Deontic Modality, Lexical Aspect and the Semantics of Imperatives[*]

Chung-hye Han

University of Pennsylvania

1. Introduction

The purpose of this paper is to show that imperative sentences have the modal force of deontic modal sentences and to explore the contribution of lexical aspect to the interpretation of imperatives. IMPERATIVE SENTENCES are sentences whose main verbs are in the form of imperative mood. In many languages, main verbs in imperative sentences are inflected with a special imperative mood morphology. In English, imperative sentences have bare verb stem. I take DEONTIC MODAL SENTENCES to be sentences with deontic modal verbs in the form of indicative mood, such as *must, can, may, should*, and *ought to*. DEONTIC MODALITY indicates whether the proposition expressed by the sentence is obligatory or permissible according to some normative background such as law, morality, convention, etc. In essence, I argue that imperative sentences contribute deontic modal force just like deontic modal sentences do, but some of the differences attested between imperatives and deontic modal sentences are due to the difference in the source of deontic modality in the two types of sentences: the source of deontic modality in imperatives is the imperative mood, whereas the source of deontic modality in deontic modal sentences is the deontic modal verbs in the indicative mood.

In section 2, I discuss the fact that imperatives can express various illocutionary forces, and what this implies for the correct semantic characterization of imperatives. In section 3, I propose that imperative sentences and deontic modal sentences are alike in that they both have the modal force of deontic modality, but that they are different in that *the existence of an obligation or a permission* is part of the assertion for deontic modal sentences, whereas *the existence of an obligation or a permission issued by the speaker* is an essential part of the meaning that cannot be contradicted or canceled for imperatives. I show that various semantic similarities and differences between imperatives and deontic modal sentences can be explained under this proposal. In section 4, I present a semantics for deontic modality using the framework of possible worlds semantics proposed by Kratzer (1991). In section 5, I extend the system and propose a semantics for imperatives. In

section 6, I compare the semantics of deontic modal sentences and imperatives given here with the semantics of conditionals given in Kratzer (1986) and Kratzer (1991). In section 7, I show how the proposed semantics accounts for the effect of the lexical aspect on the interpretation of imperatives.

2. Illocutionary Forces of Imperatives

Imperatives can express various illocutionary forces, such as advice, suggestion, permission, threats, dares, warnings and wishes as well as orders and commands. Below, I provide examples of imperatives with various illocutionary forces.

(1) order, command
   a. Stand at ease! (a commander in the army to his soldiers)
   b. Take down this poem. (a teacher to her class)
   c. Clean that mess up at once! (a mother to her child)
(2) suggestion, advice
   a. A: Excuse me, I want to get to the station.
      B: Take a number 3 bus.
   b. Get some rest. (to a friend who looks tired)
(3) permission
   a. Come in. (as a reply to a knocker on the door)
   b. A: Can I open the window? B: Sure. Open it.
(4) threat, dare
   a. Go on. Throw the rock. I dare you.
   b. Hit me and you'll be sorry.
(5). Wish
   a. Get well soon.
   b. Please don't rain.
   c. A is calling B, and mutters to himself, 'Answer the phone.'
(6) instruction
   Beat two eggs. Put salt and sugar into the beaten eggs. Mix them well.
   (Cooking instructions)
(7) warning
   a. Do not annoy him, or you'll be sorry.
   b. Be quiet. I am warning you.

Except for wishes, all the illocutionary forces exemplified above are directives. The question that must be addressed is how imperatives come to express various directive illocutionary forces as well as wishes. One approach, which is unsatisfactory, is to argue that imperative mood is many-ways ambiguous and so imperative sentences can express various illocutionary

forces. Another approach is to argue that imperative mood has a restricted meaning and the implicatures arising from the discourse context and pragmatic principles are responsible for the various illocutionary forces.

Then the question that remains is how we can characterize the contribution of the imperative mood to the meaning of the sentence. Huntley (1982), Huntley (1984) and Davies (1986) argue that it merely presents a proposition as a possibility. Wilson and Sperber (1988) argue that it presents a proposition as a possible and a desirable state of affairs. However, it is not clear how a proposition merely presented as a possibility (or even a desirable possibility) can come to have a directive illocutionary force.

I propose that a stronger notion is needed in characterizing the meaning contributed by the imperative mood: namely, imperative mood has the semantics of deontic modality. That is, imperative mood contributes as an essential part of its meaning that an obligation or a permission is issued by the speaker. An imperative sentence has the directive illocutionary force when it is implied by the context that the addressee has the obligation or the permission to bring about the state of affairs described by the sentence. This captures the intuition that the speaker imposes an obligation or a permission on the addressee to bring about the state of affairs denoted by the core proposition of an imperative and helps us to define formally the semantics of imperatives. In the next section, I present some similarities and differences between imperatives and deontic modal sentences. I argue that the differences are due to the different ways in which deontic modal force is contributed by the imperative mood and the deontic modal verbs in the indicative mood.

3. Imperatives vs. Deontic Modal Sentences

3.1. Imperative Mood vs. Deontic Modal Verbs in the Indicative Mood

I propose that imperative mood contributes as essential part of its meaning that (i) there is an obligation or a permission and that (ii) the speaker issues the obligation or the permission. These cannot be contradicted nor qualified. On the other hand, deontic modal verbs in the indicative mood contribute as assertion that there is an obligation or a permission in the current world. This assertion can be contradicted and qualified. The different ways in which the meaning of imperative mood and deontic modal verbs is contributed are established in section 3.3. But first, I discuss the similarities between imperatives and deontic modal sentences.

3.2. Similarities

Imperatives and deontic modal sentences are similar in that the lexical aspect of the predicate plays an important role in the interpretation.

3.2.1. Lexical aspect and dynamic interpretation

Imperatives with activity predicates or stage-level stative predicates are perfectly well-formed. These predicates refer to a state of affairs that can be brought about by an individual. But those with individual-level stative predicates sound anomalous. These predicates refer to inherent properties of an individual which cannot be changed (in a normal situation).

(8) Activity Predicate, Stage-level Stative
    a. Open the window. (Activity Predicate)
    b. Be quiet! (Stage-level Stative)
(9) Individual-level Stative
    a. *Know the answer.
    b. *Be intelligent.
    c. *Be tall.

To the extent that the examples in (9a) and (9b) are interpretable, (9a) has the dynamic reading paraphrasable as *Get to know the answer* and (9b) has the dynamic reading paraphrasable as *Behave intelligently*.

I point out that imperatives can take an individual-level stative predicate under the non-dynamic reading if they are expressing the speaker's desire (*wish*-reading). For example, assume a situation in which Mary is about to go on a blind date. And assume that she says to herself the following imperative.

(10) Please, be tall.

In this context, with the imperative, Mary is not ordering, advising, permitting, or suggesting her date to be tall. That is, her date does not have the obligation or the permission to be tall. Rather, she is expressing her wish or hope that the state of the world is such that her date is tall.

The well-formedness of deontic modal sentences depends on the lexical aspect of the predicate in the same way. Deontic modal sentences with stage-level stative predicates and activity predicates are well-formed, whereas those with individual-level stative predicates are anomalous.

(11) Activity Predicate, Stage-level Stative
    a. You must open the window. (Activity Predicate)
    b. You must be quiet. (Stage-level Stative)
(12) Individual-level Stative
    a. *You must know the answer.
    b. *You must be intelligent.
    c. *You may know the answer.
    d. *You may be intelligent.
    e. *You can be tall.

But when a deontic modal sentence expresses the speaker's desire, it can take an individual-level stative predicate. For instance, (13) can mean that the speaker hopes that his or her blind date is tall.

(13) My blind date must be tall.

In (13), the speaker's date does not have the obligation to be tall. Rather, it can express the speaker's belief that the blind date being a tall person is a necessary condition on the state of the world.[1]

3.2.2. Lexical aspect and future orientation

Imperatives with activity predicates or stage-level stative predicates have future orientation. This can be shown by the fact that such imperatives are compatible with future oriented adverbials, but not with past oriented adverbials.

(14) Activity Predicate
    a. Finish your homework tonight.
    b. Finish your homework now.
    c. *Finish your homework yesterday.
(15) Stage-level Stative
    a. Behave yourself when the guests arrive tonight.
    b. Behave yourself now.
    c. *Behave yourself when the guests were here yesterday.

These imperatives can occur with the adverbial *now* since the temporal point referred by *now* is compatible with the immediate future.

Imperatives with individual-level stative predicates do not have future orientation, under the *wish*-reading. This can be shown by the fact that such imperatives are not compatible with future oriented adverbials.

(16) Individual-level Stative
    a. *Be tall tomorrow.
    b. *Be intelligent when the guests arrive tonight.

Just like imperatives, deontic modal sentences with activity predicates or stage-level stative predicates have future orientation. They are compatible with future oriented adverbials, but not with past oriented adverbials.

(17) Activity Predicate
    a. You must finish your homework tonight.
    b. You must finish your homework now.
    c. *You must have finished your homework yesterday.

(18) Stage-level Stative
    a. You must behave yourself when the guests arrive tonight.
    b. You must behave yourself now.
    c. *You must have behaved yourself when the guests were here yesterday.

Moreover, just like imperatives, deontic modal sentences with individual-level stative predicates do not have future orientation, under the *wish*-reading.

(19) Individual-level Stative
    a. *My blind date must be tall when I meet him tomorrow.
    b. *John must be intelligent when the guests arrive tonight.

3.3. Differences

3.3.1. Issuer of obligation or permission

In imperatives, the issuer of an obligation or a permission is the speaker. It is infelicitous to reply to an imperative with a question as to who issued the obligation or permission.

(20) a. A: Go home.
    b. #B: Who says so?

Moreover, while it is felicitous to follow an imperative with an expression that implies that the speaker issued the obligation or the permission, it is infelicitous to follow an imperative with an expression that implies that someone other than the speaker issued the obligation or the permission.[2]

(21) a. Open the window. I insist on it.
　　 b. #Open the window. Everyone but me insists on it.

In deontic modal sentences, the issuer of an obligation or a permission is not necessarily the speaker. It may be issued by some other person, institution, law, moral code, and so forth. Hence, a question as to who or what is the issuer of the obligation, or permission can follow a deontic modal sentence.

(22) a. A: You must go home.
　　 b. B: Who says so?

It is felicitous to follow a deontic modal sentence with an expression that implies that the speaker is the issuer of the obligation or the permission as well as an expression that implies that the speaker is not the issuer of the obligation or the permission.

(23) a. You must open the window. I insist on it.
　　 b. You must open the window. Everyone but me insists on it.

The facts presented in this section follow from the proposal that imperative mood contributes that the speaker issues an obligation or a permission as an essential part of its meaning, whereas deontic modal verbs make no such contribution as an essential part of its meaning.

3.3.2. Negation and deontic modal force

The deontic modal force cannot be negated in imperatives. In a negative imperative, negation does not have scope over the deontic modal force contributed by the imperative mood. The deontic modal force of the imperative mood always has scope over the negation.

(24) Don't go.
　　 ≡ It is necessary that you not go.
　　 ≠ It is not necessary for you to go.
(25) Nobody move.
　　 ≡ It is necessary for everybody not to move.
　　 ≠ It is not necessary for everybody to move.

Moreover, if the addressee replies 'no' to an imperative, s/he is refusing to do what s/he is being commanded or requested to do, as in (26b). S/he cannot be contradicting the modal force itself, as shown in (26c) to (26e).

(26) a. A: Go home.
    b. B: No, I will not.
    c. #B: No, I don't have to. Nevertheless, I will go home.
    d. #B: No, not necessarily.
    e. #B: No, that is not true. I can stay.

 On the other hand, the deontic modal force can be negated in deontic modal sentences. In negative deontic modal sentences, the negation can have scope over the deontic modal force.

(27) Nobody must leave.
    ≡ It is necessary for everybody to not leave. Everybody should stay.
    ≠ It is not necessary for everybody to leave. Some people can stay.

If the addressee replies 'no' to a deontic modal sentence, s/he is not necessarily refusing to do what s/he is being commanded or requested to do, as in (28b). By saying 'no', s/he may be contradicting the modal force, as shown in (28c) to (28e).

(28) a. A: You must go home.
    b. B: No, I will not.
    c. B: No, I don't have to. Nevertheless, I will go home.
    d. B: No, not necessarily.
    e. B: That is not true. I can stay.

If imperative mood contributes as an essential part of its meaning that there is an obligation or a permission, then it follows that the deontic modal force contributed by the imperative mood cannot be negated. And if deontic modal verbs contribute as an assertion that there is an obligation or a permission, then it follows that the deontic modal force contributed by the deontic modal verb can be negated.

3.3.3. Adverbs and deontic modal force

Imperatives cannot take a sentential adverbial that qualifies the deontic modal force.

(29) #Perhaps, take the exam.

However, deontic modal sentences can take a sentential adverbial that qualifies the deontic modal force.

(30) Perhaps, you must take the exam.

If imperative mood contributes an obligation or a permission as an essential part of its meaning, then it is not surprising that the modal force cannot be qualified in imperatives. Furthermore, if deontic modal verbs contribute an obligation or a permission as an assertion, then it is not surprising that the modal force can be qualified in deontic modal sentences.

3.3.4. Speaker's belief in the realization of the situation described by the core proposition

Speakers believe that the state of affairs described by the core proposition of an imperative is realizable. It is infelicitous to follow an imperative with a sentence that expresses the speaker's belief that the situation described by the core proposition of the imperative will not be realized.

(31) #Eat this fish! But you won't.

On the other hand, speakers do not necessarily believe that the state of affairs described by the core proposition of a deontic modal sentence is realizable (Roberts 1989).

(32) You must eat this fish. But you won't.

It is felicitous to follow a deontic modal sentence with a sentence that expresses the speaker's belief that the situation described by the core proposition of the deontic modal sentence will not be realized.

3.3.5. Assignment of truth values

Imperatives cannot be either true or false. But deontic modal sentences have truth values.

(33) a. Finish the paper by tomorrow.
     b. You must finish the paper by tomorrow.

For instance, (33a) cannot have a truth value under any circumstances. But (33b) is either true or false, depending on the state of the world.

Imperatives do not assert anything about the current world. Thus, they cannot have a truth value. However, deontic modal sentences assert that there is an obligation or a permission in the current world. This means that they are

true if there is indeed such an obligation or a permission and false if there is no such obligation or permission. More on this issue is presented in section 6.

4. Semantics of Deontic Modality

4.1. Framework: Possible Worlds Semantics, Kratzer (1991)

Deontic modality is associated with a function f that takes a world $w \in W$ as an argument and returns a set of propositions which constitute a conversational background.[3] The conversational background could be a subset of what the speaker knows in w or what the speaker assumes to be true in w. Kratzer (1991) calls this set MODAL BASE.[4] A proposition p is identified with the set of possible worlds in which it is true. That is, p is true in a world $w \in W$ iff $w \in p$, and p is false in w iff $w \notin p$. The function f assigns to each $w \in W$ a subset of the power set of W. Intersecting the members in $f(w)$ returns a set of worlds that are accessible from w.

> (34) For all w, $w' \in W$, w' is accessible from w with respect to f iff $w' \in \cap f(w)$. $\cap f(w)$ denotes the intersection of the set members in $f(w)$.

In addition to the notion of modal base, Kratzer (1991) introduces the notion of ORDERING SOURCE. Deontic modality is associated with another function g which takes w and returns a set of propositions that constitute what the law provides in w, what is moral in w, what is normal in w, etc. The set of propositions in $g(w)$ is the ordering source which induces an ordering on the set of worlds in $\cap f(w)$. World u is at least as close to the ideal represented by $g(w)$ as world v iff all propositions of $g(w)$ which are true in v are true in u as well ($u \leq_{g(w)} v$).

> (35) $u, v, w \in W$, and for any set of propositions $g(w)$,
> $u \leq_{g(w)} v$ iff $\{p: p \in g(w) \text{ and } v \in p\} \subseteq \{p: p \in g(w) \text{ and } u \in p\}$

Let us think of $\leq_{g(w)}$ as a function that takes $\cap f(w)$, orders the worlds in $\cap f(w)$ with respect to $g(w)$ and returns a set of worlds that comes closest to the ideal established by the ordering source $g(w)$. The worlds in $\cap f(w)$ may not include the most ideal world in which all the propositions in $g(w)$ are satisfied. Moreover, the worlds in $\cap f(w)$ may not include any worlds in which any of the propositions in $g(w)$ is satisfied. In this case, $\leq_{g(w)}$ would simply

return $\cap f(w)$. The worlds in $\leq_{g(w)}(\cap f(w))$ constitute the domain of quantification.[5]

4.2. Semantics of *must(p)* and *may(p)*

Following the definitions from modal logic, *must(p)* and *may(p)* denote 1, or 0. The denotation of *must(p)* in w is 1 iff p is true in all the worlds in $\leq_{g(w)}(\cap f(w))$, and the denotation of *may(p)* in w is 1 iff p is true in at least one of the worlds in $\leq_{g(w)}(\cap f(w))$. In other words, *must(p)* is 1 iff $\leq_{g(w)}(\cap f(w))$ is a subset of p, and *may(p)* is 1 iff the intersection of $\leq_{g(w)}(\cap f(w))$ and p is non-empty.

> (36) Where $\leq_{g(w)}(\cap f(w)) = \{u: u \in \cap f(w)$ and u comes closest to the ideal established by the ordering source $g(w)\}$, and $p = \{w': w' \in \|p\|\}$,
>
> a. $\|must\ (p)\|_w = \|must'(\leq_{g(w)}(\cap f(w)), p)\|_w$
> $\qquad\qquad = 1$ iff $(\leq_{g(w)}(\cap f(w))) \subseteq p$,
> $\qquad\qquad = 0$ otherwise
>
> b. $\|may\ (p)\|_w = \|may'(\leq_{g(w)}(\cap f(w)), p)\|_w$
> $\qquad\qquad = 1$ iff $(\leq_{g(w)}(\cap f(w))) \cap p \neq \varnothing$,
> $\qquad\qquad = 0$ otherwise

This means that a deontic modal sentence evaluated in w can be either true or false depending on what the accessible worlds look like, which in turn depends on what w looks like.

The modal base of a deontic modal sentence does not have to include all the propositions that is known to the speaker (Roberts 1989). It could be a subset of what the speaker knows. It could even be empty. By associating such a modal base with deontic modality, we can account for the fact that speakers do not necessarily believe that the situation described by p in *must(p)* is realizable.

> (37) John must eat fish. But he won't.

For instance, assume that what you know in w is that John never eats fish because he hates it. Moreover, assume that eating fish is good for health. In this context, you can say *John must eat fish* if the modal base $f(w)$ is empty and the ordering source $g(w)$ includes *John eats fish*. If the modal base is empty, then $\cap f(w)$ is the set of all possible worlds W, and $\leq_{g(w)}(\cap f(w))$, the set of worlds at least as close to the most ideal world with respect to $g(w)$, is a subset of W in which John eats fish. Since *John eats fish* is true in all the worlds in

$\le_{g(w)}(\cap f(w))$, *John must eat fish* is true in w. This sentence can be continued by *But he won't* because the speaker knows that John will never eat fish.

Here is an example from Kratzer (1991) in which $\cap f(w)$ does not contain the most ideal world.

(38) If a murder occurs, the jurors must convene.

Let us assume that the modal base is initially empty. Moreover, let us assume that the ordering source is what the law provides in w and that it consists of the following two propositions:

(39) a. No murder occurs.
     b. If a murder occurs, the jurors convene.

According to Kratzer (1991), the effect of *if p* is to restrict the accessible worlds to *p*-worlds. Since the modal base is initially empty, the set of accessible worlds is initially the set of all possible worlds. But when (38) is uttered in w, the new set of accessible worlds is the set of all worlds in which a murder occurs. The proposition expressed in (38) is then true in a world w just in case the jurors convene in all accessible worlds which come closest to what the law provides in w. In determining the worlds that come closest to what the law provides in w, we are only allowed to consider worlds in which a murder occurs. Hence we have to drop the part of the law requiring that no murder occur. Now let us assume that there are worlds in which a murder occurs and the proposition in (39b) is true. In all of those worlds, by Modus Ponens, we can conclude that the jurors convene. These worlds are precisely the worlds in which a murder occurs and which come closest to what the law provides in w. Hence, the proposition in (38) is correctly predicted to be true in w under the given context.

5. Semantics of Imperatives

I propose that imperatives denote a (non-empty) set of worlds. The set of worlds denoted by an imperative is restricted by means of the modal base $f(w)$ which is the set of all the facts known to the speaker in w and the ordering source $g(w)$ which is the set of obligations or permissions issued by the speaker. Let us call this ordering source s. The ordering source s is intended to capture the fact that imperative mood contributes that there is an obligation or a permission issued by the speaker as an essential part of its meaning and that these cannot be contradicted nor qualified. Whether the deontic modality

associated with the ordering source s is obligation or permission is determined by the context.

(40) a. Modal base = $f(w)$ = the set of all the facts known to the speaker
   b. Accessible worlds = $\{v: v \in \cap f(w)\}$
      c. Ordering source = s = $\{q: q$ is obligation/permission issued by the speaker in $w\}$

The crucial point is that the ordering source for an imperative $imp(p)$ includes the corresponding core proposition p. The function $\leq_s$ takes the worlds in $\cap f(w)$, orders the worlds in $\cap f(w)$ with respect to the set of propositions that are obligatory/permissible according to the speaker and returns the worlds that are at least as close to the ideal determined by s. (Again, $\cap f(w)$ may not include the most ideal world.) I propose that the set of worlds denoted by an $imp(p)$ is the intersection between the set of worlds denoted by p and the set of worlds returned by $\leq_s$.

(41) $\|imp\ (p)\|_w = \{w': w' \in \|p\| \cap \leq_s(\cap f(w))\}$

In addition, the set of worlds denoted by an imperative consists of the earliest possible worlds (more precisely, world-time pairs) in which the core proposition in the imperative can become true. This is intended to capture the fact that imperatives with an activity predicate or stage-level stative predicate have a future orientation and dynamic reading, but those with an individual-level stative predicate have present orientation and *wish*-reading. The notion of earliest possible evaluation point is adopted from Iatridou (1996). More on this issue is presented in section 7.

For instance, given an imperative *Go home!* in w, the deontic modality contributed by the imperative mood returns a set of worlds that is the intersection between the set of worlds that is in $\leq_s(\cap f(w))$ and the set of worlds that satisfies *you go home*. These worlds are the earliest possible worlds (world-time pairs) in which *you go home* can become true.

Recall that the speaker must believe that the situation described by p in $imp(p)$ is realizable.

(42) #Eat fish! But you won't.

I propose that this is because the modal base of imperatives includes all the facts known to the speaker in w, unlike the modal base of deontic modal sentences. In other words, the modal base of imperatives is always TOTALLY REALISTIC. Let us assume that the speaker knows that you never eat fish and

will never eat fish. In this context, the modal base $f(w)$ includes the proposition *you never eat fish*. Then, the intersection between the set of worlds that validates *you eat fish* and the set of worlds in $\leq_s (\cap f(w))$ returns an empty set. But an imperative cannot denote an empty set.

Table 1 summarizes the proposed meaning contribution of imperative mood and makes a comparison to the meaning contribution of deontic modal verbs in the framework of Kratzer (1991).

	Deontic Modal Verbs	Imperative Mood
Modal Force	Obligatory (*must*, *should*), Permissible (*can*, *may*)	underspecified
Modal Base	a subset of what the speaker knows	totally realistic
Ordering Source	what is moral, what is normal, etc., does not include the core proposition	the obligations issued by the speaker, the permissions issued by the speaker, includes the core proposition

Table 1: Meaning contribution of imperative mood vs. deontic modal verbs

6. Conditionals, Deontic Modal Sentences and Imperatives

The semantics given here for deontic modal sentences and imperatives are comparable to the semantics given for conditionals in Kratzer (1986) and Kratzer (1991). In brief, a conditional *if p, q* is true iff in all the worlds in which *p* is true, *q* is true. In other words, *if p, q* is true iff the set of *p*-worlds is a subset of the set of *q*-worlds.

(43) $\|if\,(p,\,q)\|_w = 1$ iff $p \subseteq q$, where p = $\{u: u \in \|p\|\}$ and $q = \{v: v \in \|q\|\}$

The antecedent of a conditional provides the domain of quantification, and the consequent is evaluated with respect to this domain. Given a conditional with a modalized consequent (e.g., *if p, must q*), as in (38), *p* is added to the modal base restricting the accessible worlds. These accessible worlds are further restricted by the relevant ordering source to determine a domain of quantification and *q* is evaluated with respect to this domain. In effect, a conditional *if p, q* or *if p, must q* contributes two arguments: (a) the domain of quantification and (b) a set of *q*-worlds.

In a deontic modal sentence *must* (*p*) or *may* (*p*), the accessible worlds are returned by the modal base and this set of worlds are further restricted by the

ordering source to determine the domain of quantification. The core proposition p is evaluated in the domain of quantification. Thus, a deontic modal sentence contributes two arguments: the domain of quantification and a set of p-worlds.

On the other hand, an imperative *imp* (p) contributes a set of worlds that corresponds to the first argument of a conditional, but it does not contribute a set that corresponds to the second argument of a conditional. That is, an imperative is like a defective conditional that only has an *if*-clause. Both an imperative *imp* (p) and an *if p* restrict the domain of quantification to p-worlds. The difference is that p is added to the modal base in *if p*, whereas p is added to the ordering source in *imp* (p).

Recall that imperatives do not assert anything about the current world and that they do not have truth values with respect to the current world. Moreover, as discussed by Davies (1986) and Clark (1993), when an imperative is conjoined with an indicative modal sentence, the whole string is interpreted as a conditional.

(44) a. Come to the party and John will be happy.
  ≡ If you come to the party, John will be happy.
  b. Come to the party or John will be unhappy.
  ≡ If you don't come to the party, John will be unhappy.

All these facts follow if imperatives are like a defective conditional that only has a *if*-clause (setting aside the difference that p is added to the modal base in *if p*, and p is added to the ordering source in *imp*(p)). Just like imperatives, *if*-clauses do not assert anything about the current world and do not have truth values by themselves. The second sentence in (44a) is evaluated in the set of worlds restricted by the imperative, and the second sentence in (44b) is evaluated in the complement set of the set of worlds restricted by the imperative, giving the entire string a conditional interpretation.[6]

7. Lexical Aspect and the Interpretation of Imperatives

The semantics of deontic modality presented here incorporates the notion of earliest possible point in which the situation described by a proposition can become realized. This notion accounts for the fact that the lexical aspect of the predicate in imperatives (and deontic modal sentences) plays an important role in the interpretation.

When an imperative has an activity or a stage-level stative predicate, it has future orientation and dynamic interpretation.

(45) a. Open the window. (Activity Predicate)
     b. Be quiet! (Stage-level Stative)

The deontic modality contributed by the imperative mood returns a set of accessible world-time pairs in which the situation described by the core proposition can become realized. If the situations described by *you open the window* in (45a) and *you are being quiet* in (45b) are to become realized, they can only do so in the future world-time pairs (or very near future world-time pairs). By returning future world-time pairs in which the situation described by the core proposition can become realized, dynamic reading is generated, in which a change in the state of affairs is assumed.

When an imperative has an individual-level stative predicate, it has present orientation and expresses the speaker's desire.

(46) a. Be tall.
     b. *Be tall tomorrow.

In (46a), the deontic modality contributed by the imperative mood returns a set of alternate worlds in which the proposition *you are tall* can become true. But being tall is a property of an individual that does not change. If the situation is to hold, it will already be doing so at the time of utterance. If the situation does not hold, it will never do so in the future. Thus, the only possible world-time pairs in which *you are tall* can become true are alternate world-time pairs co-temporaneous with the moment of utterance. This explains why an imperative with an individual-level stative predicate has present orientation and non-dynamic reading.

The property expressed by an individual-level stative predicate cannot be changed (in normal situations) by an individual. This means that in imperatives with an individual-level stative predicate and the deontic modal force of obligation, the bearer of the obligation cannot be the subject of the imperative. Rather, the bearer of the obligation is the world. That is, such imperatives express the speaker's belief that it is necessary for the state of affairs to be such that the core proposition p is true. As an implicature, the speaker desires p to be true. Thus, a *wish*-reading is generated.

Imperatives do not have counterfactual *wish*-reading. That is, a speaker cannot use an imperative to express a desire for p to be true when s/he believes that p is false. For instance, the imperative in (46a) cannot be used when the speaker believes that the proposition *you are not tall* is true. The lack of counterfactual *wish*-reading is explained by the proposed semantics for imperatives. The modal base of imperatives is totally realistic. It includes everything the speaker knows about the current world. Hence, if it is already known that *you are not tall*, this proposition will be validated in the alternate

worlds as well since the accessible worlds validate all the facts of the current world. Then, there will be no possible world-time pairs in which the proposition *you are tall* can become true. As a result, the denotation of such imperatives will end up being an empty set.

8. Conclusion

I have shown that imperatives and deontic modal sentences are alike in that they both have the modal force of deontic modality, but that they are different in that while imperatives contribute that there is an obligation or a permission issued by the speaker as an essential part of the meaning, deontic modal sentences assert the existence of an obligation or a permission in the current world. The proposed analysis is intended to capture the intuition that imperatives and deontic modal sentences are alike in some ways but different in other ways. I have provided a formal account that captures the similarities as well as the differences between the two types of sentences. The effect of lexical aspect in the interpretation of imperatives is also explained by the proposed account.

Notes

1. The sentence in (13) is actually ambiguous. The reading which is irrelevant to the discussion is the one in which the addressee, e.g., the person setting up the blind date, has the obligation to provide a tall date. Under this reading, it is not necessarily the case that the speaker wants a tall date

2. The original issuer of an obligation or a permission expressed by an imperative may not be the speaker. For instance, in a military context, a lieutenant can issue an obligation which was originally issued by a colonel in the form of an imperative. Although the lieutenant, who is the speaker, is not the original issuer of the obligation, s/he is still the issuer of the obligation.

3. To be precise, $w \in W$ is a world-time pair. Why it is crucial to think of $w \in W$ as a world-time pair will become clear in the next section.

4. More specifically, Kratzer (1991) calls the modal base associated with deontic modality CIRCUMSTANTIAL MODAL BASE, as opposed to EPISTEMIC MODAL BASE. While epistemic modal base consists of the evidence available to the speaker, circumstantial modal base consists of the facts about the world that the speaker knows.

5. For Kratzer (1991), the ordering source associated with deontic modality is restricted to 'what the law provides.' In this paper, for simplicity, I use the term DEONTIC MODALITY as a cover term for all modality whose ordering source is associated with any normative background.

6. See Clark (1993) for a discussion on how a conjunction or a disjunction in strings like (44) determines the interpretation of imperatives.

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Department of Linguistics
University of Pennsylvania
619 Williams Hall
Philadelphia, PA 19103, USA
e-mail: chunghye@babel.ling.upenn.edu