

# From Simple Predicators to Clausal Functors: The English Modals through Time and the Primitives of Modality\*

Remus Gergel  
Universität Tübingen  
regel@web.de

## 1. Introduction

The ultimate goal of this paper is to find a representation of modality compatible with some basic conditions on the syntax-semantic interface.<sup>1</sup> Such conditions are anchored, for instance, in Chomsky's (1995) principle of full interpretation (FI). Abstract interpretation of modality is, however – be it “only” in semantic terms – already a hard nut to crack, way too vast to be dealt with in any comprehensive way here. What is pursued instead is a case-study-centered analysis. The case in point are the English modals (EM) viewed in their development through time – a *locus classicus* for a number of linguistic theories and frameworks. The idea will be to start out from two lines of research – continuous grammaticalization vs. cataclysmic change – and to explain some of their incongruities. The first non-trivial point here consists in deriving more fundamental questions from this research. The second, possibly even less trivial one consists in answering them. Specifically, I will argue that regardless of the actual numerical rate of change, there is an underlying and more structured way to account for the notions of change and continuity within the modal system, respectively.

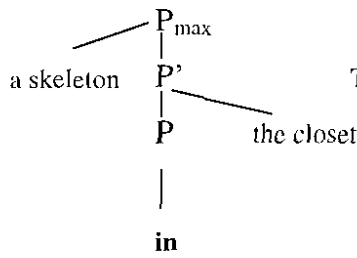
The main claim is that two primitive relations must have characterized the EM at all linguistically reconstructible times: central vs. non-central coincidence. If the spell-out presented here proves to be correct, then, in broader terms, it will fit Hale's (1985) *world view(s)*. According to such views, a principle of coincidence with two possible features (central vs. non-central) underlies a series of *prima facie* unrelated linguistic phenomena, as for instance locational prepositions and temporal predicates in (1), but also many others (cf. Hale 1985, Demirdache and Uribe-Etxebarria 2000). Starting from the premise of a quantificational representation of the EM, I will claim that there is a case for representing modality as a similar predicate, once we have defined the coincidence relations. The phrase-markers in (1) show that two sets of locations and times, respectively, coincide.

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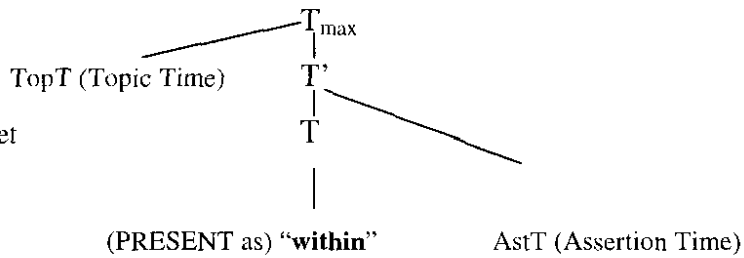
\* I am indebted to Susanne Winkler for lots of patience and helping me make this paper less of a cypher than it originally was, to H. Bernhard Drubig for pointing out to me more interesting things about tense and modality than I could have imagined, to Michael Hegarty for making modality make sense to me, and to Ute Wohlleben for proofreading the text – which of course does not entail that any of the shortcomings and mistakes below are theirs in any form.

<sup>1</sup> On the semantic side of the interface, I assume, for simplicity, the standard classification of modality as exposed in Palmer (1986) and going back at least to Hofman (1976) – in particular, this entails the epistemic vs. root distinction – up to one significant difference: I consider alethic modality part of human language and not only of logical systems. Cross-linguistic back-up for this view can be adduced from Cinque's (1999: 78) study of functional heads. For English examples – both from present usage and diachronic ones – see below.

(1a) locational central coincidence



(1b) temporal central coincidence



Turning back to modality, consider the sentences in (2), where (2b) would not be grammatical today, but where we have abundant evidence that there were such sentences at earlier stages of the language, say, from Shakespearean texts.

- (2) a. William, you must write us a sonnet.
- (2) b. William, thou must to the queen.

What the present paper attempts to account for is an explanation of why both a functional element base generated in an inflectional node of the sentence (2a) and a lexical element generated in the verbal head (2b), can have similar interpretations at an interfacial level. Both (2a) and (2b) convey the notion of obligation, a clear case of deontic modality. The relation of coincidence in the case of modality will connect two sets of possible worlds. In (2), these two sets are the one related to the speakers, or the commanders, and the one related to William, the commandee, respectively. Pursuing a slightly modified analogy to current tense theories, I will call the first set the topical world set (TopW), and take it as the external argument of the modal relation, and the latter assertion world set (AstW), its internal argument. The set TopW does not necessarily have to be related to the speaker, it can by all means be related to another “controller” present in discourse – e.g. a set of possible worlds in the AstW of a higher clause. By contrast, in all deontics, AstW will denote the set of possible worlds related to the commandee and the ordered/allowed event as above. *Mutatis mutandis*, in evidential or epistemics, AstW will denote the inferree and the inferred event.

Closely linked to the representation of modality, a further diachronic generalization will be derived as the argument unfolds. Particularly, it will be argued that positing a Predicate Phrase (PrP or Pr<sub>max</sub>) for the whole diachronic development of the EM from OE through ModE is a refinement of Roberts’ (1993) sudden-diachronic-reanalysis theory of the modals from V to T. I will take the Pr-node to be situated between T and V as in Bowers (2001). In addition to the motivation given therein for the existence of PrP, I will investigate a further argument for the existence of PrP. The argument is based on VP-ellipses (Warner 1992, Winkler p.c.) in OE, which provide complementary evidence for Pr directly pertaining to the predication of modality (and tense). I will argue that a predicate node has strong explanatory potential for the diachronic issues dealt with in this paper. One benefit of the tense-modality parallelism will be the prediction that modal verbs carry both tense and modal features which they check either by merger with PrP in ModE or by movement in OE/ME.

## 2. Facts, theories, problems

### 2.1. The modals of English: old and new meaning

Speakers of ModE following their intuitions may occasionally be confronted with an intriguing experience while reading OE or ME texts and processing the semantics, syntax and morphology of the precursors of *may*, *must*, *shall*, and *can* as shown in (3)-(7).

- (3) We *magon* eow sellan halwende geþeahte, hwæt ge don *magon*. (Bede, 28.12)  
we can you give sound advice, (as to) what you do may
- (4) ...(þat) alle Cristus wordus mote nede be trewe. (Wycliff, [94], 15)  
that all Christ's words must necessarily be true
- (5) ...who this book shall wylle lerne...  
...he-who this book shall wish learn... (Denison's 1993: 310 example 121)
- (6) Method hie ne cuþon. (Beowulf, 180)  
Creator they not knew
- (7) forðy is betere þæt feoh þætte næfre losian ne mæg ðonne þætte mæg 7 sceal.  
'therefore better is the property which can never perish [lit. never perish not can] than that which can and will.' (Warner's 1992 example 5a)

In the linguistic space occupied by the modals, it becomes an intricate problem how to map an old meaning into a new one. In a translation, one and the same item can – and in fact must – be rendered in some cases by its modern correlative and in others by another member of the class as the two occurrences of *magon* in (3) make clear.<sup>2</sup> In (4), an objective deontic *mote*, reinforced by the adverbial *nede* (the latter originally an inflected noun coming close to instrumental meaning) corresponds in ModE to its former preterite form, which has substituted the lost present form. Considering the religious context, and the additional reinforcement, *mote nede* turns out to have alethic meaning. In (5), we understand the modal *shall* more easily but at least as speakers of Standard ModE we are puzzled by the fact that something resembling a second modal comes right after it. In (6), we cannot bring the modal and the DP *method* together at all given that the pronoun *hie* already checks nominative, so we assume that *cuþon* had rather the significance of knowing in this context. The comparative construction in (7) is noteworthy for two reasons. First, negation precedes the modal *mæg*, and second, there seem to be two instances of VP ellipsis licensed by each of the modals *mæg* and *sceal* in the final relative clause.

Direct or oblique objects (for instance with prepositions) as well as adverbials often give us the first clues on the meaning of the modal cognates in ME and OE. In addition to this and to the general context, some approximating translations generally agreed

<sup>2</sup> The necessity of a certain translation cannot be absolute; it is rather imposed by the context to a certain extent. For example, equating both instances of *magon* with *may* does not make the sentence itself ungrammatical, but semantically mostly improbable in the context it is taken from, where it is essential for the speakers to convince the addressees that they truly are in a position to impart some good advice. Therefore *can* seems the more appropriate choice in ModE.

upon in the literature can offer a first orientation. The following paraphrases for some OE premodals are for instance adapted from Traugott (1992):

- (8) a. *magan* = be strong, sufficient, in good health, be able to; especially for physical ability, whereas *cunnan* is rather used for mental faculties;  
 b. *motan*\*<sup>3</sup> = be allowed to; be obliged to;  
 c. *sculan*\* = owe; be necessary.

If we take these approximating mappings of meaning to be correct, we have to handle two main issues. How do we explain the syntactic and semantic differences to modern usage? And how can we account for the OE synchronic discrepancies, notably for the two diametrically diverging root meanings of *motan* in (8b)? A further question would be whether the two problems are interrelated. Traugott (1992:197) rounds up the difficult descriptive task by giving a characterization in terms of the ability to express epistemic meaning. In such terms *cunnan*, *magan*, and *agan* are posited to lack any trace of epistemicity. On the other hand, *magan*, *sculan*, *beon*, and *willan* are reported to display some “marginal epistemic colouring”. A stronger epistemic coloring is apparently only to be encountered amid impersonal constructions. The hint is helpful as a categorization, but does not answer the questions raised above.

Visser (1969) sheds some light onto the issues by attempting to explain etymological links, sometimes traced back up to Indo-European. Take the two opposing meanings of *motan* for example. Two possibilities are considered. The first one is that *motan* of obligation developed out of the homonym expressing permission. The alternative story for the genesis of the discrepancy, and also the one preferred by Visser (pp.1791, 1797) is that both the permission and the obligation reading evolved from an original \**med-* (related to Gothic *gamut*) and meaning something like *to have it measured out for oneself, to find room*. However, theoretical backup from modal logic, and more importantly, synchronic evidence from ModE show that such seemingly contradictory overlaps as the first possibility presented by Visser are by all means possible in natural language. For instance *may not* and *must not* can still be truth-functionally equivalent in ModE. Furthermore, and in relation to the first co-occurrence, negation of alethic *must* in ModE is taken over by *cannot* although *can* is otherwise less common as an alethic. If it seems difficult to reconstruct the exact relationship between the two readings of *motan* at different stages of the language, then it is noteworthy that the two meanings share a deontic character, and we can only expect worse from the rise of epistemic readings out of the deontic ones.

Traugott (1989) treats the issue of metaphorical extension as a potential generator of new meaning among the modals. She does not rule such extensions out when it comes to the transition of one root reading to another. For instance *sculan* in its original form of *owe+DP* (e.g. *debts*) may have spread out metaphorically to mean *owe+DP/VP* (e.g. *certain behavior*). But a theory of change from the concrete to the abstract as claimed for instance cross-linguistically for verbs of perception (a standard example being *see*) is rebuked in the case of the transition from root to epistemic modals. This rejection appears to be consistent with a stronger categorial difference in the syntax of root and epistemic modals, respectively – as proposed by Drubig 2001. Traugott, however, only mentions a process of “pragmatic strengthening”. She claims a conventionalization of

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<sup>3</sup> The two starred infinitives are not attested. Henceforth I will use them as simple props when not referring to any particular form in the paradigm of any of these verbs.

implicature, but the evidence presented is rather scarce and a clear picture of how pragmatic strengthening might work does not arise.

## 2.2. Arguing for PrP: the syntactic and semantic shifts of the EM

Both Roberts (1993) and Roberts and Roussou (1999) notice that the different approaches to the diachronic development of the modals need not be at conflict as much as it seems – the null-hypothesis they entertain is that only the focus of research is varied. Before proceeding with a closer scrutiny of this hypothesis let us review some of the facts. Leaving aside the issues regarding the speed of the change and any alleged causality of the change, we get a visible change of grammatical status for the modals at the latest in the post-Elizabethan age (Roberts 1999:1023 dates it to the 1520s). The most conspicuous indications are given in (9).

- (9) Changes in the modal system of English (16<sup>th</sup> century)
- a. at the level of I-syntax: loss of argument structure or rather loss of the ability to take any objects (this seems to a facilitating, sufficient condition, cf. van Kemenade's 1999 overview on the topic, although Roberts 1993 stresses its necessity).
  - b. morphological make-up: the EM had previously been part of the preterite-present verb class, a morphologically distinct status, which they originally shared with other verbs. The inflectional poverty was exacerbated with loss of 2<sup>nd</sup> p. sg. (infinitives had always been rare, and the textual evidence even more rare; cf. OED, Visser 1969, and fn. 3)
  - c. behavior with respect to s-syntax: most prominent syntactic feature: alongside *have* and *be*, the modals remain unique movables into T in ModE after the 1660s. Pollock's (1989) tests with respect to question formation, negation, and adverbs hold.

The cataclysmic theory, which roughly states that all relevant morpho-syntactic changes occurred at one point, is due mainly to Lightfoot (1979). Let us now briefly review, what the gradual version of grammaticalization theory says. Goosens (1987) argues for instance for a grammaticalization scale parallel to a desemanticalization process. Whereas Traugott, following Coates (1983), takes polysemy to be structured in terms of fuzzy, but distinct sets – such as, say, the deontic and the epistemic – Goosens favors a theory of continuous transition through time from one meaning to another as in (10a) and (10b).

- (10) a. Grammaticalization Scale (Goosens 1987:118)  
Full Predicates > Predicate Formation > Predicate Operators
- b. Desemanticalization Scale (Goosens 1987:118)  
Facultative > Deontic > Epistemic > Futurity, Conditionality, etc

Full predicates are reported to be verbs with thematic structure of their own, i.e. which do not need an infinitive as an intermediate construction to take a DP complement. An example would be *cunnan* in (6) above. Deontics are also included into this class. Predicate operators are defined as verbal forms lacking an independent thematic structure and used for functional purposes, i.e. possessing a temporal or conditional

character. *Should*, *will*, and *would* in ModE would be typical examples. Such a binary distinction would correspond to a wide-spread taxonomy of main vs. auxiliary verbs, or more generally, to one distinguishing functional vs. lexical categories. The question, however, arises whether there was an intermediate stage of predicate formation and which verbs it contained. Goosens (1987) defines the items belonging at some point to such a putative group as a class containing verbs which do not assign argument roles and takes epistemics to be a prototypical member. This choice is not too fortunate, as the investigator himself recognizes. Goosens seems to be on the right track here, but there is one important amendment to be made. I will argue that a predicational phrase PrP in its own right and extant at all stages of the language is the least stipulatory solution for the diachronic development and for synchronic variation.

Even if continuity as proposed by Goosens is probably not be the ultimate answer to the transitions in the modal system, the idea of incremental loss of meaning accompanied by an increasingly outstanding grammatical status has more than just intuitive appeal and it will be specified less idiosyncratically and with more explanatory potential in due course. The idea of rapid reanalysis à la Lightfoot (1979), elegant as it may be, also has a number of critical points. First and foremost, there is a hard theoretical problem. Given that within this scenario we would account for reanalysis within the range of one generation, the following question comes to mind: Is a learner's internal grammar sufficient to account for historic change? If, in accordance with standard assumptions about UG, children are always able to recover the parents' grammar from their output, which is occasionally defective and never complete, then we should not get syntactic diachronic change at all.<sup>4</sup> Second, despite the obvious fact that the EM system has restructured in a number of ways (*magan* is generally expressed by modern *can*, *cunnan* by modern *know*; arise of epistemics), such basic notions as volition, obligation (and marginally epistemicity in *magan*, *sculan*, *beon*, and *willan*, according to Traugott 1992) are expressed within the system from OE through ModE.<sup>5</sup> Granted the various shifts of the modal class from within, how are we to account for the overall still class-internal transmission of these basic semantic notions? A third problem is the need for an explanation of the semantic conditions on grammaticalization. It is standardly assumed that grammaticalization of lexemes goes hand in hand with bleaching (see van Kemenade 1999). Is then bleaching just an unstructured loss of meaning formed around phonological material? If not, what is then the common semantic skeleton around which so-called bleaching occurs? One argument of this paper is that Pr is precisely in charge of this skeleton from the point of view of interpretable features. Fourth, the lexical roots of the core modals have remained generally the same: the examples (3) through (7) display just a very restricted sample. If the verbal nuclei

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<sup>4</sup> The case of creoles and language contact is trivially different since children reconstruct the closest possible approximation of a grammar if the output they get is non-consistent. Some problematic aspects of the reanalysis approach are also reviewed in Kroch (2001).

<sup>5</sup> *Know* is one of the few exceptions, where a meaning previously expressed within the system has been pushed out of it. In fact, there is an interesting development of *know* in the immediate post-Elizabethan period noted in Gergel (2000). Although historically not belonging to the prterite-present class, much less being a premodal in the sense of Lightfoot (1979), *know* may have been "wrongly mapped" into the class of verbs still undergoing verb movement (i. e. in good company of the modals) at a time when do-support was already the overwhelming rule and not the exception (cf. Ellegard 1953, Roberts 1993). An amazing exemplification of this fact can be found in the diary of Samuel Pepys. In Gergel (2000) the explanation goes as follows: Being semantically a verb expressing modality (both dynamic and evidential, depending on context) the verb *know* has initially also been tricked into joining the same syntax as the other, "established" modals.

are the same, then we might wonder whether a cataclysmic reanalysis from a purely lexical status (V) to a fully functional head position (T) might have occurred overnight. A final problem is the following: Admitted the morphological change of the modals (e.g. loss of 2<sup>nd</sup> sg. ending at the beginning of the 16<sup>th</sup> century, cf. Arnold 1995: 69, loss of gerunds and infinitives) once we look closer in any pre-theoretical syntactic terms, it turns out that in many cases (we are glossing over double modals here) it were more the other verbs' co-occurrence properties changing (e.g. no verb movement after the 1660s) than those of the modals (e.g. appearance in subject-verb inversions both before and after Shakespeare).

In addition, Warner (1992) argues for a special auxiliary-wordclass status of the modals as early as OE based on impersonal constructions and ellipses. This evidence, drawing on various additional corpora as well, poses a problem for what we may call the classical V-to-I reanalysis theory as it stands. An overall dyadic shape of modality – whether in T or in V– may contribute to our understanding of the continuity in terms of syntactic auxiliaryhood. Moreover, the fact that the modals could engage into licensing verbal ellipses just as in modern usage (see Warner's discussion for viable criteria distinguishing genuine ellipses from cases of argument reduction) forces us to posit a functional head position above the omitted verb phrase, but also below negation. That is, sentences like (7) are direct evidence for a structure as [TP[NegP[PrP[(VP)]]]], where the modal can license the omitted VP from the head position within PrP.

In sum, if we want to depart from the behaviorist null-hypothesis and entertain the admittedly more interesting UG-view of perfect language acquisition, then we should be able to come up with a more refined account of modality in our particular case. The interesting alternative hypothesis we want to pursue is furthermore also notoriously known to hold true in the general case: Syntax is significantly more change-resistant than the other language modules.

Motivated by the historical issues mentioned above, we also obtain the following more general questions :

(i) Is a discrete notion of syntactic category tenable for the English modals/ for modals and modality in general given the variation of syntactic height as observed by reanalysis advocates? From a GB model of language, an affirmative answer seems desirable. From a minimalist computational perspective, even more so.

(ii) Assuming there is such a discrete category, what is its representation? Moreover where is it situated within the clausal domain? Is it to be assumed around V as in OE or rather in T as in ModE?

(iii) How does syntactic representation correlate with semantic interpretation? How come both OE/ME and ModE modals – although in syntactic terms generally different – map onto the same modal semantic structure at LF?

(iv) A further question pertaining to the modals is their relationship to predication processes (i.e. saturation of properties as in Chierchia 1985 inter alia). Are the EM predicates in any sense? Or are they – at least partly – outside the propositional domain? (McDowell 1987 and Drubig 2001 claim T-status for deontics and a C-related position for epistemics.)

By concluding from the evidence adduced in this section that Pr is present in the clause, we can disentangle the problem of where the modality features are located and where they must be checked from the issue of different modal base-generating sites at different stages of the language. Both in pre-modern and in present usage of English, the interpretable tense and modality features are checked in the predicational node. Thereby the issues raised above would be solved in a straightforward way. The

representation of modality is on this view indeed discrete, its interpretation is regulated via the interpretable (hence non-deletable) features in Pr, and modality and predication work in quite similar ways. The checking processes will be explained in more detail in 4.1 and 4.2. What remains to be done is in fact an account for the precise types of features involved in the predication of modality.

### 3. A characterization of the EM in terms of semantics and syntax

#### 3.1. A sample semantic basis for the modals (Mc Dowell 1987)

One of the main claims of the present investigation is that modal predicates have a dyadic nature with essentially two feature specifications. Positing binary feature specifications for the English modals means that this duality corresponds to their actual distribution. I will base my argument on McDowell (1987), a study which shows precisely such a distribution based on an item-by-item inspection conducted for most of the EM. Let us see how her methods work for *must*, a representative which turns out to display a deontic/epistemic ambiguity in sentences as (11a) with the two paraphrased readings (11b) and (11c).

- (11) a. John must be a Democrat  
 b. (Necessarily) John is a Democrat  
 c. John is forced/commanded/obliged to be a Democrat

Negation takes wide scope in both readings, as it can easily be checked. Regardless of the correlation existing between the various readings of other modals and the scope of negation, this single counterexample shows that testing for scope cannot generally disambiguate the readings. The essence of the tests for ambiguity used instead is rendered in (12) and (13).

- (12) For p and q to be ambiguous,  $p \wedge q$  has to be grammatical and non-redundant.  
 (13) For p and q to be ambiguous,  $p \wedge \neg q$  has to be true (i.e. not a contradiction).

To illustrate this consider substituting the afore-mentioned sentence (11b) by p and (11c) by q. Then the two tests give a positive answer concerning ambiguity. It is worth bearing in mind that (11b) and (11c) share the same core proposition (cp) *John be a Democrat*. If the first reading of (11a), i.e. the epistemic one, quasi-asserts the cp, what does the second, deontic one do to it? Since we do not have any other options in the framework proposed by McDowell, we would (theoretically) expect (11b) to quasi or fully assert it – these being the two main illocutionary acts used in her study. Practically, it is self-evident that neither is the case. McDowell argues that it (fully) asserts a proposition as (14), i.e. an entirely new proposition, obtained from the same core, and therefore related, but not identical to the original.

- (14) There exists a/the command [ *that* ..(cp)..].

Following the line of research along the concepts of assertion and quasi-assertions in more detail, one gets a useful machinery to distinguish between epistemics and deontics pragmatically, but a common denominator for modality in general is not to be expected. Such a generalization can instead be given – with a few caveats – via Lewis' well



known model of possible worlds. The following overview is adapted from McDowell (1987:195) and shall only be used as a fix point to illustrate a number of general facts about the EM.

(15) Worlds and quantifiers for the English modals

	W* (episteme)	K (compatibility)	F (future)	N (normative)	C (commands)
must	$\forall$				$\forall$
may	$\exists$		$\exists$		$\exists$
will			$\forall$		
can		$\exists$			
should				$\forall$	

“inevitable”

$\forall$

There are two conspicuous entries we might miss from this table. McDowell posits the non-existence of English duals in the case of *can* and *should* as quantifiers over K and N, respectively. The universal counterpart in the case of compatibility is speculated upon along the lines of a predicate as *inevitable*. Certainly, most readings of *must* occurring in English do not convey this meaning as it becomes clear from the foregoing discussion – i.e. they are epistemic or, in its root meaning, subjective deontic. Nonetheless, it appears that alethic *must* comes very close to it.

Inserting the universal quantifier to check this reading – in McDowell's framework – we obtain: For the set K of compatible worlds the triple (s, p, K) is true iff for all  $w \in K$ ,  $w \in p$ . So the theory of quantification sustains such a claim too. As for the dual of *should*, sentences as in (16) may come to mind.

- (16) a. After such an accident, exchanging phone numbers is the least you could do.
- b. After the accident last night, giving me her phone number would have been the least she could have done.<sup>6</sup>

The normative character paralleling *should* is intuitively clear, and could easily be double-checked logically. There are two possible reasons why this duality may not have been considered. *Could* is not included into the main classification in McDowell, but is rather derived via its affinity to *can*. However, with all due attention paid to the still existing correlation between the two related forms, it seems that *could* has earned its autonomous status among the English modals in numerous contexts.<sup>7</sup> The fact that it patterns dually with *should* in cases as above, may in fact lead us into including it.

<sup>6</sup> The only reason I am considering a pseudo-cleft structure with a preposed circumstantial PP is that it seems to convey the normative meaning in a more straightforward, i.e. non-ambiguous way. Except for the fact that one would have to disambiguate again, there is no other reason against any other non-cleft pattern.

<sup>7</sup> For instance in (16a) we may substitute *can* for *could*, and there is no resulting temporal shift. The reason why I suggested *could* instead of *can* as a completion for *should* in McDowell's model is that in (16b) the same substitution makes the sentence ungrammatical. One could of course argue for *can* as the real counterpart in normative contexts by claiming *could* in (16b) as its inflectional form. At any rate the issue would have to be investigated more thoroughly than can be done here. The point I am making about the presence of an existential normative modal in English would be valid in either of the two cases.

A more serious objection would be that the two examples (16a), (16b) should be pragmatically derived from the fairly broad sense of operator of compatibility of *can/could*. In fact, even though this objection is justified, it may even be slightly misplaced as such, since it

can be raised to a more general criticism of the model of possible worlds – at least in the present version. Compatibility (K) may be too general as a term, so that almost any other possible worlds would also fall under its domain, i.e. not only the normative (N) as represented by *could* and *should*, but also F, and possibly also C and W\*. On the other hand, if we accept the division into worlds as done by McDowell, then a completion of (15) as noted above holds. Moreover, the classification is not extensive either. To name just one possible gap consider the well-known quantificational readings of some modals.

(17) Cocktail parties can be boring.

(17) is mentioned and quickly done away with in McDowell as a “sporadic aspectual” (p.142). This misses the point that such a reading would have to be considered in a quantificational approach before any other since it represents quantification per se, i.e. without an apparent additional restriction besides the explicit one where the set of cocktail parties is the restrictor. An LF equivalent would be (18).

(18) Some cocktail parties are boring.

(19) Generally, a spouse will have a car. That way you will have two cars in the family. (from an AFN radio-show on “Reasons to get married”)

Now consider (19), where *will* seems to complement the quantificational reading of *can*. Here, the intended meaning is not existential as in (18). Furthermore it is neither the common future interpretation nor a “bare” quantificational interpretation as paraphrased in (20a) and (20b) respectively.

(20) a. At some interval in the future, the event [a spouse have a car] holds.  
b. Every spouse has a car.

If the presence of *will* in (19) is to fit a quantificational schema for modals, and particularly to take over as the universal quantifier where *can* works as the existential in (17), then we need an additional restriction. This restriction is indeed present in the sentence as an adverb, namely *generally*.<sup>8</sup> The prediction that under the consideration of this restriction, *will* operates as  $\forall$  is borne out in (21) which correctly paraphrases (19).

(21) In the general case, every spouse has a car.

*Can* also fits this slightly restricted scheme, and is at any rate the weaker form of the two modals. Thus one may consider *will* and *can* as duals in a traditional sense and thereby extend the table (15) by one column with the heading, say, G for generic modal quantification.

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<sup>8</sup> Cf. Cinque (1999) for the exact syntactic relationship between adverbs and functional heads as carriers of modality in the sentence: specifier-head.

Having filled a gap in McDowell's model both within its own categories – with *could* as dual for *should* in normative readings – and by extending it by one additional category, we may still be far away from an extensive classification of the modals. Besides, the absence of mutual exclusiveness has also been mentioned.<sup>9</sup> Nonetheless, the semantic contribution made by classifications of this kind, and also the methods applied deserve to be kept in mind for their strong general character. The main result is the binary modeling schema for the EM.

There are also serious linguistic and psycholinguistic factors which show that an opposed-features concept (binarity) is close to the empirical facts of naturalness in human language.<sup>10</sup> I remain neutral with respect to such general claims, the crucial point for the scope of this paper being the striking binary nature of the EM, which shall be translated with the notions of central and non-central coincidence. The way this two dual notions are presently understood in the literature (Hale 1985, Demirdache and Uribe-Etxebarria 2000) makes them more appropriate as tools than a strict quantificational approach to the modals. In section 4 we will take up this idea again and claim it to be a close approximation on the conditions reigning at the syntax-semantics interfacial processing of modality.

### 3.2. Additional semantics with respect to diachrony: a visibility parameter

Bybee, Perkins and Pagliuca (1994:176) propose that we should give up finding the right semantic definition for modality within synchronic frameworks altogether. The alternative argued for is that “mood is best viewed as a set of diachronically related functions, and... a real understanding of modality would emerge from a study of these diachronic relations”.

This strong claim about the role of change in language for the understanding of modality shall not be represented here. More than anything else, modality is a synchronically present phenomenon affecting both the truth values of the utterances it is involved in and the syntactic structure (merging into the T-node) in ModE and probably in more ways than we can find out at all stages of the language. However, there is a practical point to be made here, without any claim about its being a definition. We may call it *diachronic visibility*, and maintain it simply as an observation and working tool.

- (22) The diachronic visibility function  
The predicational relations instantiated by the EM are a function of their diachronic development, which can be evaluated at all synchronic stages.

### 3.3. A minimalist glimpse at EM syntax

Following Lightfoot (1979), Roberts (1993, and previous research), Roberts and Roussou (1999) recast the lexical-to-functional reanalysis theory for the modals in minimalist terms. The crucial syntactic point is, however, still the same as in Roberts

<sup>9</sup> For a more thorough discussion of the possible-worlds approach, accessibility, and also of related problems cf. Lewis (1986).

<sup>10</sup> Cf. Jackendoff (1990) for a more skeptical view concerning binary modelling, at least with respect to certain conceptual structures which according to him seem to be harder to classify in binary terms, but see Dressler 2000 for a recent overview on naturalness and the claim that binary structures underly language conceptualization.

(1993): due to their zero-inflection and to the loss of the infinitive they were taking as a complement, the modals reanalyzed from V to T. In fact Roberts (1993) already has a strong minimal-effort motivation – in terms of traces saved by such an analysis. The facilitating factors considered are: the morphological loss of the subjunctive, the opacity of tense, especially on epistemic modals (cf. *might* in ModE), and as we have already seen, the loss of thematic argument structure. The bottom line of the new economy considerations is that merge is the preferred operation over move: Whereas in OE/ME the strong feature of T in English was satisfied by movement, in ModE it came to be satisfied by merger of one of the brand-new reanalyzed items belonging to the modal class. The criticism raised in 2.2 above still holds. Even though the syntactic reanalysis is undeniable, there are many issues relating to continuity within this theory which ask for an explanation.

## 4. The primitive elements of modality

### 4.1. Central vs. non-central coincidence in modal metric

In this section the binary semantic classification of the EM (section 3.1.) and the diachronic reanalysis (2.2. and 3.3.) are claimed to correlate with a syntactic representation of modality as abstract predication in terms of features of central and non-central coincidence. The diachronic visibility function is taken as corroborative evidence.

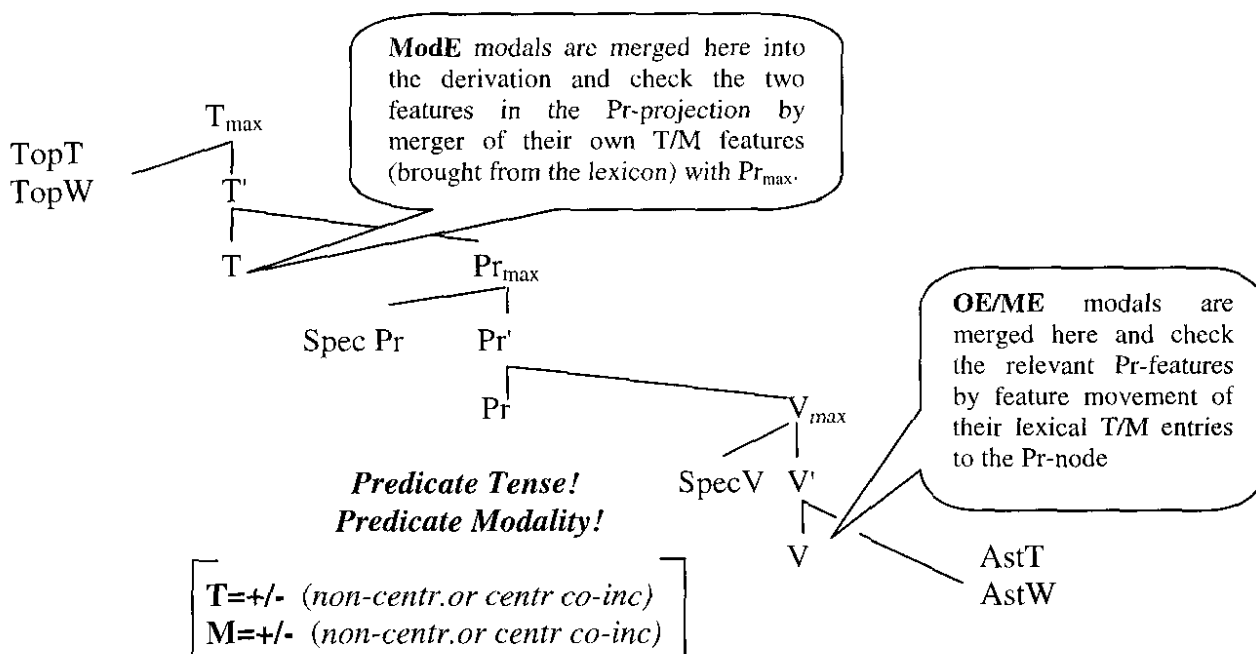
The answer to the questions about the EM raised in section 2 can be completed by considering a decomposition into primitive elements of modal semantics and syntax. This can be done in a manner related to current analyses of tense and aspect (e.g. as exposed in Stowell 1996, Demirdache and Uribe-Etxebarria 2000), by means of two adposition-like abstract dyadic predicates. The crucial difference will be to understand the non-linearity of modality and hence the different meaning of the otherwise similar predicates of central and non-central coincidence. More precisely, I will argue that the primitives of modality are modeled by human language close to AFTER and WITHIN, but that these two prepositions are to be understood with respect to a modal metric. This is the main problem with many accounts trying to bring modality onto the same denominator with tense: more often than not, they get the right structural similarity, but neglect the different semantic metric which underlies tense and modality, respectively (Iatridou 2000, Gergel 2000).

Different kinds of spatio-temporal relationship have often been invoked in the literature. It should be noted, however, that even for the simple translation from time to space (i.e. without even dealing with possible worlds or any other approach to modality yet) the analogy fails unless space is seen as on a one-dimensional line, which corresponds to Hale's (1985) "trajectory." There is for instance no general metric for establishing which of two pairs of two-dimensional co-ordinates is the bigger and which one the smaller one – the real numbers are an ordered set, the complex ones are not, as math will have it. With time, however, since it is an ordered one-dimensional set, AFTER and WITHIN make sense, in fact, even more straightforwardly than with locations – i.e. where the analogy has originally been taken from – where we have the one-dimension restriction as above.

In order to illustrate the distinction with respect to syntactic representation and semantic interpretation, let us assume three co-ordinates of meaning for any given truth-functional calculus. So we shall consider triples  $\langle s, w, t \rangle$ , where  $s$  stands for the speaker,  $w$  for the world, and  $t$  is the time the proposition is to be evaluated at. While

the variable *t* seems to behave linearly in our conceptualization of language, *w* does not, so we need a different feature for modality. Building on the possibility of modeling most modals as duals of some other modal, I argue that the computational system  $C_{HL}$  only has to read off the lexical entry which feature should be fed into the Pr-node (central or non-central coincidence). This can be done from different locations in the syntactic phrase marker as the diachronic visibility function reassures us. The following representation sums up the main ideas.

(23) The modals of English – General syntactic schema



One is tempted to introduce the constraints *Predicate Tense* and *Predicate Modality* as a generalization independent of the diachronic development of the language. Its fulfillment is, however, parametrically different for present usage and pre-Elizabethan registers.

## 4.2. Two scenarios for expressing modality in English

### 4.2.1. A modal enters the numeration in ModE

In minimalist vocabulary, we might say that an item *modal* (*may, must, etc.*) will be base-generated in T (following the insight from Roberts 1993), and it will eventually be mapped to LF in the conglomerate of the final syntactic object with a feature matrix containing similarly designed, but distinct, entries for tense and modality. I take central coincidence as the non-marked value both for tense and for modality. For tense, this means that PRESENT yields the unmarked (“minus”) interpretation for TENSE, while necessity (NEC) yields the unmarked interpretation for modality. This double prediction is indeed borne out in natural language. On the one hand, not only do we not have a present operator in intensional logic, but present tense is morphologically unmarked in English, and also tends to go unmarked in many other languages. On the other hand propositions which are necessarily true are also left unmarked in English and other languages. The clearest case of this phenomenon is represented by alethic modality,

which for instance in the reading of “neutral-necessity,” can optionally be left out or inserted. Thus *two plus two must equal four* is truth-functionally equivalent to *two plus two — equals four*. The modal entry in the feature matrix of *modal* will be otherwise free to be epistemic, deontic, and what not, depending on the finer specification of the predicational head. In standard dialects of English it will be, however, unique. This is a clearly syntactic, not a semantic constraint (uniqueness of the T position).

#### 4.2.2. A “modal” verb entering an English derivation long time ago (in OE/ME)

The same specifications with respect to markedness hold. Take central-coincidence as unmarked. Just as in the previous case, it will have different meaning at LF for tense and modality, but it will go through the syntactical machinery, Chomsky’s (1995)  $C_{HL}$ , in the same guise. As a dyadic predicational structure. With respect to modality it relates the topic w-variable to the assertion w-variable. Stowell (1996) proposes a very similar procedure for tense as a (cross-linguistic) abstract predicate. The predication process itself is the same as in modern times, Pr being in charge. We can predicate tense and modalities via merger with Pr – once the full VP merges with the Pr-head the relevant features will be checked and will not be deleted since they are all interpretable at the interface to LF. The parametric difference is accounted for in syntactic terms: The base-generating host of *modal* is different on the two scenarios. However, it can get into a checking relationship with Pr in both cases. Also parametrically different is the following fact: We do not get the uniqueness constraint in this scenario on *modal* items, since the premodals now come from VP and interact with PrP “from below” – while T was unique per clause above, V is not, i.e. multiple premodal strings are predicted, and there are such cases attested (see sentence 3 for one).

We may now see for a moment whether central and non-central co-incidence can also be made sense of intuitively. As a diacritic, we can take the unmarked value of central coincidence to have the approximate meaning of WITHIN. In the case of tense, WITHIN means that the assertion time is within the topic time. With aspect, which is, roughly speaking, an embedded tense, it means that the assertion time is within the event time, in which case we get the progressive. With modality, we only get the structural parallelism of dyadic predicate if we are not oblivious with regard to the co-ordinate we are dealing with. Therefore, while the notion of topic time is now fairly wide-spread in the literature (Klein 1994), there are good reasons to make a concept of topic world just as fashionable. Just as with time, it can be influenced by discourse or by an embedding context. It will simply be the external argument of our celebrated dyadic predicate.<sup>11</sup> For an embedded clause, it is controlled by the event time of the higher clause. In the case of a matrix clause, is controlled by the set of worlds involved in the speech act. This too follows closely the parallelism to tense pointed out in Stowell (1996).

Furthermore, there are lexical indications for the realization of the abstract predicate of coincidence from prepositional phrases in intensional adverbial expressions in a number of languages.<sup>12</sup> At this juncture, Cinque’s (1999) correlation of adverbials and

<sup>11</sup> Stowell (1996) makes a similar point with respect to time. Stowell’s terminology makes use of “reference time” for such a time which can be controlled either by discourse (default option) or by an embedding context. I refrain from this term since it may cause confusion with Reichenbach’s (1947) reference point R – from which it is radically different.

<sup>12</sup> I make use of the term adverbial as a syntactic object following Mc Cawley (1995) – where adverb would be just the more restricted, morphological term.

functional projections can be observed to work. Adverbials and (modal) functional heads are in a position of functors semantically, and following Cinque also in a syntactic Spec-Head relation. For instance, in English we have an (evidential) modal adverbial such as *in x's opinion*, i.e. modeled with the closest lexical preposition of central coincidence. On the other hand, in the German *x's Meinung nach* (*x's-opinion-after*) evidentiality has been lexicalized as non-central coincidence.

A further piece of evidence for the dyadic nature of modal predicates can be adduced from the syntax of quasi-modals. Among other researchers Harley (1995) stresses the prepositional nature of *have*. The foundation for this fact is both internal-syntactic and cross-linguistic, many languages (in fact the majority) lacking possessive verbs and replacing them by prepositional constructions (here we may take the dative as prepositional too). However, it also turns out that numerous languages express different modalities by using something close to *have* (see for instance the overviews in Bybee et al. 1994). As a matter of fact, one does not have to look too far for an illustration. English makes use of *have to* as a quasi-modal, in particular as a suppletive form for *must*.<sup>13</sup> I take this to be further evidence for the dyadic (abstract) argument structure of modality. The role of *to* may prove crucial, too, indeed. In a number of other English quasi-modals such as *be to*, this element is also available. Here the suggestion can be made that *to* enlarges the otherwise poorer argument structure of *be* in English (only one, internal, argument following Harley 1995) and makes it suitable for the syntactic configuration of modality, i.e. it makes it a dyadic relation between the set of topic worlds and that of the assertion worlds.

Cross-linguistically, let us mention only one more celebrated case of preposition-like element becoming a marker of modality. Latin – at different times – is known to have had both the prepositional possessive (*mihi est* = “to me (there) is” = “I have”) and the verb *habeo* (= “I have”). It is worth repeating that both semantically and syntactically they can be regarded as parallel. In most Western Romance dialects *habeo* became grammaticalized as a marker of futurity. Interestingly, in a second step the futurity morpheme also came to express (epistemic) modality, e.g. in Spanish. Summing this story of indirect evidence up, a dyadic “have” became a marker of dyadic modality via dyadic tense.

### 4.3. Tense and modality

Keeping the different metrics in mind, we still get an ordering process according to two main relationships in both cases. This means that modality and tense possess very similarly engineered mechanisms in grammar. If true, this may be due to an economy-driven constraint. However, the principle of FI proves strong enough to require the entry for both categories, that is, in the proposal argued for here through the mediation of the predicating node. For instance, in *John may leave* the modal feature is marked as non-central coincidence (recall that *may* can be rendered by the existential  $\exists$ , and we translated this as non-central coincidence), while the tense feature is non-marked, alias PRESENT, alias central-coincidence.

Just like with tense, only one feature is obligatory per clause. If there is a further, embedded tense in a clause than this can be aspect. If there is a second modality, then this is non-alethic, and non-epistemic. That leaves us with the result that tense is to

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<sup>13</sup> For a detailed semantic and pragmatic discussion of the quasi-modals in relationship to the core-modals, see Westney (1995).

aspect what epistemic and alethic modality are to deontics and more generally to root modals, a rough generalization given the differences between the two variables, but which holds at least in terms of embedding and necessity per clause.

Given the non-linear relationship within modal systems as opposed to tense systems, we will not necessarily expect a full parallel to a *consecutio temporum* rule, which, in essence, is a morphological linear back-shifting process to a fake morphological *past* standing for a syntactic PRESENT (notation as in Stowell 1996). Surprisingly enough, we do get a shift with respect to evidentiality in the mood system of German. After verbs of saying Standard German requires the subjunctive mood (a rather rough translation for *Konjunktiv*). By using the structural parallelism above saying tense: aspect = epistemic/alethic: deontic, we can predict the restriction that only a subset of evidential verbs can trigger the shift to the subjunctive in their complement clause. Recall that in English it is the tense of the higher clause and not its aspect which triggers the morphological back-shift rule. By the same token, in German it is the episteme feature (or at least a subset thereof) which triggers the *Konjunktiv*, the shifted type of mood.<sup>14</sup> Once we rely on Palmer's (1986) views that mood is a grammatical reflex of modality it becomes clear that we are dealing with morphologically shifted modality – so the phenomenon might be close to a *consecutio modorum* – where all the warnings afore-mentioned still hold that a *consecutio* is hard to make sense of for modality in the first place .

## 5. Conclusion

The present account had the objective of shedding some light onto the history of the EM including the modern stages of the standard dialects. The key-tools have been two simple devices: First, the relational nature of modality and the existence of a predicational node at all recorded stages of English. Second, the prepositional nature of any modal node. In particular, the Pr-head has been supported by semantic arguments starting off from the dual nature of most modals in English in section 3.1. By viewing meaning as a function with a three-coordinate domain (s, t, w) and with an eye on theories of tense, I have investigated an adaptation of such theories from the second to the third variable pointing out to significant differences, but also to striking similarities, which have given support to a generalization of Stowell's (1996) concept of abstract predicates. Further evidence for the idea of the relational nature of modality consisted in applying Harley's (1995) account of *have* to quasi-modals such as *have to*.

The hypothesis concerning the existence of the predicational projection assumed the syntactic work reviewed in Bowers (2001) complemented by four pillars of diachronic evidence. First, a uniform syntactic form and locus have been given to the relational nature of modality. Second, Roberts' (1993) reanalysis theory has been taken up and refined both syntactically and with respect to interface interpretation through the predicational phrase. Third, some criticism of the Lightfootian theory has equally been accommodated and systematized (for instance Goosens' 1987 conjecture about predicate formation). Fourth, data from Warner (1992) concerning elliptical VPs as

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<sup>14</sup> Clearly there are radically different types of mood and mood-selection, e.g. the English mandative subjunctive, or the subjunctive in Spanish, which cannot be dealt with here. Whether they pose a problem for the present account or whether the two systems can be modelled so that they ultimately converge, is for further research to find out.



early as in OE have suggested the need for a syntactic licensing head position above the elided VP and also strictly below negation since the OE modals are generally preceded by negation.

Moreover, a framework for discussing both epistemic and deontic modality in the vein of the frameworks able to deal with grammatical aspect and tense at the same time has been put forth by using cross-categorial features. The schema proposed here explains to a certain extent different grammaticalizations of modality, since the older and more recent forms of English can be regarded as different parametric options for UG. Using the two main concepts proposed here, we may have an idea why modality and tense often ride on the same vehicles (cf. the samples in Bybee et. al. 1994, and for a quick check-up, simply the modals in English). Related to this, we also have an account for why certain lexemes often change from tense to modality and vice versa such as English *will*, originally a volitional marker of root modality, today mostly a futurity and epistemicity marker. This is precisely supported by the related design of the two specifications.<sup>15</sup> Although not explored here, I suspect that the proposal made here is able to handle counterfactuality, as a special combination of mood and tense, a view compatible with the approach advocated in Iatridou (2000).<sup>16</sup>

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<sup>15</sup> Cf. Bybee et. al. (1994). Cf. Trask (1996: 144) for a further example closely resembling English *will* and *shall*: The Latin volitional *volui* and obligatory *debeo* have developed into the standard markers of futurity in Romanian *voi* and Sardinian *deppo*, respectively.

<sup>16</sup> The ExclF feature used there is a particular case of the more general non-central concept presented above.

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