A Study of Two Functions of Modal Auxiliary Verbs in English,

with Special Reference to Can, May and Must

Hui Wu

Foreign Language Department

Dongguan Nanbo Polytechnic

No.99, West Lake Road, South District

Dongguan 523083, China

Tel: 86-769-8842-2956   E-mail: wuhui289@yahoo.cn

Abstract

Many linguisticians in the English research field have detailedly illustrated all kinds of usage of English grammars and roles. However, in the modal auxiliary verbs of English, they have also stated their opinions, but deontic modality and epistemic modality have not been completely studied. Especially, how we transfer of deontic function to epistemic function, and the metaphorical extension in the process by the force dynamics between them is an extremely important aspect. The problem aroused my interest to study. In order to study further language continuous development, I begin from expounding the metaphorical extension of the epistemic function from deontic function, and then infer my own opinions as the conclusion of the thesis.

Keywords: Modal auxiliary verb, Deontic modality, Epistemic modality, Metaphorical extension

1. Introduction

Language is systematically grounded in human cognition, and cognitive linguistics seeks to show exactly how. The conceptual system that emerges from everyday human experiences has been proved in recent researches to be the basis of natural language in a wide range of areas.

Modal auxiliaries have two aspects of function: deontic and epistemic. The basic meanings of modal auxiliaries in English typically convey some indication of the speaker's perspective or attitude toward the situation or state of affairs being described.

Epistemic modality refers to the perspective that is personally determined in the situation, and deontic modality indicates what is socially determined. But, there is a close relationship between epistemic and deontic. I tell you about the transfer of deontic function to epistemic function, and the metaphorical extension in the process by the force dynamics between them.

In long teaching practice, I have known those modal auxiliary verbs before, are all the basic usage, but I can't touch their more deep gradation, and then further to study them. This time, the meaning and purpose of my study are to let more and more learners to observe two important functions in modal auxiliary verbs in English and master their usages and roles. At the same time, let them master the more deep gradation from deontic function to the extension of epistemic function and the metaphorical extension of force dynamics from deontic modality to illuminate them.

So in the thesis, first I definite two functions in modal auxiliary verbs, and then further expound their scales of deontic function and epistemic function of Can, May and Must respectively, finally expound the metaphorical extension of the epistemic function from deontic function, and then infer my own opinions as the conclusion of the thesis.

Of course, in the expounding process, I use the scientific theories as a criterion, in accordance with the facts.

2. Definitions of two functions in modal auxiliary verbs

In the many English grammar books, each of the researchers has completely illustrated their own opinions and viewpoints. From the book of Explaining English Grammar, George Yule tells us the modal auxiliary verbs in English have two aspects of function: deontic (called root) and epistemic modality. Deontic is objective, and epistemic is subjective. As the below:

① deontic: objective – general view or logical view

② epistemic: subjective – personal inference or judgment

Here are some examples, and they show objective and subjective between deontic and epistemic.

(1)　a. You must have one of these cakes.

　　b. You must be wrong.

① deontic: objective — You are forced to have one of these cakes in this situation.

② epistemic: subjective — I am compelled by some evidences to conclude that you are wrong or right.

The modal auxiliary verbs in English typically convey some indication of the speaker's perspective or attitude toward the situation or state of affairs being described. That perspective can be based on what is known or what is socially determined in the situation. So what is personally known is called epistemic modality, and what is socially determined is described as deontic (called root) modality.

What does the epistemic refer to? Epistemic uses often sound like deductions or conclusions made by the speaker. They can express the relationship in a simple assertion. However, they can also add some indication of their perspective on the likelihood of that relationship being the case. Here are some examples.

(2)　a. Tom is at home at 12 o'clock.

　　b. Tom must be at home at 12 o'clock.

　　c. Tom may be at home at 12 o'clock.

That assessment is based on the speaker's deductions, from what is known. Modal forms used with this function are interpreted in terms of epistemic necessity (2b) or epistemic possibility (2c). It is important for us to remember that it is the speaker's (or writer's) perspective that is being presented.

What does deontic indicate? Deontic function is not based on the speaker's knowledge of facts, but on the speaker's awareness of what is socially determined. Deontic modal are typically used socially and have to do withy obligation and permission. Creating an obligation or giving permission is acts that are based on social power of some kind. For example, in the situation, Tom goes to the library in the afternoon. Speakers can express the relationship as a simple observation. However, if the speaker has some socially-based power to control that relationship, then the speaker's perspective can be marked with the deontic function to indicate the use of that power to determine the relationship. Here are some examples.

(3)　a. Tom goes to the library in the afternoon.

　　b. Tom must go to the library in the afternoon.

　　c. Tom may be go to the library in the afternoon.

The modals indicate the speaker's perspective on whether the event simply occurs (3a), is required to occur (3b), or is permitted to occur (3c). The speaker's social power is often based on some established social relationship (e.g. parent — child or boss – worker). But, between deontic and epistemic, there is a clear parallel between the major distinctions made in English. For example, if I see someone buying a lot of beer at the store, I can come to the strong conclusion expressed in (4a) or the weaker conclusion in (4b).

(4)　a. He must drink a lot of beer. (=necessary)

　　b. He may drink a lot of beer.　(=possible)

These epistemic uses are knowledge-based and can be paraphrased as 'necessary that' (must) and 'possible that' (may).

If a parent wants a child to drink some milk, it can be expressed as a strong obligation as in (5). Alternatively, if the parent is responding to the child's request for something to drink, it can be expressed with the weaker obligation, as in (5b).

(5)　a. You must drink some milk. (=necessary)

　　b. You may drink some milk.　(=possible)

These deontic modality uses are socially-based, given the general social authority of parents in determining their child's behavior. In these examples, the modals can be paraphrased as 'necessary for' (must) and 'possible for' (may). These are their major distinctions.

It is very important for us to remember that epistemic modality is a kind of deductions, which comes from a speaker or a writer, and deontic is a kind of requirements from a speaker or a writer.

But, in Mood and Modality, Palmer also illustrates the deontic and epistemic modality. So it says, deontic modality is an objectivity, and epistemic modality is a subjectivity. English has a basic of weak and strong epistemic modality, so it seems also have a basic system of weak and strong deontic modality. As the below:

① deontic: objectivity — at least of directives, comes from the directive

② epistemic: subjectivity — show a performative, come from a subjective judgment

Here are some examples of the directive and performative.

(6)　a. John must come tomorrow.

　　b. He may be at home today.

In (6a), the notions of possibility and necessity are involved. When 'must' is used for laying an obligation, as expressing deontic necessity, the speaker imposes the possibility or necessity of coming tomorrow upon his hearer. It is a strong deontic modality. In (6b), there is an obvious form of giving permission, with epistemic modality.

Palmer says that subjectivity might be considered an essential feature of modality and that epistemic modality, at least, is always subjective.

Palmer further illustrated the relationship and distinguish ability between the epistemic and deontic modalities of the modal verbs 'may' and 'must'.

First, the relation between 'may' and 'must' can be clearly stated in terms of possibility and necessity. They express what is epistemically possible and what is epistemically 'necessary'. For example,

(7)　a. He may be there.

　　b. He may not be there.

　　c. He can't be there.

In (7b), it says, 'it is possible that he is not there', in (7c), it says, 'it is not possible that he is there'. Yet there is no similar set for 'must'. Instead, for a　positive judgment about a negative proposition. For example,

(8)　a. He must be there.

　　b. He can't be there.

　　c. He may not be there.

The same forms are used. This is easily explained in terms of logical relations between possibility and necessity since 'not possible' is equivalent to 'necessary not' and 'not necessary' to 'possible not'. But English uses only the 'can' and 'may' forms and this may be significant.

A second way of approaching the meaning of "may" and "must" is simply in terms of the kind of judgment being made, and in particular between speculation and deduction. This is clearly suggested in the comments of Coates: In its most normal usage epistemic 'must' convey the speaker's confidence in the truth of what hi is saying, based on a deduction from facts known to him (which may or may not be specified).

'May' and 'Might' are the modals of epistemic possibility, expressing the speaker's lack of confidence in the proposition expressed.

Now, next we'll again study by Sweetser, she analyzes the deontic and epistemic modality. Historically, the English modals developed from non-modal meanings to "deontic" modal meanings, and later still broadened to include the epistemic readings as well. Her proposal is that deontic-modal meanings are extended to the epistemic domain precisely because we generally use the language of the external world to apply to the internal mental world, which is metaphorically structured as parallel to that external world. As the below:

① Deontic : to be treated as lexical predicates involving force or obligation, and permission or ability as an objectivity

② Epistemic: to be treated as combinations of logical operators, and denotes necessity, probability, or possibility as a subjectivity

She thinks that deontic is viewed as referring specifically to permission giving or to social duty, and epistemic-modal senses is based on an objective understanding of logical certainty or possibility. Other researchers think epistemic modality binds the speaker to believe the proposition, while deontic modality binds the subject to do the action expressed in the proposition. Here are two examples:

(9)　a. You must come home today.

　　b. You must have been home last night.

In (9a), the speaker believes to do the action in the proposition, so it is a deontic modality, while in (9b), the speaker believes the proposition, so it is a epistemic modality. However, they all think that the ambiguity of modal expressions between deontic and epistemic senses has long been recognized. Linguists have characterized as deontic those meanings which denote real-world obligation, permission, or ability; and as epistemic those which denote necessity, probability, or possibility. For examples;

(10)　a. Joan must be at home by ten.　　(Mother won't let her stay out any later.)

b. Joan must be at home already.   (I see her coat.)

In (10a), it indicates a deontic modality. It comes from an objective condition. In (10b), it indicates an epistemic modality. It comes from a subjective condition.

Sweetser thinks we need an analysis of deontic and epistemic modality which will in some way make natural their clear, close, crosslinguistic semantic relationship.

In the sections that follow, I will use the distinction between epistemic and deontic modality to explore a consistent difference in the use of each modal. Individual modals have other distinct meanings and these too will be discussed and illustrated in context.

Having noted the basic meaning distinctions in the uses of modal verbs, we shall explain, in the following sections, the core meaning of each modal verb shows how that core meaning is interpreted in different circumstances. In helping us make sense of modals, it is important to encourage us to notice the context or circumstances in which those modal forms are used.

3. Deontic function of Can, May and Must

3.1 Can

After we have confirmed the two functions of modal auxiliary verbs, we should study the aspect of deontic function to analyze how the specific context influences the interpretation of each deontic modal verb.

In most grammar texts, they list three meanings for the modal verb 'can'. They are usually identified as 'ability', 'permission' and 'possibility'. Here are some examples.

(11)   a. Tom can ride a bike.

b. He can speak Japanese.

(12)   Son: Can I go swimming now?

Dad: No, you have lots of things to do.

(13)   Student: Mr. Li, can I choose another topic to write the composition?

Teacher: Yes, you can choose it freely.

(14)   You can do anything yon would like to do.

In (11), the individual potentiality enables someone to do it, and an agent has the potential to perform actions. There is typically an inference of ability, either natural or acquired. Most of the time, the agent is human and the action is physical.

In (12) and (13), the potential for an event to occur is controlled by the person having social authority. Requests for permission are addressed to, and granted by, the one with social power at that moment. These examples often occur between   teachers and students, bosses and workers, and parents and children, etc.

And in (14), it indicates the source of that potential is in the social power of one individual relative to another. It is important to remember that these uses in the sentences all have 'potential' in common, and the differences result from their different circumstances. Next, there is another permission, and it refers to little potential. For example.

(15)   a. Can I leave early today if we aren't too busy?

b. Well, you can, but there's lots of work to be done.

In such cases, it creates impression of less imposition and hence greater politeness, as in (15a). It also marks less likelihood of social permission being given, as in (15b).

Generally, the core concept which these uses have in common is about 'potential'. The differences result from the way in which that 'potential' is perceived in different circumstances. But it is not the personal potential for action that is being considered, but the potential for some social transaction.

3.2 May

In the modal auxiliary verbs, 'may' has two main uses. One of them is socially – oriented (deontic) and has to do with permission.

It comes from the deontic modality, which involves social authority having the power to create or prevent the possibility of an event, hence the 'asking permission' interpretation of the below and the 'giving permission' interpretation of the below. Here are some examples.

(16)   a. May I take one subject of these in a day?

b. Well, you may only register for two classes.

(17)   a. May I smoke here?

b. Yes. Customers may smoke in designated areas only.

In (16), (17), the socially – oriented (deontic) uses involve some social authority having the power to create or prevent the possibility of an event. These types of socially–oriented uses are becoming much less common in everyday spoken English and tend to be associated with formal or official usage. In casual versions of the sentences in (16), 'can' would be more frequent. Thus, in our daily life, the child tries to use 'Can I leave?' with its never permission meaning. The parent responds with an ability interpretation ' I' m sure you can' , and then insists on the older use of 'may' for permission (but you may not).

However, when the source of 'may' is human authority or social regulations, it   is a deontic modality. The modality is often used to be interpreted as 'permission'.

Palmer said the notions of possibility in 'may' may be interpreted as expressing deontic possibility. For example,

(18)   a. You may come tomorrow.

b. We may finish the work in two days.

The speaker imposes the possibility of 'coming tomorrow' or 'finishing the work in two days' upon his hearer. (In colloquial speech, 'can' is more common for permission, but 'may' still survives.)

But, Sweetser says that the majority of the deontic modals refer to various forces, which is reasonable, since we recognize many different varieties of force in the sociophysical world. For example:

(19)   John may go.

It indicates that John is not barred by (my or some other) authority from going. It is a deontic modality.

Generally speaking, the deontic of 'may' is based on human authority or social regulations to be decided in different circumstances. The core concept of 'may' has either permission or possibility, or relative remoteness. And the deontic of 'may' is viewed as referring specifically to permission giving or to social duty.

3.3 Must

The distinction between the epistemic and deontic uses of English modals is very clear in the case of 'must'. One of the core concepts is 'necessity', with socially-oriented (deontic) necessity being interpreted as an obligation. In socially – oriented uses, there is a range of imposition from strong obligation, which can be interpreted in terms of an order or even a legal requirement. Here are two examples,

(20)   a. You must complete the task in three days.

b. You must concentrate on one thing at a time.

Of course, in socially-oriented (deontic) uses, there is also a weak obligation which comes simply from the speaker's sense of the importance of some action. And then, the weak obligation sense of 'necessity' allows speakers to express self-imposed obligations with first person subjects, as in (21).

(21)   a. I must remember to feed the cat later.

b. I must try harder next time.

Conceptually, the imposition of an obligation tends to apply to present and future actions (rather than states). It also involves animate subjects (typically humans) who are capable of performing those actions. The obligation meaning of 'must' is often found in non-personal warnings and rules of the type. For example,

(22)   a. Door must be closed when machine is in operation.

b. Students must pay course fees before attending classes.

An interesting development in contemporary English is the use of 'must' in statements that indicate a desire to meet some social obligation, but which are actually interpreted as vague arrangements rather than fixed events. As illustrated in (23), these expressions seem to carry the meaning that the social obligation is recognized as necessary, but the actual occurrence of the event that will fulfill the obligation is not to be fixed. The social obligation is being met by expressing awareness of the social obligation.

(23)   a. You must come to see us one of these days

b. We must get together for lunch sometime.

English is not alone in having expressions of social obligation (without specific arrangements) and we can quickly recognize the use of these types of expressions once they are explained or clearly illustrated, even if there are very complicated conditions.

Palmer said 'must', when used for laying an obligation, as expressing deontic necessity. In saying 'You must come tomorrow', the speaker imposes the necessity of 'coming tomorrow' upon his hearer. He also said the status of conditional uses of the modals is more problematic, for they are not always clearly distinct from deontic modality, in the strictly subjective sense. But other researchers think deontic can comes to refer to logical compatibility between a person's or the world's state and some events, while deontic must refers to logical necessity of the occurrence of some events, given the state of the world.

4. Epistemic function of Can, May and Must

4.1 Can

Now we will analyze the usages of these modal verbs from epistemic functions .Most grammar texts list three 'meanings' for the modal verb 'can'. One of them is usually identified as 'possibility'. It is an epistemic function. Here are some examples,

(24)   a. It can sometimes get very cold here in winter.

b. A visit to the dentist can be frightening.

c. I am sure these problems can be solved.

These types of constructions express epistemic modality. They will tend to be used when there is a desire to convey the potential for an event taking place, even when the speaker is not sure of how or when the potential will be realized. The core concept in common is also about 'potential'. The differences result from the way in which that 'potential' is perceived in different circumstances.

Palmer says that it refers to there is a subjectivity. It was suggested earlier that subjectivity might be considered an essential feature of modality and that epistemic modality, at least, is always subjective. In saying ' He can't be there.' The possibility notion is also clearly illustrated in the negative relationships. It expresses 'it is possible that he is not there.' But, Sweetser says positive can is almost unusable in an epistemic sense. But its negative and interrogative forms are quite acceptable (cf. "Can that be true?"). Another example, 'You can't have lifted fifty pounds', and so on.

As though these researchers have many point-views to the epistemic functions of 'can', but they all illustrated the potential of 'can' has its possibility and subjectivity and play a role in different circumstances.

4.2 May

In the epistemic functions, the knowledge-oriented uses of 'may', indicates that an even is judged to have an equal possibility of occurring or not. This equivalence is sometimes stated and draws attention to the 'weak possibility' interpretation associated with epistemic 'may'. Here are some examples,

(25)   a. Careful, that gun may be loaded . (it is possible that it is loaded.)

b. Our flight may be delayed.

c. They may come later or they may not.

d. We may be old- fashioned, but we believe in good manners.

There is also a third interpretation of 'may' which happens when the speaker wishes to acknowledge the possibility of some event or state of affairs being the case, but not necessarily relevant for the current discussion. This type of 'possibility' is interpreted as a concession, and is often followed by a 'but' clause. It can usually be paraphrased by a clause beginning with 'although'. Here are some examples.

(26)   a. You may have good reasons, but that doesn't make it legal.

b. He may be old, but he's still fit. (Although he's old, he's still fit.)

c. Although I may be old, I'm not crazy.

As before illustrated, the epistemic is based on the speaker's deductions from what is known. Modal forms used with this function are interpreted in terms of epistemic possibility. For example,

(27)   a. Mike may go to the shop in the morning.

b. He may drink a lot of beer.

These epistemic uses are knowledge-based and can be paraphrased as 'possible that' (may).But other researchers think the analysis of the epistemic-modal senses is based on an objective understanding of logical certainty or possibility. This epistemic analysis takes the premises in the speaker's mind. For example.

(28)   John may be there.

"I am not barred by my premises from the conclusion that he is there."

On the other hand, the epistemic function of 'may' has some differences on relative remoteness from the point of utterance. The remoteness of possibility interpretation of 'may' results in a sense of 'uncertainty' about the likelihood of an event taking place.

4.3 Must

Next we study the epistemic function of 'must'. In the modal verbs in English, the distinction between the epistemic and deontic uses of English modals is very clear in the case of 'must'. One of the core concepts in both meanings is 'necessary', with knowledge-oriented necessity being interpreted as a conclusion. Generally, in its knowledge-oriented uses, 'must' indicates that some conclusion is necessary, given the speaker's assessment of what is known. That conclusion has the status of an inference and signals an assumption that no other explanation is available. Conceptually, that conclusion tends to be about past and present states, as well as actions. It can refer to non-animate subjects and can involve events viewed retrospectively (with perfect aspect) or internally (with progressive aspect). Here are some examples.

(29)   a. Look at that house!   Those people must have a lot of money.

       b. It must be hot in there with no air-conditioning.

       c. Oh no, a traffic jam. There must have been an accident.

       d. The computer is on, so someone must be using it.

Palmer thinks that in many languages it is possible to make at least two kinds of epistemic judgment, a 'weak' one and a 'strong' one. A typical example is English with one of its modal verbs 'must', and this will be considered first. The relation can be clearly stated in terms of possibility and necessity. They express what is epistemically 'possible' and what is epistemically 'necessary', although the word 'necessary' itself is not used in an epistemic sense in ordinary language. As in (29), the meaning of 'must' is simply a kind of judgment being made, and in particular between speculation and deduction. This is clearly suggested in the comments of Coates: "In its most normal usage, epistemic 'must' conveys the speaker's confidence in the truth of what he is saying, based on a deduction from facts known to him (which may or may not be specified)".

Other researchers think that the analysis of the epistemic-modal senses is based on an objective understanding of logical certainty or possibility. That epistemic uses of the modals result from our understanding the logical necessity of a proposition in terms of the forces which give rise to the sociophysical necessity of the corresponding event in the real world. Here is an example.

(30)   You must be Mary's sister.

The speaker did not really mean that somehow the proposition must be true because some real-world causes have brought about the relevant state of affairs, but rather that he was obliged to 'conclude' that it was true because the available informational premises caused him to reason thus.

5. Epistemic function extended from deontic function

The English modals developed from non-modal meanings to 'deontic' modal meanings, and later still broadened to include the epistemic readings as well. Shepherd's work gives some evidences that creoles first develop their expression of deontic modality before going on to extend that expression fully to the epistemic domain. And studies of child language have revealed that children acquire the deontic senses of modal verbs earlier than the epistemic ones.

Past historical changes in this domain, then, were shaped by a general semantic linkage which probably has inherent psycholinguistic motivation. Sweetser's proposal is that deontic-modal meanings are extended to the epistemic domain precisely because we generally use the language of the external world to apply to the internal mental world, which is metaphorically structured as parallel to that external world.

The present study will thus argue that modal verbs do not have two separate unrelated senses, but rather show an extension of the basic deontic-sense to the epistemic domain – an extension which is strongly motivated by the surrounding linguistic system. Many recent linguistic works seem to treat English modal verbs as essentially cases of homonymy rather than ambiguity, tacitly assuming that (whatever the historical development may have been) epistemic and deontic modality are synchronically unrelated. Deontic-modal meanings are often treated as lexical predicates involving force or obligation, while epistemic readings are treated as combinations of logical operators.

Talmy has suggested that the semantics of deontic modality is best understood in terms of forces dynamics, that is in terms of our linguistic treatment of forces and barriers in general.

Let us now explore the results of transferring this view to the epistemic domain. Thus deontic 'can' comes to refer to logical compatibility between a person's (or the world's) state and some events, while deontic 'must' refers to logical necessity of the occurrence of some events, given the state of the world. A slightly more promising line of explanation is that suggested in passing by Lyons: namely that epistemic uses of the modals result from our understanding the logical

necessity of a proposition in terms of the forces which give rise to the sociophysical necessity of the corresponding event in the real world. But this too falls down when closely examined: in uttering the example (31), the speaker did not really mean that somehow the proposition must be true because some real-world causes have brought about the relevant state of affairs, but rather that he was obliged to 'conclude' that it was true because the available informational premises caused him to reason thus.

(31)   (Look at the girl)   "You must be Mr. John's girlfriend."

Thus (31) does not express the speaker's compulsion to state that the addressee has a certain identity, but his compulsion to 'conclude' that this is the case. Phrases like "I must say" or "I must tell you." seemingly have modals applied to the act of speaking, but, in fact, have a completely different meaning from epistemic modals.

Finally, Antinucci and Parisi have suggested that 'must' has two readings analyzable . For examples.

(32)   You must come home. (deontic)

CAUSE X / Speaker (BIND (YOU COME HOME))

(33)   You must have been home last night. (epistemic)

CAUSE (X) (BIND (BELIEVE (SPEAKER) (YOU BE HOME)))

This analysis proposes that epistemic modality binds the speaker to believe the proposition, while deontic modality binds the subject to do the action expressed in the proposition. Sweetser trusts that the rudimentary analysis of deontic modality has given some idea of the elements of her proposed general analysis of modality.

The deontic modality can be applied to the epistemic world. If deontic modality is viewed as referring specifically to permission giving or to social duty, for example, there would appear to be little chance of extending such an analysis to epistemic modality. But we need to find a motivated semantic connection between the epistemic domain of reasoning and judgment and the domain of external sociophysical modality. That evidence gives us a motivating background against which to set a more specific metaphorical mapping between epistemic and deontic modality. Given that the epistemic world is understood in terms of the sociophysical world, we can see why general sociophysical potentiality, and specifically social permission, should be the sociophysical modality chosen as analogous to possibility in the world of reasoning.

'May' is an absent potential Barrier in the sociophysical world, and the epistemic, 'may' is the force-dynamically parallel case in the world of reasoning. The meaning of epistemic 'may' would thus be that there is no barrier to the speaker's process of reasoning from the available premises to the conclusion expressed in the sentence qualified by 'may'. I think that an epistemic modality is metaphorically viewed as that real-world modality which is its closest parallel in force-dynamic structure.

Sweetser also designed a diagram that might schematically represent the image-schematic structure of 'may'. But it is representing a potential barrier which is not actually in place. From the structure of the schema, this assumes that a basic causal event-structure is mapped from our understanding of social and physical causality onto our understanding of our reasoning processes. Once such a mapping is assumed to exist, it is clearly natural to map the meaning of 'may' onto epistemic possibility, and not (for example) onto epistemic certainty, because there is some very general topological structure shared by the two senses of 'may'.

Of course, we must know forces and barriers as premise in the mental world, since no other kinds of obstruction/force exist in that world. The majority of the deontic modals refer to various forces, which is reasonable, since we recognize many different varieties of force in the sociophysical world. Next I shall contrast the use of a modal in its real- world sense (a) with its corresponding usage in the epistemic domain (b).

May

(34a)   John may go.

"John is not barred by (my or some other) authority from going."

(34b)   John may be there.

"I am not barred by my premises from the conclusion that he is there."

Must

(35a)   You must come home by ten. (Mom said so.)

"The direct force (of Mom's authority) compels you to come home by ten."

(35b)   You must have been home last night.

"The available (direct) evidence compels me to the conclusion that you were home."

This epistemic analysis of (35b) takes the premises in the speaker's mind as parallel to the force of authority in (35a). Note that the usual 'reluctance' which is assumed to exist in the compelled person in (35a) has no counterpart in (35b). Such a contrast is a natural consequence of the differences between the sociophysical world and the epistemic world. In the real world, we don't usually use force unless we need to overcome reluctance on the part of the person we are forcing. But we do not view our mental processes as being affected by such reluctance, or by anything other than the available premises. Furthermore, in the real world, force is usually resented by the victim because freedom is valued. But in the world of reasoning, we wish to have our conclusions forced or restricted by premises (not by external sociophysical forces like threats) because this gives us more certainties within our belief system, and knowledge is valued. Here are two examples.

Can

(36a) I can lift fifty pounds.

"Some potentiality enables me to lift 50 lbs.

(36b) You can't have lift fifty pounds.

"Some set of premises dis-enables me from concluding that you lifted 50lbs.

Positive 'can' is almost unusable in an epistemic sense. But its negative and interrogative forms are quite acceptable (cf. "Can that be true?") and have the reading of questioned or negated epistemic enablement on the part of the speaker.

Furthermore, Sweetser thinks that modal semantics is from a pragmatic interpretation. Pragmatic factors will influence a hearer's interpretation of a particular uttered modal as operating in one domain or the other. Although between deontic and epistemic contrast might profitably be viewed as polysemy, the difference between the imposing and describing uses of modals should be rather considered as a pragmatic generalization. If a modal verb simply expresses the application of some particular modality towards the event or action described in a sentence, pragmatic factors will determine what appropriate entity is understood as imposing the modality, and upon what entity it is imposed. For examples. In saying "You must be home by ten," a parent could impose an obligation on a child, or an older sibling could report the obligation imposed by the parent. In saying "John can have three cookies," I could be granting permission or listing the maximum allowance given to him by his new diet.

For epistemic modality, the story is simpler than for deontic modality. In the epistemic world, only premises count as forces or barriers. The only kind of event is a logical conclusion (or the verification of a theory); and it even has to be the speaker's own conclusion, because the force-dynamic structure of other people's reasoning processes is not readily accessible to us. Sometimes there seems to be a feeling that our reasoning process is a rather general one, which our interlocutor may share – but the speaker's own reasoning process is always the primary subject of epistemic modality.

Pragmatic factors explain why modals can be used either to impose or to describe real-world modality, while only description of epistemic modalities is possible. Sociophysical modalities can be imposed by speakers-epistemic obligations and forces cannot be imposed by anything but premises. Thus a performative use of sociophysical modality (doing by describing) is natural, while it is impossible for the epistemic modalities. Epistemic-modal sentences thus lack the multiple ambiguities inherent in the pragmatic interpretation of real-world modality: there is no possible doubt as to the nature of the mental modality's imposer and imposee.

Sweetser has elsewhere given reasons why she thinks the deontic /epistemic contrast is not best treated as two purely pragmatically conditioned interpretations of a single semantics, but rather as a motivated polysemy relationship. One reason is that the metaphorical mapping involved appears to be a linguistic convention: it is a fact about the semantics of English that these specific lexical items bear both these related senses. It is likewise true that such a polysemy is crosslinguistically common. But it is not the case (as we might expect if the modals were simply monosemous) that all deontic modals must/can have epistemic uses – this is neither historically true for the English modals nor a crosslinguistic universal. Of course, the application of real world modalities to the epistemic domain is not just modality, but causality in general, has extended uses in the epistemic and speech-act domains.

6. Conclusion

As above we have already analyzed the modal auxiliary verbs in English that have two aspects of function: deontic(called root) and epistemic modality. Deontic is objective, and epistemic is subjective. But the ambiguity of modal expressions between deontic and epistemic senses has long been recognized. Linguists have characterized as deontic those meanings which denote real-world obligation, or possibility.

The analysis of linguistic modality as being generalized or extended from the real-world domain to the domains of reasoning. The advantage of such an approach is that allows us to unify our account of the contrast between deontic and epistemic senses of the modal verbs. Sweetser emphasized that her proposed analysis is also coherent with the historical and developmental linguistic evidence, which suggests that an extension from the sociophysical domain to the epistemic domain would be normal, while an extension in the opposite direction would be unnatural.

Talmy's approach to deontic modality and causality in terms of forces and barriers has also given us a way to look at deontic-modal senses which can be extended to the epistemic. Attempts to find single superordinate analyses which include both deontic and epistemic modal meanings have proven unsuccessful. But the problem is removed by taking into account our understanding of mental processes as involving forces and barriers analogous to those involved in "real-world" physical and social interactions. Without taking into account this background metaphor, trying to unity deontic- and epistemic-modal meaning is like trying to find the common semantic features of "optimism" and "pink sunglasses" without basing our analysis on the knowledge that physical sight is a primary metaphor for world-view in the mental domain. But given the priority of the real world, and the structuring of the epistemic in terms of that prior world, it then follows naturally that the deontic understanding of modality will be readily extended to apply in all the worlds.

Among current semantic theories, Fauconnier's concept of "mental spaces" is particularly useful for an understanding of these multi-domain ambiguities. Fauconnier would say that the three domains I have discussed (content, epistemic, and speech act) are three mental spaces, and that certainty is the counterpart in the epistemic domain of compulsion in the real-world domain, while epistemic possibility is the counterpart of deontic possibility or permission.

But Sweetser thinks the basic semantic analyses of the modals which she has proposed is a very simple one. It would not extend so easily into the epistemic domain if it explicitly mentioned a complex set of possible identities for real-world imposers and targets of modalities. Rather, it leaves these identities to pragmatic interpretation. She considers this to be a further advantage of her analysis, since the semantics of the modals appears to be indeterminate in this area.

As was mentioned above, however, researchers or specialists or linguists, they have a common viewpoint, which in the two functions of the modal auxiliary verbs , that the deontic understanding of modality will be readily extended to apply to a real-world, that is the epistemic modality as an extension of deontic modality. I think in understanding the aspect of the function, it is one of the most important aspects of the modal verbs. I believe, in the usages of the function in the future, we will further expand the domain and more study the mass of metaphorically structured polysemy data; attempt to grasp the general idea of connections between deontic and epistemic modality.

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