

Remus Gergel

Modal Syntax: Detecting its Parameters with VP-Ellipsis

Abstract

Recent syntactic approaches unconventionally transfer semantic modal distinctions to syntactic structure or syntax-relevant observations with the evidence usually concentrating on scope (relative to negation, quantifiers, etc). This paper discusses why such interesting preliminary indications are less than fully satisfactory. Moreover, it argues for at least a local co-encoding of modal parameters in English syntax with corroborating support based on licensing of VP-ellipsis. Evidence is presented in which dichotomies between (i) differently grammaticalized modals, (ii) epistemic/deontic modals, and (iii) universal/existential modal force, respectively, interfere with ellipsis in diagnostically telling ways.*

1. Introduction and structure of the article

Part of ongoing work, this syntactic paper presupposes the essentials of modal mechanics developed in the semantic tradition of Lewis, Kratzer, and others (cf., e.g., Kratzer 1981). These are taken as the null-hypothesis mechanism regulating modal interpretation at LF. Any additional, particularly pre-spellout involvement of modality is a departure from the null-hypothesis and needs syntactic evidence (Reis 2001, Wurmbrand 2001). This is where we start in conceptual terms, heading for English.

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Section 2 introduces a classical field among the attempts to investigate discriminatory syntactic effects in the domain of modality: the outlandish status of epistemic modals. By scrutinizing recent approaches, we will see that there is interesting motivation to consider encoding epistemicity as a syntactic factor amongst the computations operative in natural language, but we will return to the issue later. In section 3, a different type of argument building on diachronic data is introduced. It illustrates distinct (non-lexical) modal positions relevant to the reanalysis of the English Modals. The link between this section and the others consists in the method used: licensing properties for VP-ellipsis through functional material instantiated by modals (cf. Lobeck 1995).

In sections 4 and 5, we return to the synchronic concerns, homing in to the issues of division of labor, particularly between epistemics vs. deontics on the one hand, and between strong vs. weak (or universal vs. existential) on the other.¹ We discuss the relevant aspects of two specific approaches attempting to come to terms with such properties: one as a rigid cartographic arrangement of functional heads, the other as a condition on quantifiers for epistemic modals. I use the quantificational approach as a term of comparison, and because I think it is a potentially interesting alternative venue directly pertinent to the well-trodden approaches on modal syntax of the last decade, but I dwell more on cartography arguing that pending further evidence it is still the tool with the wider data coverage. At least up to date it seems to be an ampler machinery, capable of handling more dimensions of modality. Nonetheless it should be taken with a grain of salt. This may entail relative c-command relations and possibly language-particular telescopic structures, rather than wholesale universal representational cartography, as suggested in the final sections. Section 6 in particular includes strong additional evidence from VP-ellipsis both for the epistemic/deontic, and the necessity/possibility distinctions as being co-encoded in the syntax.

¹ The field of English studies often uses the strong/weak terminology (cf., e.g., Huddleston & Pullum 2002), whereas the formal semantics school in the Lewis-Kratzer tradition the universal/existential one. Nothing relevant should hinge on notation for the purposes of this paper.

2. Epistemics go farther

To see epistemicity provoking havoc consider (1), for which Williams (1994: 23) notes that it “does not mean ‘It is not probable that John left’ even though this is a sensible thing to say.”

- (1) John didn’t **probably** leave.
 (*negation > epistemic marker, where “>” denotes “takes scope over”)

What we see in (1) then is an epistemic adverb obligatorily taking scope over negation, though the relationship could be otherwise—both semantically, as Williams’ paraphrase shows, and syntactically, as seen from the reverse overt linearization.

According to Cinque (1999, 2001), adverbs and functional heads stand in a tight specifier-head relationship. If the recent claims hinting at a tendency for functional epistemic elements to take wider scope in the clause over other scope bearing elements are correct, as for instance illustrated with negation above, then we would expect it to be identifiable with the modals (the heads) in particular. There is indication that this is the case in view of data such as (2).

- (2) Maryann **might not** sleep well these days.
 (*neg > epi)

This cannot be interpreted with the negation scoping over the epistemic modal.

Further elements that lend themselves to scope comparisons with epistemics are tense and deontic modals, *prima facie* both not too practical choices due to the morphosyntax of standard English registers, which precludes the modals from directly combining with tenses (though not with aspect, cf. *Jack might be driving to his office*) and with each other—the latter restriction being not cross-dialectal. Drubig (2001), however, observes an instance where tense-modal interaction can be directly witnessed in English. The diagnostic originates in Hoffmann’s (1976) rule of past tense replacement. This states that, in a set of certain delimited contexts, a past tense morpheme (*-ed*) is realized as *have*. Through this replacement, the past tense morpheme can override the dilemma of getting

bound to an inhospitable host such as the modal (cf. **musted*, or the absence of *may+ed*, which cannot generally be equated with *might*, as is well known). This phenomenon is clearly distinct from the (unambiguous) perfect interpretation, which would be ungrammatical with temporal adverbs such as *yesterday*, or *last year* in nonexistential perfect constructions; cf. by contrast the grammatical sentence (3).

- (3) Sue may have bought the book yesterday/last year.
(epi > past)

Drubig works out a concept of epistemicity aligning its particular syntactic form to that of more fully developed evidential systems. Under this approach the scope relation 'evidentiality > tense' is explicitly predicted by the syntactic form. But what about examples like (4) and (5)? Are they not contrary evidence, viz. with tense scoping out?

- (4) At that point, he could/might still have won the game.
(past > alethic possibility)
- (5) In October, Gore should still have won the election.
(past > alethic necessity²)
(Stowell, forth: (20a, b))

On closer semantic and pragmatic inspection, it turns out that they are not. Assuming a somewhat similarly restrictive, i.e. mostly an evidentiality-based concept of epistemicity, as the one explicitly argued for by Drubig, Condoravdi (2001) and Stowell (forth.) show that counterexamples which allow *have* to scope over the modal are not *bona fide* epistemics (though traditionally classified as such), but rather metaphysicals or alethics.³

² Huddleston & Pullum (2002) classify *should* as medium modality given its peculiarities. In this paper I will not deal with the specifics of this particular type of modality. Cf. also de Hamm (1997).

³ An interesting question sometimes explored in the literature is to what extent scope reversal relates to the morphology of the modal itself. For discussion on the particular case of English see Condoravdi (2001) and Stowell (forth.), who suggest semantic and syntactic explanations, respectively, why scope reversal, i.e., counterfactual alethics, should be only possible for non-present modals such as *might*, *could*, *should*.

3. VP-ellipsis in Middle English

This section starts the discussion of the interaction between modals and ellipsis in English. We will particularly see that the diachronic treatment of the English modals makes (a minimum of) two distinct positions necessary, specifically one preceding and one following their reanalysis. The discussion is less refined than in the other sections, mainly due to the fact that one seems to be better advised to discuss various readings and their syntactic correlations in synchronic terms with an accessible language. Nonetheless, the diachronic data prove the point of looking at modals and ellipsis in conjunction. We will see that the modals were picked up by the process of diachronic reanalysis from a projection different from V (cf. the “standard” reanalysis theory developed in the wake of Lightfoot 1979).

We turn our attention to the most relevant period for the reanalysis, i.e. the time span ranging over the later periods of Middle English (ME) to early Modern English (ModE). It will be argued that an appropriate approximation equates the post-reanalysis position of the modals indeed with T, but the pre-reanalysis one with a lower projection, quasi-functional in nature, but crucially still able to license VP-ellipsis.

The fact that the reanalysis stranded the emerging ModE modals roughly in T is generally accepted and convincingly demonstrated by Roberts (1985, 1993). However, based on the quantitative and theoretical analysis in Gergel (2002), drawing on the second version of the *Penn Helsinki Parsed Corpus of Middle English* (PPCME2), I argue that the existence of ellipsis makes the standard account untenable with respect to where the reanalysis picked the modals up.⁴ While the standard view of the reanalysis assumes that the premodals were fully lexical verbs up into the sixteenth century, when they allegedly have cataclysmically reanalyzed, it

Denison (1992) observes a perhaps less well-known use of *may* in counterfactuals, where on strict morphological mapping one would expect *might*, as illustrated by (i).

(i) Swift launch **may** have saved Penlee lives. (*Gdn*, 15 Mar 1983, cited from Denison 1992)

Context: all lives have been lost, the possibility doesn't exist any longer.

⁴ See especially Warner (1992) for complementary discussion on ellipsis forms possibly extant in Old English. Moreover, besides ellipsis there are also further problems with what is here referred to as the standard accounts of the reanalysis, of lesser relevance for present purposes; cf. Harris & Campbell (1995) for discussion.

will be argued here that they were quasi-functional, in the configurational sense defined below, by that time already. More specifically, instead of reanalyzing from V to T they only underwent the shorter distance (in the syntactic metric) from the quasi-functional projection to T. Note that while functional material going by different names, say, in the Infl domain (AUX, I, T, etc.) may yield similar results, e.g., in the NICE contexts, or similarly in the so called low IP domain (where, e.g., *v*, *Tr*, *Pr*, *Asp* have been recently operated with), we can also phrase the crucial difference at hand in more general conceptual terms. The reanalysis ended with functional modals (this is where we agree with the standard accounts) but it started quasi-functional and not lexical (this being the part where we disagree with it).

While there is little doubt that volitional and perhaps further adjunct theta-assignments—in the sense of Zubizarreta (1982)—co-existed with the late Middle English modals, (as is still the case today, e.g., notably with negated *will*), there is also strong evidence that in many cases they elided their VP complements. Interestingly this type of elision is not random but falls in place with all the major diagnostics of VP ellipsis, which in turn are a typical indicator of functional status. Consider (6)–(11) for some of these features.

- (6) *But for he couþe not selle and undo his cloþþ as a womman*
 but since he could not sell and undo his clothes as a woman
schulde _ , he was...
 should _ he was ...
 (POLYCH,VIII,105.3677⁵)
- (7) *Bie war se ðe wile _!*
 be cautious who that (whoever)will
 (VICES1,139.1725)
- (8) *telle who þat wil _ what it myghte mene.*
 tell who that will what it might mean
 (POLYCH,VIII,89.3584)

⁵ The notation follows the PPCME2 standards.

- (9) *'My doghtyr, why wol þou not schew me þyher?'*
 my daughter why will you not show me your heart
 (MIRK,90.2421)
- (10) *'Lord, 'quod scho, ' I may not _, for schame.'*
 lord said she I may not for shame
 (MIRK,90.2422)
- (11) *þei sent hir fro þe kyngis coferes what þei wold_*
 they sent her from the king's coffers what they would/ wanted to
 (CAPCHR,150.3516)

What these examples immediately show is that we find linguistic antecedents for the ellipsis sites, and that ellipsis can range over phrasal categories and need not be flanked, as opposed to gapping. Furthermore there are cases of sloppy identity between antecedent-related referents and the elided ones (6), evasion of the complex NP-constraint (7), the relationship between antecedent and ellipsis can function across embeddings (8), and also across utterances as the sentence-pair in (9)–(10) illustrates. There are cases of *wh*-extraction from the elliptical sites, like in (11).⁶ The existence of *wh*-movement is a strong discriminating indicator of VP-ellipsis, as opposed to null-complement anaphora due to the fact that null-complement anaphora verbs do not allow it, as the contrast to the null-complement verb in (12) shows (cf. Depiante 2000: 35f. for discussion).

- (12) * Mary wondered which conference talk Tommy refused to attend and Susan wonders which colloquium talk Mary refused _.

Furthermore, from the corpus-theoretic perspective, it is noteworthy that virtually all elliptical examples are parsed as M in the PPCME2—and not as V, which is an alternative annotational variant used in the corpus, e.g., especially for earlier instances of modals. In terms of numerical developments, after a collapse in the early Middle English period, the relative frequency of verbal elliptical structures in relation to the total number of tokens increases with approximately 50% per corpus-segment, a

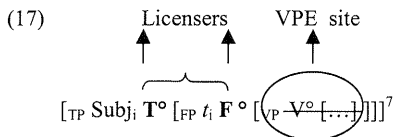
⁶ Cf. Gergel (2002) for further empirical evidence, discussion of some pitfalls, and additional corpus-theoretic and numerical argumentation.

trend that may be taken as significant for an internal grammar change in the sense of Kroch (1989, 2002).

Before investigating how the reanalysis might have worked on the syntactic component diachronically, we need to sketch some facts underlying VP ellipsis in synchronic terms. With Harley (1995), Emonds (2000), among others (and *contra*, e.g., the classical analysis of Emonds, 1970), I assume that ModE verbs like *have* and *be* are merged directly in a projection structurally higher than V, which predicts the properties setting them apart from main verbs today. For the purposes of ellipsis licensing this has an interesting consequence. Consider (13)–(16), (cf. Emonds 2000).

- (13) * Since in the past you **have** represented us well, I'm sure you must _ yesterday.
 (14) Since in the past you **have** represented us well, I'm sure you must **have** _ yesterday.
 (15) * I make Mary **be examined often** even though her brother refuses to _ .
 (16) I make Mary **be examined often** even though her brother refuses to **be** _ .

The ungrammaticality of examples like (13) and (15) suggests that the verbs *have* and *be* cannot be generally deleted under a T-element such as *must* or *to*—by contrast, it is well-known that under the appropriate parallelism requirements in terms of feature subsets (e.g. Oku 2001) VPs headed by genuine main verbs can. An explanation of these facts is that deletion of the VP depends on a set of two licensers in order for it to safely occur. Consider (17).



⁷ Given that at the latest on minimalist assumptions categories are but feature bundles, the issue of what F is does not affect the positional argument of this section. We have a distinct projecting head accommodating auxiliaries. Regarding the set of solutions for F one has various candidates following recent options of investigation in this domain. Fox & Lasnik (2003: 151) operate with aspect. Thus if we replace F in (17) with Asp we essentially get the Fox & Lasnik proposal for licensing of VP-ellipsis. Though I haven't been able to fully evaluate this recent approach, as Fox and Lasnik (p. 151) seem to concede, in their framework not much hinges on the label of the projection below T –

Thus in addition to the well-known licensing function of T, we have a co-licensing element F. This hypothesis in fact neatly captures some features of both ME and ModE modals and their respective behavior in elliptical contexts. The modals in synchronic ModE terms are merged in T given that they do not check tense (cf. Roberts 1985, 1993 for additional justification of this finding). The auxiliaries *have/be* do check tense, but they are also above the deletion line as aforementioned.

Now, for ME the situation is different. Auxiliary deletion was available in cases in which it would be illicit today (Warner 1995). That is *have/be* were below the deletion line (as also indicated by corpus findings). The modals in ME were able to overtly check tense and they were right at the critical licensing line of VP deletion, but on the licensing, not the licensee side. A possible generalization for ME then from these facts is the following: Fill T with the modals through merge (in complementary distribution with the tense morpheme *-ed*), and F with the reanalyzed verbs *have/be*.⁸

perhaps due to the different focus of their paper. Gergel (2002) argues for a syntactic Pr head in the position occupied by F, partly following Bowers (2001) and additional diachronic argumentation.

⁸ The relative positions of the modals on the one hand, and *be/have* on the other in pre- and post-reanalysis grammars are surprising at first sight. There is, however, rather strong evidence for this rough modals/"aspectuals" dichotomy for the data at hand. First, note that there is indication that roughly 99% of the verbal elliptical structures in ME are licensed by modals solely – not by *have/be*, not by verbs (cf. Gergel 2002, with the estimate based on studies on the PPCME2). Second, the peculiarities of *have*, and especially of *be* with respect to VP-ellipsis are late changes, as is well-known. This fact was noted and seriously discussed by Anthony Warner, and explored in various diachronic and synchronic studies; cf. Warner (1995) among others. For time and space reasons, the changes are not discussed here, but the relevant approximating generalization is clear: Preceding these late changes, the "aspectuals" could establish antecedent-ellipsis dependencies following the same or similar retrieval rules as used in the parallelism-requirements for main verbs, whereas today they no longer can under the same conditions.

Note also that I am not ruling out that aspectuals and main verbs be further distinguished following various criteria, e.g., semantic, typology-oriented ones (e.g., in the spirit of Heine 1993), or even further syntactic ones. All that I am saying is that for the course run by English the ellipsis-facts strongly suggest taking *have/be* all in all below the critical double-line of co-licensors before the reanalysis, and that they are merged higher up later on. A third piece of evidence can be adduced from linearization

Finally in this section, we look at adverb placement, which offers a corroborating diagnostic for the structural distinction between the VPE licensers in the PPCME2 data, viz. the modals vs. lexical verbs. Since all finite verbs move to T in ME, in order to detect anything at all, it is useful to use this diagnostic with the verb to be tested *in situ*. Consider (18) and (19).

(18) *And whan this creatur was [þus] [gracyowsly] comen a-geyn ...*
 and when this creature AUX thus graciously come.PRT again...
 (KEMPE, 9, 139)

(19) *he muste ofte and manytymes rede in thys boke and*
 he had to often and manytimes read in this book and
[earnestly and diligently] marke [wel] that he redeth
 earnestly and diligently mark well that (what) he reads
 (REYNAR,6.7)

The intermediate position F has an effect in these cases by providing an intermediate hosting site for a second adverb between T and *in-situ* V. Thus both configurations with two adverbs, (20), and (21), are available for lexical verbs, as just exemplified by (18) and (19).

(20) T [Adv] [Adv] [**non-fin V**], where non-fin V is a non-finite *in-situ* verb

(21) T [Adv] [**non-fin V**] [Adv]

For modals, the comparable configurations are not available in the entire PPCME2 independently of adverb classes. Given that ME is the flourishing period of non-finite modals when compared to the other stages of English, the failure of the test can indeed not be blamed on a lack of *in-situ* modals. The phenomenon can straightforwardly be explained by means of the intermediate projection. With modals, the intermediate position cannot be

facts. Modals productively co-occur with *have/be* in Modern English. However the use of such sequences is late (cf., e.g., van Gelderen 2003: 35). One way to go would be that having found a licit position to be first-merged (namely in F in (17), after F has been evacuated by the modals through the reanalysis), *have/be* have now found a more natural position to be licensed in cases where modals are present in the initial numeration of a given sentence, i.e. in the quasi-functional F – in post-reanalysis grammars they are not blocked by the presence of the modals from that position.

made visible due to the fact that it most probably does not exist, as shown by the unattested patterns in (22), and (23)—the premodals occupying F themselves.

(22) * ? T [Adv] [Adv] [**non-fin M**],
 where non-fin M is a non-finite *in-situ* modal

(23) * ? T [Adv] [**non-fin M**] [Adv]

As one reviewer notes, complications may lurk behind adverb syntax. Following this lead, the first, fundamental question would be whether we have traditional adjunction or more intricate mechanisms involved, e.g., to take one option from the literature, say, with correspondences between syntactic position and semantic content (Cinque 1999). However, from recent research the issue seems to hardly be settled for any of the two diametric options just mentioned, i.e., (A) syntactically random and potentially stacked adjunction, or (B) structurally determined and rigid insertion sites, e.g., as specifiers. Note, however, that the discriminating findings of (20)–(23), i.e. crucially that one set of configurations is attested and the other is not, already make an unrestricted adjunction theory highly unlikely by themselves, no circularity involved. This, of course, still does not tell us what an appropriate theory, or perhaps theories, of adverbs should look like in general, that also being far beyond the ellipsis-based concerns of this paper.⁹ What the data simply corroborate instead is that an

⁹ While the contrast (20) vs. (22) may speak for itself, the reviewer furthermore perspicuously points out that further complications arise from the attested type I gave in (21) (and cross-comparisons between this type and the three others). For instance, what is the projection where the final adverb in (21) is merged to. While a definite take on the issue indeed has to await further research on adverbial syntax, I think the data are less confusing than they appear. First, adjunction is out of the question for the data we are concerned with as mentioned above. Then we are essentially left with two options:

- either move the non-finite verb in configurations such as (21) over the adverb,
- or merge the adverb to a relatively low position (perhaps in a vP-shell architecture).

Given that there is no modal in the numeration in data reflecting (21), this being the crucial point in the pair (20)-(21), I am not sure whether the first option should be discarded in order to keep the “base-generating” modal position free. It is, however,

intermediate position may be detectable with verbs, but not with modals. If the modals are structurally higher than verbs, as we have seen based on the discriminating ellipsis evidence above, then this fact is explained.

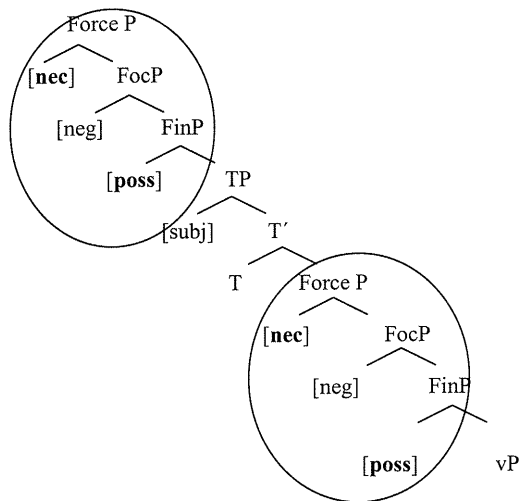
4. Cartography

Having illustrated licensing as a function of modals in conjunction with ellipsis through the diachronic excursus, we now prepare the ground for using VP-ellipsis licensing in some more intricate cases of modalized data. Thus Cinque (1999, 2001) argues for an articulate division of the functional structure of the clause into various projections correlating with semantic functions relating to tense, aspect, mood, and in particular distinct kinds of modality. One of the main claims of these and related studies is the rigid order of the functional material. In this section and the subsequent ones we will see evidence supporting some ordering relations. I will, however, remain agnostic as to whether one needs a rich Cinque-style hierarchy. What I will argue for are local relationships between heads hosting the modals. For now, to put the discussion on a concrete footing, consider the syntactic representation in (24) (Butler 2003).¹⁰

more than anything an independent matter of empirical finding whether non-finites have the ability to undergo at least some shorter movements in ME, and what principles this movement should exactly obey. Cross-linguistically this option is certainly available (see, e.g., Bok-Bennema 2002 for interesting facts regarding short V-movement in Romance, partly foreshadowed by Pollock's 1989 system), and it is not unlikely to find it, e.g., for reasons of participle-morphology licensing in English varieties either, as recently assumed by Roberts & Roussou (2003: 2.1). Otherwise the second option or a variant thereof, needed for what appear to be cases of apparent low adverbs in any event, may be involved.

¹⁰ Butler capitalizes on the necessity-possibility distinction drawn in Cormack & Smith (2002). Cinque also has distinctions between necessity and possibility, although he argues against this split in the epistemic domain. I focus on Butler's structure, rather than Cormack & Smith's for the purposes of this paper, first, because it allows a more straightforward comparison with Cinque's well-known cartography; second because it is worked out in a close relationship with the interface interpretation; and third, because it has roughly the usual assumptions on the grammatical model, whereas, e.g., Cormack and Smith's introduces additional assumptions, (for instance, on Merge) and the split-sign hypothesis, which would need an additional layer of theorizing.

(24)



(cf. Butler 2003: 988)

Let's start with the theoretical implications. First, rather complex at first glance, this phrase marker is on the one hand overall much less articulate and hence perhaps more learning adequate than Cinque (1999)'s influential cartography of the functional domain. This comparison holds even if the latter were truncated to the modality-relevant projections, for more appropriate contrast. At the same time, the structure is symmetrical in interesting ways. Note that necessity c-commands possibility twice, once in the higher domain of epistemicity, and once again in the lower one in charge of root modality. We mainly concentrate on modality, though Butler assumes connections between the heads hosting the modals and functional projection in the sense of Rizzi's (1997) Split-CP hypothesis, as the labelling in (24) shows.

Second, the reduplicative character of many of Cinque's projections has been recently critiqued as a way-out solution designed to fit scope facts otherwise not accommodated. Recursion might, however, be simply a descriptive necessity, in view of the wide typological view argued by Cinque-style approaches. How is then the tension to be solved? In fact,

once one assumes a structure along the lines of (24) and, crucially, substantiates the evidence for it, the alleged weakness of recursion can turn into a virtue. For instance, this structure has recursion in *all* nodes responsible for modal interpretation. Cinque's original formulation, where, for instance, evidentiality only appears once, does not. What I consider the main effect of this line of thought is the ability to descriptively generate the wide gamut that Cinque aims at in the domain of modality; but at a lower cost. Incidentally, it is also very well known that similar phenomena exist in other functional domains as well; e.g., in the domain of focalization.¹¹ It is no little achievement to make rich structures fit explanatory and acquisition-based principles. In this line of reasoning, learning one segment of the structure and re-applying the same part at a later age in a higher domain of the clause would facilitate the task of the language learner considerably. The reapplication might be motivated by meta-representational interpretative impact as approaches such as Papafragou (1998) would suggest. Furthermore, if the recent phase-theoretical concerns (Chomsky 2001) are on the right track, then a structure rounding off the vP and then ending symmetrically in a reduplicated CP would also be in line with it.

Consider now the main empirical support Butler adduces to underpin the structure proposed, e.g., through examples like the ones rendered as (25)–(27) below.

- (25) The registrar mustn't/mightn't have got my letter.
(epi > neg)
- (26) The children mustn't do that in here.
(root necessity > neg)
- (27) The children can't do that in here.
(neg > root possibility)

The set of sentences above can be used for two purposes. On the one hand, the relative order epistemic vs. root comes to the fore when considering subject scope relative to the modal in (25) vs. (26) and (27). While an

¹¹ From this kind of research, Butler adopts the labelling ForceP, FocP, FinP, as aforementioned; see Rizzi (1997), and Drubig (2003) for ampler discussion of layered effects in the domain of focalization. I leave information-structural concerns aside in this paper.

epistemic doesn't allow the subject to scope over it, as in (25), the two deontics clearly do. The scope position for subjects assumed in this context is the (generatively) traditional Spec, TP. On the other hand, the possibility vs. necessity divide is deducible from the comparison between (26) and (27) and the indicated scope relations. These sentences suggest that while possibility scopes below, necessity scopes above negation.

5. Quantifier containment: insights on epistemics from intervention effects

In this section, we consider an alternative view of phrasing at least the outlandish property of epistemic modals. Instead of phrasing the high position of epistemic modals in cartographic, and thus phrase-structural terms, von Stechow & Iatridou (2003), F&I hereafter, formulate it as an intervention effect by investigating the interaction between quantificational expressions and epistemic modals. According to F&I, a quantifier cannot take scope over an epistemic modal, an observation dubbed the epistemic containment principle (ECP).

(28) **ECP**: At LF, a quantifier cannot bind its trace across an epistemic modal.

* $Q_i \dots$ [**Epistemic Modal** (... t_i ...)] (cf. F&I 2003: (31))

(29) Most of our students **must** be home by now.

(**most ...* > epistemic *must*)

Suppose the modal in (29) is epistemic. Then it also must get scope over the quantifier. As a counterfoil to the observation on epistemics it is useful to observe that, by contrast, deontics and tenses do not obey it. For instance, on a deontic reading (30) allows both scope arrangements *modal* > *quantifier* ('it is necessary that most students get outside funding') on the reading facilitated by continuation in a., and *quantifier* > *modal* (very roughly 'for most students it is the case that they necessitate outside funding') on the reading induced by b.

- (30) Most of our students **must** get outside funding—
- a. for the department budget to work out.
(*must* > *most* ...)
 - b. the others have already been given university fellowships.
(*most*... > *must*)

In the same vein, the tense in (31) displays both options with respect to relative scope with the quantifier.

- (31) a. Most of our students will be professors in a few years.
(*most*... > *will*)
- b. Most of our students will be foreigners in a few years.
(*will* > *most*...)

As the contrast between (29) on the one hand, and (30)–(31) on the other illustrates, quantification constitutes a vivid domain to observe discriminating effects of epistemic modals. While it might be too early to fully assess F&I's approach, there is initial evidence presented in section 6 that to the extent that it is correct, its main syntactic effect can be derived from the syntax and semantics of epistemic modals in general.

6. Ellipses in the approaches. Approaches through ellipsis

First, note that for some of the examples above, e.g., (1) or (29), it could be counterargued that not only do they not parallel semantic paraphrases which would allow the modals to scope lower but, put simply, they also override overt syntax, so that the entire matter becomes a somewhat impalpable "scope matter," in many syntacticians' view not a satisfactory situation. This alone would make additional evidence necessary.

Second, though appealing, Butler's symmetric approach has some loops in the argumentation. It distinguishes strong from weak modality in both phases. But the evidence is not as well-balanced and symmetrical as the tree-structure proposed. Consider again the negation-based evidence, used as a crucial argument. The bottom line is the assumption that negation resides in a distinct head sandwiched between modals in both phases, thus serving as the scope element relative to each necessity and possibility can be tested, both in the epistemic and the root domain. However, the main support adduced with respect to negation is of the type rendered above in

(25)–(27), i.e., in which only root necessity and possibility can be told apart. But for epistemic modality, negation only indicates the ordering *modal* > *negation*, not the relative scope of strong and weak modality; cf. (32), and (33).¹²

(32) Jack must not have had a very good education.
(epistemic necessity > negation)

(33) John may not have finished dinner.
(epistemic possibility > negation)

As for the quantificational approach, F&I refer to a number of problematic cases themselves (some of which they eventually attempt to accommodate), and further ones could be added. Suppose however, for the sake of the argument, that the quantificational observation were accurate. While an interesting fact, then, it would still be desirable to find an explanation for it. However, the “principle” supposedly driving it given in (4), viz. the ECP, turns out to be equally descriptive—mainly a restatement of the facts.¹³

There are two major venues to achieve more. One would be the following. F&I clearly define the ECP as a condition on QR and would like to see it in the general context of research of this type. The integration into this type of investigation does, however, not actually happen, despite the insightful discussion. For instance, some of the essential recent work on QR accounts for scope (im)possibilities as an economy condition on a reference set of logical forms, i.e. as a process motivated by concrete, ideally derivational options at each step.¹⁴ For brief illustration consider

¹² Butler (2003: 984) presents evidence with respect to negation in the higher domain (phase); however, with suppletive forms. That is, instead of capturing the syntax of epistemic *may* and *must*, we learn interesting things about suppletive forms like *can't* and *needn't*, which in logical terms should do. For the purposes of natural language analysis, however, this rests on the assumption that they are the exact linguistic equivalents of the modals *may* and *must* in negated contexts. This would need investigation first. If, based on empirical inquiry, it turns out that they are, then this paper may provide strong empirical support to the suggestions based on negation..

¹³ The ECP as rendered above is a more accurate statement than a preliminary version F&I offer and which for lack of space I omit.

¹⁴ Cf., e.g., Fox (1995), and Fox (2000) with updates—which F&I also cite and work with for other purposes.

(34), an ambiguous sentence with respect to the relative scope of the quantifiers, and then (35), a variant with a continuation including VP-ellipsis.

(34) Some boy admires every teacher.

(35) Some boy admires every teacher and every girl does _ too.

(36) *every teacher₁ [some boy admires t₁] and every teacher₂ [every girl admires t₂]

However, in (35), only the overt scope relation is possible, viz. no scope reversal and thus no ambiguity is possible given that in logical terms movement of the quantifier in the elliptical conjunct would be vacuous. The laws of Quantifier Independence predict this lack of movement (Partee et. al. 1993: 148). In other words, the universal quantifier from the elided site in (35) has a right to stay in situ, because moving over another universal would not make an interpretative difference. This indeed predicts the ungrammaticality of the superfluous derivation in (36). The generalization beyond this kind of behavior is, according to Fox, along the lines of (37).

(37) **Ellipsis Scope Generalization (ESG):** The relative scope of two quantifiers, one of which is an antecedent VP of an ellipsis construction, may differ from the surface c-command relation, only if the parallel difference will have semantic effects in the elided VP. (cf. Fox, 1995: 149)

Nonetheless, returning to the ECP, no similar or alternative explanatory condition is offered and what remains is the carefully stated and well-thought descriptive observation in (4).

A second way to gain more insight into the phenomenon is to note that quantification is just one among various properties setting epistemics apart. Then the cartographic approach has some of the makings to derive the consequence of their observation, in that the epistemic modal, operating from a topologically high position c-commanding the other scope positions of the clause also takes scope, *inter alia*, over quantifiers, even after these have QRed. The phrase *takes scope over* in the perspicuous formulation of the ECP reflects the fact that the containment may not apply to quantifiers directly merged in a superordinate clause of the epistemic modal (though F&I, e.g., p. 182, fn. 15, once more diligently caution against the possibility of being on somewhat shaky judgments ground).

Some of the main observations from a cartographic thrust are that epistemic modals tend to avoid co-occurrence with other inhabitants of the high clausal domain, roughly the traditional C area, a fact visible from question formation, *only*-preposing, possibly focus structure more generally, and at least for some speakers also for *wh*-extraction (cf. Jackendoff 1972: 103, Drubig 2001: 2.2, 3.3; and Butler 2003, for some suggestions on sources of variation).

- (38) Must / Should/ May Max leave?
 (39) Only three people must/ should/ may Max see.
 (40) * Where must he have been going?

The sentences above all lack the epistemic interpretation according to the aforesaid studies. Leaving *wh*-movement *per se* aside, we return to our more central concerns in this study. It is thus possible that the cartographic approach gains consolidating support from further syntax-oriented studies. Without getting into the issue of how quantificational elements move and get into scope positions, note that albeit being able to cross nonfinites, by and large they do not cross finite clause-boundaries, as opposed for instance to topicalization (cf. Johnson, 2000 for discussion). By way of simplified midway conclusion, given the following conditions:

- when merged into a derivation epistemics close off the finite clause,
- (epistemic) modals only appear in finite clauses in (standard) English,
- quantification generally stays within the finite clause,

then the ECP follows. If correct in some form, then this line of thought makes the interesting quantificational facts derivable and aligns them in the more general context of research on modal syntax, ideally towards explanation.¹⁵

¹⁵ F&I (e.g., section 3.2) also mention the quest for explanation. They contend that one should explain why epistemics should be so high. Though not too often asked, requirements asking not only for proof that a node X c-commands a node Y, but, after having presented syntactic evidence that it does so, also asking *why* this is the case may have an interesting appeal from a more general perspective on language. From what we know on the specific case of epistemics, language acquisition, and the way mental representations work are things that come to mind, but essentially such requirements fall outside the scope of syntax proper. As a matter of fact, if seriously asked, the issue may

Note that F&I foreshadow a venue roughly along the cartographical lines described above, and present purported arguments against it, as follows:

- justify that the one case discussed, where the ECP fares worse than the cartographic (topological) account, should not be considered (F&I: 3.3.1),
- attempt to show that syntactic claims on epistemic modality are in trouble (F&I: 3.3.2),
- argue that modals cannot move to epistemic positions (4.1).

We turn our attention to each of these arguments. The first argument implicitly acknowledges that a cartography-like approach might do better on cases of antecedent-contained deletion (ACD), and is then concerned with an interesting discussion of why QR and ACD-QR are different, against traditional beliefs. Due to this difference, the implication then goes, the latter should not be considered quantifier movement any longer. By that reasoning, given that the ECP's domain of competence is specifically restricted to QR, and not to explaining epistemics in other terms, notably not in other quantificational terms either, the ACD cases are discarded as irrelevant. This does not prove cartography wrong—it rather nicely justifies that the ECP itself is at least descriptively not incorrect once one narrows down its domain accordingly.

Let's now proceed to the second part of the argument (F&I: 3.3.2). The actual piece of evidence, and the essential portion of discussion against cartography F&I present, centres on what they assert to be “low epistemic modals.”¹⁶ Three sentences are given:

need an investigation of the standard theory about C_{HL} as being operative in some version of the syntactocentric T-model, in which phrase-structure is rather an axiom than a theorem – an exploration that would take us too far afield here.

¹⁶ This is a somewhat puzzlingly declared argument when fending off cartography. Is the set {*not+ have to, need+not, can't*} of (41) representing the low modals, and the others are still “the high ones”? Then one could simply restrict the domain of the topological account to the complement set, e.g., due to morphosyntactic reasons, and then still derive the ECP. It seems a dubious move to discard topology while taking topological relations for granted. I take it that the proper logic of the ECP argument should involve an additional step of a *reductio ad absurdum*, and continue the argument from there.

- (41) a. John does not have to be at home.
 b. John need not be home.
 c. John can't be at home.

Sentence a. contains *have to*, a “more verbal” element as acknowledged by the authors. This can indeed be an interesting counterfoil for discussing English modals in general, morphosyntactically it is, however, notoriously too different to be seen on a par with them (Roberts 1993, Stowell forth.). Taking negated *need* as an illustration as in b. may be in need of more discussion as well, since negation scoping over epistemic necessity expressed through *need*—the purported crucial argument of this sentence—“is only acceptable to a small fraction of speakers” (Butler 2003: 985). Suppose we shove acceptability and morphosyntactic concerns aside, and focus on the remaining stock. First, we are still dealing with suppletive forms not with the *may*'s and *must*'s F&I (p. 184) started out with (cf. the discussion in fn. 12). Furthermore, for this argument to refute the phrase-structure approach it presupposes that all the latter hinges on is negation.¹⁷ It is in fact perhaps no accident that the putative counter-examples involve negation. First note that a modal like *need* is well-known to be a polarity-sensitive item (cf., e.g., Cormack & Smith 2002).¹⁸ I extend this approach and claim that epistemic *can't* is also but a polarity item. By and large, there is no epistemic affirmative *can* in English (Stowell, forth). This may then represent additional and independent evidence why the examples in point involve negation (under the proviso that negation is a good tester).

Third, F&I (p. 185f.) claim that on a topological account, epistemic modals would be moved to a high position, but they note that on stacked modal structures it is rather the surface structure that ends up being

¹⁷ While negation often plays a central role in cartography oriented approaches, it is less than accurate to assume that it is the only argument of the topological account; see for other arguments Jackendoff (1972), Cinque (1999), Drubig (2001), Butler (2003), and the discussion of this paper, among others.

¹⁸ One may slightly disagree with the terms of Cormack & Smith here, who claim that *need* is a *negative* polarity item, although they give the right contexts of its occurrence elsewhere. Particularly *need* as a modal is also licensed by, e.g., interrogatives. By contrast, there are languages that have indeed developed modal uses more restrictedly licensed by negation. Thus German *brauchen* ‘need’ is a case in point. This verb is not standardly licensed in interrogatives in its modal use, but it is by negative polarity contexts.

interpreted as epistemic. This argument contains some assumptions in syntactic terms. I will only briefly illustrate why it would present drawbacks as a counter-argument placed in a syntactic discussion. To begin, it is based on unrestricted feature checking, or movement. One could, for instance, imagine economy conditions why modals check epistemic features paralleling surface structure, at least as a general rule, rather than crossing paths. It would seem dubious instead to expect that modals should freely move diverging from first-merged structures given their interpretable impact. In languages with multiple modal sequences, it is the structurally higher modal that gets an epistemic reading. This by itself is in fact a strong argument for positing epistemicity high in relative terms. The modals presented by F&I (p. 185) are, moreover, lexical verbs. Furthermore, it is not the case that modals are totally precluded from scope reversal situations, it is rather the case that modal expressions *usually* are, perhaps regulated by requirements of avoiding gibberish at LF, economy, and perhaps indeed also by phrase structure as aforementioned. There are, however, even cases of scope reversal known with modal expressions like in (42), in which a lexical epistemic raising expression like *seem* scopes over the root modal *can't*.

- (42) John can't seem to run very fast. (Quirk 1965: 217, cited from Langedoen 1970: 25)

This might, however, happen in rather exceptional constructions only. More productively, in cases when it comes to the interaction not of pairs of modals, but of one modal and one auxiliary, scope reversal is again potentially possible, however obeying modal nuances (cf., e.g., Condoravdi 2002).

Concluding this comparison, we may note that the quantificational approach is not orthogonal to cartography, though the domains of application do not overlap. There are significant intersections; e.g., both approaches try to capture aspects in the behavior of epistemic modals. Despite the fact that the proposal is not entirely problem-free, recall that F&I also correctly account for an impressive range of data involving epistemic modals (sketched in section 4). It's also their merit to have opened up ways of viewing modality, in a manner reminiscent of the

research on intervention effects and different from the well-trodden syntactic paths, at the very least.

Returning to cartography, the idea of the phase and particularly the sort of “reduplication with a purpose” might bring some alleviation to the heavy style research on rich structures over the last years. There is in fact evidence from VP-ellipsis that partly corroborates and partly complements some of the structural relations proposed by Butler. McDowell (1987) offers some interesting views relating modality and elliptical processes such VP-ellipsis in (43)–(44) (cited from Drubig 2001: 30). She also discusses the related pseudo-gapping construction illustrated in (45) (for which she uses the term gapping), whose discussion I will leave aside for space reasons and for its more complex character, due to the additional syntactic operations involved known on independent grounds (Lasnik 1999).

- (43) John must wash his car every day and Peter must _ too (*epi)
 (44) John will often sit there and do nothing and Bill will _ too (*epi)
 (45) John may not obey his mother, but he must _ his father (??epi)

McDowell’s main claim is that ellipsis is incompatible with an epistemic reading of the modal. Originally phrased in government theory, in very general cartographic terms her proposal translates into having an epistemic modal in a scope position higher than the deontic modal, and thus too distant from the ellipsis site for licensing to occur. The traditional assumption is that VP-ellipsis depends on the presence of a licensing head along the lines of Infl (cf. Lobeck 1995 and Drubig 2001 for explanatory oriented exploration). Consequently, the epistemic modal position is predicted to be ungrammatical with ellipsis.

Note that all the examples rendered above include the universal quantifiers *must* and *will*. However, with existential quantifiers like, say, *might*, *could*, or *may* ellipsis licensing becomes possible on both readings, to wit the epistemic reading will not be excluded.

- (46) Jane may wash her car and Mary may/might/could _ too.
 (47) Mary will talk to her boss and John might _ to his.
 (48) John will fly to London and Mary may _ too. (Bošković, 1994: 280)
 (49) You have to be a real masochist to want to direct," he says with a smile. But Fearheiley does, and Smith might _ , too. (*Gazette.Net*, Maryland, Aug. 29, 2002)

An assumption McDowell has to stipulate is that only the ambiguous modals should be reluctant to license VP-ellipsis on an epistemic reading. This way she would perhaps be able to discard the instances of *might* in the examples above, given that this modal is arguably only epistemic in present day usage. But this cannot discard *could* from the list of potential licenser, which has various productive uses. More important is, however, the fact that this ad hoc condition on ambiguity is conspicuously at odds with her clause-structural theory of a general incompatibility between epistemic modals and VP-ellipsis.

Next, let's examine how an epistemic modal such as *may*, as in (46), would be discarded in McDowell's framework, incidentally, an enterprise conducted more explicitly. First, it is clear that *may* is generally ambiguous, as McDowell agrees, and the aforesaid assumption does not go through. A second assumption is needed: The purported reason in this case is that readings with a future shift are simply not epistemic. For instance epistemic and future oriented readings of *may*, would exclude each other under her approach. However, under the standard concept on epistemic modality, to which she subscribes, this is a stipulation she is forced to make for her claim to be applicable. Drubig (2001), on a more focused line of research on evidentiality also allows epistemic readings with the scheduled future; Declerck (1991: 86/7) observes evidence-evaluation at a future-shifted time (e.g., for what traditionally are known as epistemic *will* cases of the type *That will be the mailman* uttered when hearing a ringing bell); and Stowell (forth.) crediting Karen Zagona (1990) argues more generally that unless they have a stative complement, epistemics in fact must shift the eventuality time. Building on the empirical insight of these studies, I argue that the problem in logical terms has been caused by an illicit use of a biconditional where no more than one-way implication would have been motivated. That is, deontics tend to shift the eventuality time to the future—given the well-known presupposition that if something is allowed/required to be done, then it has not yet been done. But conversely, it is not the case that future-shift with a modal automatically implies root modality.¹⁹ There is thereby no reason to generally discard epistemics due

¹⁹ In fact note that even the reverse implication is not absolute. There are root modals which seem to make use of their deontic force with a past-shift of the eventuality time especially in some formalized registers, e.g., as in (i)-(ii).

(i) The plaintiff must have filled in a complaint form.

to temporal properties (which is not to say that there are no correlations between mood, tense and predicate type; see Stowell for a perspicuous review and some new observations on these topics). Moreover, consider (50), for which consultants gave the epistemic reading either as the strongly preferred or the only one.

(50) Mary may know about the meeting and Melissa may _ too.

With a predicate like *know* it is even clearer that temporal forward-shift for *may* is not compulsory and we have an epistemic reading on the modal.

What the examples (43)–(50) may indicate instead is that the necessity/possibility (or universal/ existential) divide also plays a part in the licensing of elliptical phenomena. They thus offer additional evidence for an essential subset of the relations proposed. The epistemic/root divide is, however, also crucial. Note that it is only for epistemics that necessity and possibility part ways with respect to ellipsis. Ellipsis then first takes epistemic and root modals apart in that only the former show the variation in licensing, and furthermore takes apart the epistemic class in that, within it, a higher head of strong existential quantification (e.g., *must*) is not an appropriate licenser. It is worth noting that this neatly complements the evidence from negation presented by Butler. While ellipsis operates as just mentioned, negation first distinguishes *must* and *may* with respect to epistemic vs. root status (in that only the latter shows scope variation) and then fine-grainedly takes apart the deontics into necessity and possibility, though not epistemics, as we have seen.

7. Conclusion and outlook

This discussion has drawn on various strands of interaction between modality and VP-ellipsis. Specifically, we have argued that ellipsis is a profitable share in three main domains:

- diachronic reanalysis in the sense of Roberts (1993),
- modal force, and in particular the special concerns on epistemic modality,
- the distinction between necessity and possibility.

(ii) You must have acquired all the credits to get your diploma.

While the arguments have been put forward for English, there is to my mind no immediate reason to overgeneralize to other languages. Rich functional hierarchies are perhaps best thought of as telescopic in that particular languages may pull out certain subsets of them and grammaticalize them accordingly, or may not. Moreover, elliptical processes quite in the same vein may function in a number of various ways and may be more or less developed in certain areas in different varieties. In general, English has a well-developed type of VP-ellipsis, as numerous attempts to compare other systems to its criteria have shown (cf. Holmberg 2001, Ngonyani 1996, among others). Without getting into the exploration of further elliptical systems, let's just note that there may be parallels in subdomains. For instance, German allows VP-like elision only under very restricted lexical and information-structural conditions (Klein 1993, Winkler 2003). It has, however, an overt anaphoric form *es* with some of the hallmarks of VP-ellipsis if not all (López & Winkler 2000). Interestingly this form of VP-replacement follows the epistemic-root dichotomy, in that it is only licensed with non-epistemic modals (Ross 1969). This would then again confirm the intuition expressed in Drubig (2001) that epistemic modality is not an appropriate licenser. Romanian, to take a typologically different example, behaves—once more with the proviso on elliptical structures and modal grammaticalization—primarily sensitive to the other parameter, viz. necessity vs. possibility.

- (51) *Dacă Maria poate să-și crească copiii singură, și*
 If Maria can comp-dat.cl grow children.det alone, too
*eu pot / *trebuie _.*
 I can-1sg/ *must _
 'If Mary can raise her children alone, I can/ must _ too.'

In an antecedent-ellipsis configuration as in (51) the strong modal does not allow elision while the weak one does. One of the hypotheses argued for in this paper, and with different diagnostics in Cormack & Smith (2002) and Butler (2003), was that strong modality is structurally higher relative to weak modality. Based on it we might have an explanation for the Romanian asymmetry too. An interesting task of research would be to investigate how far such claims fall in place with the mechanism of agreement (Chomsky 2001). For instance, López (2002) argues on the basis of variation within expletive constructions that probe-goal agreement

works cyclically and not at a distance as in Chomsky. This falls then in place with the modality observations. The higher modal (depending on the parameter chosen by language X, e.g., say, strength by Romanian) is more likely to fall outside the domain of agreement configurations (in this case with the subject), given that there are more steps where things might go awry in a successive cyclic process. Romanian confirms this upper limit assessment through its lack of agreement on the necessity modal *trebuie*, 'must', and through its presence on the possibility modal *putea* 'can'.

While it is for further research to more fully investigate some of the latter ideas laid out above, all in all this paper has hopefully shed additional light on the fact that the syntax of modality displays an interesting sensitivity to certain semantic and functional parameters which I have investigated from the perspective of elliptical structures.

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Contact information:

Remus Gergel
 SFB 441/ B13
 Nauklerstrasse 35/ 3.05
 72074 Tübingen, Germany
 Tel.: ++49 (0) 7071/ 29-77163
 Fax: ++49 (0) 7071/ 29-5830
 Email: remus.gergel@uni-tuebingen.de