Modality, its syntax, and allosemy

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Abstract

This thesis presents an argument in favor of contextual allosemy (polysemy with structural conditions) based on the domain of modal expressions, which present the following puzzle. On one hand, modals are systematically ambiguous between, e.g., epistemic and non-epistemic readings, which motivates the view that there is a single lexical item for modals. On the other hand, however, even in ambiguous modals, the epistemic and non-epistemic readings are associated with different syntactic properties — something unexpected under a view where there is a single lexical item for modals. My solution is that, similarly to contextual allomorphy (syntactic objects having a constant semantic interpretation, or 'meaning', and a variable morphological interpretation, or 'form', depending on the structural context), ambiguous modals have a constant morphological interpretation and a variable semantic interpretation depending on the structural context. Although the idea of variable semantic interpretation is a minority position in the generative literature, the behavior of modals stops being a problem once the assumptions about grammatical architecture are changed to allow such configurations. In fact, the existence of a syntactic object with constant morphological interpretation and variable semantic interpretation is exactly what one expects to have with contextual allosemy. The behavior of modals can thus be construed as an indirect argument for contextual allosemy.

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List of abbreviations

ABIL: abilitive
ACC: accusative
AOR: aorist
ATTR: attributive
AUX: auxiliary
COMP: complementizer
COND: conditional
COP: copula
ERG: ergative
F, FEM: feminine gender
FV: final vowel
FUT: future tense
GEN: genitive
IMPF: imperfective
INC: incoative
INF: infinitive
LOC: locative
M: masculine gender
N: neuter gender
NEG: negation
PF, PFV: perfective
PL: plural
PST, PAST: past tense
POSS: possessive
PROBAB: probabilitive
PRS: present tense
Q: interrogative marker
SG: singular
WHOLE NUMBERS: either nominal class, or person

1 Introduction

This thesis is an attempt at adding something to a long-standing debate: what is the relationship between syntax and semantics, especially given the conception of grammar found in the generative approach to linguistic theory (Chomsky 1957 *et seq.*). A common position is that the mapping between syntax and semantics is 'perfect' and all 'imperfections' (such as variation) happen 'at PF'. It is said often that syntax 'builds' 'complex thoughts' everything syntax does is to provide the roadmap for semantic composition (cf. early writings in formal semantics, according to which there is 'no great interest in syntax except as a preliminary to semantics', as put by Montague 1970, p. 374). Works pursuing this general idea include, among others, recent works by Chomsky (from Chomsky 1995 onward, I believe), the Meaning-First approach of Alexiadou & Sauerland 2020, the system presented in Ramchand 2018, the Exo-Skeletal model of Borer 2005a, Borer 2005b, Borer 2013.

This thesis' goal is to go against this position, building the argument on the cross-linguistic behavior of modal expressions, their ambiguity and the syntactic properties of said ambiguity. As shown by the existing literature, modals seem to exhibit two contradicting properties at once. From one perspective, they seem to be systematically ambiguous. It is often the case that a modal can express epistemic modality and non-epistemic modality (although not always, see Nauze 2008, van der Auwera & Ammann 2013). This observation has motivated approaches where all modal interpetations, or 'flavors' (epistemic, deontic, and so on) share a semantic core, which is the lexical semantics of modals. For example, an influential strand of linguistic research (started by Kratzer 1977, influenced by Kripke 1963) considers the lexical semantics of all modals to be quantifiers over possible worlds. However, another property of modals seems to contradict approaches where all modal readings follow from the same core semantics of a single lexical item. Even when the modal is ambiguous, its different interpretations are discerned via structural properties — epistemic and non-epistemic interpretations of an ambiguous modal have different syntactic distributions (Ross 1967; Brennan 1993; Cinque 1999; Hacquard 2006; and many others). These empirical facts will be reviewed in the section 2 of this thesis. It is clear that the systematic ambiguity of modals motivates the picture where all modals are realizations of a single lexical item in syntax while the grammatical differences of modal flavors motivate a homophony view where various interprertations of modals are represented as distinct lexical items with their own syntactic properties.

Section 3, the theoretically-inclined section of this thesis, argues that, to bring the two properties of modals together, one needs to reverse the direction of explanation of the generalizations about modal expressions. Instead of posing the question as different modal readings having different syntactic properties and thus presupposing that different modal readings correspond to distinct syntactic items, the problem needs to be restated as follows. Why are modals found in the structural context $C1$ interpreted epistemically? Why are modals found in the structural context $C2$ interpreted non-epistemically? Reformulating the question allows to analyse the syntax-semantics correspondences without missing the generalization that the same modal expressions are often ambiguous between structurally unequal modal readings — the syntactic object corresponding to modals is the same (as evidenced by morphology) but the interpretation depends on the structural context.

I identify two ways to tackle such questions as the reformulated questions above. The first way, which I dub 'compositional', is to argue that the structural contexts are themselves meaningful and influence an underspecified semantics for modals via semantic composition, which

derives the observed distribution. Such approaches align with the idea that syntax is a structure-building mechanism for complex meanings (cf. Borer 2005a; Ramchand 2018; Alexiadou & Sauerland 2020). Modals have already been tackled in such a fashion by Hacquard (2006) and Ramchand (2018). It is clear that any approach in this spirit will strengthen the syntactic generalization about modals into a semantic constraint on possible scope configurations. This strengthening, however, is not welcome — as argued in section 3, the proposals of both Hacquard and Ramchand make an incorrect prediction with respect to possibility of epistemics being in the scope of the tense operators. Given that the source of the problem does not lie in their particular implementations of the core idea of the compositional approaches but rather in the core idea itself, I conclude that the compositional approaches to syntax-semantics interactions are inadequate when applied to modals.

The second way, which I dub 'lexical', is to argue that the interpretation of any given syntactic object is arbitrary and only defined relative to its context, in a parallel way to the mechanisms of Vocabulary Insertion found in the contemporary syntactic approaches to morphology (Distributed Morphology, Halle & Marantz 1994, and Nanosyntax, Starke 2009). The best developed lexical approaches to influence of structural context on the interpretation are found in the literature on contextual allosemy (Marantz 2013; Wood 2015; Myler 2016; Wood 2023). An important property of the lexical approaches is that the influence of a syntactic context is essentially arbitrary, which makes a weaker claim than compositional approaches and predicts variation in syntax-semantics correspondences. The latter part of section 3 defends the arbitrariness of the syntax-semantics correspondences from the conceptual side, answering the concerns about explanatory adequacy of contextual allosemy, raised, among others, by Ramchand 2015 in a rather forceful way.

Section 4 will present a handful of case studies that support the arbitrariness of syntax-semantics correspondences predicted by contextual allosemy based on the variation in particular syntactic structures, which influence the interpretation of modals. Based on the behavior of English ability modals and Russian directed deontic modals, I conclude that the influence of argument structure on modal interpretation cannot be understood as non-arbitrary. Based on the data from Poshkart Chuvash (Knyazev 2021), I show that there are interactions of modal intepretation with case marking, a purely syntactic phenomenon with little to no semantic basis. Based on the syntactic properties of modal adjectives in Russian and English and modal verbs in BCS (Veselinović 2019), I conclude that the structural properties associated with a particular modal interpretation (namely, epistemic) is variable enough to constitute an argument for an analysis based on allosemy. This observation is also connected to the work on clausal complementation done in the similar spirit (Lohninger & Wurmbrand 2020). To bring the related topics of modality and clausal complementation together in the allosemy-based framework, I end section 4 with a case study of belief-/intent-report alternation of Russian verb *dumat'*, which, as I argue, is best understood through allosemy.

Section 5 concludes the thesis and outlines the further research questions in the allosemy-based framework presented in this work.

2 Syntax and semantic of modality

This section reviews the existing literature on the two well-known properties of modal expressions. The first property is their systematic ambiguity across natural languages. The second property is that modal expressions have different syntactic distributions. I conclude this section by arguing that one needs a theoretical tool to analyse syntactic influence on interpretation in order to bring together the two properties of modals.

2.1 Modal ambiguity across world languages

Of course, there is modal ambiguity in English. The basic observation in any introduction to semantics of modality is that English *can* and *must* are associated with a variety of meanings (Kratzer 1977), as shown in (1). Sometimes these meanings are called flavors. I will use the terms *modal meanings*, *modal flavors*, and *modal interpretation* interchangeably.

(1) Modal ambiguity in English

a. (According to my knowledge), John must/can be home — epistemic

b. (According to the law), John must/can leave the jail — deontic

c. (According to the soil's condition), dandelions must/can grow here — circumstantial

Most commonly, modal ambiguity means the presence of a modal such that it has epistemic and non-epistemic interpretations. Other Germanic languages show modal ambiguity as well. For example, modal ambiguity is found in Dutch (van Dooren 2020), where (among others) the modal verb *moeten* can have deontic and epistemic interpretations as shown in (2), where the necessity of the speaker's grandparents having a fence is either motivated by a fence-building law or by the speaker's knowledge that they are private people.

(2) Ambiguous necessity modal *moeten* in Dutch (van Dooren 2020: 118)

Mijn grootouders moeten een hek hebben
my grandparents must a fence have

i. 'My grandparents must have a fence (they're very private people)' — epistemic

ii. 'My grandparents must have a fence (the mayor tells them to).' — deontic

Other Indo-European languages show modal ambiguity as well. For example, Russian (Slavic, data my own), Catalan (Romance, Picallo 1990). In Russian, there is (among others) an ambiguous modal *možet*, which can have epistemic interpretations (as in example 3a where the possibility of Vasja being home is based on the speaker's beliefs about Vasja's schedule), deontic interpretations (as in example 3b where the impossibility of the convict leaving the country is dictated by the law), and dynamic interpretations (as in example 3c where Vasja has the ability to lift a piano on his own).

(3) Ambiguous possibility modal *možet* in Russian (sentences my own)

a. Epistemic

Vasja možet uže byt' doma
Vasja can already be home
'Vasja might be home already.' (if I remember his schedule correctly)

b. Deontic

Osuždennyj ne možet pokinut' stranu
convict NEG can leave country
'The convict may not leave the country.'

c. Dynamic

Vasja možet podnjat' pianino
Vasja can lift piano
'Vasja is able to lift a piano.'

In Catalan, an ambiguous modal *poder* in example (4) can be interpreted epistemically or dynamically, the possibility in (4) can be based upon speaker's beliefs or the physical characteristics of the thief themselves.

(4) Ambiguous possibility modal *poder* in Catalan (Picallo 1990: 288)

El lladre podér entrar per la finestra.
the thief could come in by the

a. 'It is possible that the thief came in by the window.' epistemic
b. 'The thief was able to come in by the window.' dynamic

Indo-European languages outside of Europe show modal ambiguity as well. For example, Tajik (Indo-Iranian, Koohkan & Mofidi 2023) has an ambiguous modal *boyad*. Example (5) is reported to have epistemic and deontic readings (see ff.25 of Koohkan & Mofidi 2023).

(5) Ambiguous necessity modal *boyad* in Tajik (Koohkan & Mofidi 2023: 150)

modar boyad dar xona boš-ad
mother must in home be.PRS-3SG
'Mother must be at home.' (according to my knowledge, according to the law)

Other language families also have modal ambiguity. For example, Logoori (Bantu, Gluckman & Bowler 2020), Turkish (Turkic, Nauze 2008), Tuvaluan (Polynesian, Nauze 2008), and Buryat (Rossyaykin 2022). In Logoori, the verbal affix *-nyal-* denotes possibility and can be interpreted dynamically (6a), deontically (6b), or epistemically (6c), which presents a case of Standard Average European-like modal ambiguity in a Bantu language.

(6) Ambiguous possibility modal *-nyal-* in Logoori

a. Dynamic modality (Gluckman & Bowler 2020: 206)

Sira a-nyal-a ku-sad-a li-gena
1.Sira 1SM-NYAL-FV 15-lift-FV 5-rock
'Sira can lift that rock.'

b. Deontic modality (Gluckman & Bowler 2020: 207)
u-nyal-a *ku-zi-a* *mu*
2SG-NYAL-FV 15-go-FV in
'You may go in.'

c. Epistemic modality (Gluckman & Bowler 2020: 209)
Profesa *a-nyal-a* *ku-za* *mu* *ki-lasi* *karono*
1.professor 1SM-NYAL-FV 15-come in 7-class today
'The professor might come to class today.'

In Turkish, there is a variety of modal expressions (see Nauze 2008), which includes the verbal affix *-(y)Ab(il)*, which denotes possibility and can be interpreted dynamically (7a), deontically (7b), and epistemically (7c), showing that Turkic languages can exhibit modal ambiguity (see Rentzsch 2015 for a more involved exploration of modality across Turkic languages).

(7) Ambiguous possibility modal *-(y)Ab(il)* in Turkish (Nauze 2008)

a. Dynamic modality (Nauze 2008: 91, citing Kornfilt 1997)
oku-yabil-ir-im
read-ABIL-AOR-1SG
'I am able to read.'

b. Deontic modality (Nauze 2008: 93, citing Göksel & Kerslake 2004)
bilgisayar-ım-ı *ne zaman* *ist-er-sen* *kullan-abil-ir-im*
computer-1SG.POSS-ACC when want-AOR-2SG-COND use-ABIL-AOR-2SG
'You can use my computer whenever you like.' (I give you the permission)

c. Epistemic modality (Nauze 2008: 97, citing Göksel & Kerslake 2004)
Ali'nin *patronu* *onu* *sev-mi-yor* *ol-abil-ir*
Ali'GEN boss him like-NEG-IMPF AUX-ABIL-AOR
'It's possible Ali's boss doesn't like him.'

Tuvaluan also has an ambiguous possibility modal in its lexical inventory — the expression *ttau* can be interpreted deontically (8a) and epistemically (8b), which shows that modal ambiguity is observed in Polynesian languages as well.

(8) Ambiguous possibility modal *ttau* in Tuvaluan (Nauze 2008)

a. Deontic modality (Nauze 2008: 109, citing Besnier 2000)
Koo *ttau* *o* *taa* *nee* *Vave* *a* *ia* *loa.*
PAST must COMP strike ERG Vave COMP 3SG indeed
''Vave must kill himself.'

b. Epistemic modality (Nauze 2008:113)
Koo *ttau* *o* *lima* *sefulu* *ana* *tausaya*
INC must COMP five ten 3SG.POSS years
'He must be 50 years old.'

To finish this short (and by no means representative) sample, I present Buryat, a Mongolic language, which has an ambiguous necessity modal *johotoi*, which can be interpreted deontically or epistemically, as shown in examples (9a) and (9b), respectively.

(9) Ambiguous necessity modal *johotoi*[1] in Buryat (Rossyaykin 2022)

a. Deontic modality (Rossyaykin 2022: 249)
bi hojor sag-ta unta-xa johotoi-b
I two hour-LOC sleep-FUT must-1SG
'I must be sleeping in 2AM.'

b. Epistemic modality (Rossyaykin 2022: 250)
səsəg hojor sag-ta unt-a: johotoi
Seseg two hour-LOC sleep-PST must
'Seseg must be sleeping at 2AM.'

Some sign languages are also argued to exhibit modal polyfunctionality, see Salazar-García 2018 on Spanish Sign Language. While it is not the case that all languages display this ambiguity (according to the cross-linguistic data presented in van der Auwera & Ammann 2013, 123 out of 226 languages in their sample lack ambiguous modals), it certainly appears in unrelated languages across the world (even though European languages do exhibit modal ambiguity more often), as shown in this subsection. From that I conclude both that the modal ambiguity is worth discussing and that it is necessary to have an account for this ambiguity, which does not resort to proclaiming all interpretations of a modal distinct lexical items (homophony). A particular implementation of this idea has become classic in formal semantic literature on modality, which is to be reviewed in the next section.

2.2 Classic treatment of modal semantics

The seminal paper by Angelika Kratzer (Kratzer 1977) presents an underspecification account of modal expressions, which is shown in (10). While the technicalities of the account have changed throughout the years (see Kratzer 2012, a compilation of Kratzer's papers throughout the years), the core idea remains the same: modal expressions are quantifiers over possible worlds, the set of which (the domain of quantification) is provided by the context. Inspired by Kripke's semantics for modal logic (Kripke 1963), possibility is understood as an existential quantifier and necessity is understood as a universal quantifier. In Kratzerian accounts, modals take a propositional argument of type $\langle s, t\rangle$ (assuming that propositions denote sets of possible worlds or functions from the set of possible worlds to the set of truth values).[2]

(10) Kratzer's underspecification account

a. $[\![\text{can}]\!] = \lambda p_{\langle s,t\rangle}.\exists w'\colon wRw' \wedge p(w')$

b. $[\![\text{must}]\!] = \lambda p_{\langle s,t\rangle}.\forall w'\colon wRw' \rightarrow p(w')$

[1] Rossyaykin notes that the modal *johotoi* is the comitative form of the noun *joho* 'tradition'. I do not think that this fact is relevant here, so this observation is not reflected in glosses.

[2] See Heim & Kratzer 1998 for an introduction to the apparatus of formal semantics. I assume that the reader is familiar with the basic notions of formal semantics.

Kratzer's proposal reduces modal ambiguity to context-sensitivity, explaining why such 'meanings' as epistemic modality, deontic modality, and many other modalities are expressed by the same expressions cross-linguistically — there is no different 'modal meanings' for Kratzer, they are instantiations of the same quantifiers with different contextually given sets of quantifications (or accessibility relations, or modal bases, as in Kratzer's later writings).

A lot of ink has been spilt on the proper semantic characterization of different flavors (among others, see Yanovich 2013 for epistemics, Rubinstein 2012 for deontics, Santorio 2022 for ability modals), but I am lucky enough to have these semantic considerations not influencing the contents of this work much given that they mostly concern available inferences from sentences with modals, not their syntactic properties. The core intuition, which is shared by everyone adopting the Kratzerian approach to modals, is that modals reduce to quantifiers over possible worlds. The restrictors of these quantifiers is where the money is in — the precise domains of quantification are thought to be responsible for different modal flavors and their properties.

There is a particular prediction of a Kratzerian approach that I want to highlight. If everything beyond the basic quantifier blueprint for modals is left for the context to decide, no structural differences are expected to be found between different interpretations of the same ambiguous modal. As the next subsection shows, this prediction is not borne out. Epistemics and non-epistemics show different syntactic properties, which raises the question of viability of the Kratzerian approach to modality.

2.3 On syntax of modal flavours

Here, I will present a subset of existing data on the structural asymmetries between modal expressions in different flavors. Recall that the classic (Kratzerian) treatment of semantics of modal expressions does not predict such asymmetries. Hence, the syntactic data showing syntactic asymmetries between different modal flavors calls for some sort of revision to the Kratzerian framework.

The most well-known structural asymmetry between modal expressions of different flavors is that epistemic modals are structurally higher than non-epistemic modals (also called root modals), this asymmetry is best explored in Ross 1967, Brennan 1993, and Hacquard 2006, with conclusion that epistemic modals are higher than T, and root modals are lower. Subsequent works have established different classes of root modals with respect to syntactic position as well. Rubinstein (2012) argues that deontic modals are right above Asp(ectual)P, Ramchand (2018) argues that dynamic modals are in the EvtP domain of the clause, which means that they reside in the domain of argument structure, lower than VoiceP. A compression of what is suggested in the literature is given in (11). I should note that by no means do I commit myself to this hierarchy. I present it for the sake of completeness of the review in this subsection.

(11) Partial clausal hierarchy with modals (as in van Dooren 2020)
$\text{Mod}_{\text{Epist}}$ » T » $\text{Mod}_{\text{Deont}}$ » Asp » Mod_{Circ} » Voice » Mod_{Dyn}

Here is the place to overview existing evidence for the provided hierarchy. However, the main focus will be on the asymmetry between epistemic modals and all other types of modals due to its being the most discussed one and the fact that only one grammatical asymmetry between various modals suffices to make the necessary argument that Kratzer's underspecification proposal is inadequate. While I will focus on much discussed (mostly English) data from the literature, the

existing literature has shown these facts to be correct for other languages as well (for example, Rossyaykin 2022 presents data from Russian, Buryat, and Balkar, a Slavic, Mongolic, and Turkic language, respectively).

The first piece of evidence comes from the cartographic exploration of morphological ordering of different modals with respect to other clausal heads, such as T and Asp, done in Cinque 1999. The logic of that work is as follows: linearly, epistemic modal expressions (such as *likely*) are found on the left of tense expressions, while root modal expressions are found on the right of tense expressions. Or, given the Mirror Principle (Baker 1985), the epistemic modal affixes are on the right of tense affixes, while root modal affixes are on the left. I will give one example and refer the reader to Cinque's work for further discussion. Examples in (12) from Una, an Irian Jaya language. The epistemic verbal affix *-darib* is found on the right edge of the verbal form, on the right of tense and person agreement, while the ability affix *-ti* is found closer to the verbal root than tense. Again, given the Mirror Principle, this suggests a $\text{Mod}_{\text{Epist}}$ » T » Mod_{Root} hierarchy.

(12) Modality in Una (Cinque 1999: 55)

a. Epistemic modality
Er bin-kwan-de-darib
she go-FUT-3SG-PROBAB
'She might go.'

b. Root modality
Ni buk-ti-nyi
I sit-ABIL-PRES
'I can sit.'

I should note, however, that this ordering by itself is not an insurmountable obstacle to a Kratzerian underspecification-based approach. The problem arises once we take into account the fact that an inverted order is unattested by Cinque. If everything that modal readings have as the difference between them is a contextually-determined relation, we do not expect them to have mutually exclusive distribution in the grammar. Another caveat is that this point holds only if there is no way to derive these properties from the semantics of tense and other clausal categories, which serve as 'pivots' in a linear ordering-based investigation. As will become clear later, such semantic approaches face problems in light of existing cases of tense outscoping epistemic modality.

Second piece of evidence for structural asymmetry of modals comes from various semantic operators scoping over root modals but under epistemic modals. Here, I will focus on past tense and quantificational subjects. Consider the pair in (13). The epistemic modal *may* allows the sentence to have an interpretation while the sentence with the modal *can* with a root modality reading is non-sensical: it describes a contradiction. This can be seen from the logical form of these sentences. If quantifiers *every* and *no* outscope the modal, we end up with a conjunction of two mutually exclusive propositions. If the modal outscopes the subject quantifier, the conjunction is possible, since both $\Diamond P$ and $\Diamond \neg P$ can be true simultaneously.

(13) Quantificational subjects scope differently with respect to epistemics and roots

a. Every radio may get Chicago stations and no radio may get Chicago stations
$(\forall x$: x is radio $\rightarrow \Diamond$(x gets Chicago stations)) $\wedge$ $\neg(\forall x$: x is radio $\rightarrow \Diamond$(x gets Chicago

stations))

b. #Every radio can get Chicago stations and no radio can get Chicago stations
$\Diamond(\forall x$: x is radio $\rightarrow$ x gets Chicago stations) $\wedge$ $\Diamond(\neg\forall x$: x is radio $\rightarrow$ x gets Chicago stations)

Some scholars argue that deontic modals behave inconclusively with respect to this test (Ramchand 2018: 140) but I think that those objections can be dismissed once we distinguish ought-to-be (subject-oriented) deontics and ought-to-do (addressee-oriented) deontics syntactically (as done in Hacquard 2006). Let me rephrase what the scope of subject quantifiers shows us. Assuming that subjects end up in Spec,TP, those modals which are syntactically above TP do not give rise to a contradiction and those modals which are syntactically below TP do so. [3]

Similarly to the quantificational subjects, past tense outscopes root modals and does not (usually) outscope epistemic modals, as shown by the example (14). It should be noted that some languages are known not to display these properties (e.g., Dutch). Such counterexamples will be discussed in detail later.

(14) Past tense scopes differently with respect to epistemics and roots
Darcy had to be home. $\text{Mod}_{\text{Epist}}$»PST; *PST»$\text{Mod}_{\text{Epist}}$

The logic of the argument is the same as the argument from quantificational subjects. Assuming that syntactic prominence (c-command) is related to scope, the fact that T outscopes root modals and does not outscope epistemic modals suggests that epistemic modals are above TP while root modals are below TP.

Another piece of evidence comes from cases of stacked modals, which is unattested in English, but found in other languages, like many Germanic languages (Thráinsson & Vikner 1995; Eide 2005; Ramchand & Svenonius 2014).[4] Sentences in (15) from Icelandic show that it is possible to stack epistemic modal on top of a root modals but not vice versa (at least, in Danish and Icelandic, according to Thráinsson & Vikner 1995). While the first sentence is easily understood with modal adjectives being one of the options for stacked modality in English, the second is really hard to given a sensible reading.

(15) Double modal constructions in Icelandic

a. Epistemic over root: grammatical
Hann kann að verða að selja húsið.
he can to must to sell house-the
'It is possible that he will have to sell the house.' (Thráinsson & Vikner 1995:78)

b. Root over epistemic: ungrammatical
Hann verður að kunna að kunna að synda.
he must to can to can to swim
Intended: 'He has to may be able to swim' (Thráinsson & Vikner 1995:78)

[3] Note that the picture becomes less clear, once we allow quantifier raising (Fiengo & May 1994). We can make stipulations which prohibit trace binding across epistemic modals, as done by von Fintel & Iatridou (2003). There may be other possibilities under a continuation-based alternative to QR (Barker 2002). Nevertheless, the picture is more complicated than presented here.

[4] Data from other language families is discussed by Nauze (2008) with the same conclusion.

It is easy to imagine a counterargument along these lines: such sentences are bad because of them being uninterpretable and not due to syntactic factors. I do not intend to provide an analysis here, since my point is much simpler. This section is intended to show that a Kratzerian semantic theory of modals (which considers all modals to be quantifiers over possible worlds) makes incorrect predictions. Indeed, there is no semantic reason for different quantifiers over different sets of possible worlds to be unstackable. The observation that it is hard to imagine a sensible reading for a root modal scoping over an epistemic modal constitutes an argument against a Kratzerian theory on its own.

Before we discuss the implications of the finding that modal readings differ syntactically, I should note that there are major dissenting voices in the literature on modal-temporal interactions. Most notably, Rullmann & Matthewson (2018) have argued that all modals are found in the position between T and Asp. Their main argument rests on the availability of a past epistemic readings after why-questions (von Fintel & Gillies 2008), as in example (16). Similar examples are provided by Rullmann & Matthewson (2018) based on the data of endangered Salish languages.

(16) Context: Sophie is looking for some ice cream and checks the freezer. There is none in there. Asked why she opened the freezer, she replies:
There might have been ice cream in the freezer.

I dismiss the arguments given by Rullmann & Matthewson (2018) for two reasons. Firstly, as already argued by Hacquard & Cournane 2016, such readings arise only in the context of *why*-questions. Given this observation, it is unclear why putting epistemic modals under T is necessary or better than an analysis, which makes use of a covert *because*-like operator, which is able to shift the parameters of evaluation (Stephenson 2007). Secondly, as shown by van Dooren (2020), while there are languages which systematically exhibit past epistemic (e.g., Dutch, see next section), English is not such a language and the arguments for epistemic being located higher than T hold (quite notably, they hold even in Dutch, where a bi-clausal structure for epistemic is needed, see van Dooren 2020).

To recap, the Kratzerian approach to modals led us to expect a uniform syntactic behavior of modals. This prediction was not borne out — structural asymmetries have been found, most of which separate epistemic modals from others. Although some authors (such as Rullmann & Matthewson 2018) do not consider the structural asymmetry to be real, their counter-evidence has been dismissed.

2.4 How to bring the two properties of modals together

At this point, we find ourselves in a messy position. On one hand, modals are ambiguous too often to ignore this fact and consider all distinct readings to be related to distinct lexical items (like $can_{\text{epistemic}}$, can_{deontic}, can_{dynamic}, and so on). Hence, we might want some approach similar in spirit to the Kratzerian analysis of modals as quantifiers over possible worlds. On the other hand, some classes of modal readings have different syntax: there are structural diagnostics that show that epistemic modals are found in a different position in the clausal spine, compared to non-epistemic modals.

If one wants to maintain an analysis, which does not treat the ambiguity of modals as a systematic homophony of different lexical items with similar interpretations, one needs to have a

theoretical tool for the role of syntactic context in determining the semantic interpretation of a modal. In the next section, I will review two types of such approaches (which I dub 'compositional' and 'lexical', the difference lies in the generality of the interpretational role of the syntactic context) and present an argument against the 'compositional' approaches based on the cases of past tense outscoping epistemic modals.

3 Interpretation and structural contexts

This section discusses a question of devastating complexity: to what extent does syntax influence meaning, and how should the linguistic theory approach such influences. To our peril, this question must be discussed in order to bring together two independent observations about modals, as was argued in the previous section. The first observation was that modals are often ambiguous, which has motivated a Kratzerian account, which posits that modals are quantifiers over possible worlds, and the contextually-determined sets of the possible worlds determines the modal reading. The second observation was that different modal readings do not have the same structural distribution — there are clear syntactic properties, which distinguish, for example, epistemic modals from non-epistemic modals. Hence, we need a way for syntactic configuration to influence the interpretation of a syntactic item.

In this section, I consider different theoretical proposals, which aim to account for phenomena requiring syntax to influence interpretation. Roughly, there are two branches of such analyses, which I dub compositional approaches and lexical approaches. Compositional approaches introduce syntax into semantic composition via the semantics of the structural configurations themselves. For example, structures built from functional items have their own semantic properties, which, when combined with lexical items, result in different semantics (as in the system presented by, e.g., Borer 2005a). Such logic has already been applied to modals in works like Hacquard 2006 and Ramchand 2018, which I will argue against in this section. The weak point in their work, I believe, lies in the core of any compositional approach — the desire to have a semantic motivation for a syntactic constraint, to reduce the syntactic generalization to a constraint on possible scope configurations. As will be argued later, the prohibiting epistemics from the scope of tense for semantic reasons is an unwelcome consequence, since there are *bona fide* examples of such scope configurations.

While compositional approaches aim for generality in semantically-motivated syntactic properties, lexical approaches differ from them in permitting idiosyncratic (lexical) interaction between structural configurations and syntactic items. Whereas compositional approaches simply add the semantics of syntactic configurations to the process of semantic composition, lexical approaches permit any interaction between any local structural configuration and any given lexical item. This line of reasoning is mostly reminiscent of the Distributed Morphology literature, which makes use of contextual allosemy, a notion of polysemy, which is structurally conditioned in an non-principled way (Wood 2015; Myler 2016; Wood & Marantz 2017; Wood 2023).

The crux of the distinction lies in the following question: is it the case that syntax and semantics are related unambiguously across languages? Ultimately, I will argue that the relationship between syntax and semantics is much more arbitrary than most modern generative literature assumes.

3.1 Compositional approaches to syntactic influence on interpretation

3.1.1 (Unambiguous) interpretation of syntactic constructions

This section presents compositional approaches to syntax influencing interpretation. The conceptual argument behind such approaches is best presented in the following quote by Hagit Borer, taken from the introduction of the first part of her monumental work "Structuring Sense" (Borer 2005a, Borer 2005b, Borer 2013), which presents a *constructionist* view of syntax-semantics

interface, according to which structural configurations are meaningful by themselves.

> Specifically, given that *every*, for example, is already marked lexically as a distributive-universal, and assuming that such a lexical specification comes with certain restrictions on its interpretation, why should the syntax reiterate this information by projecting a distinct and unambiguous functional structure above it? Such structure could not be implicated in the assignment of a distributive interpretation to every, as that interpretation is already associated with every by virtue of its lexical properties. Thus, at most, such a structure is a form of agreement with those lexical properties, thereby marking it a second time. Likewise, by assumption, the lexical properties of the listeme *kick* entail the knowledge that it is a verb and that it means a particular act involving some specified arguments. Repeating this information through the projection of a syntactic structure is thus redundant. (Borer 2005a: 7).

The core motivation is, thus, to avoid the redundancy brought by the logic of items with interpretation I being located in the structural context C. For Borer (and related work), such formulations miss the underlying connection between the interpretation I and the structural context C. The alternative is to say that items get the interpretation I *in virtue of* being located in the structural context C. Thus, C has its own meaning, *constructional meaning*. This theoretical move avoids the inherent redundancy of the lexicon-centric approaches and the underlying generalization is accounted for on the architectural level.

Similar sentiments and proposals can be found in the work on modality. The idea is that there is something about being above TP, which makes a modal epistemic, and, likewise, there is something about being below Asp, which makes a modal deontic. For example, Hacquard 2010 restates the problem of structural asymmetry of modals in the following quote.

> This event relativity [the core idea of her proposal] allows for the following reformulation of Cinque's puzzle: why is it that attitude or speech event-relative (i.e., high) modals get an epistemic inter- pretation, while VP event-relative (i.e., low) modals get a root one? (Hacquard 2010: 83)

Hacquard, thus, makes the same conceptual development as Borer: instead of a particular structural position being a property of epistemic or non-epistemic modals, it is the epistemic or non-epistemic interpretation that is a property of the modal in a particular structural position. Hacquard's own reasons are less far-reaching than Borer's — all she aims for is to give an account of modals without distinct lexical entries for different flavors. But it is clear that once one aims to bring together a Kratzerian semantics for modals and their structural differences, a constructionist view becomes necessary.

However, before we look at two proposals for a compositional analysis of syntax-semantics interaction in the domain of modals, we first need to discuss a bigger picture related to the compositional approach. It is related to the putative unambiguousness of syntax-semantics interactions, which is often assumed in the contemporary generative enterprise. The idea, which was (I believe) popularized in Chomsky 1995, is that the locus of linguistic variation lies in the syntax-morphology interface (or PF, see recent review by Embick 2023).[5] The corollary is that

[5]One could argue that the Borer-Chomsky conjecture should be understood this way (to remind the reader, the Borer-Chomsky conjecture states that the cross-linguistic variation is limited to the properties of distinct lexical items). As we will observe later in this work, however, idiosyncratic interpretations of lexical items in different structural configurations are also 'properties of lexical items'.

syntax-semantics mapping is invariant cross-linguistically and, hence, syntax can even be construed as the system for building 'complex thoughts' (Chomsky has argued that Aristotle's claim that language is 'sound with meaning' should be turned to 'meaning with sound', see Chomsky 2015, p. 14). Some researchers (Ramchand 2018; Alexiadou & Sauerland 2020) have put this to the limit and proclaimed that syntax **is** the system of semantic composition with everything 'linguistic' being put to the PF waste bin, reprising the idea that morphosyntax mediates between meaning and sound, which is reminiscent to the fashionable theories of the 60s-70s (Lakoff 1976; Mel'čuk 1981).

While the similarities are obvious, I do not wish to use 'generative semanticist' as a curse word and to dismiss these approaches based on the failure of their predecessors. Instead, I want to point out that the idea of constructional meaning, when combined with the conception of uniform syntax-semantics mapping, necessitates the idea of uniform constructional meaning. This, however, is a fairly strong statement, which, for example, predicts the following: syntactic configuration for a modal flavor are universal and rigid. It appears that no room for variation is left — to be epistemic, you should be at the left periphery, above tense, above aspect, and so on.

The next parts of this subsection review the existing compositional approaches to the syntax of modals and take a shot at a variant of this prediction of rigidity. Both accounts to be reviewed cannot accommodate existing data about *bona fide* scope of past tense above epistemic modals. Let us get more technical now.

3.1.2 Compositional approaches and modality

Here, I will review analyses of syntax of modals by Hacquard 2006 and Ramchand 2018. As already mentioned, their ideological goal is to provide a system, in which it automatically follows that structurally high modals are interpreted epistemically and structurally low modals are interpreted non-epistemically. In particular, they aim to do the following: given the lexical semantics for modals and for the syntactic items that constitute the structural context of said modals, the process of semantic composition should provide the distribution we observe (that high modals are epistemic and low modals are non-epistemic). Although the devices used in the analyses of Hacquard and Ramchand are rather different in nature, the shared goal of providing a system where the syntax of modals falls out of the semantic composition is exactly what makes their analyses fail, as will be argued.

Hacquard's implementation is based upon these statements. First, modals are event-relative, which means that the domain of quantification (the set of relevant possible worlds, the modal base) is defined relative to an event variable in the lexical specification of the modal. Hacquard defines the following functions from events to sets of possible worlds (which provide a modal base relative to the event): $f_{\text{epistemic}}$, which returns the set of worlds compatible with the content of e (Hacquard considers the content of e to be the mental state of the attitude holder in e) and $f_{\text{circumstantial}}$, which returns the set of worlds compatible with the circumstances of e.[6]

Second part of her proposal is that there are two possible binders for the event variable, the aspectual operator, which identifies the event variable of the modal with the event described by the main predicate, and the speech act operator, a silent operator on the left periphery, which identifies the event variable of the modal with the event of uttering the sentence. Combined

[6]There is the third function, which Hacquard employs to account for true deontics (deontics where the obligation is placed upon the addressee). I do not discuss such modals in this work and omit this part of Hacquard's analysis.

with the assumption that the event variable should be bound by the closest binder, the event variable of 'high' modals is bound by the speech act operator and the event variable of 'low' modals is bound by the aspectual operators. Analysis along these lines derives the observation that epistemics are speaker-oriented, while non-epistemics are oriented to the subject or other factors of the situation described in the sentence.

The final piece of her proposal is that not all event binders are compatible with all functions from events to possible worlds. The $f_{\text{epistemic}}$ is compatible with all contentful events (to simplify, these are events described by attitude predicates). When the epistemic function is applied to the event variable bound by the speech act (to a 'high' modal) one gets an epistemic reading (modal base is the set of worlds compatible with the speaker's beliefs). When the epistemic function is applied to an event variable bound by the aspectual operator (to a 'low' modal), the results depend on whether or not the predicate in the clause is an attitude or not. If it is an attitude, a pseudo-epistemic reading arises (as in *Mary can think that you two are dating*) where the possibility is based upon the subject's beliefs. If the main predicate is not an attitude predicate, the event is incompatible with $f_{\text{epistemic}}$. The $f_{\text{circumstantial}}$ function is compatible with all events but Hacquard stipulates that the result is 'odd' when this function is applied to the speech event.

To summarize, Hacquard's system is a generate-and-filter type of analysis. There are two possible positions for modals, which end up with different events in their logical form. The modal base is defined relative to these events using functions from events to sets of possible worlds, which are incompatible with some types of events. The analysis is clearly of a compositional spirit: the lexical item has its meaning specified by the structural context by the virtue of semantics of said structural context. If a modal is below Asp, the semantic composition ensures it will not be epistemic. If a modal is above Asp, the semantic composition ensures it will be epistemic. Thus, Hacquard achieves the goal of a compositional analysis: the modal becomes epistemic or non-epistemic due to its structural position and vice versa.

Another compositional approach to the syntax-semantics interaction in the domain of modality can be found in Ramchand 2018. While giving a detailed overview of the highly innovative system of Ramchand's is definitely out of scope for this work, I will attempt to sum up the relevant parts. The core idea of her proposal coming from her earlier work (Ramchand & Svenonius 2014) is the partition of the verbal domain into three distinct zones (zone of the event predicate, zone of spatio-temporal anchoring, zone of assertive content) which correspond to three main syntactic projections in the verbal domain (*v*P, TP, CP). Ramchand proposes that the modals have uniform semantics but the modals in the zone of assertive content are epistemics and the modals in the zone of spatio-temporal anchoring are circumstantial.

Deviating from the Kratzerian approach to modal semantics, Ramchand suggests that the core semantic component of modals is the notion of choice from relevant alternatives. To quote Ramchand herself, "modal meaning involves the assertion of a CHOICE within a set of live alternatives for a topic individual x in a perspectival situation s'. These alternatives are directly constructed from the constituent that the modal attaches to." (Ramchand 2018:163). As Ramchand argues, modal assertions are made from "a background of uncertainty". For circumstantial modals, the uncertainty comes from the fact that the future relative to the topic situation is non-decided and thus something can happen (John can arrive early, Mary can mess up the cake). For epistemic modals, the uncertainty comes from the choice between possible assertions for the speaker.

I will not aim to critique the conceptual and ideological foundations of either Ramchand's or Hacquard's proposals. Instead, I want to highlight an important property of both approaches:

they aim to give a principled semantics explanation of the syntactic generalizations about modals. In doing so, both Ramchand and Hacquard end up with a far stronger claim. The syntactic claim that epistemics are above tense becomes a constraint on possible scopes. Both accounts do not allow tense to outscope epistemics because if epistemic modality is shifted in time, it is the speech act event, which is shifted by the tense opreator. Even if we accept a speech act operator in the syntax, existing proposals (see Speas & Tenny 2003; Krifka 2019; Miyagawa 2022 among others) put such operators in the left periphery of the clause, higher than the usually assumed structural position for tense morphology. Thus, having past tense over an epistemic modal (with respect to scope and c-command) is unexpected, given the analyses of Hacquard and Ramchand. The next subsection presents a number of cases where past tense does indeed scope above an epistemic modal.

3.1.3 Where compositional approaches fail

Here, I will discuss two cases of past tense outscoping epistemic modal operators. The first one comes from Dutch modal verbs (van Dooren 2020). The second case comes from Russian modal nominals and adjectives (however, I will suggest that the same basic pattern is available in English as well). For the purposes of the argument I am aiming to make, these two cases will suffice.

In Dutch, modal verbs have past tense forms, as shown in (17). However, unlike English, past tense on epistemic modals is interpreted outside the scope of the modal operator, as examples in (18) show. In those examples, the possibility is anchored to the past epistemic state of the speaker since the new evidence, known by the speaker, rules out the proposition embedded under the epistemic modal. Given that people are not usually ignorant about what they know and do not know, examples in (18) constitute a robust case of past tense outscoping epistemic modals.

(17) Dutch modal verbs exhibit TAM morphology (van Dooren 2020: 41)

a. *Marie moest/ mocht/ kon/ zou/ wilde/ hoefde niet te blijven*
Mary must.PST/ may.PST/ can.PST/ will.PST/ want.PST/ need.PST not to stay
''Mary had to/was allowed to/could/would/wanted/doesn't need to stay'

b. *Marie heeft dat gemoeten/ gemogen/ gekund/ gewild/ gehoeven*
Marie has that must.PF/ may.PF/ can.PF/ need.PF/ may.PF/
'Marie had to/was able to/needed to/was allowed to/wanted to do that.'

(18) Past tense on epistemics is interpreted as PST»Mod (Aelbrecht 2010: 34; van Dooren 2020: 61–62)

a. *Gisteren moest hij nog in Portugal geweest zijn op zijn verjaardag, maar*
yesterday must.PST he still in Portugal been be on his birthday but
het nieuwe bewijsmateriaal toont aan dat dat een foute conclusie was.
the new evidence shows on that that a wrong conclusion was
'Yesterday it was still highly likely that he had been in Portugal on his birthday, but the new evidence indicates that that conclusion was wrong.'

b. *Gisteren hoefde hij nog niet in Portugal geweest zijn op zijn verjaardag,*
yesterday need.PST he still not in Portugal been be on his birthday
maar het nieuwe bewijsmateriaal toont aan dat dat zeker weten het
but the new evidence shows on that that surely known the
geval was.
case was
'Yesterday it was still not necessarily the case that he had been in Portugal on his birthday, but the new evidence indicates that that surely was the case.'

c. *Gisteren kon hij nog in Portugal geweest zijn op zijn verjaardag, maar*
yesterday can.PST he still in Portugal been be on his birthday but
het nieuwe bewijsmateriaal toont aan dat dat onmogelijk was.
the new evidence shows on that that impossible was
'Yesterday it was still possible that he had been in Portugal on his birthday, but the new evidence indicates that that was impossible.'

In Russian, combination of modal nominal *vozmožnost'* or adjective *vozmožno* with a *cto*-clause gives rise to an epistemic interpretation (19). However, when combined with past tense, the interpretation parallel to the interpretation of Dutch examples in (18) arises, as shown in (20). So, it is another example of past tense outscoping epistemic modals. Note also that similar English sentences have been used by Aelbrecht and van Dooren to translate the Dutch data. While I do not necessarily want to commit to it, English modal adjective *possible* appears to behave just like Russian *vozmožno*. I leave the modal-temporal interaction in modal adjectives and nominals beyond Russian for further investigation.

(19) Russian *vozmožnost'* / *vozmožno* with a *čto*-clause

a. *Vozmožno čto na den' roždenija Džon byl v Portugalii*
possible that on day birth John was in Portugal
'It is possible that John was in Portugal on his birthday.'

b. *Est' vozmožnost' čto na den' roždenija Džon byl v Portugalii*
be possibility that on day birth John was in Portugal
'There is a possibility that John was in Portugal on his birthday.'

(20) Russian *vozmožnost'* / *vozmožno* can scope under past tense

a. *Bylo vozmožno čto na den' roždenija Džon byl v Portugalii, no nash agent*
was possible that on day birth John was in Portugal but our agent
govotit čto videl ego v tot den' v Pariže
says that saw him on that day in Paris
'It was possible that John had been in Portugal on his birthday but our agent says that he saw John in Paris that day.'

b. *Byla vozmožnost' čto na den' roždenija Džon byl v Portugalii, no nash*
was possibility that on day birth John was in Portugal but our
agent govotit čto videl ego v tot den' v Pariže
agent says that saw him on that day in Paris
'There was a possibility that John had been in Portugal on his birthday but our agent says that he saw John in Paris that day.'

I believe that these examples show that it is possible to have tense outscoping epistemic modality once we leave the well-researched domain of fully grammaticalized modal auxiliaries. It is important however, to note that, in my opinion, examples from Dutch and Russian are less compatible with analyses that postulate a covert perspective-shifting operator, similar to the existing answers to the observation of von Fintel & Gillies (2008) that English *might* can scope under past tense (for example, Hacquard 2010 notes that the scope reported by von Fintel and Gillies is found only with preceding *why*-questions in the discourse). I believe that Russian and Dutch data is more robust because (a) Dutch data has experimental back up (see, again, van Dooren 2020); (b) Russian strings presented in (20) either have the necessary interpretation or are judged by some speakers as simply infelictious. The fact that Russian data gives rise to variability in judgements invites an experimental investigation, which I leave for further research.

To sum up, the existing compositional approaches to syntax-semantics interactions in the domain of modality make a prediction about impossibility of tense outscoping epistemics. Although some cases of this scope relation are faulty (e.g., those presented in Rullmann & Matthewson 2018), the cases presented here show that it is indeed possible, casting doubt on the compositional approaches when applied to the syntax of modal expressions. Now it is time to discuss the alternatives.

3.2 Lexical approaches to syntactic influence on interpretation

As mentioned in the previous subsection, both compositional and lexical approaches aim to reverse the explanatory flow. The phenomena are presented not as items with interpretation I being located in the structural context C but rather items found in the structural context C having the interpretation I. The difference between compositional and lexical approaches lies in the generality of the interpretation of structural contexts. Here, I want to present and defend the idea of contextual allosemy found in the Distributed Morphology literature (Marantz 2013; Wood 2023), which states that semantic interpretation of lexical items in structural context is idiosyncratic and does not follow from general principles but is rather listed as rules which map a syntactic object to a semantic formula relative to a structural context. This approach, as will be argued in the next section, predicts an attested range of cross-linguistic variation. Although there are explanatory concerns with such an approach (for example, one can argue that contextual allosemy is stipulative), I will argue that these concerns are misguided and do not invalidate the contextual allosemy approach. But first, the conceptual background should be laid.

3.2.1 Late insertion across the board

Ever since its conception, the architecture of grammar in the generative enterprise has been modular (in the sense of the Modularity of Mind hypothesis of Jerry Fodor, see Fodor 1983). In particular, I mean the strong modularity thesis applied to linguistics, which states that syntactic

representations only contain entities that are relevant for the application of syntactic principles and operations (Vanden Wyngaerd, De Clercq & Caha 2021: 2). Given this statement, it is apparent that the syntactic representations should not contain any phonological information and the phonological form of morphemes is inserted after the syntactic derivation (hence, late insertion). To quote Alec Marantz, "[n]o phonological properties of roots interact with the principles or computations of syntax, nor do idiosyncratic Encyclopaedic facts about roots show any such interactions" (Marantz 1996: 16).

Although the idea of Late Insertion is almost universally accepted in contemporary generative work on syntax-morphology interface (with Collins & Kayne 2023 as a major exception), the mainstream position on Late Insertion at the syntax-semantics interface is rather unclear. On one hand, the 'classic' Heim-Kratzer framework for interpretive semantics (the function of semantic interpretation takes the syntactic tree as its argument and returns a semantic formula) is, strictly speaking, a Late Insertion model (unlike, say, Direct Compositionality approaches, in which the semantic composition and syntactic structure building go in parallel, see Jacobson 2004 and Barker & Jacobson 2007).

However, the mainstream Heim-Kratzer picture presents a Late Insertion system without irregularities. The syntax-semantics mapping, as mentioned in the previous subsection, is regarded by many to be perfectly regular. This conception can be seen in the Terminal Nodes rule of Heim & Kratzer 1998 according to which all terminal syntactic nodes have a constant semantic interpretation. Given the Y-model of grammar (Chomsky 1965), it is unclear why the syntax-semantics mapping and the syntax-morphology mapping are different. If we assume the lexical translation mode of communication between modules (Scheer 2012; Scheer 2020), which is the idea behind the Vocabulary (a list of syntax-morphology mapping rules) and Encyclopedia (a list of syntax-semantics mapping rules) lists, the difference in regularity between the two lists of essentially arbitrary rules seems theoretically suspect.

Nevertheless, the conceptual argument against the regularity of syntax-semantic mapping rules is not that strong (being based on the parallelism between two interfaces, which is not necessary). Hence, it needs to be supported by empirical considerations. Here, I will draw heavily from the unpublished work (slides and blogposts) by Omer Preminger, which aim to show the necessity of syntax-semantics mapping rules that are sensitive to the structural context. The argument will be built upon idioms in English. Similar observations hold for other languages, which I do not repeat and urge the interested reader to consult the slides in Preminger 2021.

It is clear that the notion that building blocks of syntax regularly correspond to a single semantic interpretation seems to be challenged by the existence of idioms. For example, the past tense form *went off* presents a case of mappings from syntax to morphology and semantics, which are (a) context-sensitive (or, take more than one syntactic terminal); (b) not parallel (mapping to morphology takes different objects than mapping to semantics).

(21) Form-meaning mismatches in idioms

a. The bomb went off.

b. PF:/went/ $\leftrightarrow$ {T, v, $\sqrt{\text{GO}}$}

c. LF: EXPLODE $\leftrightarrow$ {$\sqrt{\text{GO}}$, p, $\sqrt{\text{OFF}}$}

The objection from idioms, however, can be avoided by relaxing the Terminal Nodes rule (or a similar rule). One could state, for example, that the interpretation function is defined on syntac-

tic objects rather than syntactic terminals.

(22) Given the syntactic object $\gamma = \{\alpha, \beta\}$, $[\![\gamma]\!]$ equals to

a. $[\![\alpha]\!]([\![\beta]\!])$ if defined, or

b. $[\![\beta]\!]([\![\alpha]\!])$ if defined, or

c. $[\![\gamma]\!]$ if γ is listed in Encyclopedia

Although this formulation avoids the problem posed by phrasal idioms such as *go off* or *to kick the bucket*, a case can be made that there are idioms, which do not form a constituent. For example, the idiom presented in examples like *read the shit out of that book*. As shown in example (23), [the shit] and [out of] do not form a constituent in exclusion to, which could be mapped onto the meaning component of, say, intensity. The non-constituency is supported by the observation that the *the shit out of* idiom can undergo a certain kind of passivization on English, which would have been impossible, if the *the shit* constituent was a part of a larger *the shit out of* constituent, which were the sister of *that book*. The construction appears to be structurally parallel to sentences like (23c). The fact that the parts of the idiom do not form a constituent rules out an analysis, in which the meaning of intensity comes from a non-terminal syntactic object.

(23) The idiomatic interpretation comes from a non-constituent *the shit out of*

a. She read the shit out of that book.

b. The book had [the shit]$_1$ read t_1 [out of it].

c. She drank [some coffee] [out [of that cup]].

This single example makes it necessary to have a mechanism that allows the interpretation of an item to vary depending on the syntactic context. So, for example, the verbal root when composed 'next to' *the shit out of* is interpreted as an intensive action (see Preminger 2021 for technicalities). If such a mechanism is necessary, the idea behind the compositional approaches to syntactic influence on interpretation appears to be misguided. Hence, if the linguistic system allows non-constituents to have idiosyncratic interpretation when in a local configuration with each other, not using this mechanism for attested syntax-semantics interaction phenomena can only be motivated by a notion of 'interesting-ness' of an analysis, which should play little to no role in science.

So, a theoretical mechanism to derive interpretation relative to a structural context is necessary. Luckily, the work has already been done. Similarly to the Vocabulary Inserion rules, which match syntactic objects to morpho-phonological interpretations (mapping of PL to *-en* for *oxen*), researchers working in the framework of Distributed Morphology posit similar rules for the Encyclopedia, the list of $\langle$SYN, SEM$\rangle$ pairs. Such rules are sometimes called Sense Insertion rules (cf. Schwarzschild 2022). The phenomena analysed via Vocabulary Insertion rules are referred to as *contextual allomorphy* while the phenomena analysed via Sense Insertion rules are referred to as *contextual allosemy*.

(24) Insertion rules in Vocabulary and Encyclopedia

a. PL $\leftrightarrow$ -/en/ / $\sqrt{\text{ox}}\frown$__ (derives ox-en)

b. PL $\leftrightarrow$ $\lambda p_{et}.p$ /$\sqrt{\text{scissor}}$+__ (derives *pluralia tantum* scissors)

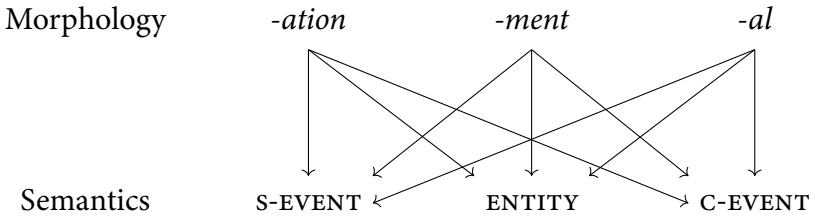
Now, let us discuss the basic explanatory logic behind the analyses, which employ the idea of contextual allosemy. By doing so, I will illuminate that the case of modals and their structural asymmetry is essentially the same and requires a similarly spirited analysis.

3.2.2 Logic of allosemy and modals

In my opinion, some of the best theoretical works advancing the idea of allosemy are Myler 2016 and Wood 2023, which, among other things, articulate the advantages of allosemy beyond its conceptual naturalness in a modular conception of the architecture of grammar. The introduction of Wood 2023 can help understanding the usefulness of allosemy in the domain of structural properties of modal expressions.

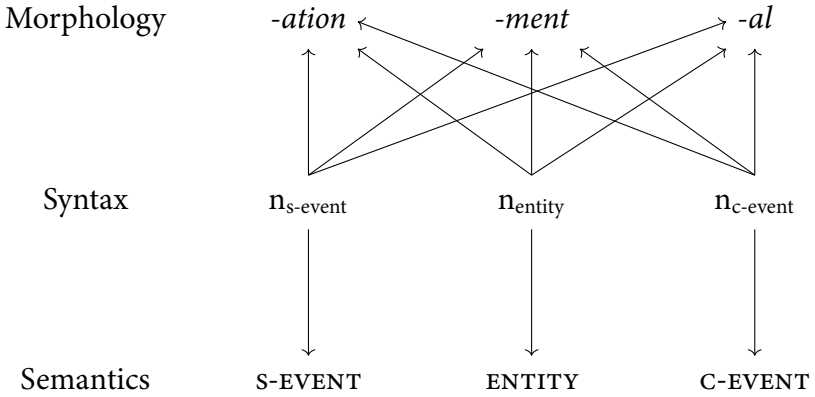
Wood's work is focused on nominalizations and, more narrowly, on the fact that a diverse set of nominalizing affixes in world's languages (e.g., English *-ment*, *-ation*, *-al* and so on) all seem to get the same basic readings (Complex Event reading, Simple Event reading, Referring Nominals, cf. Grimshaw 1990). The picture in (25) shows the form-meaning mappings in the domain of nominalizations.

(25) Correspondences between nominalizing affixes and readings (Wood 2023: 15)



As Wood notes, the idea of contextual allomorphy allows to group together the same reading of different affixes under the same 'flavor' of the nominalizing head, as shown in the picture in (26). However, contextual allomorphy only gets us half the solution. It does not explain "why the same meanings get the same set of affixes.", this property does not follow from the analysis. However, the three-way ambiguity of nominalizations is widely attested, if not universal, which makes the non-accidental nature of the three-way ambiguity a desirable feature of an analysis.

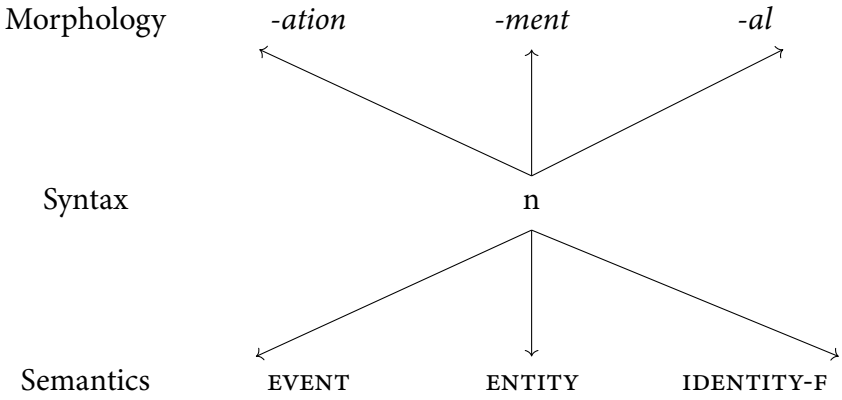
(26) Where contextual allomorphy gets us (Wood 2023: 15)



The contextual allosemy solution proposed by Wood presents a neat configuration, which ex-

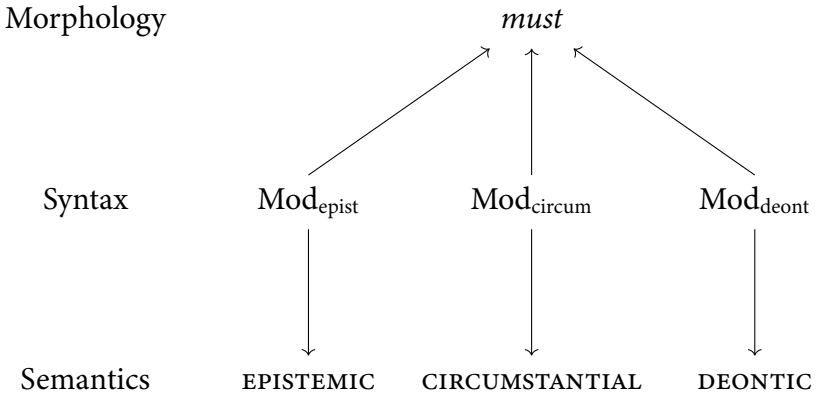
plains why multiple affixes are matched with multiple meanings in a systematic fashion — this property follows from the fact that they correspond to the same syntactic object, the nominalizing head *n*, as shown in the picture in (27)[7]

(27) A system with both allomorphy and allosemy (Wood 2023: 15)



The contextual allosemy, thus, is a way to systematically link a multitude of meanings to each other, it presents an alternative to underspecification accounts of polysemy, which (as we have seen earlier) cannot account, among other things, for cases where 'meanings' of an ambiguous expression have different structural properties. It is clear that modals present a strikingly similar case. Given the failure of Hacquard's and Ramchand's analyses, the prospects are bleak without allosemy. We are required to postulate three different 'flavors' of the Mod(al) head in syntax, which just so happen to be mapped onto the same morphological form (like *must*).

(28) A homophony-based analysis for modals

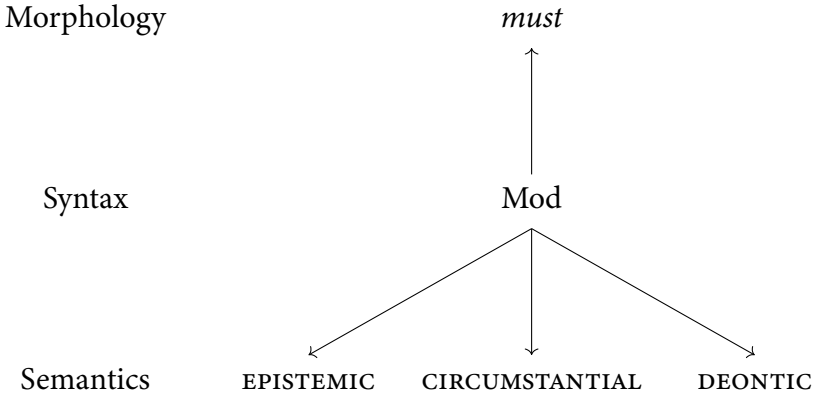


Contextual allosemy allows to avoid the postulation of different Mod heads. An alternative system presents a view where the single Mod head has a number of allosemes (the precise list of those is irrelevant to me), and the choice of a particular alloseme is conditioned by the structural

[7] For Wood, there are three allosemes for the *n* head. First alloseme denotes an event (the simple event readings follows). Second alloseme denotes an entity (the referential nominal reading follows). Third alloseme, however, is empty at LF, it denotes a function that returns its input. This is how Wood derives the complex event reading, assuming that *n* is on top of *v*, which can semantically introduce the eventuality and its argument structure. It should be noted, however, that the alloseme selection in Wood's system is rather unconstrained.

context of the modal, which presents us with a picture as in (29) that, similarly to the Wood's argument about nominalizations, allows to capture the fact that the same set of forms is systematically paired with the same set of interpretations, the only difference being that the set of forms for modals is often a set with one member.

(29) An allosemy-based analysis for modals



Although the argument in this thesis is mostly non-commital to a particular implementation, a putative allosemy system for English *must* is presented in (30). The system is rather straightforward (similar ideas can be found in van Dooren 2020). The modal becomes epistemic when its sister is TP. The modal becomes circumstantial as an elsewhere case. If we buy the argument in Rubinstein 2012, the modal becomes deontic when its sister is AspP. Note that the allosemy system can accommodate virtually any generalization about syntactic properties of modal, even those, which are unattested.

(30) Sense Insertion rules for Mod

a. Mod ↔ EPISTEMIC /__+TP

b. Mod ↔ DEONTIC /__+AspP

c. Mod ↔ CIRCUMSTANTIAL

The fact that allosemy does not put any restrictions on what generalization it can implement (after all, Sense Insertion rules are in principle as arbitrary as Vocabulary Insertion rules) is allosemy's strength and weakness. On one hand, the essential arbitrariness of Sense Insertion rules easily accounts for a fair share of cross-linguistic variation with respect to the syntactic behavior of modal readings. On another hand, however, as already argued by, for example, Ramchand 2015, any allosemy-based analysis is stipulative and has little to none explanatory power. In this largely theoretical and conceptual section, I will address the explanatory concerns associated with contextual allosemy. The predictions of a system based on contextual allosemy will be dealt with in the next section.

3.2.3 Explanatory concerns

As already mentioned, contextual allosemy is arbitrary by definition. Here, I will review and respond to objections to the arbitrariness of contextual allosemy, put forth in a forceful way by Ramchand (2015). She aims at three 'costs' of allowing contextual allosemy in the architecture

of grammar: (a) allosemy requires a list that determines the distribution of allosemic variants, in addition to the lists for allomorphy and subcategorization; (b) once the tight universal link between syntax and semantics is severed, Ramchand does not see how acquisition works, since the tight link is assumed by hypotheses of syntactic and semantic bootstrapping (see the review in Fisher et al. 2010); (c) "generalizations about hierarchy and meaning correspondences like the (I think exceptionless) one that syntactic embedding never inverts causational structure is completely mysterious and cannot fall out naturally from such a system".

The first 'cost' presented by Ramchand is mysterious to me. A list of syntax-semantics correspondences is necessary on every model of syntax-semantics interface which does not assume Direct Compositionality (again, see Jacobson 2004). So, no conceptual baggage is added by the list of Sense Insertion rules. One could understand Ramchand's claim as arguing that adding multiple Sense Insertion rules is costly (e.g., for the reasons of Minimal Description Length principle for grammars, see Katzir 2014). Still, Ramchand's first claim needs to be backed by any quantitative data on precise implementations of allosemy-based systems, which currently do not exist. On the conceptual level, the 'cost' does not appear that big.

The second 'cost' is an argument from empirical success. Many works on the syntactic and semantic acquisition assume that learning of verbs depends on the tight links between syntactic configurations and semantic properties (such as argument structures), which can be innate or learned (Gleitman et al. 2005). Ramchand argues that allosemy severs these tight links and, as such, is incompatible with current models of language acquisition. Similar sentiments can be found in Ramchand 2018. She worries that the non-lexicalist models of grammar do not correspond well with the psycholinguistic evidence for the level of 'lemma'. However, I think that the order of argumentation is incorrect in this argument. In accordance with Marr's three levels (Marr 1982), the level of grammatical description (the level of theoretical linguistics) is a prerequisite for research in language acquisition and other behavioral and neurological properties of language faculty. To make the claim substantive, a recent paper by Krauska & Lau (2023) suggests a way to reconcile the findings in psycho- and neuro-linguistics, which assume a leixcalist architecture of grammar, with the theoretically-motivated non-lexicalism in contemporary theoretical linguistics.

The third 'cost' presented by Ramchand is the one to be discussed the most. In essence, it boils down to the following concern: there is no independent motivation for arbitrary Sense Insertion rules and, hence, any generalization about impossible syntax-semantics correspondences does not naturally follow from the theory of syntax-semantics interaction based on allosemy. Quite interestingly, concerns of the same type are found in another part of theoretical linguistics, namely, the works on phonetics-phonology interface. The position of contextual allosemy is to the syntax-semantics interface is similar to the idea of substance-free phonology, which states that the basic objects of phonology are matched up with phonetic properties in an arbitrary way (see Chabot 2021 for an overview and empirical motivation). A striking example of an arbitrary phonology-phonetics relationship comes from South-East British English (Scheer 2022, citing Harrington, Kleber & Reubold 2008). The *uu*-sound (in words like *boot*) is fronted and pronounced as [ii]. Despite that, it triggers the insertion of [w]-glide in contexts like *do it* [dii w it]. The vowel acts like *u* in phonology despite being pronounced as a front vowel.

As argued by Scheer 2014, although there is empirical evidence for the arbitrary relations between phonological primes and their articulatory properties, the conclusion that the relationship between the two is arbitrary in principle is quite counter-intuitive. After all, in most cases it is regular. To take a quote by Scheer, which is relevant to our purposes as well, "It is fairly un-

controversial that the most important ontological gap within subcomponents of grammar is that between syntax, morphology and semantics on the one hand, and phon- (-ology, -etics) on the other" (Scheer 2014: 268). The mapping, which crosses this gap (syntax-morphology mapping) cannot be anything but 100% arbitrary.

So, the situation is that we have theoretical motivation to treat phonology-phonetics and syntax-semantics mappings to be arbitrary by design but this conclusion does not appear attractive since the arbitrary maps are edge cases and appear to be exceptional. The question is, if the mapping is arbitrary why is it so often not? The suggestion of Scheer 2014 is that this is due to the process of grammaticalization (or conventionalization). To take a quote again, "The symbolic vocabulary of morpho-syntax and semantics is the grammaticalized version of real-world experience such as time, speakers, the difference between living and non-living items, between humans and non-humans, etc. On the other hand, phonetic categories are grammaticalized in terms of phonological vocabulary." The difference between the syntax-morphology mapping and others lies in the fact that the syntax-morphology mapping (mapping between syntactic objects and morpho-phonological strings) does not grammaticalize anything, unlike phonetics-phonology mapping, which grammaticalizes patterns of sounds, and unlike syntax-semantics mapping, which grammaticalizes patterns of meaning. To quote Preminger (2019), meaning contrasts are parasitic on available syntactic contrasts. This can be reformulated as follows: syntax utilizes its purely abstract objects to conventionalize patterns of meaning and this is why the essentially arbitrary syntax-semantics mapping is not so in most of the cases.

The discussion here was rather abstract but I want to make the following point. Contextual allosemy, when understood as conventionalized patterns of meaning, makes it possible to reframe the question of impossible syntax-semantics mappings in a functionalist (third-factor, cf. Chomsky 2005) way. Instead of aiming for generalizations like 'syntactic embedding never inverts causational structure' to fall out of the inner workings of grammar, one should instead aim to explain these generalizations in the properties of, e.g., causal cognition and not the grammar in the narrow sense. In fact, Ramchand herself states that she is "looking for an explanation of the templatic [cartographic] effects from the semantic and cognitive primitives that form the basis of natural language" (Ramchand 2018: 7). I agree with the sentiment but the goal expressed by Ramchand is achievable in an allosemy-based framework as well.

To summarize the discussion, contextual allosemy, as argued by Ramchand, does not alleviate the need for fundamental explanations of the syntax-semantics interactions found cross-linguistically. What contextual allosemy instead achieves is the shift of the *explanandum* to the arbitrary conventionalized patterns, which are more amenable to a cognitive-based, functionalist explanation, as evidenced by the rich literature on the topic of grammaticaliztion of syntactic constructions (see, for example, Goldberg 2005; Bybee 2006. I am personally fond of the functionalist framework proposed by Kirby 1999). Though, of course, the resulting picture presented here is much less in denial of syntax than most functionalist work, the closest thing I can think of can be found in Newmeyer 2005.

3.3 Taking stock

In this section, I have presented the general logic of the 'constructionist' views of grammar. Limiting ourselves to modals, the idea is to reverse the question from 'why are epistemic modals found above TP?' to 'why are modals found above TP epistemic?'. In addition to that, I have presented and defended a particular constructionist view, which I have dubbed 'lexical'. The

idea is that, unlike the compositional approaches (Borer 2005a; Ramchand 2018), the semantic interpretation of a lexical item in a given structural position is arbitrary and does not follow from general semantics of the lexical item and the structural position themselves. In particular, I have adopted the idea of contextual allosemy, according to which the interpretation of any given syntactic item is many-to-one (allowing the influence of structural contexts) and arbitrary.

The resulting view has been argued to converge with many functionalist approaches to grammatical phenomena with respect to the syntax-semantics mapping. Since the mapping of syntactic atoms to their interpretation is many-to-one and arbitrary, the question of (im)possible patterns of syntax-semantics mappings is reframed as the question of (im)possible patterns of conventionalization, which is the main question of the literature on functional-typological literature on linguistic phenomena.

This section has presented a defense of contextual allosemy and has put forth a particular understanding of a grammatical architecture and grammatical explanation, once we accept the idea of allosemy. It has been shown that contextual allosemy is the perfect analytical match for a phenomenon like the structural pattern of modals. In the next section, I present a more substantive defence of allosemy when applied to modals. In particular, I aim to show that the range of cross-linguistic variation with respect to structural correlates of distinctions in the semantic domain of modality is attested, which lines up with similar works on clausal complemenation (Lohninger & Wurmbrand 2020).

4 Exploring the empirical possibilities

This section is devoted to motivating an allosemy-based approach by showing the types of data, for which allosemy helps account in a straightforward way. First, I will discuss the analytical possibilities provided by an allosemy-based model for modality. Contextual allosemy, when understood as mapping syntactic objects and the syntactic properties of its structural context, allows for a range of syntax–semantics interactions, beyond the process of composition and the interpretation of distinct syntactic items, as was the case with the compositional approaches. Hence, we may easily account for modal alternations, which depend on more 'syntactic' phenomena with less straightforward influence on semantic interpretation and composition, such as argument structure and case marking.

Another promising possibility given by allosemy (its arbitrary nature, to be exact) is the lack of commitment to idea that the structural configuration is tied to the same modal interpretation, both cross-linguistically and inside a grammar. Thus, we expect variation in two directions: (a) different structural configurations may give rise to the same modal interpretation; (b) different modal interpretations may arise due to the same structural configuration.

This section's goal is to give empirical justifications for all these properties of an allosemy-based account. First, we explore the cases of argument structure influencing the modal interpretation, building upon existing work on dynamic modals (drawing from the overview in Ramchand 2018) and Russian modal *dolžen* (Postnikova 2022). Then, we look at a case of interaction between case marking and modal interpretation from Poshkart Chuvash reported by Mikhail Knyazev in a recent paper (Knyazev 2021). These case studies will be shown to indicate that a thematic relation between the modal and the subject cannot be consistently connected to a single type of a modal interpretation – providing evidence that different modal interpretations may arise due to the same structural configuration.

Coming to the question of variation in structures with the same modal interpretation, the main focus will be on epistemic modals, which embed CPs, not TPs as we might expect from the studies of well explored epistemic modal auxiliaries in European languages. Such epistemics are found, on one side, in adjectival and nominal domains in Russian and English, and, on other side, in verbal modals in BCS (as reported by Veselinović 2019). Data from epistemic modals that embed CPs is crucial in showing that the structural configuration of the modal is not fully pre-determined by its interpretation – while there is semantic motivation behind the fact that epistemics embed larger structures than roots, the observed syntactic behavior of modals cannot be reduced to semantic generalizations. This point has also been made in the closely related domain of attitude verbs in the cross-linguistic study of Lohninger & Wurmbrand (2020), and the case study of Serbian clausal complementation will accompany the argument made based on epistemic modals. To bring my work and the work of Wurmbrand and Lohninger together, I also present a case study on belief-/intent-report alternation with Russian verb *dumat'*.

I believe that case studies in this section, when taken together, show the promise of an allosemy-based approach to syntax-semantics interaction. However, I should reiterate the crucial caveat made in the previous section. It is not the case that anything goes in allosemy. One cannot make the interpretation of a modal vary based on the gender of a nominal in the same clause. Additionally, it is not the case that allosemy patterns found in natural languages are random – they might have underlying semantic motivation. However, I am aiming to show that such motivations are just that and they should not be considered principles of grammar, which, I think, is what the case studies in this section show.

4.1 Modals and argument structure

4.1.1 In a nutshell

An allosemy-based account opens the way for many syntactic properties to influence interpretation, should they be local enough. This subsection discusses the interaction of argument structure with modal interpretation. First, we will revisit existing diagnostics for dynamic interpretations of modals and show that all they show is that such modals interact with argument structure.

Then, we will look at the case of Russian modal expression *dolžen*, which shows a specific syntactic behavior when interpreted as directed deontic verb. This behavior is also best understood as following from the interaction of such modal with argument structure. These two cases, I argue, constitute an argument against the modal interpretation determining its structural configuration since the presence of a thematic relation between the modal and the subject may end up enforcing different modal interpretations.

4.1.2 Diagnostics for dynamic modals in English

Ramchand 2018 presents a number of diagnostics for distinguishing dynamic modals from all the rest. Let us go through them. The first diagnostic mentioned is the impossibility of expletive subjects with dynamic modals. As Ramchand shows, both deontic (shown in 31a-31b) and epistemic (shown in 31c-31d) readings are possible with expletive subjects in English, while dynamic readings are not, as shown in (31e-31f).

(31) Expletives are possible in all modal flavors but dynamic (Ramchand 2018:138-139)

a. Epistemic with *it*:
It may be raining

b. Epistemic with *there*:
There may be some eggs in the refrigerator.

c. Deontic with *it*:
It must be quiet in the reading room at all times.

d. Deontic with *there*:
There may be up to five cars in the lot at one time.

e. Dynamic with *it*:
*It is capable that Mary swims.

f. Dynamic with *there*:
*There can Mary swim.

Although Ramchand ultimately draws the conclusion that dynamic modals take a VP complement, it is clear that this diagnostic only shows the presence of a thematic relation between the subject and the modal. The fact that zero-place predicates (like the weather predicate *rain*) are incompatible with dynamic modals follows from the thematic role assignment, not the syntactic position. Same goes for availability of *there*: since English verb does not undergo V-to-T head movement (Pollock 1989), it is impossible to have subject in postposition to the predicate, which bears a thematic relation to the subject. Another reason to reach the conclusion that this diagnostic is the diagnostic for thematic role assignment is the fact that there are deontic modals

(so-called directed deontic modals), which do not allow expletives, such as *be obliged*, as shown in (32)

(32) Deontic *be obliged* does not allow expletives (Ramchand 2018: 139)

a. *There is obliged Mary to pay the extra fees herself.

b. *It is obliged that Mary pay the extra fees herself.

The next diagnostic is the disruption of symmetry in symmetric predicates: whenever one has a true sentence with a symmetric predicate, one can reverse the roles and still get a true sentence. Same with falsity – the two sentences in (33) entail each other.

(33) Symmetric entailment with symmetric predicates
John has the same score as Bill. $\Leftrightarrow$ Bill has the same score as John.

However, when a dynamic modal is added, the symmetry is disrupted, which does not happen with other modal flavors, as shown in (34).

(34) Symmetric entailment and lack thereof with modals

a. Epistemic modals
John may get the same score as Bill $\Longleftrightarrow$ Bill may get the same score as John

b. Deontic modals
John must get the same score as Bill $\Longleftrightarrow$ Bill must get the same score as John

c. Dynamic modals
John can get the same score as Bill $\not\Leftarrow/\not\Rightarrow$ Bill can get the same score as John

As was the case with the previous diagnostic, this diagnostic only detects presence of a thematic relation – as evidenced by the fact that directed deontics also disrupt the symmetry of entailment, as shown in (35)

(35) Directed deontic modals
John is obliged to get the same score as Bill $\not\Leftarrow/\not\Rightarrow$ Bill is obliged to get the same score as John

Two other diagnostics of Ramchand's are linear order in the sequence of modals and the possibility of being expressed by derivational suffixation. Linear order, however, also appears to be 'contaminated' by directed deontic modals, as Ramchand shows herself. Although the observation that derivational suffixation only expressed dynamic modality is definitely interesting, I do not have to say anything about it.

To summarize, most of the diagnostic Ramchand cites to establish the 'low' position of dynamic modals are better described as, basically, thematic role diagnostics. If the thematic role assignment is the crucial property of dynamic modals, we should not find a modal, which is underspecified and is interpreted as a directed deontic modal when projecting an argument. After all, English directed deontics like *obliged* are separate lexical items and could be argued to not be in the same class as *can*. The next part of this subsection argues that Russian modal *dolžen* is such a modal.

4.1.3 Argument structure and Russian *dolžen*

The previous parts of this subsection have established that the presence of a thematic relation between the subject and the modal is the only property, which may distinguish dynamic modals syntactically. The possible complication comes from directed deontic modals like English *obliged*, which behave just like dynamic modals with respect to diagnostics for a thematic role.

An immediate answer could come from a position that *obliged* is not really a counterpoint to linking modals with dynamic modality because, for example, it is not underspecified – hence, there is no role of structure in determining its semantics (I do not subscribe under this argument but it definitely could be made). Here, I present the data from Russian modal *dolžen*, which is underspecified, can get a directed deontic reading, and exhibits different syntactic behavior depending on its interpretation. I should note that most generalizations to be presented come from Postnikova 2022.

First, let us establish that Russian *dolžen* can have a range of interpretations. Examples in (36) show that Russian *dolžen* can have undirected deontic (the proposition is true in worlds corresponding to the law), directed deontic (the proposition is true in worlds corresponding to the law and the law places the obligation on the subject), and epistemic interpretations (the proposition is true in worlds corresponding to the speaker's beliefs). These three classes of interpretations of sentences with *dolžen* provide the ground for the argument to come.

(36) Possible interpretations of *dolžen*

a. Epistemic
Oni uže dolžny proežat' Tver'
they already must drive.by Tver'
'They should be driving by Tver' already.'

b. Undirected deontic
Bumagi dolžny ležat' na stole
papers must lie on table
'Papers must be on the table.'

c. Directed deontic
Pokupatel' dolžen sovershit' oplatu v techenii dvux nedel'
buyer must make payment in timespan two weeks
'The buyer must pay in two weeks.'

The second point of variation found with *dolžen* is the linear position with respect to the past tense copula *byl*. As shown in examples in (37), all imaginable linear orders are found, both *dolžen* preceding the copula and copula preceding *dolžen*.

(37) Two possible linear orders of *dolžen* and *byl*

a. *dolžen»byl*
Oni dolžny byli sdat' esse vchera
They must COP.PST.PL submit essay yesterday
'They were supposed to submit their essays yesterday.'

b. *byl»dolžen*

Oni byli dolžny sdat' esse vchera
They COP.PST.PL must submit essay yesterday
'They had to submit their essays yesterday.'

Postnikova herself ties two possible orders to there being two lexical items pronounced as *dolžen* in Russian. The first *dolžen* is a functional item in the extended verbal projection, much like English *must*. Position of the pre-copula *dolžen* appears to be above T.[8] On the other hand, the post-copula *dolžen* is a lexical verb, which projects an argument (resulting in its obligatory directed deontic interpretation). Hence, it is predicted to be below the copula syntactically and be linearly preceded by said copula.

The evidence from this comes from zero-place predicates and symmetric predicates embedded under *dolžen* in different positions with respect to the past tense copula. As the example in (38a) shows, *dolžen* in postposition to *byl* is unacceptable with *raspogoditsya* 'weather to get better', a zero-place weather predicate in Russian, while the configuration with *dolžen* in preposition is acceptable, as shown in (38b).

(38) Zero-place predicates with *dolžen* and *byl* (Postnikova 2022: 21)

a. *Včera dolžno bylo raspogodit'sja*
yesterday must COP.PST.N weather.get.better
'The weather was supposed to get better yesterday.'

b. **Včera bylo dolžno raspogodit'sja*
yesterday COP.PST.N must weather.get.better
Intended: 'The weather was supposed to get better yesterday.'

Symmetric predicates behave in a similar way with respect to different orders of *dolžen* and *byl*. As examples in (39) show, the two-way entailment between swapped roles of a symmetric predicates is necessarily broken when *byl* goes before *dolžen* (39a) and isn't when *byl* goes after *dolžen* (39b).

(39) Symmetric predicates with *dolžen»byl* (Postnikova 2022:21)

a. *Vasja dolžen byl požat' ruku ženje*
Vasja must COP.PST.M shake hand ženja.DAT
'It must have been that Vasja shook hands with ženja.' (=b)

b. *ženja dolžen byl požat' ruku Vasje*
ženja must COP.PST.M shake hand Vasja.DAT
'It must have been that ženja shook hands with Vasja.' (=a)

[8] The fact that an apparently deontic modal is found above T is out of scope for this section, since its main point is that *dolžen* has a default position where all readings are available and a 'marked' position, which only allows directed deontic readings. Although I should note that an allosemy model easily accounts for such lexical idiosyncrasy.

(40) Symmetric predicates with *byl»dolžen* (Postnikova 2022:21-22)

a. *Vasja byl dolžen požat' ruku ženje*
Vasja COP.PST.M must shake hand ženja.DAT
'Vasja was obliged to shake hands with ženja.' (≠b)

b. *ženja byl dolžen požat' ruku Vasje*
ženja COP.PST.M must shake hand Vasja.DAT
'ženja was obliged to shaje hands with Vasja.' (≠a)

Additional evidence comes from the verbal fronting found in Russian polar questions (similarly to T-to-C in English polar questions). In polar questions with the particle *=li*, the highest verbal element is fronted, as shown in examples in (41). I should note that fronting of other elements in the sentences provided below yields acceptable strings but results in a narrow focus interpretation.

(41) Fronting in Russian polar questions

a. Main verb is fronted
Kupila =li ona jablok?
buy.PST.F =Q she apples
'Did she buy some apples?'

b. Tensed auxiliary is fronted
Budet =li one plakat?
COP.FUT.3SG =Q she cry
'Will she cry?'

c. Modal auxiliary is fronted
Mog =li on postupit' inache?
can =Q he act differently
'Could he have acted differently?'

This pattern is found with different structures for *dolžen* as well. When the copula is fronted, only the directed deontic reading is available (42). When it is *dolžen* that is fronted, all readings become readily available (Postnikova 2022: 48).[9] The 3/4 pattern strongly suggests that there is a specific structural configuration available for directed deontic modals, but this configuration is merely sufficient for a directed deontic reading to arise, since *dolžen* in other structural positions can also be interpreted as a directed deontic modal.

(42) Fronting in Russian polar questions and *dolžen*

a. Fronted modal with non-directed deontic reading
Dolžno =li bylo kafe otkryt'sja v vosem'?
must =Q COP.PST.N cafe open in eight
'Was the cafe supposed to open at eight?'

[9] Posnikova herself judges the example (b) infelicitous, which is unclear to me. The context, in which two teachers discuss the absence of Petja's essay, and one of teachers raises the point expressed in (b), makes the sentence OK, according to my judgement (and the judgement of several Russian speakers).

b. Fronted modal with directed deontic reading

Dolžen =li byl Petja sdat' esse?
must =Q COP.PST.M Petja submit essay
'Was Petja required to submit his essay?'

c. Fronted copula with non-directed deontic reading

**Bylo =li dolžno kafe otkryt'sja v vosem'?*
COP.PST.N =Q must cafe open in eight
'Was the cafe supposed to open at eight?'

d. Fronted copula with directed deontic reading

Dolžen =li byl Petja sdat' esse?
must =Q COP.PST.M Petja submit essay
'Was Petja required to submit his essay?'

To summarize the discussion of the data, we end up with the following picture. There are two syntactic positions, in which *dolžen* is found: a position in the vP domain, which only allows directed deontic readings (following Postnikova, that this is a control structure, which embeds a large verbal phrase), and a position above T, which allows all readings and is higher than all verbal morphology in the clause, leading to availability of fronting. The difference between the two then lies in the presence of a Voice head on top of the modal (argued to be the only characteristic of control predicates, see Rudnev & Shikunova 2022).

I believe that the interpretational differences between the two positions of *dolžen* is the result of argument-projecting functional structure (like the Voice head) influencing the modal interpretation in an allosemy-like fashion. I do not see any alternative explanation that does not involve two distinct lexical items, *dolžen*$_1$ and *dolžen*$_2$, as Postnikova (2022) suggests (which is an unattractive analysis, in my opinion, given the fact that the two *dolžen*'s are in complementary distribution).

So, *dolžen* presents a clear case of a modal that (a) has directed deontic reading when projecting an argument and (b) is underspecified in a sense that it has multiple interpretations. The implications of such understanding of *dolžen* are discussed in the next subpart of this section.

4.1.4 On modals with arguments

This subsection has built upon three case studies to make the following argument. First, we have established that if there is a syntactic property, which distinguishes dynamic modals from others, it is likely to be the projection of an external argument. The second premise of the argument is that the projection of external argument results in a directed deontic reading for the Russian ambiguous modal *dolžen*. From these two observations, it follows that the projection of external argument does not consistently correspond to any particular modal interpretation.

A possible caveat is that it could be argued that directed deontics and ability modals are discerned by the amount of functional verbal structure below the two. In this regard, however, the burden of proof does not lie on me — as shown previously, there is no evidence that ability modals are found in the putative EvtP domain of Ramchand 2018. Furthermore, rare examples of English abilitive modal *be able to* embedding a perfective auxiliary can be found online — although I have not re-checked this data with a native speaker, one example comes from the

Guardian article, a reputable source on English language, to say the least.

(43) English *be able to* embedding an auxiliary phrase with *have*

a. I am blessed to have been able to have run with – name drop time – Seb Coe, Brendan Foster and Haile Gebrselassie. (link)

b. Ben must perform some action and be such that he was able to have done otherwise (link)

The system based on allosemy accommodates such findings with respect to argument structure and argument introducing functional heads easily — if the relationship between modal interpretations and the structural configurations of modals is regulated by Sense Insertion rules, which allow a certain degree of randomness by design, such deviations from the one-to-one correspondence between structural contexts of modals and their readings are expected. It should also be noted that the domain of argument role assignment is one of the most fruitful branches of research on allosemy, developed in works of, among other people, Jim Wood and Neil Myler (Wood 2015; Myler 2016). So it is unsurprising that the domain of argument structure provides evidence for allosemy-based analyses in other types of syntax-semantics interaction.

In the next subsection, we will look at data from Poshkart Chuvash where the modal interpretation is dependent upon case on the subject. As was the case with Russian *dolžen*, we will find a 3/4 pattern where a structural configuration fixes a certain reading but is not necessary for this reading to arise. Yet again, a mismatch will be found, a many-to-one relationship between structures and interpretations, which is something expected and natural in the allosemy framework.

4.2 Modals and nominal case

In this subsection, I look at the case-alternations involving modal predicates in Poshkart Chuvash, based on Knyazev 2021. Of interest to us are modal constructions with the *-mAlA* affix, shown in examples (44). As these examples show, the modal construction with *-mAlA* can be interpreted both as deontic and epistemic necessity.

(44) Poshkart Chuvash modal constructions with *-mAlA* (Knyazev 2021: 103-105)

a. Deontic modality with *-mAlA*
man amal ёɕ-me-le
I.GEN medicine drink-INF-ATTR
'I need to take a pill.'

b. Epistemic modality with *-mAlA*
ku arbuz vonə kilo dort-ma-la.
this watermelon ten kilo weigh-INF-ATTR
'[According to my assessment,] this watermelon must weight 10 kilos.'

It is crucial, however, that it is not the case that this construction can be freely understood either epistemically, or as root modality. The possible interpretations depend on the case-marking of the 'subject' of sentences with the *-mAlA* construction. As Knyazev summarizes, the genitive case is impossible with epistemic interpretation, as shown by the ungrammaticality of a sentence,

which is the version of (44b) with genitive subject (example 45a). It should also be noted that this effect does not seem to be connected to some differential marking, since animate subjects do not allow genitive case under an epistemic interpretation as well (45b).

(45) Epistemic interpretation is unavailable with genitive subjects (Knyazev 2021:105)

a. **ku arbuz-ən vonə kilo dort-ma-la.*
this watermelon-GEN ten kilo weigh-INF-ATTR
'[According to my assessment,] this watermelon must weight 10 kilos.'

b. *vəl /*on klas-ra lar-ma-la.*
he he.GEN class-LOC sit-INF-ATTR
'He [Petya] must be in the class [preparing, as he is giving a talk at the seminar tomorrow].'

With the deontic interpretation, the situation seems to be more complicated, however. While all deontic interpretations allow genitive subjects, they seem to behave differently with respect to nominative subjects, which are possible only if the subject is not interpreted as the obligee, as shown in examples in (46).

(46) Deontic interpretations and nominative subjects (Knyazev 2021:103-104)

a. Nominative is unavailable when the subject is the obligee
san/ ??es pajan kaɕ-pa urok-sam tu-ma-la.
you you.GEN today evening-INS lessons-PL do-INF-ATTR
'You must do homework tonight [as you promised me].'

b. Nominative is available when the subject is not the obligee
kam-ən/ kam da bol-in şkol-da jol-ma-la.
who-GEN who ADD be-CONC school-LOC remain-INF-ATTR
'Someone [whoever it is] must stay in the school [in order to guard it while the others are away].'

In short, Knyazev shows that the *-mAlA* construction in Poshkart Chuvash undergoes alternation in modal interpretation, which is dependent on the alternation in the case marking of the subject. Following the literature on Russian dative-infinitival constructions (Tsedryk 2018; Burukina 2020), Knyazev proposes that the genitive case on the 'subject' is assigned by an Appl head, which is high in the syntactic structure and selects for the modal projection ModP, see structures in (47).

(47) Structures for genitive and nominative subjects with *-mAlA* (Knyazev 2021:112)

a. Deontic reading, subject is the obligee, GEN on subject
$[_{\text{ApplP}}\ \text{DP}_{\text{GEN}}\ [_{\text{ModP}}\ \ldots\ \text{Mod}_{[\text{DEONT}]}\ ]\ \text{Appl}\ ]$

b. Deontic reading, subject is not the obligee, GEN on subject
$[_{\text{ApplP}}\ [_{\text{ModP}}\ [_{\text{TP}}\ \text{DP}_{\text{GEN}}\ ]\ldots\ \text{Mod}_{[\text{DEONT}]}\ ]\ \text{Appl}\ ]$

c. Deontic reading, subject is not the obligee, NOM on subject
$[_{\text{ModP}}\ [_{\text{TP}}\ \text{DP}_{\text{NOM}}\ ]\ldots\ \text{Mod}_{[\text{DEONT}]}\ ]$

d. Epistemic reading, NOM on subject
$[_{\text{ModP}}\ [_{\text{TP}}\ \text{DP}_{\text{NOM}}\ ]\ldots\ \text{Mod}_{[\text{EPIST}]}\ ]$

To account for the impossibility of genitive marking under an epistemic interpretation, Knyazev stipulates that (a) the Mod head bears a diacritic DEONT/EPIST; (b) the Appl head selects for Mod[DEONT] only. Note that the introduction of such diacritics is exactly what allosemy-based analyses aim to eliminate. In a framework sketched in the preivous sections, the Poshkart Chuvash data can be handled by (a) giving the Mod head an underspecified default interpretation; (b) stating that Mod head is interpreted deontically when LF-adjacent to an Appl head.

While it is true that both accounts stipulate the case marking facts (they are likely to make sense only through a diachronic lens), an allosemy-based account works without putting a diacritic for modal flavor in syntax. Moreover, such non-trivial interactions are exactly what the allosemy accounts capture best, since these are the various syntactic ways to encode the semantic distinction in the domain of modality.

To draw intermediate conclusions, we have looked at several cases where the relationship between structural context of a modal and its interpretation is not pre-determined. Same structural properties give rise to different interpretations (as is the case with dynamic modals and directed deontic modals) and different structural properties give rise to the same interpretation (as is the case with Russian *dolžen* and the Poshkart Chuvash *-mala*).

In the next two subsections, we will continue this topic of non-determination and look at the cross-linguistic syntactic variation with epistemic modals and attitude verbs, which will bring additional support to the intermediate conclusions drawn here.

4.3 Modals embedding more than expected

Some epistemic modals embed full CPs rather than TPs. Firstly, this is evidently the case for Russian and English modal adjectives *vozmožno* 'possible' and *possible*. Given that the complementizer status of *that* and *čto* is (in my opinion) impossible to argue against, I will not provide additional evidence for these clauses being CPs.

(48) Epistemic modals with CPs

a. *It is possible that John did not prepare for the exam*

b. *Vozmožno, čto Vasja ne podgotovilsja k ekzamenu*
possible that Vasja not prepare for exam
'It is possible that Vasja did not prepare for the exam.'

The question is, why do non-verbal epistemic modals embed a CP in languages where verbal epistemic modals embed TPs? This is problematic if we want the structural context to partially determine the modal interpretation (which is an essential part for any analysis of modal ambiguity that does not resort to homophony, as argued in the section 2).

In a strictly compositional framework, it could be said that *that*- and *čto*- clauses are semantically equivalent to TPs. In fact, this is the position found in many work on attitude predicates, which follows the influential Hintikkian analysis of attitudes. However, recent years have seen a large body of literature supporting an alternative view that *that*- and *čto*- clauses are predicates, which specify the content of an entity or an event (Moulton 2015; Elliott 2017; Bondarenko

2022). If one agrees with this branch of linguistic theory (and I certainly do), another solution to CP-embedding epistemic modals is needed.

Here, I want to suggest an option, which is, in my opinion, more promising: there are many syntactic routes to the same interpretation, and, thus, there is no reason to assume that verbal modals will have the same syntactic distribution of modal flavors as adjectival modals and nominal modals. While the differences in syntactic distribution probably arise for syntactic reasons of clausal embedding, the 'goal' of modal expressions is still the same: to 'use' the available syntactic means to 'encode' semantic contrasts. Hence, while an adjective like *possible* cannot embed a regular TP found under epistemic modal auxiliaries, it can embed *that*-CPs and *for*-CPs, the difference between which acts as a syntactic parallel to the epistemic-root divide in semantics.

Note that should this reasoning hold, we expect similar things to happen cross-linguistically. It is hardly necessary, under an allosemy-based approach, that all epistemic modals across the world, even more 'verbal' ones, behave like English *might* and embed a TP. This prediction appears to be borne out. In her dissertation (Veselinović 2019), Dunja Veselinović argues that Bosnian-Croatian-Serbian (BCS) necessity modal *morati* 'must' embeds a CP when interpreted epistemically, just like English and Russian modal adjectives. So, she argues that the structure behind the string in (49) is bi-clausal.

(49) BCS epistemic necessity construtction

Mora (bi-ti) da djeca jed-u povrće
must be-INF that children eat-3PL vegatables
'The children must be eating vegetables.' (Veselinović 2019:16, glossing simplified)

I cannot do all her arguments justice (especially given the depth of discussion of BCS syntax), but I will iterate her most concise argument. It is known that *ni*-pronouns in BCS are only licensed by clausemate negation (Progovac 1991). Veselinović shows that the *ni*-pronoun can be licensed by negation scoping under a root modal, by negation scoping under an epistemic modal, by negation scoping over a root modal, but not by negation scoping over an epistemic modal, as the paradigm in (50) shows.

(50) Negation, *ni*-pronouns and modals in BCS (Veselinović 2019: 46-47, glossing simplified)

a. Negation under a root modal in BCS licenses *ni*-pronoun

Djeca mora-ju da ne po-jed-u ni-šta
kids must-3PL that NEG PFV-eat-3PL ni-what
'The kids must not eat anything.'

b. Negation under an epistemic modal in BCS licenses *ni*-pronoun

Mora da djeca ne jed-u ni-šta
must that kids NEG eat-3PL ni-what
'The kids must not eat anything.'

c. Negation over a root modal in BCS licenses *ni*-pronoun

Djeca ne mora-ju da po-jed-u ni-šta
kids NEG must-3PL that PFV-eat-3PL ni-what
'The kids don't have to eat anything.'

d. Negation over an epistemic modal in BCS does not license *ni*-pronoun

**Ne mora da djeca jed-u ni-šta*
NEG must that kids eat-3PL ni-what
'The kids must not eat anything.'

This data thus provides two points in favor of bi-clausal analysis of epistemic *morati* in BCS: (a) the availability of two negations (none of which is constituent negation, see Veselinović 2019); (b) the fact that there is a boundary below the epistemic modal that makes the negation and *ni*-pronouns in (50c) count as not clausemates. Given that there are two position for *da* in BCS (Todorovic 2016): CP-level and below C, and that epistemic *da*-clause contains a "boundary" and root *da*-clause does not, the natural conclusion is that BCS epistemics embed a CP, which is what we need to make the point of this subsection, which is that one cannot associate epistemic modals with a particular structural position as well. While there definitely is a semantic motivation for the types of structures possible with epistemic modals (for example, they need to contain interpretable tense), it does not appear that the epistemic interpretation is built step by step using an underspecified modal semantics and the interpretation certain structural configuration of functional heads (cf. Hacquard 2006; Ramchand 2018)

To summarize, the arbitrariness of Sense Insertion rules of allosemy predict variation in syntactic configurations leading to the same set of meanings, both cross-linguistically and inside the grammar. In the next subsection, we will look at the data from clausal embedding, which supports the expressed view as well.

4.4 Variation in clausal complementation

Lohninger & Wurmbrand 2020 is a cross-linguistic study on implicational hierarchies in clausal complementation. To recap their paper, Wurmbrand and Lohninger look at the ways different semantic classes of clausal complements are syntactically realized. Those classes are based on the three-way distinction between events, situations and propositions, adapted from Ramchand & Svenonius 2014.

(51) Three semantic classes of clausal complements (per Lohninger & Wurmbrand 2020)

a. Events: implicative and strong attempt contexts

b. Situations: emotive and irrealis contexts

c. Propositions: speech and epistemic contexts

The core finding of Lohninger & Wurmbrand 2020 is, to quote the paper itself, that "the mapping between syntax and semantics is thus not fully deterministic—syntax restricts meaning (in predictable ways), but does not fully determine it". There is only an implicational hierarchy: since there is a semantically grounded superset-subset relation between events, situations, and propositions, a certain syntactic construction cannot express events and propositions in exclusion of situations. But that is it, there is nothing more that can be said with respect to syntax-semantics mapping of three classes of clausal complements. Although some structural properties are necessary to encode events/situations/propositions (for example, a non-deficient T head appears necessary for the proposition type), the particular syntactic implementation of the basic semantic type-distinction is not determined by semantics itself.

Here, I should provide an example. Lohninger and Wurmbrand examine the patterns of clausal complementation in Serbian[10] (among other languages) and focus on two types of clausal arguments. First type is the infinitival clause, the second type is an embedded finite clause. Their main finding is that infinitival clauses can express events and situations, but not propositions, and finite clauses with overt subjects can express situations and situations, but not events.

(52) Serbian infinitival clauses (Lohninger & Wurmbrand 2020:17)

a. Propositions cannot be expressed by infinitives
*Tvrdim čitati ovu knjigu
claim.1SG read.INF this book
'I claim to be reading this book.'

b. Situations can be expressed by infinitives
Odlučila sam čitati ovu knjigu
decide.SG.FEM AUX.1SG read.INF this book
'I decided to read this book.'

c. Events can be expressed by infinitives
Pokušala sam čitati ovu knjigu
try.SG.FEM AUX.1SG read.INF this book
'I tried to read this book.'

(53) Serbian finite clauses with overt subjects

a. Propositions can be expressed by finite clauses with overt subjects
Jovan je tvrdio da je Petar otišao pre Marije
Jovan AUX claimed da AUX Peter left before Mary
'Jovan claimed that Peter has left before Mary.'

b. Situations can be expressed by finite clauses with overt subjects
Jovan je odlučio da Petar ode
Jovan AUX decided da Peter leaves
'Jovan decided that Peter would leave.'

c. Events cannot be expressed by finite clauses with overt subjects
*Jovan je pokušao da Petar ode
Jovan AUX tried da Peter leave
Intended interpretation is not provided by Wurmbrand and Lohninger.

The importance of this pattern in Serbian is that (a) there is no strict semantic class – syntactic class correspondence; (b) there can be more structure than "necessary" for a semantic class. Since three semantic classes roughly correspond to three domain of clausal domain (level of argument structure (vP), level of TAM (AspP-TP), and level of speech act (CP and higher)), we

[10] In the previous section, I have used the label BCS because it was used by Veselinović 2019. Here, I use the label Serbian because it is used by Lohninger & Wurmbrand 2020. I do not take a stance on the question of proper characterization of the status of the Serbain language.

would expect a strict correspondence between syntax and semantics, which we do not find. To repeat the idea expressed in the earlier sections, it appears that syntax-semantics correspondence is rather loose and this property of looseness can be accounted for in a system where the semantics of a particular syntactic configuration is not fully pre-determined by the configuration itself.

4.5 Allosemy in attitude alternations

To capitalize on the parallels between the existing literature on attitude verbs and the proposal put forth in this thesis, I present a short case study of a belief-/intent-report alternation found with the Russian verb *dumat'*, a rough equivalent of the English verbs *think*, exemplified in (54). When the embedded clause of the verb *dumat'* is finite, the sentence is interpreted as a belief report. When the embedded clause of the verb *dumat'* is non-finite, the sentence is interpreted as an intent report.

(54) Belief-/intent-report alternation in Russian

a. Belief report with a *čto*-clause

Vasja dumaet čto my idem pit' pivo
V. thinks that we go drink beer

'Vasja thinks that we are going to drink beer.'

b. Intent report with a non-finite clause

Vasja dumaet vypit' piva
V. thinks drink.INF beer

'Vasja intends to drink beer.'

To truly show that the non-finite clause results in an intent report and not, say, a desire report, I use the diagnostics from Grano 2022: intent reports cannot embed a non-volitional predicate (55a) or an impossible event (55b).

(55) Intention diagnostics with *dumat'*+INF

a. Intention reports are incompatible with non-volitional predicates

#Ya dumayu umeret'
I think die.INF

'I intend to die'
(The English version is also incoherent)

b. Intention reports are incompatible with impossible events

#Ya dumayu postroit' večnyj dvigatel'
I think build.INF perpetual machine

'I intend to build a perpetual motion machine'
(Judged ?? by Grano 2022)

To rule out the homophonous verbs analysis, it is enough to show that the suppletive nominalization *mysl'* exhibits the same alternation, as shown in the examples in (56).

(56) Suppletive nominalization *mysl'* shows the same alternation

a. *U menja est' mysl' čto Vlad idiot*
PREP me is thought that Vlad idiot
'I think that Vlad is an idiot.'

b. *U menja est' mysl' vypit' piva*
PREP me is thought drink.INF beer
'I'm thinking about drinking some beer.'
(='I intend to drink some beer')

The question is, can we reduce the alternation to the semantics of the embedded clause while giving *dumat'* a general enough lexical semantics to be able to occur in both constructions (see Bogal-Allbritten 2016 for a similar approach to attitude alternations in Navajo)? My answer is negative. The problem is, the semantic ingredients of intention are rather unique to intention reports. Not only do intentions require a causal chain from the state of intention to the embedded event, the causal chain has to be a 'right one'. To quote Grano 2022, "suppose Betty aims her gun at someone with the intention of shooting and killing them. Her intention makes her nervous and nervousness causes her to pull the trigger; the gun fires and the target is killed. Did Betty carry out her intention to kill the person in question? The intuition is that she did not, because although she intended to kill the person, and her intention caused the target outcome, it did not do so in the right way."

It is not the case, for example, that other 'modal' uses of Russian infinitival clauses carry the same restrictions as intent-reports. For example, Russian infinitival clauses can act as rationale clauses, as shown in (57a). As shown in example (57b), this particular use of infinitives does not constrain the (im)possibility of its embedded event.

(57) a. Russian infinitives are found in rationale clauses
Ya pishu etot diplom čtoby sebja pomuchat'
I write this thesis COMP REFL tease.INF
'I am writing this thesis to tease myself.'

b. Rationale clauses can describe an impossible event
^{OK}*Anton brosil rabotu čtoby postroit' večnyj dvigatel'*
A. left job COMP build.INF perpetual machine
'Anton left his job to build a perpetual motion machine.'

At this point in the case study, we are in a position similar to the have+NP debate between Pustejovsky on one side and Fodor with Lepore on the other (Fodor & Lepore 1998; Pustejovsky 1998).[11] For Fodor and Lepore, the question was: is there a level of representation where *want a beer* corresponds to [want [have a beer]], with a non-nominal complement of *want*? For us, the question is: is there a level of representation where the infinitival clause has all the ingredients for the intent report? The problem is the same: to maintain strict compositionality, postulation of syntactically non-motivated silent items is necessary.

It is clear that all possible approaches will present a stipulation that makes the verb *dumat'* denote an intent-report when composed with a non-finite clause. However, consider the follow-

[11] For rhetorical purposes, I ignore Harley's paper on the topic (Harley 2004).

ing: postulating a silent element on the left periphery of the embedded clause raises the question of why isn't such a variant of the infinitival clause possible elsewhere in Russian grammar? If one needs a stipulation, it is better to make it as specific to the case as possible. Allosemy provides just that — it will be lexical information that the verb *dumat'* denotes an intent report when composed with a non-finite clause. I should note that the co-compositionality proposal of Fodor & Lepore 1998 is remarkably similar to the allosemy framework I am advocating for. It is a great company to be in.

4.6 Variable syntax-semantics correspondences

In this section, we have looked at several empirical domains where an allosemy-based framework provides the analytical tools to capture the data straightforwardly. In the first part of the section, we have looked at cases where modal interpretation is influenced by case and argument structure, focusing on dynamic and directed deontic modals.

The argument was rather simple. First, we have established that existing diagnostics for dynamic modals in English are diagnostics of thematic relation between the subject and the modal, as evidenced by the fact that directed deontic readings pass these diagnostics as well. To make the case that the projection of external argument does not influence the modal interpretation in a straightforward way, we established that there is an underspecified modal (Russian *dolžen*), which is interpreted as a directed deontic only, when projecting an external argument. When taken together, the evidence points at the impossibility of characterizing dynamic and directed deontic readings as structural contexts, in which underspecified modals are put into.

In the second part of this section, we have looked at the data supporting the same statement: although semantic considerations place constraints on the possible syntactic configurations for, e.g., epistemic modality, semantics does not fully determine the syntactic structure. Three cases have been provided in favour of such conclusion: the fact that Russian (and English) modal adjectives (and the nominals derived from them) embed a CP when interpreted epistemically, the fact that BCS epistemic modals also embed a CP. These findings in the domain of modality correspond nicely to the findings of Lohninger & Wurmbrand 2020 in the domain of clausal complementation. Wurmbrand and Lohninger too come to a conclusion that the resulting semantic interpretation does not determine the syntactic structure cross-linguistically nor inside one language. Finally, we finished the section with a quick look at a belief-/intent-report alternation in Russian and concluded that allosemy provided the most constrained framework for such phenomena.

I take the contents of this section to constitute evidence that the mismatches predicted by an allosemy-based framework are indeed found once we consider modals across languages and across grammatical domains. Thus, allosemy fares better for modality than proposals found in Hacquard 2006, Ramchand 2018 and similarly spirited works: the syntactic distribution of modal flavors, although definitely not random with respect to semantic considerations, is not fully determined by those.

5 Conclusion

This thesis has presented an argument in favor of contextual allosemy as an approach to the syntax-semantics interface (see Wood 2023). The argument was based upon a well-known domain of syntax-semantics interactions, namely, the syntactic distribution of modals and different modal readings. I have argued that the behavior of modals is best explained by contextual allosemy when one takes cross-linguistic variability of structural properties of modals into account. In addition to capturing modals, I have connected the current proposal with contemporary work on clausal complementation (Lohninger & Wurmbrand 2020).

The framework given in this work follows the minority voice in generative literature (Marantz 2013; Preminger 2021; Wood 2023) that claims that syntactic primitive objects do not correspond to either form or meaning in a reliable way cross-linguistically. Although intuitively false, this view, I believe, is motivated by the linguistic data. In this work, I applied such logic to a well-known puzzle from the literature on syntax-semantics interface and did so in a deflationary way — the puzzling behavior of modals is exactly what one expects to happen in a grammatical architecture defended in this work. I believe many other phenomena on the syntax-semantics interface can be given similar accounts. After all, a problem is only a problem insofar as one's assumptions are correct.

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