalisation needs to be weakened.

4. Hope
4.1. The meaning of hope

Klecha (2016) shows that *hope* is a future-shifter. As noted in the first example, this verb can take either a finite or non-finite complement, both with the same future-shifting effect.

(13)   a.   Yena hopes to win the bout.

    b.   Yena hopes she wins the bout.

This future-shifting is however, not obligatory. It is possible to have a present tense or even past tense complement of hope.

(14) a. I hope Yena is winning the bout (right now).

  b. I hope Yena won the bout (that just ended).

As per the generalisation motivated in the previous section, the temporal orientation of an attitude report depends on its modal base. If *hope* is to have a variable temporal orientation, it must also have a variable modal base.

Klecha (2016) provides a semantics like the following:

(15) ⟦a hopes that q⟧ is defined iff B_c satisfies Disparity with respect to q.
  If defined it is true just in case $\forall w' \in bou_{a,w}(B_c), q(w', t_B) = 1$.

  where B_c is a contextually determined modal base, and $bou_{a,w}$ is a bouletic ordering source (i.e. based on the agent's preferences).

Since the quantification is universal, both parts of the Temporal Orientation from Modal Base generalisation will apply (recall that one half refers only to universal strength modals). The generalisation predicts that when B_c is a doxastic modal base, $t_B \preceq t*$, and no future-shift can occur. When B_c is a circumstantial modal base, $t_B \succ t*$, and there is a future-shift.[5]

4.2. The trouble with hope

The trouble with *hope* is that we have independent reasons to believe that it future-shifts even when it does not take a circumstantial modal base. The lexical semantics assigned to *hope* by Klecha (2016) in conjunction with the TOMB generalisation mean that *hope* should be an optional future-shifter, depending on the modal base being quantified over. In order to highlight the problems with the TOMB generalisation, we will first establish that *hope* obligatorily future-shifts its non-finite complements. Once this is established, we will then consider an example where the complement of *hope* is non-finite, and thus future-shifted, but the modal base cannot be circumstantial as TOMB says must be the case.

As noted in the introduction, finite complements of *hope* can have either a simultaneous or future-shifted interpretation.

(16) I hope you're hungry (now/tomorrow).

Recall that as per the analysis from Ogihara (1996), non-finite clauses behave like relative presents, and so should show the same distribution as statives. But this is not the case. A non-finite complement of *hope* can never be interpreted simultaneously.

(17) I hope to live here (*and so I do ⟨live here⟩).

Rephrased in Abusch's terms, *hope* seems to be an optional F-verb with finite complements, but an obligatory F-verb with non-finite ones. So we have established that non-finite complements of *hope* are always future-shifted.

Now, let us consider a situation where we have a future-shifted non-finite complement of *hope*, but the modal base is necessarily not circumstantial. Suppose that an evil Queen has organised a fencing competition, and unbeknownst to the competitors, she will execute the winner (so she can be the best swordsperson in the land). Yena is a competitor, but is unaware of the fatal consequence of victory. She is led to believe winning will bring her fame and fortune. It might then be felicitous to report the following.[6]

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[5] I use $\preceq$ to mean 'earlier than or at' and $\succ$ to mean 'later than'. The exact ontology of time is unimportant here, but for concreteness, we can assume that the precedence relation is defined on intervals, and $t*$ is the interval of speech time.

[6] Thanks to Milo Phillips-Brown, p.c. for the idea behind this example.

(18)   Yena hopes to win the competition.

The complement of *hope* in (18) is certainly future-shifted. Not only is it non-finite, which we established obligatorily future-shifts in the complement of *hope*, but the complement also refers to the outcome of a competition that has not yet taken place. It seems that (18) is a felicitous future-shifted thing to say, especially since Yena does not know the consequence of winning.

Yet if we attribute the future-shift to a circumstantial modal base, we run into trouble. The relevant circumstances at play here are the Queen's commands, since her word is law. Thus, the course of history in a circumstantial modal base will be one in which every world is compliant with the Queen's laws. If this is ordered according to Yena's preferences, the worlds in which she lives will outrank those in which she dies, despite her ignorance about the circumstances. But then in Yena's most desirable circumstantial worlds, she lives, and hence she loses the competition. So (18) should be false if we are quantifying over a circumstantial modal base. Since, (18) is both felicitous and true, we must be quantifying over a doxastic modal base. The modal base that is relevant here is that made up worlds compliant with Yena's beliefs. Her ignorance about the circumstances mean that the consequences of victory do not factor into Yena's desires, which is why (18) is not false.

The data from *hope* provides several challenges and counterexamples to the TOMB generalisation. The temporal orientation of *hope* is dependent on whether its complement is finite or not, which is not predicted if the only thing that should affect the future-shifting abilities of an attitude report is the modal base it quantifies over. Moreover, even when obligatorily future-shifting its non-finite complements, *hope* cannot be taking a circumstantial modal base, as was shown in this section. This is exactly contra the prediction from the TOMB generalisation, that a future orientation is only possible with a circumstantial modal base.

5. Want
5.1. The meaning of want

The verb *want* can also future-shifts its complement. Example (1c) is repeated below.

(19)   Sam wants to defeat the dragon.

Analyses for *want* come in three flavours as per Rubinstein (2017): comparative (Heim, 1992), modal-quantificational (von Fintel, 1999), and utilitarian (Lassiter, 2011). Since the TOMB generalisation makes predictions about modals, I will adopt the modal-quantificational analysis. A basic version based on von Fintel (1999) is given below.

(20)   ⟦a wants q⟧ is defined iff $\text{DOX}_{a,w}$ satisfies Disparity with respect to q.
       If defined it is true just in case $\forall w' \in bou_{a,w}(\text{DOX}_{a,w}), q(w', t) = 1$.

       where $\text{DOX}_{a,w}$ is the doxastic alternatives of the agent in w, $bou_{a,w}$ is a bouletic ordering source, and $t \succ t*$.

So *want* has a bouletic ordering source ($bou_{a,w}$), and doxastic modal base. However there are two issues with this meaning for *want*. The first is that it is incompatible with the TOMB generalisation. The modal base in the semantics in (20) is doxastic, and thus the temporal orientation should be past or present. But we see from (19) that *want* can have a future orientation, and indeed this was built into the lexical semantics with the clause $t \succ t*$, in violation of the generalisation. In addition to this problem, Villalta (2008) notes that simply having a doxastic modal base is problematic because it allows for invalid inferences, as shown below.

(21)   Invalid doxastic inference from Villalta (2008:478)
       a. I want to teach Tuesdays and Thursdays next semester.
       b. I believe that I will teach Tuesdays and Thursdays next semester only if I work hard now.
       c. Invalid inference: therefore I want to work hard now.

The inference fails because there are worlds outside the speaker's doxastic alternatives in which they teach Tuesdays and Thursdays next semester, despite not working hard. These worlds must play a role in the speaker's wants. Otherwise, *want* would be purely doxastic and the inference above should be valid. The solution is then to allow the modal base to vary, and not be just doxastic. A revised attempt at a modal-quantification meaning for *want*, based on von Fintel (1999), while taking into account the argument from Villalta (2008) that a variable modal base is necessary to prevent incorrect inferences is given below.

(22) $[\![$a wants q$]\!]$ is defined iff $\text{DOX}_{a,w} \cap B_c$ satisfies Disparity with respect to q.
       If defined it is true just in case $\forall w' \in bou_{a,w}(B_c), q(w', t_B) = 1$.

   where $\text{DOX}_{a,w}$ is the doxastic alternatives of the agent in w, B_c is a contextually determined modal base, and $bou_{a,w}$ is a bouletic ordering source.

The TOMB generalisation predicts that as with *hope*, when B_c is a doxastic modal base, $t_B \preceq t*$, and no future-shift can occur. When B_c is a circumstantial modal base, $t_B \succ t*$, and there should be a future-shift. Thus, we predict *want* to be an optional future-shifter like *hope*.

5.2. The trouble with want

The trouble with *want* is that adopting the TOMB generalisation will lead us to a contradiction. The generalisation was based on Werner's (2006) Disparity principle. However we will see that if TOMB is used to predict the modal base of *want* in certain constructions, it requires that Disparity be violated. In order to show this, we will first establish the existence of cases where *want* does not future-shift, but has a simultaneous complement. The TOMB generalisation predicts that we must have a non-root modal base in these cases. I will argue that a non-root modal base in these constructions cannot possibly satisfy Disparity, thereby leading to a contradiction: That the Disparity principle be inviolable is necessary to derive the TOMB generalisation; but if the generalisation is true, the Disparity principle cannot always be satisfied.

Let us begin by establishing the cases where *want* does not future-shift its complement. While example (1c) in the introduction had a future-shifted non-finite complement of *want*, it turns out that there are cases where the complements are not future-shifted.

(23)   Bolivia examples from Iatridou (2000:243)
       a.   I live in Bolivia because I want to ⟨live in Bolivia⟩.
       b.   I have what I want ⟨to have⟩.

The Bolivia examples from Iatridou (2000) in (23) show that *want* does not obligatorily shift its complements, since the matrix clauses establish that the complement of *want* is true at speech time. It is not only constructions with ellipsis that show this behaviour; small clause complements of *want* can also be simultaneous.

(24)   I want the flowers just as they are.   (Keir Moulton, p.c.)

Now that we have established that *want* does not necessarily have a future orientation, let us consider what the TOMB generalisation tells us about the modal base at play. At first, the variable temporal orientation of *want* seems like a good sign for the Temporal Orientation from Modal Base generalisation, since we have adopted a meaning for *want* with a variable modal base. We should predict optional, not obligatory future-shifting. However, when we look closer at the analysis of simultaneous complements of *want* that the TOMB generalisation forces us to adopt, we find a contradiction.

Since the source of futurity is tied to the choice of modal base, the only way to have a present-oriented universal force modal is for it to be non-root (i.e. doxastic). Let us consider example (23a) more closely. The matrix portion of (23a) asserts that the speaker lives in Bolivia. If this is an established fact, then this means that the evidence available to the speaker entails that they live in Bolivia. So, the proposition that

the speaker lives in Bolivia is true in all the worlds that are doxastically accessible to them.[7] Thus the speaker's set of doxastic alternatives is not disparate with respect to the proposition *I live in Bolivia*, since every world verifies it. The complement of *want* is *PRO to live in Bolivia*, which, given the temporal interpretation of non-finite clauses as relative presents and subject control from the external argument of *want*, means the same thing as the proposition: *I live in Bolivia*. Now we have a contradiction. If *want* is a modal quantifier, its modal base must satisfy the Disparity principle for felicitous use, and we have just shown that in this example, if TOMB is correct, the doxastic modal base cannot satisfy the Disparity principle.

In this section, I outlined the challenges that *want* poses to the Temporal Orientation from Modal Base generalisation. We established that complements of *want* could be simultaneous in certain constructions. The TOMB generalisation then predicted that the modal base being quantified over must be non-root. However, a non-root modal base in these constructions does not satisfy the Disparity principle, which is a foundation of the TOMB generalisation itself. Thus applying the generalisation to simultaneous complements of *want* leads to a contradiction.

6. Denken

6.1. The meaning of denken

The Dutch verb *denken* 'to think' has a similar distribution as the English verb *think* with finite complements. The verb is either past or present-oriented in this usage.

(25) Dutch (Loes Koring, p.c.)

  a. *Ik denk dat ze (nu)   thuis is.*
    I think that she (now) home is.

    I think that she is home (now).

  b. *Ik denk dat ze gister   de wedstrijd gewonnen heeft.*
    I think that she yesterday the match   won   has.

    I think that she she won the match yesterday.

Unlike the English verb *think*, which does not tolerate non-finite complements, *denken* does.

(26) a. * I think to win the match.

  b. *Ik denk de wedstrijd (wel) te winnen (ja).*
    I think the match   (AFF) to win   (yes).

    I think I'm winning the match, (yes).   (Loes Koring, p.c.)

Given that following Ogihara (1996) we assumed that non-finite clauses had the interpretation of a relative present, we would expect that *denken* with a non-finite complement should be able to have a present orientation, and this is exactly what we see in (26b). This data is in line with an analysis of *denken* as a universal quantifier over a doxastic modal base. Since the modal is non-root, its orientation is either past or present. An example of the meaning of *denken* is given below.

(27) ⟦a denkt q⟧ is defined iff $\text{DOX}_{a,w}$ satisfies Disparity with respect to q.
    If defined it is true just in case $\forall w' \in ster_w(\text{DOX}_{a,w}), q(w', t) = 1$.

  where $\text{DOX}_{a,w}$ is the doxastic alternatives of the agent in w, and $ster_w$ is a stereotypical ordering source (i.e. based on likelihood in the real world).

Since the modal base is doxastic, t in the definition above will be such that $t \preceq t*$.

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[7] Note that the matrix portion of example (23a) either does not involve a modal claim or involves strong necessity (i.e. no ordering source). The speaker does not assert that they believe they live in Bolivia. So even if we assume following Alonso-Ovalle & Menéndez-Benito (2010) that every assertion involves a covert modal assertion operator, this operator is a strong necessity modal, with no ordering source. Thus, the prejacent of such a covert modal is true in all the speaker's doxastically accessible worlds, not just the best ones.

6.2. The trouble with denken

The trouble with *denken* is much like the trouble with *hope*, but more straightforward. We have already established that *denken* involves non-root modality. The Temporal Orientaiton from Modal Base generalisation then predicts that the temporal orientation of *denken* should be past or present only. The trouble is that despite this, *denken* can be future-oriented with a non-finite complement.

(28) Dutch (Loes Koring, p.c.)
     Ik denk die wedstrijd morgen (wel) te winnen (ja).
     I think that match   tomorrow (AFF) to win   (yes).
     I think I will win the match tomorrow (yes).

In Dutch, it is possible to use a non-finite complement of *denken* have the complement be interpreted as occurring in the future, as we see in example (28).[8] This also serves as a direct counterexample to the TOMB generalisation, since we see non-root modality having a future orientation.

7. Discussion

In the three preceding sections, we have considered evidence from the attitude verbs *hope*, *want*, and *denken* that contradict the Temporal Orientation from Modal Base generalisation. It seems quite clear that the TOMB generalisation is incorrect, at least in its extension to attitude verbs. However, if we reject the generalisation altogether, we lose any accounts for the temporal orientation of epistemic necessity, which it was originally meant to capture. Both Werner (2006) and Lekakou & Nilsen (2008) based their arguments on modal auxiliaries, and aimed to capture their temporal orientation. In particular, it was a puzzle why epistemic necessity appeared to cross-linguistically be past or present-oriented, but never future-oriented. In this section, I will consider which parts of the TOMB generalisation failed, and consider where the arguments put forth by Lekakou & Nilsen (2008) and Werner (2006) went wrong. With a better understanding of the issues, we can then turn to suitably modifying their arguments so as to retain as much of the generalisation as possible without making the incorrect predictions about attitude reports.

7.1. Accounting for want

In the case of *want*, the presence of a doxastic modal base and a simultaneous complement lead to a violation of the Disparity principle (Werner, 2006). In particular, we found a modal base for *want* which, according to the TOMB generalisation was doxastic, but was not disparate with respect to its complement. Of the challenges presented by the three attitude verbs considered, this is perhaps the easiest one to mitigate. There are two possible ways to develop a meaning for *want* that avoid a contradiction with the Temporal Orientation from Modal Base generalisation.

The first option is to use a semantics for *want* that is not modal-quantificational. Consider the example below.

(29) Sam wants to defeat the dragon.

Rubinstein (2017) notes that other than the modal-quantificational analysis of *want* used here, two other analyses exist. One is the comparative analysis developed by Heim (1992), which under certain assumptions may not be equivalent to the modal-quantificational analysis. In brief, a comparative semantics for *want* says that (29) means that to Sam, defeating the dragon is preferable to some salient set of alternative outcomes. The other analysis is a utilitarian one, developed by Lassiter (2011). This analysis says that (29) means Sam is acting in such a way so as to bring about the outcome of defeating the dragon. Since neither of these two analyses is modal-quantificational, the Temporal Orientation from Modal Base generalisation should not apply to them. Thus by adopting an alternative semantics, the behaviour of

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[8] I am told that the absence of the affirmative particles *wel* and *ja* makes this sentence more marginal, but still not ungrammatical. I am uncertain why this may be the case, and have no account for this.

want can be taken out of the purview of the Temporal Orientation from Modal Base generalisation. The contradiction with the Disparity principle does not arise, since *want* is not a modal quantifier.

The second option allows us to retain a modal-quanfiticational semantics for *want* without running into a contradiction with the Disparity principle. Recall that we argued in the problematic Bolivia examples, *want* did not future-shift its complement. Example (23a) is repeated below.

(30)   I live in Bolivia because I want to ⟨live in Bolivia⟩.

This line of reasoning argues that the complement of *want* in (30) is in fact future-shifted.[9] Following Altshuler & Schwarzschild (2013), statives and progressives have a property whereby if they hold at a moment, they hold of a superinterval about that moment. The predicate *live in Bolivia* is stative, and thus if it holds of a given moment m, it holds of an open interval t such that $m \in t$. The verb *want* in Bolivia examples could be quantifying over a circumstantial modal base, and thereby in compliance with TOMB be future-oriented. If the future-shift is infinitesimally small, the superinterval property of statives will give a simultaneity effect. So in example (30), the complement of *want* could be so near in the future that the superinterval property requires that in order to be in the state of living in Bolivia so near in the future, we must be living in Bolivia already. Under such an analysis, *I live in Bolivia because I want to* means something like *I live in Bolivia now because I want to live in Bolivia at some very near future time*. This shifts *want* from being affected by the first clause of TOMB (the one about non-root modality) to the second (the one about root modality). Whether the doxastic alternatives of the speaker are disparate with respect to the prejacent are irrelevant in this case, since the modal base is not doxastic, but circumstantial. Presumably, things could happen in the future such that the speaker no longer lives in Bolivia, and so a circumstantial modal base can satisfy the Disparity principle. Such an analysis however is somewhat intuitively displeasing because the complement of *want* in such Bolivia examples seem to be simultaneous as a result of their direct meaning, not as an entailment because of the nature of states.

In any case, even if the arguments against the Temporal Orientation from Modal Base generalisation from *want* are defeasible, the challenges put forth by *hope* and *denken* are much more direct and not so easily mitigated.

7.2. Modifying the generalisation

With both *hope* and *denken*, we had cases where the modal base shown to be doxastic for independent reasons, but contra the Temporal Orientation from Modal Base generalisation, the complement was still future-shifted. Recall the generalisation repeated below.

(31)   Temporal Orientation from Modal Base (TOMB) generalisation

     i.   Universal force non-root modals cannot be future-oriented.

     ii. Root modals must be future-oriented.

The challenge presented by *hope* and *denken* is that they directly contradict (i.) by having a universal force doxastic modal with a future orientation. Let us consider the arguments put forth by both Werner (2006) and Lekakou & Nilsen (2008) in defence of this part of the generalisation.

Werner posited the Non-disparity principle.

(32)   Non-disparity principle (Werner, 2006:248)
    A proposition must make no distinction between speech-time branching worlds.

The Non-disparity principle bans making modal claims about the future in an effort to capture the non-future orientation of epistemic necessity. Given the modal-quantificational analyses of attitude verbs, this must extend to attitude reports as well as modal auxiliaries. Given that this principle is both stipulatory and categorical, there is no way to salvage this without making incorrect predictions about attitude verbs. That is to say, there is no way to restrict this principle to apply only to modal auxiliaries and not attitude verbs, if both are to involve modal quantification. The evidence from *hope* and *denken* then

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9   Thanks to Rob Pasternak for the idea behind this analysis.

necessitates rejecting this principle, and thereby undermines the explanatory power of Werner's analysis for the temporal orientation of epistemic modal auxiliaries.

The account given by Lekakou & Nilsen (2008) can be suitably modified to exclude attitude verbs. First, let us go over their mechanism for predicting that universal force epistemic necessity cannot be future-oriented, before determining how to tailor this to apply only to modal auxiliaries and not attitude reports.

Lekakou & Nilsen (2008) assume that the structure of an epistemic modal base consists of all of the courses of history compatible with the speaker's evidence up to the temporal perspective of the modal. They claim that when attempting to make a universal force future-oriented epistemic claim, one of two things happens. Either the evidence entails the prejacent, which means it occurs in every course of history, or the evidence does not entail the prejacent, meaning there is one world in each course of history in which is does not happen. Thus, a future-oriented universal force epistemic claim either fails to satisfy the Disparity principle, or is simply not true.

This reasoning led to incorrect predictions about the temporal orientation of attitude reports because the inherent assumption about the structure of a modal base where there is epistemic uncertainty was wrong. It is possible for the evidence to not entail a future eventuality, without having at least one world in each course of history falsifying the prejacent. Suppose some eventuality p totally determines some future eventuality q. That is to say $p(t) \iff q(t')$, where $t \prec t'$. Suppose we are epistemically uncertain as to whether p has occurred. So our modal base consists of at least one course of history in which p happened, and at least one course of history in which p did not happen. But then the course of history in which p happened is one where q happens in every branching future, and the course of history in which p did not happen is one in which q does not happen in each branching future. So we have a situation where the evidence available does not entail q, yet the modal base consists of at least one course of history in which every branching future is such that q occurs in it. This shows that the assumptions made by Lekakou & Nilsen (2008) about the structure of the modal base were not correct.

Consider this concrete example of such a case. Suppose there is a string of dominoes stretching from the room we are in, into the next room and around a corner. We cannot see the start of the line of dominoes. Because this is a deterministic system, barring external intervention, we know that if the first domino is knocked over the last one in our room will eventually fall. We do not know how long the line of dominoes is, or whether the chain reaction has been started, so our epistemic state will consist of at least two courses of history: one where the first domino was left upright, in which every branching future has no chain reaction, and another where the first domino has been knocked over, and so the dominoes in our room will eventually fall.

Suppose we hear the characteristic click-clack of falling dominoes approaching, giving us evidence that the first domino was indeed knocked over. We cannot make the following strong epistemic necessity claim.

(33)   * The last domino must fall soon.

So how do we go about excluding the case described, wherein we are epistemically certain about a past eventuality, and the truth or falsity of said eventuality can totally determine a future eventuality? This setup is a problem for Lekakou & Nilsen (2008) because their theory of ordering sources predicts that it should be possible to rank the course of history where p happened higher than the others, and make the future-oriented modal claim *must q*. This can be fixed by assuming that epistemic *must* in English has no ordering source at all. Following von Fintel and Gillies (2010), who argue that epistemic *must* is a strong necessity modal, we can say that what makes *must* strong is the lack of an ordering source.

(34) $[\![\text{must}]\!]^c = \lambda q. \forall w \in B_c, q(w) = 1.$

The prejacent of *must* does not just have to be true in the best worlds in the modal base, but all of them. In order to allow this to work, the Disparity principle will need to be indexed to the presence of an ordering source, otherwise using epistemic *must* will violate it whenever it is used. Simply stated, we want the Disparity principle to say that if there are distinctions being drawn between possible worlds, the distinctions must be meaningful. An updated version of the Disparity principle that reflects this intuition is given below.

(35) Disparity principle (updated)
   If a modal M has an ordering source, then the modal base of M when embedding φ must contain worlds where φ is true, as well as worlds where φ is false.

With this appropriate modification, we effectively exempt strong epistemic necessity from the same set of requirements as other modal elements. This will allow to us to have non-root modals that are future-oriented, despite epistemic *must* not being future-oriented.

Recall that the issue with Lekakou and Nilsen's (2008) reasoning was that we might actually have a situation where the modal base had some courses of history where a eventuality happened in every future and others where it happened in none. By eliminating ordering sources from strong epistemic necessity claims, this problem is avoided. Unless every course of history is one in which the prejacent holds, the strong epistemic necessity claim will be false.

There are two possible cases when attempting to make a future-oriented strong epistemic necessity claim. Either our evidence entails a future eventuality, or it does not. In the case where it does not, we discovered that Lekakou and Nilsen's reasoning was not quite right, and modified the Disparity principle to allow us to retain their conclusion that a strong epistemic necessity claim is simply false. But having exempted ourselves from the Disparity principle when we have strong necessity, we face a problem when our evidence does entail a future eventuality. Recall that previously, this was ruled out because the Disparity principle was not satisfied. But with our modifications, Disparity no longer plays a role. The Disparity principle is indexed to the presence of an ordering source, and strong epistemic necessity has no ordering source. So we need a way to rule this case out. There are in principle two options. One option is to re-instate Werner's Non-disparity. Rather than have the two principles compete, they could be in complementary distribution. If there is an ordering source, Disparity holds; if there is no ordering source, Non-disparity holds. This is somewhat of a capitulation though, since it amounts to just stipulating that a future-oriented strong epistemic necessity is not possible, without attempting to derive this pattern from elsewhere in the grammar. The alternative is to invoke the idea of complementarity. Recall the futurate construction.

(36) The next Haverhill train leaves at 6:43 tomorrow.

As per Copley (2002), these constructions involve a covert scheduling modal.[10] But, as noted by Copley herself, these constructions are not always restricted to things that are strictly controllable. Things which are predictable with certainty are also permissible for many speakers.

(37) % The storm makes landfall tomorrow near Yarmouth.

We might then say that in those cases where the evidence entails a future eventuality, we use the futurate construction rather than a future-oriented strong epistemic necessity modal due to complementarity. Since the futurate construction is felicitous in a more specific case than strong epistemic necessity (i.e. just when we have a future orientation), it is used in place of strong epistemic necessity. Granted, this is somewhat informal and the mechanism for lexical complementarity requires much more explanation, but it is perhaps somewhat less stipulatory than a principle which simply bars referencing the future.

Regardless of which account for why strong epistemic necessity cannot have a future orientation, we now make the same set of predictions about the temporal orientations of modal elements.

(38) Temporal Orientation from Modal Base generalisation (updated)

   i. Strong non-root necessity modals cannot be future-oriented.

   ii. Root modals must be future-oriented.

Notice that the updated version of TOMB makes no reference to weak necessity modals. This version of TOMB will still predict that modals and attitude verbs with circumstantial modal bases will be future-oriented, as before, but it no longer makes any prediction about attitude verbs that quantify over doxastic

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[10] The exact implementation involves the existence of a 'director' with the capacity to bring about the proposition, who in all relevant worlds is committed to doing so. The details are not crucial in this case.

modal bases, since attitude verbs have non-trivial ordering sources, and are thus weak necessity modals if they are necessity modals at all.

Weak necessity modals are in theory compatible with a future orientation. Indeed, in English we can see this contrast between *must*, which is a strong necessity modal as per von Fintel and Gillies (2010), and *should*, which is a weak necessity modal.

(39)   a.   * The Haverhill train must arrive at Ballardvale at 19:35 (given it left North Station at 18:55).

        b.   The Haverhill train should arrive at Ballardvale at 19:35 (given it left North Station at 18:55).

This makes the prediction that if there were to be languages which lack strong necessity modals altogether, it should be possible to have future-oriented epistemic claims in those languages like with *should* in English. Preliminary data from Bulgarian and Austrian German suggests that these may be candidates for such a language.

(40)   Bulgarian (Vesela Simeonova, p.c.)

    tja trjabva da specheli turnira utre
    she must SUBJ win.3SG.PFV tournament.DEF tomorrow

    ✓The evidence is such that she will necessarily win the tournament tomorrow (given her training).
    ✓The is obligated to win the tournament tomorrow (in order to remain in first place).

(41)   Austrian German (Martina Wiltschko, p.c.)

    Sie muss das Spiel morgen gewinnen.
    she must the game tomorrow win.PCPL

    ✓The evidence is such that she will necessarily win the game tomorrow (given her training).
    ✓The is obligated to win the game tomorrow (in order to remain in first place).

The examples from Bulgarian and Austrian German suggest that the epistemic necessity modals in these languages are more like English *should* than English *must*, and thus can have a future orientation.

The updated version of the Temporal Orientation from Modal Base generalisation now no longer makes incorrect predictions. The first clause of the generalisation captures the fact that languages that have strong epistemic necessity modals like English, Bengali, and Greek cannot use them with a future orientation. The second clause of the generalisation is unchanged and thus still predicts that circumstantial modals should have a future orientation. But the cost of avoiding the incorrect predictions that the previous version of the generalisation made is that we no longer make any predictions about the temporal orientation of weak non-root modals at all.

8. Summary and next steps

In this paper, I considered two separate arguments defending the generalisation that the temporal orientation of a modal element could be predicted solely by the strength of the quantifier and the modal base involved. In considering data from *hope*, *want*, and Dutch *denken*, I argued that the generalisation overpredicted correlations. There are cases where the modal base and temporal orientation of a modal-quantificational attitude verb together run counter to the pattern predicted. Since the original purpose of the generalisation was to predict the temporal orientation of modal auxiliaries, I proposed and motivated suitable modifications to the generalisation that retained the desired predictions about modal auxiliaries, without making the erroneous predictions about attitude verbs. The cost of this modification was a loss of explanatory power about the temporal orientation of attitude verbs.

It is certainly not the case that any attitude verb can have any temporal orientation. Unlike Dutch *denken*, English *think* cannot have a future orientation. However, given the evidence from *hope* and *denken* itself, it will not do to try to link the lack of future orientation of *think* to the modal base being doxastic. As it stands, perhaps the best we can do is resort to lexical specification in the semantics of attitude verbs themselves.

This paper highlights two remaining puzzles pertaining to the temporal orientation of attitude verbs. I will discuss them briefly before concluding.

While predictions about weak non-root necessity modals are no longer a part of the generalisation, predictions about root modals are: they should be future-oriented. In this paper, I simply built into the lexical semantics a clause describing what time parameter should be passed down to the complement of such an attitude verb. However, ideally, we should seek an implementation of the generalisation, which, when given a contextual modal base, can return the appropriate temporal interval without resort to lexical specification for at least those verbs where the predictions of the generalisation hold.

It is also worth noting that any account of the temporal orientation of attitude verbs must be compatible with, and ideally be an explanation for, the fact that all temporal shifting attitude verbs are partial control verbs, as observed by Landau (2000). Pearson (2016) provides a mechanism to link partial control (extension from an individual to a superset) and temporal shift (shift from an interval to another interval that precedes, follows, or contains the first) using the notion of *extension*. However *extension* as defined by Pearson involves simply specifying that containment in the domain of individuals and pluralities is the same relation as precedence, subsequence, and containment in the domain of intervals. Ideally, we should be able to specify a relationship that satisfies this criteria without resort to lexical specification, which is compatible with the principled mechanism by which circumstantial modal bases give rise to a future orientation only.

These topics are certainly in need of further exploration. Unfortunately, they are beyond the scope of this paper. The remaining work about where the future comes from must be left for the future.

References

Abusch, Dorit (2004). On the temporal composition of infinitives. Guéron, Jacqueline & Alexander Lecarme (eds.), *The Syntax of Time*, MIT Press, Cambridge, US.

Alonso-Ovalle, Luis & Paula Menéndez-Benito (2010). Modal indefinites. *Natural Language Semantics* 8:1, 1–31.

Altshuler, Daniel & Roger Schwarzschild (2013). Moment of change, cessation implicatures and simultaneous readings. *Proceedings of Sinn und Bedeutung*, vol. 17.

Anand, Pranav & Valentine Hacquard (2013). Epistemics and attitudes. *Semantics and Pragmatics* 6:8, 1–59.

Condoravdi, Cleo (2002). Temporal interpretation of modals: Modals for the present and for the past. Beaver, David, Stefan Kaufmann, Brady Clark & Luis Casillas (eds.), *The Construction of Meaning*, CSLI Publications, Stanford, US.

Copley, Bridget (2002). *The Semantics of the Future*. Ph.D. thesis, Massachusetts Institute of Technology, Cambridge, US.

von Fintel, Kai (1999). NPI-licensing, strawson-entailment, and context-dependency. *Journal of Semantics* 16:2, 97–148.

von Fintel, Kai & Anthony Gillies (2010). Must…stay…strong! *Natural Language Semantics* 18:4, 351–383.

Heim, Irene (1992). Presupposition projection and the semantics of attitude verbs. *Journal of Semantics* 9:3, 183–221.

Iatridou, Sabine (2000). Grammatical ingredients of counterfactuality. *Linguistic inquiry* 31:2, 231–270.

Katz, Graham (2001). (A)temporal complements. Féry, Caroline & Wolfgang Sternefeld (eds.), *Audiatur Vox Sapientiae: A Festschrift for Arnim von Stechow*, Akademie Verlag, Berlin, DE, 240–258.

Kauffman, Stefan (2005). Conditional truth and future reference. *Journal of Semantics* 22:3, 231–280.

Klecha, Peter (2016). Modality and embedded temporal operators. *Semantics and Pragmatics* 9:9, 1–49.

Kratzer, Angelika (2012). *Modals and Conditionals: New and Revised Perspectives*. Oxford University Press.

Landau, Idan (2000). *Elements of Control: Structure and Meaning in Infinitival Constructions*. Kluwer Academic Publishers, Boston, US.

Lassiter, Daniel (2011). *Measurement and Modality: The Scalar Basis of Modal Semantics*. Ph.D. thesis, New York University, New York, US.

Lekakou, Marika & Øystein Nilsen (2008). What aspect can tell us about the future of *must*. *Proceedings of the 8th International Conference of Greek Linguistics*.

Ogihara, Toshiyuki (1996). *Tense Attitudes and Scopes*. Kluwer Academic Publishers, Dordrecht, NL.

Pearson, Hazel (2016). The semantics of partial control. *Natural Language and Linguistic Theory* 34:2, 691–738.

Rubinstein, Aynat (2017). Straddling the line between attitude verbs and necessity modals. Arregui, Ana, María Luisa Rivero & Andrés Salanova (eds.), *Modality Across Syntactic Categories*, Oxford University Press, Oxford, UK, 610–633.

Villalta, Elisabeth (2008). Mood and gradability: An investigation of the subjunctive mood in Spanish. *Linguistics and Philsophy* 31, 467–522.

Werner, Tom (2006). Future and non-future modal sentences. *Natural Language Semantics* 14, 235–255.

Wurmbrand, Susi (2006). Tense and aspect in English infinitives. *Linguistic Inquiry* 45:3, 403–447.

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