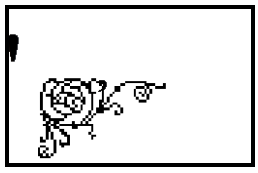


MODALS AND MODALITY IN ENGLISH

CARLOS INCHAURRALDE BESGA
UNIVERSIDAD DE ZARAGOZA

1. INTRODUCTION

Modality in English has traditionally been interpreted in terms of the use of modals, and although this is not the only resource available for the expression of this notion,[1] there is no doubt that it is the most important one. Still, modality as a whole is not a clear area of study, for several reasons, the most important being the fact that we can identify two different kinds of modality: "root" (deontic) modality (dealing with obligation, permission, ability, etc.) and epistemic modality (dealing with probability, possibility, certainty, etc.). This distinction has been studied in the past, and an interesting suggestion is that epistemic uses are dependent on, and derive from, deontic ones (cf. Sweetser 1982, 1990, who gives a unified treatment in terms of force dynamics and causality).[2] From a diachronic point of view, it is clear that epistemic modality derives from "root" modality, and we shall elaborate on this below. Diachrony can also be understood from a language learning perspective: children acquire the deontic senses of modal verbs earlier than the epistemic ones (as mentioned by Sweetser 1982: 485, who refers to Kuczaj and Daly 1979 and Shepherd 1981). Synchronically, "root" and epistemic modalities are related by means of a subsumption relation which will also be discussed here.

However, modality as a notion also needs to be examined in connection with tense and aspect. As will be shown, epistemic modality can be represented in a compact way together with tense in a graph which has time as one axis and possible worlds as the other. There is strong evidence that tense and modality are related: both are categories that are encoded in predications at the same level of depth, and both clearly interact with each other. This will also be looked into. If we consider tense, we shall also need to consider aspect, which deals with the internal configuration of time as it is expressed in verbs. The three categories tense, aspect, and modality are expressed mainly by auxiliaries; there is a great deal of crosslinguistic evidence that the three of them are closely interrelated (cf. Givón 1984: 269-318).

In order to analyse the way in which this interrelation takes place, we are going to use two axes: the diachronic one (relations through historical time) and the synchronic one (relations in the system at a given moment).

2. THE DIACHRONIC AXIS

2.1. Heine's account of the grammaticalization process of auxiliaries

Modals in English *(can, could, may, might, must, will, would, shall, should, ought* and *need)* are considered to be auxiliary verbs with a high degree of grammaticalization which is reflected in some morphosyntactic characteristics, such as the fact that they have no *-s* endings for the third person singular, and no infinitives, or past forms (except the forms *could* and *would* in some instances). In addition, many of them also have weak and contracted forms.

However simple their morphosyntactic functioning has become, a corresponding simplification and reduction of their meaning has not taken place. Let us take for instance the modal *can*. With this verb we can form sentences like the following:

[1] *If you want you can do it* (theoretical possibility)
[2] *Zaragoza can be very warm in Summer* (characteristic behaviour of reality)
[3] *You can leave the classroom now* (permission)
[4] *I can swim* (ability)
[5] *We can meet tomorrow* (suggestion)
[6] *Can I help you?* (offer)

[7] *Can you come here a minute, please?* (order)

We can see that there are many different possible senses for this verb ([5], [6], and [7] are pragmatically motivated, but [1], [2], [3] and [4] are clearly different meanings of the same modal). It could be argued that this is not a good example, since there are other modals which are more grammaticalized. Such is the case of *will* or *would*. But, still, we can distinguish different senses, as we can see in these examples for *will:*

[8] *It will rain tomorrow* (Prediction in the future)
[9] *There is somebody coming. That'll be Peter* (Prediction in the present: possibility)
[10] *He will keep forgetting everything* (habitual behaviour)
[11] *I won't open the door* (refusal; willingness not to do something)
[12] *You'll leave the classroom at six* (order)
[13] *Will you open the door, please?* (request; order)

This broad spectrum of possibilities for the different modals is a direct consequence of a historical process of grammaticalization with several stages. When the process stops at different points, different senses appear. Some of these senses are closer to the etymological origin (root modality), whereas others are nearer the pure epistemic modality scale in terms of possibility, probability or certainty.

Heine (1993) has put forward a very clear explanation for this phenomenon in cognitive terms. According to him, and drawing on extensive crosslinguistic data, there are several basic event schemas which underlie possible processes of grammaticalization for auxiliaries. They provide the basic concrete representations from which all known languages make the shift towards abstract concepts like tense, aspect, and modality distinctions. As basic event schemas he proposes the following:

a. Location (i.e. where one is)
b. Motion (where one moves to, from, through, etc.)
c. Activity (what one does)
d. Desire (what one wants)
e. Posture (the way one's body is situated)
f. Relation (what one is like, is associated with, or belongs to), or
g. Possession (what one owns)

(Heine 1993: 28)

All these event schemas have a very clearly identifiable conceptual form which helps us identify the constructions that use them:

	Conceptual form	Proposed label
a.	"X is at Y"	Location
b.	"X moves to/from Y"	Motion
c.	"X does Y"	Action
d.	"X wants Y"	Volition
e.	"X becomes Y"	Change-of-state
f.	"X is (like) a Y"	Equation
g.	"X is with Y"	Accompaniment
h.	"X has Y"	Possession
i.	"X stays in a Y manner"	Manner

(Heine 1993: 31)

These basic schemas, together with a few derived ones *(serial, evaluative* and *purpose)*, can be the etymological source for auxiliaries marking tense, aspect or modality. This is shown in the following table:

Location	progressive, ingressive, continuous
Motion	ingressive, future, perfect, past
Action	progressive, continuous, ingressive, completive, perfect
Volition	ingressive, future
Change-of-state	ingressive, future
Equation	resultative, progressive, perfect, future
Accompaniment	progressive
Possession	resultative, perfect, future
Manner	progressive

(Heine 1993: 47)

The following are examples of how these schemas have evolved in different European languages:

[14] *I am **going to** play golf tomorrow* (motion schema > future) [English]
[15] *I **do** work very often with Mary* (action schema) [English]
[16] *You **will** go to the cinema* (volition schema > future) [English]
[17] ***Anda** diciendo por ahí que Juan es un incompetente* (manner schema > progressive) [Spanish]

[18] *Hij is een boek* ***aan het lezen*** (location schema > progressive) [Dutch; example from Heine 1993]
[19] *Bernd* ***wird*** *kommen* (change-of-state schema > future) [German]
[20] *Hoy* ***comeré*** *[comer-he] pronto* (possession schema > future) [Spanish]

Now, if we look at the way in which these schemas have given rise to modals in English, it is interesting to note that verbs with full semantic content have become emptied of their semantic load. This phenomenon has also run parallel to a shift in grammatical category, word-class, morphosyntactic properties and even phonetic form. In a schematic way, we can say that modals have followed the shift from being in a structure [X-verb-complement] to a structure of the form [X-grammatical concept-main verb] (as postulated for all kinds of auxiliaries in Heine 1993: 47). Heine calls this shift the Verb-to-TAM[3] chain, in which several processes work at the same time: *Desemanticization, decategorialization, cliticization*, and (phonetical) *erosion* (Heine 1993: 54-58). This is well conceptualized by means of 'overlap' models, such as the following:

Overlap model of conceptual shift:

Stage:	I	II	III
Type of concept:	Source	Source Target	Target

Overlap model of morphosyntactic shift:

Stage:	I	II	III
Morphosyntax:	Verbal	Verbal Grammatical	Grammatical

Overlap model of erosion:

Stage:	I	II	III
Phonological			

form of expression:	Full Reduced	Full	Reduced

(Heine 1993: 49-51)

Heine's account is extremely interesting as a model for the formation of current English modals. He gives even more details about the different stages in the four processes mentioned above, and specifies up to five steps in the process of decategorialization. Looking at the way in which these different steps take place together he postulates the existence of seven main stages in the Verb-to-TAM chain, which he denotes by the letters A to G:

Stages in the Verb-to-TAM chain:

Overall stage	A	B	C	D	E	F	G
Desemanticization	I	II	III				
Decategorialization	I		II	III	IV	V	
Cliticization	I				II		III
Erosion	I				II		III

(Heine 1993: 58)

2.2. English modals and the grammaticalization process

If we try to fit the evolution of English modals into this general schema and look for the stages that correspond to some of them, we find that they are in stage E in most of their uses, which means that, according to the specifications provided by Heine (1993: 54-56) for every stage, they have the following properties:

Desemanticization: "The subject is no longer associated with willful/human referents, and the verb acquires a grammatical function" (III). This is clearly seen with *will*, the most desemanticized of the English modals. However, there are some instances of the use of this verb as a full semantic form in fossilized expressions such as "do as you will".

Decategorialization: "The verb loses further verbal properties such as its ability to be negated separately and to occur in other positions of the clause, and the complement loses in nominal (and adverbial) properties, such as its nominalizing and/or adverbial morphology" (IV). All modals in English need to be attached to the main verb and have lost most of their verbal properties. This is a very characteristic feature of English modals, which all grammars identify as peculiar to them. Other languages retain verbal morphology for some of these auxiliaries (e.g. Spanish *poder* and French *pouvoir,* German *können* and Dutch *kunnen,* etc.)

Cliticization: "The verb loses its status as a separate word and develops into a clitic. The verb and its complement are now likely to form a *simple phrase,* which permits only one expression of tense, negation, passivization, etc." (II). The rule for negation in English clearly takes into account the relative position of the modal and the main verb, with only the form *not* inserted between them. Tense itself is marked by the modal. When this is not possible, the verb *have* is used (e.g. "he must be there now" vs. "he must have been there") adding perfectivity in the process.

Erosion: "The phonological substance of the verb tends to be eroded" (II). This is clear in written English with the modals *will* and *would*, where contractions like *'ll*, *'d*, are common. With other modals, unstressed forms are not uncommon. The tendency to fuse with *not* in negations also has a written manifestation: *can't, won't, shouldn't, wouldn't,* etc.

In general terms, English modals tend to be very homogeneous as far as their decategorialization and cliticization stages are concerned. But they are less so for desemanticization and erosion, which tend to go parallel. Some senses are closer to etymology, and they are expressed phonetically in a less eroded way. This means that they did not travel all the way to stage E of Heine's table without leaving some instances of less grammaticalized uses unharmed.

3. THE SYNCHRONIC AXIS

3.1. Introduction: The TAM system and layers in FG

In the preceding section, we have seen that there exists a clear, systematic account of how different senses of the same modals are etymologically related. However, their coexistence in a given moment is something that needs a synchronic formulation. Owing to the fact that modality is closely related with tense/aspect in most linguistic descriptions, it is fair to treat them here together, as constitutive parts of the so-called TAM (Time-Aspect-Modality) system. With this in mind we could start by referring to a grammatical model in which tense, aspect and modality have provided evidence for a complex, multilayered description of the clause: S. C. Dik's Functional Grammar (from now on, FG).

In FG, following suggestions by Hengeveld (1989), which were in turn based on the layered structure of the clause proposed in Foley and Van Valin's (1984) RRG,[4] utterances can be analysed in terms of a multilayered structure with this form:

LAYERS
Clause: $(E_1: [ILL\ (S)\ (A)\ (x_1: etc.\ (x_1))]\ (E_1))$
Proposition: $(x_1: [(e_1: etc.\ (e_1))]\ (x_1))$
Predication: $(e_1: [Pred_\beta\ (x_1)^n]\ (e_1))$
Term: $(x_1: Pred_N\ (x_1))$

(Dik and Hengeveld 1990: 3)

There are operators (p) for each of the four levels, so that the total representation would be something like

$(E_1: [\pi_4 ILL\ (S)\ (A)\ (\pi_3 x_1: (\pi_2 e_1: [\pi_1 Pred_\beta\ (x_1: pred_\beta\ (x_1))\ ...\ (x_n)]\ (e_1))\ (x_1))]\ (E_1))$

π_1: Predicate operators
π_2: Predication operators
π_3: Proposition operators
π_4: Illocution operators

(Dik and Hengeveld 1990: 2)

Van Valin's original proposal found justification for its tripartite division of clause structure in evidence from expressions for the TAM system. This is also the case with FG; we shall therefore look at how FG treats TAM

questions in its description, in order to see what can be used for an adequate treatment of modality interactions.

3.2. Tense and aspect

Tense and aspect are traditionally considered to deal with the expression of time. Tense concerns its "external" configuration, that is, the distribution of events along a temporal line, whereas aspect concerns its "internal" structure, that is, how time is organized inside a situation. Tense, according to Hengeveld (1989: 132), is represented by level-2 π_2 operators. This is so because it tends to be further away from the verb nucleus than aspect (level-1 and level-2 operators; see below). Aspect, however, is a more complicated matter. Aspectuality encompasses many distinctions that are categorized under different labels in different linguistic traditions. In Functional Grammar, according to Dik (1989: 186-187), who reserves the term "aspect" only for those aspectuality distinctions which are grammatically rather than lexically expressed, aspectuality covers the following sub-areas:

> (a) The type of SoA [State of Affairs] as designated by the predicate frame . . . also called *Aktionsart* (Mode of action). . . .
> (b) *Perfectivity/Imperfectivity*. . . .
> (c) *Phasal aspectuality* distinctions serve to describe what can be said at some reference point on the temporal dimension, in relation to the occurrence of some SoA. . . .
> (d) *Quantificational aspectuality* distinctions express different forms of quantification over sets of occurrences of SoAs. . . .

(a) concerns aspectuality expressed lexically, which means that it is not to be treated as aspect in FG. As for (b), (c) and (d), they have operators at two different levels, because they function at different levels of the clause. This can be contrasted empirically in different languages.

The opposition perfectivity/imperfectivity and phasal aspect are treated as level-1 π_1 operators. Dik (1989) notes that there is very frequent interaction of these operators with a certain SoA. Conflicts between imperfectivity and telic SoAs, or between perfectivity and open-ended SoAs tend to resolve by assigning certain interpretations (conative, iterative or distributive for the former; ingressive or terminative for the latter). As for phasal aspect, it is expressed through different interpretations of the

perfective and imperfective (cf. Dik 1989: 187 ff.; Siewierska 1991: 118-120).

Quantificational aspect is treated as a level-2 π_2 operator for several reasons: it can quantify over any element of a core predication[5] and it can be specified independently of the other kinds of aspect (cf. Dik 1989: 204 ff.; Siewierska 1991: 121-122).

3.3. Modality

Modality receives a very complex treatment in Functional Grammar. Dik (1989: 205), following Hengeveld (1987, 1988), mentions the following sub-areas of modality:

Level 1: *Inherent modality*, which defines the relation between a participant and the realization of the SoA in which he is involved. It concerns ability or willingness, obligation, and permission.

Level 2: *Objective modality*, which expresses the speaker's evaluation of the likelihood of occurrence of the SoA. It can be divided into two sub-areas with a gradation of the degree of actuality involved. These are: *Epistemic objective modalities* (Certain-Probable-Possible-Improbable-Impossible) and *Deontic objective modalities* (Obligatory-Acceptable-Permissible-Unacceptable-Forbidden).

Level 3: *Epistemological modality*. Here we have modal distinctions signalling the speaker's personal commitment to the truth of the proposition. They are: *Subjective modality*, in which the speaker takes personal responsibility for the content of the proposition, and signals how certain he is about its truth; and *evidential modalities*, in which the speaker assesses the quality of the proposition according to how he has obtained it, be it through evidence, by personal experience, or by having heard it from someone else.

As far as English modals are concerned, only objective modality will be considered here. In fact, this is the proper type of notion that corresponds to modality, according to most authors. Inherent modality covers modal distinctions such as ability, willingness, obligation, permissibility, and volition. However, Siewierska remarks that

> these distinctions are realised lexically . . . , not grammatically. Hengeveld (1987: 11-12) suggests that there is also a semantic difference between inherent and objective modality in that by means of the former speakers merely present their knowledge of a given situation, while by means of the latter they offer an evaluation of the situation in terms of this knowledge. For many linguists, this difference excludes inherent modality from the proper domain of modality. (1991: 124)

As for subjective modalities, they are statements of opinion rather than fact, and Siewierska reminds us that, in English, "the modal auxiliaries are open to an objective and a subjective reading" (1991: 126). The distinction between "root" and epistemic modality (cf. Sweetser 1982), made on etymological grounds, corresponds broadly to the distinction between deontic and epistemic modalities. Root modality is closer to the etymological meaning, which has to do with evaluative judgement in many cases. Other authors also agree with this distinction, although they define modality in a way sometimes misleadingly similar to FG modality varieties for level 3 or 1. This is the case with Givón's (1993: 169) definition, in which, if we assume that modality has to do with the speaker's attitude towards a proposition, this attitude concerns two types of judgement:

(a) Epistemic judgements of truth, probability, certainty, belief or evidence.
(b) Evaluative judgements of desirability, preference, intent, ability, obligation or manipulation.

Of the utmost interest is the fact that, regardless of their concrete value as judgements, all these possible modalities can easily be explained in logical terms by means of a possible worlds approach.[6] Modality expressed logically in terms of possible worlds (certainty and probability) has been extended in order to interpret obligation/permission *(deontic logic)*, and knowledge/belief *(epistemic logic);* all these different logical models account for the opposition *realis/irrealis*, which Givón (1993: 172 and ff.) uses to denote a

characteristic feature of modality. The logical approach therefore provides us with an instrument which explains deontic modality as a special variety of epistemic modality, the subsumption of the former by the latter being plausible in the kind of explanatory schema suggested below. *Obligation* implies certainty and *permission* possibility; in a similar way, *knowledge* implies certainty and *belief* possibility.

3.4. Interactions

It has been mentioned in the previous sections that both FG objective modality and tense are considered to be in level 2 of the multilayered structure of the clause. We shall argue here that this is due to the fact that both tense and modality interact in a coordinated way, which in turn implies that a compact representation for both of them can be found. This representation can be made in a simple way by means of a two-axis schema in which the vertical axis represents time and the horizontal axis possible worlds or possible states of affairs (let us call it the *hypothesis/reality* axis).

For a start, it has been suggested that the following correlations between tense-aspect and epistemic modality show high predictability (Givón 1993: 171), which is a proof of interaction between the time axis and the hypothesis axis:

(a) Past ===> R-assertion (or presupposition)
(b) Perfect ===> R-assertion (or presupposition)
(c) Present ===> R-assertion
(d) Future ===> IRR-assertion
(e) Habitual ===> IRR-assertion

All this is congruent with a branching-path perspective at which we also arrive using a combination of temporal and possible-worlds logic (cf. van Benthem 1988: 32). The present is closed and comes from a single path of events that are already fixed in the past; but the future is open and there are parallel possible paths. Their number and "width," so to speak, is limited only by a certain perceived speed of change of things in reality. A good model for representing this would be a conceptual analog of Minkowski's light cones.

Minkowski's light-cones have been used as a convenient representation of what happens with the light travelling from distant objects in relativistic

physics. If we look at fig. 1, in which the horizontal axis represents distance and the vertical one time, and we imagine ourselves to be at the PRESENT point, the light that comes from objects inside the PAST cone can reach us at this point. The light of objects outside the cone will not reach us at this moment, but only later on in time, because the speed of light is fixed and there is too much distance for too little time. The same happens with our light, which will reach all objects inside the FUTURE cone but none outside it. We only have to substitute hypothetical distance for physical distance and perceived speed of changes in reality for speed of light, to use this representation for the tense-modality complex in natural language.[7] In this case, both PAST and FUTURE cones have limits that change according to the experienced speed of change in reality (we need to be careful about this convention: personal experience is highly subjective and it may be the case that speaker and hearer do not agree on it, which leads to not-completely-shared knowledge about possible paths of events).

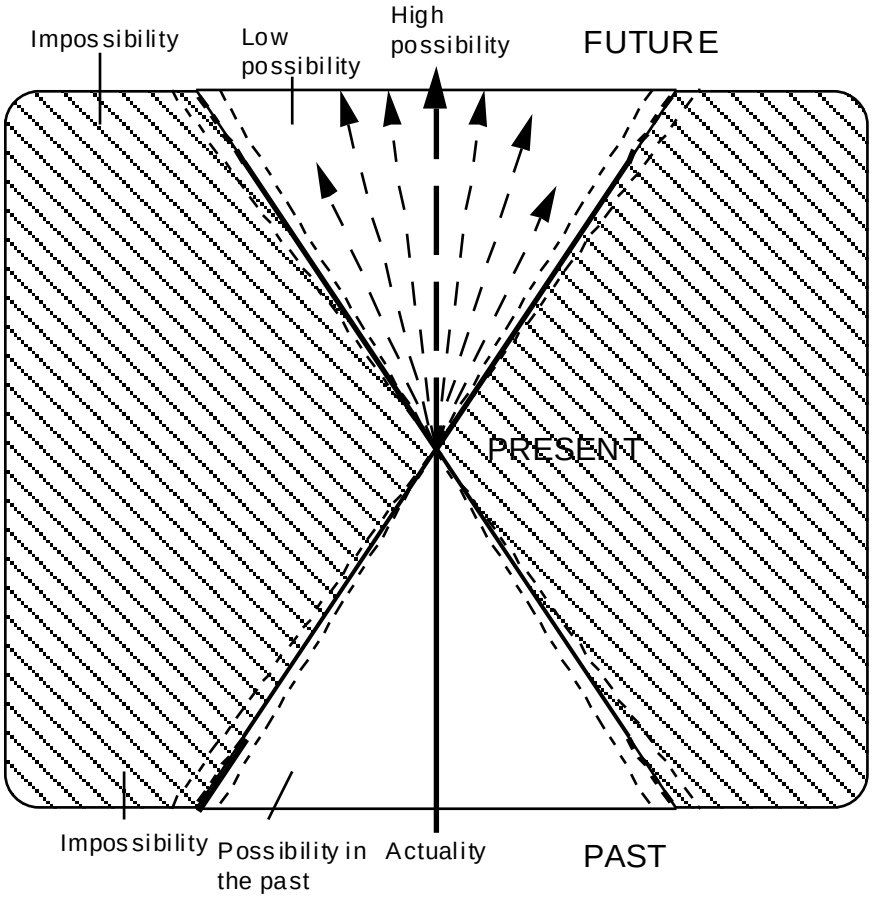


Fig. 1

The dynamics of this representation is similar to that of Langacker's *dynamic evolutionary model* (1991: 277), an idealized cognitive model with three main components: (1) the *structured world model* (the world is structured in a certain way, which motivates the possibility of some situations and events, but the impossibility of others), (2) the *elaborated epistemic model*

(in which reality evolves in a certain way, but only a limited portion of reality is known to the conceptualizer), and (3) some force-dynamic concepts necessary to account for the evolution of events. However, the PAST and FUTURE cones we use here seem to us a more realistic diagrammatical representation of the tense-modality complex than Langacker's cylinders[8] (1991: 242, 244, 277). They clearly show the fact that, for a given point in time, the farther one goes into the past/future, the larger the number of possible alternative preceding/following situations one can find.

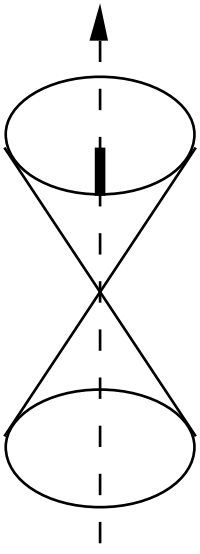
We can add to this representation a three-parameter general scheme similar to Reichenbach's three-parameter system for tense. In his analysis (Reichenbach 1947), verbal tenses can be classified according to the following temporal points: time of event (E), time of reference (R), and time of speech (S). If we follow an order relation (denoted by <; time overlap is denoted by =), we have the following combinations:

Present	(R = E = S)
Past	(R = E) < S
Future	(R = S) < E
Present Perfect	E < (R = S)
Past Perfect	E < R < S
Future Perfect	S < E < R

The three parameters can now be used not only as points in temporal space, but also as points in hypothetical space. Thus, the expression of hypothesis can be compactly explained together with time. If we look at fig. 1 again, we can see that in the PAST cone there is an actual path *(certainty)*, some other paths that could have been possible since they could have led to the PRESENT point *(possibility)*, and an area outside the cone in which no path could have led to that point *(impossibility)*. In the FUTURE cone the picture is pretty much the same, although, as we are now in the *irrealis* mode, there is no certainty path but only a highest possibility one. A convenient way of stating three parameters for modality would be to consider at least three degrees of "reality" (certainty, possibility, and impossibility or uncertainty). Again, we can set three parameters: *reality of event* (Er), *reality of reference* (Rr), and *reality of speech* (Sr). The *reality of event* stands for the degree of reality that the main event has; the *reality of reference* may be the certain condition or assumption that is used for assigning *realis* or *irrealis* status to the event; finally, the *reality of speech* has to do with the utterance itself.

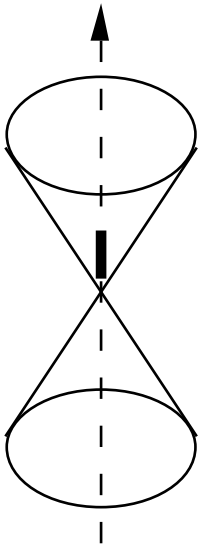
Some examples of how this representation is to be applied are the following:

1. Certainty (Unmarked schema: [$R_r = E_r = S_r$])
shall, shall not, will, will not, must, cannot, could not, would, would not



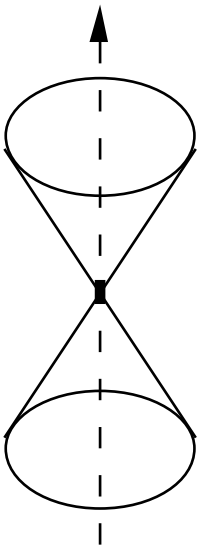
Future + Certainty
(Highest possibility):

[21] *I shall see you tomorrow.*



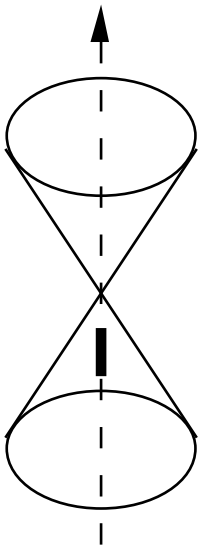
Near future + Certainty
(Highest possibility)

[22] *I'll see you in a minute.*



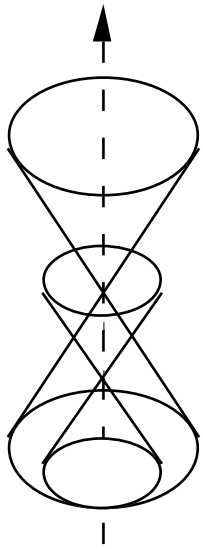
Present + Certainty
(Highest possibility):

[23] *That can't be John - he's in Dublin.*



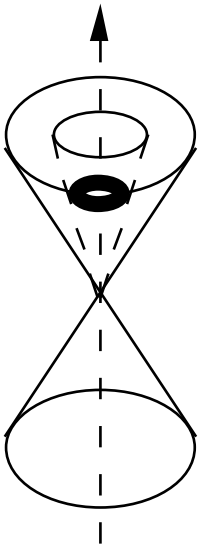
Past + Certainty:

[24] *I knew it couldn't be John.*



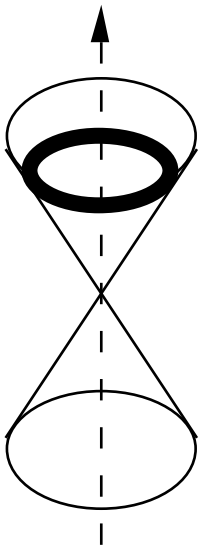
Future of the past + Certainty:
[25] *This child would one day rule all England.*

2. Probability (Unmarked schema: $[R_r = E_r < S_r]$)
should, should not, ought to, ought not to, may (not)



Proximal future + Probability (High possibility):
[26] He should be here soon.

3. Weak probability (Unmarked schema: [$E_r < R_r < S_r$])
might, might not, could



Future + Low probability:

[27] I might see you again next year - who knows.

4. Theoretical or habitual possibility
(Unmarked schema: [$R_r = E_r < S_r$])
can

[28] *Zaragoza can be very warm in September.*

This possibility can be well understood in terms of a *structured world model* (Goldsmith and Woisetschlaeger 1982; Langacker 1991: 264).[9]

5. Conditional certainty or possibility
(Unmarked schema: [$R_r < E_r = S_r$]; also [$R_r < (E_r < S_r)$])
would, would not, could, could not, might, might not

[29] *If I were a rich man I would buy a yacht.*
[30] *If John came we could all go home.*

Conditionals, whether clearly marked by a suitable subordinator or not, involve shifting the deictic center (cf. Langacker 1991: 266-269). In the three-parameter schema proposed here the reality of reference has a higher degree of uncertainty. If this condition were to become true, E_r and S_r should also become true (in a basic conditional; if we use modals like "may," "might," "can," or "could," we change their degrees of reality somewhat).

4. CONCLUSION

To conclude, we can say that epistemic modality in terms of a certain-probable-possible-impossible-uncertain scale can conveniently be considered to be the most basic kind of modality which subsumes others, and this is clearly seen from both a diachronic and a synchronic perspective. If we analyse modal auxiliaries as a characteristic word class for the expression of modality in English, it is clear that from a diachronic point of view there has been a process of grammaticalization in which their semantics has evolved from the concrete to the abstract. Heine's account (1993) is a good model which shows how constructions for the expression of concrete event schemas have gradually been desemanticized and eroded to end up as expressions for TAM notions in English, as well as in many other languages. From a synchronic point of view, epistemic modality is the basic reference kind of modality: it interacts directly with tense and can therefore be combined as complementary notions in any expression using modal auxiliaries. The schema proposed as a descriptive representation has a very strong resemblance to Minkowski's time-space cones used in relativistic physics and it is a simple and clear model which allows for more detailed analysis using lineal algebra methods. These methods could perhaps help in the future to compute relationships between tense and modality. We all know that language analysis is not as straightforward and direct as we would like it to be, but there is no doubt that this kind of study could reveal interesting potential phenomena for further study.a

NOTES

1. Dirven points out that "there is a long tradition in the descriptive grammar writing of English which concentrates solely or predominantly on the modal auxiliaries, excluding the other expressions of modality" (1989: 60). We acknowledge the fact that this is true; moreover, there are even expressions in which modals themselves use adverbials to grade their meaning. Consider, for instance, the following sequence of expressions for epistemic modality:

will certainly + V	100%
will almost certainly + V	
will probably + V	
may well + V	
may/will possibly + V	
might + V	
probably will not + V	
certainly will not + V	0%

Our consideration of only modal auxiliaries here does not imply that there are not other resources for the expression of modality.

2. It is customary in research on modals and modality to refer to the work carried out by authors like Palmer (1979, 1986), Twaddell (1963), and others. The interested reader may go to these sources for more information. Basically, Sweetser (1990) and Heine (1993) give a very up-to-date (although less extense) account of this topic, enriched with a more cognitively-oriented perspective.

3. TAM is a widely accepted acronym for "Time-Aspect-Modality."

4. Foley and Van Valin propose three levels: the *nucleus* (predicate and predicate operators - aspectual inflections and adverbials), the *core* (nucleus and verbal arguments, as well as some modal operators), and the *periphery* (adjuncts, tense, subjective markers, evidential modalities, and indicators of illocutionary force).

5. A core predication has the form $[[\pi_1 \text{pred (arg)}^n] (\sigma_1)^n]$ in FG, corresponding to a level-1 structure.

6. Basically, in a possible worlds semantics we have a model M=<W, R, V> in which W stands for a set of "possible worlds," R for a relation of "accessibility," and V for a valuation. It is not my intention to explain this kind of semantics in more detail, since it is a very well-known area in logical linguistics. For references, vid. Van Benthem (1988: 15).

7. Van Benthem (1988: 36) makes a connection with tense logic systems and also refers to a partial tense logic system developed by Goldblatt (1980), but the use of these cones for the study of modality in natural languages is unknown to me.

8. Langacker's representation is a tridimensional one. We follow a similar criterion: the horizontal dimension has a central point of maximal probability, and the values decrease the farther we move from this central point on two dimensions (this makes a total of three with the vertical axis). As is clear in the figure, the result is two cones.This representation is the same as the original by Minkowski for relativistic physics.

9. A structured world model assumes that the world is structured in a certain way and that some events are incidental whereas others are regular and predictable. When it is the case that we are referring to manifestations of the normal course of events, then we may do so by using strong probability or habituality.

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