THE INTERACTION OF MODALITY AND TENSE IN KOREAN

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By

Bokyung Mun, M.S.

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This dissertation examines the interpretations of modal expressions in Korean, focusing on their interaction with tense. I look at two specific modal constructions in Korean that clearly show modal-tense interactions. One involves a modal –ul swu iss– ‘can, may’ which was previously assumed as a possibility modal, and the other involves a necessity priority modal –eya ha– ‘must, have to’. There are many descriptive accounts in the literature but few works formally analyze modality in Korean. The goal of the dissertation is to provide a coherent theory about how tense contributes to meanings of modal sentences from a formal semantic perspective.

The modal –ul swu iss– ‘can, may’ in Korean can receive various kinds of interpretations: epistemic, priority, and dynamic. With a past complement, however, –ul swu iss– does not allow non-epistemic readings. In addition, when –ul swu iss– ‘can, may’ is realized in the past tense, an actuality inference arises in addition to the primary modal interpretation. In my proposal, the semantic ambiguity arises due to three distinct semantic entries. I argue that the new semantic component “x chooses P” plays a crucial role for the –ul swu iss– modal having circumstantial modal bases. “Choosing” is defined if it satisfies two requirements: the diversity requirement and the agentivity requirement. Based on the proposed semantic entry, I argue that the actuality inference, which is an R-based implicature, is derived by a combination of the semantic meaning and pragmatic reasoning.

The necessity priority modal –eya ha– ‘must, have to’ gives rise to the non-actualization inference when it combines with a past complement. After showing that the uncancellable
non-actualization inference is a not-at-issue entailment, I discuss how to derive the infer-
ence semantically and pragmatically. My proposal builds on the analysis presented for the
–ul swu iss– modal, as “x chooses P” is part of the semantics of the –eya ha– modal. Unlike
the –ul swu iss– modal, however, I introduce new machinery to shift the reference time
backwards. That is done by decomposing the modal into a modal and a choosing operator,
and the choosing itself incorporates a time argument.

INDEX WORDS:  modality, tense, actuality inference, non-actualization inference,
Korean
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This dissertation examines the interpretations of modal expressions, focusing on their interaction with tense. As Portner (2009: 221) points out, even though modal meanings are primarily in the modal domain, in order to have a thorough explanatory theory of modality, we cannot ignore their interactions with tense and aspect. By exploring the relationship between modality and time, I will show that traditional modal theories, which treat modality as independent of time, do not suffice and we need a larger scale modal analysis (Hacquard 2011).

The goal of my dissertation is to investigate the meanings of Korean modal sentences, focusing on their interaction with temporal components. This dissertation consists of two main chapters, which are devoted to two specific modal constructions that clearly involve modal-tense interactions. On the basis of empirical evidence, I aim to provide a coherent theory about how the morphological realization of temporal operators contributes to the meanings of modal sentences. In my dissertation, new semantic entries are proposed in order to account for the interpretation patterns and derive the unexpected inferences that arise in modal-tense interactions.

The remainder of the introduction will address the following issues: why modal-tense/aspect interactions are interesting, in what linguistic phenomena I am interested, and how I am going to approach them. In section 1.1, cross-linguistic data which shows close associations between modality, tense, and aspect is introduced. Section 1.2 identifies two empirical puzzles found in modal constructions in Korean, and based on the empirical
data, I outline my hypothesis regarding the research questions. Lastly, section 1.3 gives a
summary of how this dissertation is structured.

1.1 The Association among Modality, Tense, and Aspect

Previous literature has revealed that the combination of a modal with a tense or
aspect component exhibits a wide range of phenomena. For example, the close connection
between past tense morphology and the notion of modality has received much discussion
morphology plays an important role in modal interpretations in at least three different envi-
ronments: (i) conditionals, (ii) complements of certain predicates, and (iii) modal sentences.

(i) If $p, q$ conditional

*English*

(1) If Oswald hadn’t killed Kennedy, someone else would have. (Adams 1970: 90)

*Modern Greek*

(2) An i$\chi_1$e pari to siropi $\chi_a$ i$\chi_1$e $\chi_1$ini kala.  
if had taken the syrup FUT had become better  
‘If he had taken the syrup, he would have gotten better.’ (Iatridou 2000: 233)

*Korean*

(3) Nay-ka khi-ka khu-(ess)-tamyen, nongkwu senswu-ka  
I-NOM height-NOM tall-PAST-if basketball player-NOM  
toy-ess-ul kes-i-ta.  
become-PAST-COMP BN-COP-DEC  
‘If I were taller, I would have become a basketball player.’

2
Japanese

(4) Ko-zi-no hikooki-ni nor-eba, Ken-wa asita Siatoru-ni five-O’clock-GEN plane-DAT take-if Ken-TOP tomorrow Seattle-DAT tui-ta kamoshirena-i. arrive-PAST may/might-NONPAST

‘If (he) had taken the five o’clock plane, Ken might have arrived in Seattle tomorrow.’ (Komoto 2011: 619)

As we can see from (1) to (4), past tense morphology in the conditional sentence is used to convey that the antecedent and the consequent are not true. In English and Modern Greek, we can find past tense morphology in both the antecedent and the consequent of conditionals. As for Japanese, according to Komoto (2011: 627), the ‘unreality’ reading arises due to the presence of the past tense in the consequent regardless of the tense in the antecedent. Similarly, in Korean, the counterfactual reading arises due to the past tense marker in the consequent, and the past tense in the antecedent is optional as in (3). It is interesting to observe that past tense morphology is employed to convey ‘counterfactuality’ among a number of unrelated languages.

(ii) Complements of certain predicates

English

(5) Suppose Jill knew French. (Portner 2009: 242)

(6) I wish I knew how to speak German.

Sentences (5)-(6) show that past tense morphology in the complements of certain predicates like *suppose* and *wish* in English is also used to convey ‘counterfactuality’. The past tense in (5) and (6) is not semantically real because the sentences describe present situations not past ones. Compare (6) with (7):
(7)  I hope she knew where the restaurant was.

In contrast to *wish* in (6), *hope* in (7) does not convey the counterfactual inference.

(iii) Modal sentences

*English*

(8)  John should have taken the train.  (Portner 2009: 225)

(9)  He might (still) have won the game.  (Condoravdi 2002: 62)

*Korean*

(10) Chelswu-nun swukcey-lul ceychwulhay-ss-eya ha-n-ta.
    Chelswu-TOP homework-ACC submit-PAST-COMP AUX-NONP-DEC
    ‘Chelswu should have submitted his homework.’

Similarly, the perfect *have* in (8) and (9) and the past tense morpheme –*ess* in (10), which are realized in the complement of the modal, seem to contribute to the unreality inference.

In the examples from (1) to (10) above, past/perfect morphology is used to express ‘unreality’ or ‘counterfactuality’. Interestingly, however, certain combinations of the modal and the aspect morphology seem to force the complement to hold in the actual world (Hacquard 2006: 14). The English examples in (11) and the Korean examples in (12) are meant to show how those languages are different from the languages which have an overt morphological distinction between the perfective and the imperfective aspect, such as Hindi and French. In English and Korean, what plays a role in the actuality inference is the past tense, not the perfective aspect.

*English*

(11)  a.  In those days, firemen were able to eat 50 apples.
b. Yesterday, firemen were able to eat 50 apples. (Bhatt 1999: 188)

Korean

(12) a. Ku tangsi Chelswu-nun tayhak-ul colepha-l swu
at that time Chelswu-TOP college-ACC graduate-COMP BN
AUX-PAST-DEC but graduate-COMP NEG-PAST-DEC
‘At that time, Chelswu was able to graduate from the college. But she didn’t graduate.’

b. Kyelkwuk Chelswu-nun tayhak-ul colepha-l swu
after all Chelswu-TOP college-ACC graduate-COMP BN
iss-ess-ta. #Kulentey colepha-ci anh-ass-ta.
AUX-PAST-DEC but graduate-COMP NEG-PAST-DEC
‘After all, Chelswu was able to graduate from the college. #But she didn’t graduate.’

Hindi

(13) a. Yusuf havaii-jahaaz uraa sak-taa hai/thaa, lekin vo havaii-jahaaz
Yusuf air-ship fly can-impf be.PRES/be.PAST but he air-ship
nahii uraa-taa hai/thaa.
NEG fly-impf be.PRES/be.PAST
‘Yusuf is/was able to fly airplanes, but he doesn’t/didn’t fly airplanes.’

b. Yusuf havaii-jahaaz uraa sak-aa hai/thaa, #lekin us-ne
Yusuf air-ship fly can-pfv be.PRES/be.PAST but he-ERG
havaii-jahaaz nahii uraa-yaa.
air-ship NEG fly-pfv
‘Yusuf could fly the airplane, #but he didn’t fly the airplane.’ (Bhatt 1999: 176)

French

(14) a. Jane pouvait traverser le lac à la nage, mais elle ne le fit
Jane can-past-impf cross the lake by swim, but she NEG it do-past-pfv jamais.
ever
‘Jane could swim across the lake, but she didn’t do it.’
b. Jane a pu traverser le lac à la nage, #mais elle ne le fit pas.

‘Jane was able to swim across the lake, #but she didn’t do it.’ (Hacquard 2009: 2)

Unlike (11) and (12), where the ‘actualization’ inference is context-dependent, helped by the adverbials, in (13) and (14), the ability modal with the perfective morphology yields the actuality entailment. That is, when the ability modal bears the perfective aspect, the modal sentence implies that the eventuality was actualized. This linguistic phenomenon, particular to the languages in which there is an overt morphological distinction between perfective and imperfective aspect, is called the actuality entailment.

The examples above show that the tense, aspect, and modality systems of these languages are not completely autonomous units, but they affect one another in crucial ways (Hacquard 2006). In this dissertation, I will mainly discuss the interaction between the modal element and the tense morphology with particular focus on –eya ha– modal sentences like (10) and –ul swu iss– modal sentences like (12).

1.2 ISSUES AND THE OUTLINE OF THE PROPOSAL

In the previous section, we saw that certain combinations of the modal and the tense/aspect morphology force unexpected inferences (counterfactual or actual inference). For example, in English, was able to (an ability modal with the past tense) tends to imply the actuality while should have p.p. (a priority modal with the perfect have) implies the opposite. Although we can find similar linguistic phenomena cross-linguistically, it is hard to give a uniform formal account for the phenomenon across languages. Recently, there have been many studies which examine the interaction of modality with tense and/or aspect (Bhatt 1999, Condoravdi 2002, Hacquard 2006, Mari and Martin 2007, 2009, Homer 2011...
among others). This dissertation contributes to this line of research. In this section, I
describe the main problems with the empirical data and briefly outline my solutions to the
problems. The first puzzle is about the possibility modal expression –ul swu iss– ‘can, may’
and the second puzzle is about the necessity priority modal expression –eya ha– ‘must, have to’.

1.2.1 –ul swu iss– MODAL CONSTRUCTIONS

Modals are ambiguous and their meanings are determined by conversational back-
grounds. The Korean possibility modal expression –ul swu iss– ‘can, may’ conveys all
three kinds of modal readings, and its meanings are disambiguated by the context.

(15) Chelswu-ka sihap-ul iki-∅-l swu iss-∅-ta.
Chelswu-NOM game-ACC win-NONP-COMP BN AUX-NONP-DEC
'It is possible for Chelswu to win the game.' (epistemic)

‘Chelswu is allowed to win the game.’ (priority)

‘Chelswu is able to win the game.’ (dynamic)

As shown in (15), –ul swu iss– ‘can, may’ has epistemic, priority, and dynamic readings. When the embedded clause is in the past tense, however, non-epistemic readings become unavailable.

(16) Chelswu-ka sihap-ul iki-ess-ul swu iss-∅-ta.
Chelswu-NOM game-ACC win-PAST-COMP BN AUX-NONP-DEC
'It is possible that Chelswu won the game.' (epistemic)

#‘Chelswu is allowed to have won the game.’ (priority)

#‘Chelswu is able to have won the game.’ (dynamic)

In (16), only the epistemic reading is possible. The next example is when the main predicate
is a stative predicate.

(17) Chelswu-ka pappu-∅-l swu iss-∅-ta.
Chelswu-NOM be.busy-NONP-COMP BN AUX-NONP-DEC
‘It is possible that Chelswu is busy.’ (epistemic)

‘Chelswu is allowed to be busy.’ (priority)

‘Chelswu is able to be busy.’ (dynamic)

In (17), as in (16), the ability readings are not possible. The priority reading in not as
natural as the epistemic reading, but it is not as bad as the dynamic reading. It seems that
the aspectual class of the complement contributes to determining the modal interpretations.

Now consider (18), where the subject is inanimate.

(18) Pay-ka kalaanc-%ul swu iss-%ta.
    boat-NOM sink-NONP-COMP BN AUX-NONP-DEC

‘It is possible that the boat will sink.’ (epistemic)

‘The boat is allowed to sink.’ (priority)

‘The boat is able to sink.’ (dynamic)

Again, similar to (16), the non-epistemic readings are not compatible with an inanimate
subject. As we can see from (15) to (18), there is an asymmetry between epistemic and
circumstantial modals. Why is this the case? Is this phenomenon due to distinct syntactic
structures or semantic properties? For the first puzzle involving –ul swu iss– modal con-
structions, I aim to answer such questions.

In the literature, the dichotomy between epistemic and non-epistemic modals is not new.
Jackendoff (1972), Lyons (1977), and Brennan (1993), for example, respectively argue that
we should assign distinct syntax to epistemic and non-epistemic readings of modals. My
proposal does not completely abandon the syntactic approaches, but complements them
with richer semantic and pragmatic grounds.

As we will see in Chapter 3, according to my analysis, the lack of certain meaning in
–ul swu iss– modal constructions results from three distinct semantic entries. Even though
the surface structures are the same, –ul swu iss– has three distinct entries and each of the
entries is responsible for a different correct interpretation. In the semantic entries, there is
a crucial distinction between epistemic and circumstantial modals. That is, only circum-
stantial modals incorporate “choosing” in their semantic entries. “Choosing” is defined if
it satisfies two requirements: the diversity requirement and the agentivity requir-
iment. As we will see in Chapter 3, we can account for the asymmetrical distribution of the modal
interpretations by applying this new semantics for the –ul swu iss– modal.

The second issue in –ul swu iss– modal constructions is that when this modal with the
permission/ability reading is realized in the past tense, the modal sentence gives rise to the
actuality implicature. Since the –ul swu iss– modal is more natural with the ability reading
than the permission reading, I will illustrate the example with the ability –ul swu iss–.

(19) Chelswu-ka ku pawi-lul tuleolli-∅-l swu iss-ess-ta.
   Chelswu-NOM that rock-ACC lift-NONP-COMP BN AUX-PAST-DEC
   ‘Chelswu was able to lift that rock.’

In (19), the sentence has an ability reading (Chelswu had ability to lift that rock) and addi-
tionally, the sentence has the actuality inference that Chelswu actually lifted that rock. This
actuality inference phenomenon, which arises with the ability modal, has been discussed in
the literature. Bhatt (1999), Hacquard (2006), Mari and Martin (2007), and Homer (2011)
focus on the actuality entailment in French and Hindi. After reviewing each proposal, I
argue that none of their approaches solve the actuality inference problem in Korean. I pro-
pose a way to derive the actuality implicature by a combination of the semantic meaning
and pragmatic reasoning. Based on the proposed semantic entry for –ul swu iss–, I argue
that the actuality inference depends on the agent’s choice. My analysis builds on Horn
(1984), in which the author identifies the actuality inference as an R-based implicature. In
my proposal, what connects the ability to the actuality is the agent’s choice in the past.
Though building on Horn, my analysis improves his argument in that it explains the dif-
ferent strengths of the inferences between the present ability sentence and the past ability
sentence. Another advantage of my analysis is that, in this way, we can keep the semantic entry for the ability –ul swu iss– and derive the implicature by some pragmatic factor.

1.2.2 –eya ha– MODAL CONSTRUCTIONS

The next main puzzle that this dissertation addresses is the non-actualization inference which arises from the combination of the priority modal –eya ha– ‘must, have to’ with the past complement.

(20) Chelswu-nun swukcey-lul hay-ss-eya ha-n-ta.
    Chelswu-TOP homework-ACC do-PAST-COMP AUX-NONP-DEC
    ‘Chelswu should have done his homework.’

In order to precisely classify this inference into the right category, this dissertation goes over the traditional and newer classifications regarding types of inference.

First, I try to use the traditional classification which categorizes inference types into entailments, presuppositions, conversational implicatures, and conventional implicatures. After showing that the uncancellable non-actualization inference does not belong to any of the traditional category, I argue that the traditional classification is not enough, especially for the inferences which arise from the modal-tense/aspect interaction, and that Tonhauser et al.’s (2013) at-issue vs. not-at-issue distinction works better for this purpose. After I show that the nature of the non-actualization inference found in –eya ha– modal constructions is a not-at-issue entailment, I propose that this inference is derived by the semantic meaning and pragmatic reasoning. My proposal builds on the analysis presented for the –ul swu iss– modal with permission readings, but modifies it in order to capture the unique properties of the –eya ha– modal. Specifically, I argue that the agentivity requirement and diversity requirement in the semantics of –eya ha–, which define the meaning of choosing, are the important components for the non-actualization inference in obligation modal sentences.
When we discuss the interaction of the modal with tense, the diversity requirement is particularly important because whether both P and not-P are possible or not changes over time. As we will see in Chapter 4, my new semantics of –eya ha– decomposes the modal into a modal and a choosing operator, and choosing itself occupies a syntactic position in the structure.

1.3 OUTLINE OF THE DISSERTATION

The rest of the dissertation is organized as follows. Chapter 2 discusses background assumptions on modality which are necessary for understanding the discussion throughout the dissertation. The semantic framework that this dissertation mainly employs is Kratzer’s (1981, 1991) ordering semantics. After briefly discussing the standard modal semantics, I survey recent developments within the standard framework of modal semantics. These include temporal interpretations of modal sentences, weak necessity modals, and deliberative modality. I then present the basic syntactic and semantic properties specific to Korean modal expressions. Finally, I survey the previous works on the interaction between tense/aspect and modals from a broad perspective. The survey includes (i) counterfactuality in modal sentences, (ii) the actuality inference which arises from the interaction of modality with aspect, and (iii) counterfactual conditionals.

Chapter 3 focuses on modal constructions involving –ul swu iss– ‘can, may’. First, I discuss the semantic ambiguity found in –ul swu iss– modal constructions in Korean. This phenomenon has been discussed in several studies (Ha 2007, Chung 2007, Kim 2010) although they do not deal with the complete data. In order to explain the semantic ambiguity, I propose that the –ul swu iss– modal has three distinct semantic entries depending on the interpretation. The second part of Chapter 3 examines the actuality inference phenomenon which is found in the ability –ul swu iss– constructions with the past tense
modal. Recently, the actuality inference has received much attention in languages other than Korean. I critically survey the previous analyses and apply them to the Korean data. After showing that none of the previous approaches appropriately accounts for the actuality inference case in Korean, I argue that it can be explained by a semantic analysis based on the definitions I propose for –ul swu iss– and pragmatic reasoning.

Chapter 4 is devoted to an account of the non-actualization inference in –eya ha– modal constructions. I begin with the discussion of the properties of a priority modal –eya ha–. I then attempt to determine the status of the non-actualization inference. In order to deduce where the non-actualization inference should belong, I argue that the traditional classification (entailments, presuppositions, conversational/conventional implicatures) does not suffice and a newer way to classify inference types (at-issue vs. not-at-issue) needs to be considered. After demonstrating the characteristics of the non-actualization inference, I discuss how this inference is derived semantically and pragmatically.

Chapter 5 summarizes the main ideas of this dissertation and discuss the implications of the proposals.

There are many descriptive accounts in the literature but few works formally analyze modality in Korean. In this dissertation, I analyze the modal constructions in Korean from a formal semantic perspective. By exploring the interaction between modality and tense in Korean, I hope that the analysis I propose in this dissertation will adequately account for the empirical puzzles as well as contribute to an understanding of modality in Korean in general.
In this chapter, I introduce theoretical frameworks that I adopt throughout my dissertation. After briefly discussing Kratzer’s (1981, 1991) standard modal semantics in section 2.1.1, recent developments in the standard framework are discussed in section 2.1.2. In section 2.2, I discuss relevant syntactic and semantic background on modal expressions, specific to Korean. In section 2.3, I provide a summary of previous studies which discuss the interaction between tense/aspect and modality in other languages. The purpose of doing this is to look at the modal phenomena in Korean from a broader perspective.

2.1 BACKGROUND ON MODALITY

2.1.1 KRATZER’S ORDERING SEMANTICS (KRATZER 1981, 1991)

Modal expressions are used to talk about possibilities and necessities, which can be captured formally by using the notion of ‘possible worlds’ (Carnap 1947). Consider the following examples:

(21) a. John wins.

b. John might win.

(21a) and (21b) are different in that John’s winning in (21b) is not a settled event, but merely a possible event. We see that modals enable us to talk about a situation that is not necessarily happening now.
The most influential work on modality in formal semantics is Kratzer’s (1981), in which she developed the theory of modality based on modal logic. In modal logic, modals are analyzed as quantification over different sets of worlds, as determined by an accessibility relation. Kratzer defines such accessibility relations with conversational backgrounds. There are two conversational backgrounds in Kratzer’s modal theory: the modal base \( f \) and the ordering source \( g \). The modal base determines the initial set of worlds and the ordering source provides an ordering on this set of worlds.\(^1\) If we assume the *Limit Assumption* (Lewis 1973), we can have a finite number of ordering sources and in turn, we have a set of ‘best’ worlds.\(^2\) Given this, now consider the derivation of *John might win*:

\[
\begin{align*}
(22) \quad & \text{a. John win: } \lambda w \lambda e[\text{John win}] (w)(e) \\
& \quad \text{b. might: } \lambda P \lambda w \exists w': R_{f,g}(w, w') \land \exists e[P(w')(e)] \\
& \quad \text{c. John might win: } \lambda w \exists w': R_{f,g}(w, w') \land \exists e[[\text{John win}](w')(e)]
\end{align*}
\]

As we can see from (22c), the modal sentence *John might win* is true iff there exists a world \( w' \) such that \( w' \) is epistemically accessible from \( w \) and his winning in \( w' \) is true. In this case, the time from which the accessibility relation holds is taken as the time of utterance. The futurity expressed in *John might win* comes from the aspectual class of the predicate *win*. This kind of forward-shifting effect in modal sentences will be discussed later when Condoravdi (2002) is reviewed. As we will see shortly, according to Condoravdi, modal sentences have future orientation obligatorily with eventive predicates and optionally with stative predicates.

Now consider the following example:

\[
(23) \quad \text{John might have won.}
\]

\(^1\) According to Kratzer, the main difference between epistemic and root modals is in the modal bases and the ordering sources associated with these modal bases.

\(^2\) As Portner (2009: 67) notes, this assumption is made for simplicity.
In order to derive the meaning of (23), the semantics in (22) does not suffice since the sentence involves temporal meanings but the semantics does not consider the temporal variable. The following derivation shows how we derive the epistemic interpretation of *John might have won*.

\[(24) \quad \begin{array}{ll}
\text{a. John win: } & \lambda w \lambda e[\text{John win}](w)(e) \\
\text{b. might: } & \lambda P \lambda w \exists w': R_{f,g}(w, w') \land \exists e[P(w')(e)] \\
\text{c. have: } & \lambda P \lambda w \lambda t \exists t'[t' \prec t \land \exists e[P(w')(e)] \land e \text{ is at } t'] \\
\text{d. John might have won: } & \lambda w \exists w': R_{f,g}(w, w') \land \exists t'[t' \prec t \land \exists e[[\text{John win}](w')(e)] \\
& \land e \text{ is at } t']
\end{array}\]

The modal sentence *John might have won* is true iff there exists a world $w'$ such that $w'$ is epistemically accessible from $w$ and a time $t'$ such that $t'$ precedes the time of utterance and his winning in $w'$ is true at $t'$. It seems that the semantics above derives the epistemic interpretation of *John might have won*, by combining a temporal semantics with a modal semantics. However, the sentence is ambiguous and often yields a counterfactual interpretation, as in (25).

\[(25) \quad \text{John might have won, but he didn’t.}\]

The counterfactual interpretation of (25) cannot be explained by (24). In order to explain more sophisticated interpretations of modal sentences like (25), recently, newer ideas in the standard modal semantics have been introduced. In the next section, I present how Kratzer’s modal semantics has been expanded on to capture temporal interpretations of modal sentences, the different strengths of necessity modals, and deliberative modality.
2.1.2 RECENT DEVELOPMENTS IN THE STANDARD FRAMEWORK OF MODAL SEMANTICS

In this section, I discuss some recent developments in Kratzer’s standard modal semantics. These include explanations for modal sentences with tense operators, weak necessity modals, and deliberative modality. These topics will be connected to my discussion and proposals in Chapters 3 and 4. Temporal interpretations of modal sentences are related to the discussion where the tenses of the modal and complement matter. Weak necessity and deliberative modality are related to the notions of obligations, preferences, and decisions, and these will be relevant to my discussion where obligation and permission are at issue.

2.1.2.1 TEMPORAL INTERPRETATIONS OF MODAL SENTENCES

Modals quantify over worlds and times. In order to account for the fact that modals are relative to a world and a time, the modal base should be taken to be a contextually determined function from world-time pairs to sets of worlds.

In discussing temporal interpretations of modal sentences, it has been noted that modality involves two times (temporal parameters): (i) the time from which the modal background is accessed, and (ii) the time at which the eventuality/situation described by the complement of the modal holds. In Condoravdi’s (2002) terminology, (i) is referred to as the temporal perspective and (ii) as the temporal orientation. Then we can ask the question of how these temporal parameters get fixed. In Condoravdi’s proposal, temporal perspective of the modal is determined by the operator which directly takes scope over the modal. Temporal orientation of the modal is determined by the aspectual class of the described eventuality which appears in the scope of the modal. According to Condoravdi, modal sentences have future orientation obligatorily with eventive predicates and option-
ally with stative predicates. When the perfect is present, temporal orientation is shifted backward.

(26)  
   a. Mary must have left.  
   (Portner 2009: 225)
   b. PRES(MUST(PERF(Mary leave)))

In (26), temporal perspective is PRES and temporal orientation is PAST due to the presence of PERF in the scope of the modal.

Condoravdi (2002) employs the AT-relation whose definition depends on the type of eventualities:

(27)  
   AT(t, w, P)  
   = ∃e[P(w)(e) & τ(e,w) \subseteq t] when P is eventive  
   = ∃e[P(w)(e) & τ(e,w) \circ t] when P is stative  
   = P(w)(t) when P is temporal

AT(t, w, P) means that the property of eventualities P is instantiated in w at t. Condoravdi’s analysis assumes the event semantics (first proposed by Davidson (1967)): the predicates take an eventuality argument. Condoravdi discusses temporal relations between time intervals in terms of the AT-relation, which reflects the difference between telic and atelic predicates.

With this new implementation, Condoravdi successfully derives two distinct interpretations of *John might have won*. As we will see in section 2.3.1, the counterfactual interpretation in (25) is derived from the scopal relations between temporal perspective and temporal orientation.

### 2.1.2.2 Weak Necessity

In this section, I examine some theoretical approaches to weak necessity modals. von Fintel and Iatridou (2008) and Rubinstein (2012) each try to formalize the weakness of
weak necessity modals. As we can see from the following example, there is a relative strength difference between *ought to* and *must*.

(28)  
   a. You ought to do the dishes, but you don’t have to.
   b. #You must do the dishes, but you don’t have to. (von Fintel and Iatridou 2008: 117)

As (28a) shows, since *ought to* is a weaker element than *have to*, the sentence implicates the negation of higher elements. In (28b), however, since *must* is not a weaker element than *have to*, the sentence sounds infelicitous. Since this is a scalar implicature in Horn’s (1972) sense, the inference is defeasible, as illustrated in (29a).

(29)  
   a. You ought to wash your hands – in fact, you have to.
   b. ??You have to wash your hands – in fact, you ought to. (von Fintel and Iatridou 2008: 117)

In order to account for the difference between *ought to* and *must*, von Fintel and Iatridou propose that the semantics of weak necessity modals is derived by adding additional ordering sources to the semantics of strong necessity modals. As discussed above, Kratzer exploits a pair of conversational backgrounds (i.e. modal base and ordering source). In von Fintel and Iatridou’s proposal, however, they introduce a pair of ordering sources, i.e. the primary one and a secondary one, and argue that weak necessity modals are the result of the promotion of the secondary ordering source of a strong necessity modal.

The promotion of the secondary ordering source is only relevant to necessity modals like *ought to* and *should*, but not to *must* or *have to*. For example:

(30)  
   a. To go to Ashfield, you have to take Route 2.
   b. To go to Ashfield, you ought to take Route 2. (von Fintel and Iatridou 2008: 127)
(30a) does not consider secondary goals at all while in (30b), the best way to go to Ashfield is the one where some secondary goal is also satisfied. Some possible secondary goals would be avoiding toll roads, visiting friends on the way, or having a scenic drive.

Since the difference between strong necessity modals and weak necessity modals is the domain of quantification, this analysis is called the domain restriction approach. That is, the domain of quantification of weak necessity modals is smaller than that of strong necessity modals. This analysis seems to fit in the semantics of modality developed by Kratzer since the basic assumptions, that necessity modals are universal quantifiers and that the domain of quantification is determined by the context, remain the same (Rubinstein 2012).

Rubinstein points out, however, that this approach is not complete if we do not have a criterion for determining the distinction between primary and secondary backgrounds. By showing that the overt rationale clauses do not reliably split priorities as primary or secondary, she argues that the split between primary and secondary priorities is correlated with a difference between strong and weak preferences.

Rubinstein (2012: 101) distinguishes two kinds of priorities: ones that are presupposed to be collectively committed to, and ones that are presupposed not to be collectively committed to. She argues that sensitivity to presuppositions about collective commitment in a conversation is a determining factor in describing modal strength. Upon this assumption, Rubinstein (2012: 13) proposes that “weak necessity modals are sensitive to priorities for which the lack of collective commitment is presupposed.” To summarize her proposal (Rubinstein 2012: 60):

- Strong necessity modals are relativized only to priorities that are presupposed to be collectively committed to.

- Weak necessity modals that are relativized just to such priorities are infelicitous.
• Weak necessity modals are relativized in part to priorities that are presupposed not to be collectively committed to.

Now consider the following examples (Rubinstein 2012: 46):

(31) Babushka is preparing to take the Trans-Siberian train from Moscow to visit her daughter in Vladivostok.

Babushka: I want the trip to be pleasant.

Daughter: To get here comfortably, you have to (#ought to) take the Chinese train.

(32) At the train station, Babushka asks the clerk about the trains to Vladivostok.

Babushka: I want the trip to be pleasant.

Clerk: To get there comfortably, you ought to (#have to) take the Chinese train.

In both scenarios, Babushka wants a comfortable train ride. What distinguishes the use of modal here depends on whether Babushka and her interlocutor are collectively committed to the same priorities or not. In (31), for example, Babushka’s daughter asserts a strong necessity claim since she accepts her mother’s desire for a comfortable train. In (32), on the other hand, the clerk asserts a weak necessity claim since she is more hesitant to rule out other options.

2.1.2.3 DELIBERATIVE MODALITY

Deliberative modality refers to the particular modal flavor of priority modals, which are used in practical deliberations (Cariani et al. 2013: 226). Consider the following example:

(33) We ought to read that article. (Cariani et al. 2013: 226)

In (33), a necessity modal ought is used to express the optimal thing to do. In the standard modal semantics, ought has been analyzed as quantification over possible worlds that are
ranked according to contextual backgrounds (Kratzer 1981, 1991). As Cariani et al. note, however, Kratzer’s framework has been challenged because this theory cannot derive adequate inferences involving sentences that express deliberative modality (Cariani et al. 2013: 225). The miners puzzle, which has been discussed in Kolodny and MacFarlane (2010), is one such challenge.

(34) Ten miners are trapped either in shaft A or in shaft B, but we do not know which. Flood waters threaten to flood the shafts. We have enough sandbags to block one shaft, but not both. If we block one shaft, all the water will go into the other shaft, killing any miners inside it. If we block neither shaft, both shafts will fill halfway with water, and just one miner, the lowest in the shaft, will be killed. (Kolodny and MacFarlane 2010: 1-2)

Under the situation described above, we get the following judgments (Cariani et al. 2013: 227):

(35) a. We ought to block neither shaft. True
   b. If the miners are in shaft A, we ought to block shaft A. True
   c. If the miners are in shaft B, we ought to block shaft B. True
   d. Either the miners are in shaft A or they are in shaft B. True
   e. Either we ought to block shaft A or we ought to block shaft B. False

Given that we do not know what shaft the miners are in, (35a) is judged to be the right decision to the problem. The conditionals (35b) and (35c) are judged to be true as well. (35d) is also true in this scenario. In addition, (35b), (35c), and (35d) entail (35e). The problem is that (35a) is not compatible with (35e). In fact, (35e) seems to be an invalid inference. Kolodny and MacFarlane argue that this puzzle poses a logical problem of how we should block the derivation of (35e) from (35b), (35c), and (35d). Kolodny and MacFarlane’s solution to this logical problem is to make one of the inference rules invalid; by giving up
modus ponens in the semantics of a conditional, the derivation of (35e) from (35b), (35c), and (35d) can be blocked. Regarding this, what Kolodny and MacFarlane argue is that since the truth of the antecedent depends on the information state of the agents, modus ponens is not necessarily valid. Kolodny and MacFarlane’s solution will be described in more detail shortly.

In addition to the above dilemma, the miners puzzle poses a problem for the standard framework. The problem is how the semantic machinery derives all of the salient verdicts (Cariani et al. 2013: 227). As Cariani et al. show, the semantic problem directly affects the standard linguistic picture of deliberative modality. The standard Kratzerian framework analyzes *ought* as a weak necessity operator, but this theory fails to account for the truth of (35a) in the scenario because, regardless of whether the modal is circumstantial or epistemic, the best ranked worlds are worlds in which they block the shaft where the miners are, not worlds in which the agents block neither shaft (Cariani et al. 2013: 246). Considering the miners scenario above, the relevant ordering source is defined as follows:

(36) \{ all miners are saved, at least 9 miners are saved, ..., at least 1 miner is saved \}

According to this ordering source, the best worlds should be the worlds in which we block either shaft A or shaft B, and save all miners. This implies that, under this framework, (35a) is judged to be false and (35b) and (35c) are judged to be true. This conclusion conflicts with our intuitions that, under uncertainty, we should block neither shaft in order to save more miners.

First, I discuss Kolodny and MacFarlane’s analysis of the miners problem. As Kratzer (1981) uses a pair of conversational backgrounds, Kolodny and MacFarlane (2010) use two parameters: the *information state* and the *selection function*. They model an information state as a set of possible worlds, and argue that epistemic and deontic modals are sensitive to an information state. This is similar to the modal base in Kratzer’s framework. The
second parameter is a deontic selection function which maps an information state to the set of worlds that are as deontically ideal as possible. This parameter corresponds to the ordering source in the standard framework. A central argument in Kolodny and MacFarlane’s theory is that deontic selection functions are seriously information-dependent. That is, as the information state is shifted, both the set of ideal worlds and the ranking of worlds vary. Kratzer would agree that the modals are sensitive to the modal base and the set of ideal worlds shifts. What is different from Kratzer’s framework is the fact that the ranking of worlds can shift.

What (37) tells us is that the best course of action could change as more information becomes available. Relying on this property, Kolodny and MacFarlane successfully account for the deliberative reading in the given scenario; relative to the original information state, the best ranked worlds are those in which we block neither shaft. However, in a richer information state where we know the location of the miners, the best ranked ones are in which we block the shaft where the miners are.

As Cariani et al. (2013: 242) point out, however, Kolodny and MacFarlane’s approach is not completely satisfying either, since their theory does not provide a systematic account of how the selection function works and what the selection function looks like. For this reason, Cariani et al. claim that giving up the ordering source in favor of the less transparent selection function would be a significant cost.

Returning to the point that the standard modal analysis cannot adequately account for the truth of (35a), Cariani et al. propose an extension of the standard Kratzerian framework.
by emphasizing the importance of (37). The core idea of their proposal is that, in addition to two conversational backgrounds (modal base and ordering source), deliberative modality is sensitive to a contextually salient decision problem $\delta$. This decision problem identifies the set of actions from which the agent has to choose in that world (Cariani et al. 2011: 21, 2013: 246), and filters into the ordering source to affect the ranking.

(38) Definition of filtering

Let $\delta$ be a decision problem and $f$ a modal base. The result of filtering $\delta$ by $f$ is a decision problem $[\delta|f]$ defined as follows: For all worlds $w$, $[\delta|f](w) = \{ \cap(f(w) \cup \{p\}) \mid p \in \delta(w) \}$ (Cariani et al. 2011: 22, 2013: 247)

The relevant ordering source is repeated here:

(39) {all miners are saved, at least 9 miners are saved, ..., at least 1 miner is saved.}

In addition, we have three options in the decision problem:

(40) {we block shaft A, we block shaft B, we block neither shaft}

The ranking below shows how the ordering operates in the miners scenario (Cariani et al. 2011: 24)\(^5\):

(41) $u \leq [\delta|f](w) \text{ v iff } \{p \in g(w) \mid [v]_{[\delta|f](w)} \subseteq p\} \subseteq \{p \in g(w) \mid [u]_{[\delta|f](w)} \subseteq p\}$

[u] refers to the cell that contains u. In this theory, distinguishing [u] from u is crucial. Consider, for example, that u is a world in the set of worlds where we block shaft A. If the miners are in shaft A and we block shaft A, then we save ten miners. However, this is not always the case. A world u can be the one where we block shaft A but the miners are in shaft B. In this case, we save none. The effect of introducing the decision problem $[\delta|f]$ refers to “the function that results from combining the modal base $f$ with the decision problem, which, at each world, returns a restriction of the decision problem to the worlds in the modal base.” (Cariani et al. 2011: 22)

\(^5\)Cariani et al. (2013: 248) use different notation. I used the earlier version for simplicity.
is that in comparing actions, “each is only as good as the worst outcome it can possibly have” (Cariani et al. 2013: 249). Consequently, the theory predicts that, under uncertainty, the set of worlds in which we block shaft A contains both worlds in which the miners are in shaft A and worlds in which the miners are in shaft B. The same applies to the worlds in which we block shaft B. Each action may save ten miners or none. When we block neither shaft, however, nine miners are saved, regardless of whether miners are in shaft A or in shaft B. Since the worst outcomes we compare are “no miners are saved” vs. “nine miners are saved”, the worlds in which we block either shaft are outranked by the worlds in which we block neither. If the information state is updated with the information that the miners are in shaft A, then we restrict the initial set of worlds in which the miners are in shaft A, and rank those worlds. Now, the best ranked worlds are those in which we block shaft A.

We have seen that, in Cariani et al’s theory, the ranking and the best-ranked worlds vary with information, but the ordering source remains constant (Cariani et al. 2013: 257). In this theory, both the decision problem and ordering source are used to induce the ordering on the worlds in the modal base. This is different from Kratzer’s modal semantics, in which the ordering is induced solely by the ordering source.

2.1.3 Summary

So far, I summarized Kratzer’s standard modal semantics and the recent developments which have expanded on Kratzer’s semantics. These include Condoravdi’s temporal semantics for modal sentences, Rubinstein’s weak necessity modals, and Cariani et al’s discussion on deliberative modality. In this dissertation, I will develop a modal theory that elaborates the standard modal semantics as well. Based on the above discussion, now I will try to connect what I’ve learned from the previous studies to my proposal.

On the basis of possible world semantics, the semantics of tense I will adopt is based on the Reichenbachian (1947) framework and Condoravdi’s semantic analysis of temporal
interpretations of modals. Reichenbach introduces the notion of reference time, which allows us to account for the distinction between simple past and present perfect in English. Following Reichenbach, in my proposal, the eventualities are located relative to the reference time. The notion of reference time will be incorporated with Condoravdi’s two temporal parameters, which are more systematically encoded in Korean modal sentences due to the morphosyntactic properties.

In order to solve the puzzle involving the priority modal, Rubinstein’s insight that modal presuppositions differ according to the modal strength will be useful, even though differences between strong and weak preferences are not directly related to my analysis. The idea I will pursue instead is that modals have different presuppositions, depending on the modal flavor. In my proposal, the crucial part of the definitions of circumstantial modals is choosing, which is a modal concept. That is, circumstantial modals put certain properties into the agent’s To-Do Lists while epistemic modals do not.

The reason why I am particularly interested in Cariani et al.’s theory is the fact that the decision problem is associated with different sets of accessible worlds. The set of possible actions (the decision problem) influences the definition of the ordering, and ultimately the set of worlds which the modal quantifies over, as we learn more about the world. The idea of the set of possible actions (the decision problem) is similar to that of choosing because both involve the agent’s action and the agent’s choosing options change over time in both cases.

2.2 Background on Korean Modal Expressions

The notion of modality in Korean has been confused with other grammatical categories such as mood or clause type. This is because the definition of modality has not been well-established in the literature. In consequence, what is included in the category of modality
and what is not varies depending on the author. For example, Park (2006) defines modality as “the speaker’s attitude towards the proposition expressed” following Lyons (1977: 452), and argues that pre-final particles and final particles express modality while adverbs and periphrastic constructions do not. The following examples are from Park (2006: 13-15, emphasis/translations added):

(42) a. Ecey Yenghi-ka pyengwon-ey ka-te-la.
    yesterday Yenghi-NOM hospital-LOC go-MOD-DEC
    ‘I saw that Yenghi went to the hospital yesterday.’

b. Yenghi-ka hakkyo-ey ka-ney.
   Yenghi-NOM school-LOC go-MOD
   ‘Now I know that Yenghi goes to school.’

c. Amato ku-nun cwuk-ess-ul kes-i-ta.
   maybe he-TOP die-PAST-COMP BN-COP-DEC
   ‘He may have died.’

d. Haksayng-un kongpwu-lul yelsimhi hay-ya ha-n-ta.
   student-TOP study-ACC hard do-COMP AUX-NONP-DEC
   ‘Students must/have to study hard.’

According to Park, (42a) and (42b) convey modality while (42c) and (42d) do not. She excludes (42c) because the meaning of amato ‘maybe’ comes from the lexical meaning and (42d) because the periphrastic expression –eya ha– does not convey the speaker’s attitude but describes the subject’s obligation. J. Kim (1998), on the other hand, argues that (42d) still conveys modal meaning but (42c) does not.  

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6 For this reason, most of the studies on modality in Korean have focused on the pre-final or final particles which contain some kind of modal meanings (Park 2006).

7 Focusing particularly on –ul swu iss– constructions, Shi and Kim (2009) argue that the syntactic structure of –ul swu iss– constructions is unambiguously a double nominative construction, and not a modal construction at all. They argue that the primary meaning of –ul swu iss– constructions is possibility and other meanings are derived from the possibility meaning. The meaning of possibility comes from the bound noun swu. Bound nouns refer to defective nouns which need to be preceded by a demonstrative, a clause, or another noun (Sohn 1999: 205).
There are several properties that make Shi and Kim conclude that –ul swu iss– constructions are not modal. First, only –ul swu iss– constructions allow a nominative case marker (–i or –ka) after the bound noun swu.

(i) a. Ku-ka ttena-l tus(*-i) hay-ss-ta.  
   he-NOM leave-COMP BN-NOM do-PAST-DEC  
   ‘He seems to leave.’

b. Ku-ka ttena-l moyang(*-i) i-keyss-ta.  
   he-NOM leave-COMP BN-NOM COP-MOD-DEC  
   ‘He seems to leave.’

c. Ku-ka ttena-l kes(*-i) kath-ta.  
   he-NOM leave-COMP BN-NOM seem-DEC  
   ‘He seems to leave.’

d. Ku-ka ttena-l swu-ka iss-ta.  
   he-NOM leave-COMP BN-NOM exist-DEC  
   ‘He may/can leave.’ (Shi and Kim 2009: 133, translations added)

Unlike other modal constructions in (ia-c), the –ul swu iss– construction in (id) takes a nominative marker after the bound noun swu; thus, there are two noun phrases that are marked with a nominative marker. Shi and Kim argue that this fact suggests that the –ul swu iss– construction is a double nominative construction.

Second, –ul swu iss– constructions behave differently from other modal constructions in the scope of negation. Compare (ii) and (iii) with (iv).

    I-TOP again come-COMP NEG-MOD-DEC  
    ‘I will not come again.’

b. [[NEG [I again come]] will]

     he-TOP come-COMP BN-AUX-COMP NEG-DEC  
     ‘It is probable that he will not come.’

b. [[NEG [he come]] will]

(iv) a. Ku-nun o-l swu iss-ci anh-ta.  
     he-TOP come-COMP BN AUX-COMP NEG-DEC  
     ‘He cannot come.’

b. [NEG [[he come] can]]

In modal constructions with a particle –keyss and with a bound noun tus, as in (ii) and (iii), what NEG negates is the proposition, not the modal expression. In (iv), however, the modal –ul swu iss
In this dissertation, I define modality as a grammatical category which allows us to talk about possibilities and necessities. These modal meanings are formally analyzed with the notion of possible worlds. I adopt Kratzer’s ordering semantics which is based on modal logic to capture the meaning of modal expressions. With this definition, we can say that there is a variety of ways to express modality, including verbal morphology, auxiliaries, and adverbs. Therefore, all of the sentences in (42a-d) belong to modality. The main focus of the dissertation is on periphrastic constructions like (42d).

In this section, I move on to discussing relevant syntactic and semantic background assumptions specific to Korean modal constructions. In 2.2.1, I present syntactic discussion of Korean modal expressions. In 2.2.2, I discuss temporal interpretations of modal sentences.

2.2.1 Syntax

Unlike English where the modal auxiliaries are morphologically independent, modal expressions in Korean are often formed in a more complex way due to the agglutinative nature of the language. Korean periphrastic modal constructions consist of either (i) a complementizer, a bound noun, and an auxiliary, or (ii) a complementizer and an auxiliary. Table 2.1 below illustrates periphrastic modal expressions in the verbal domain in Korean. Following Portner (2009: 134), I assume a three-way distinction to classify sentential modality: epistemic, priority, and dynamic modality. In addition to this semantic distinction, a modal expression can be classified according to whether it is a possibility modal or a necessity modal. (i)-type modal constructions are related to the discussion in

\footnote{`can’ is in the scope of NEG, so the meaning of ability becomes the meaning of inability. In my opinion, however, even if we assume that the ambiguity is from the bound noun swu, we still need to call –ul swu iss– constructions modal constructions because the bound noun swu itself has a modal flavor.}

\footnote{I will use the term the ‘auxiliary (predicates)’ to include both the auxiliary verbs and the auxiliary adjectives.}
Chapter 3. Chapter 3 is about the modal expression –ul swu iss– which has epistemic, permission, and ability readings. (ii)-type modal constructions are related to the discussion in Chapter 4. Chapter 4 is about the modal expression –eya ha– for obligation.

<table>
<thead>
<tr>
<th>Possibility</th>
<th>Epistemic</th>
<th>Priority</th>
<th>Dynamic</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-un/l moyang-i- (conjecture)</td>
<td>-eto toy- (permission)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-ul swu iss- (conjecture)</td>
<td>-eto coh- (permission)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-un/l kes kath- (conjecture)</td>
<td>-eto kwaynah- (permission)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-un/l tus-ha- (conjecture)</td>
<td>-ul swu iss- (permission)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-un/l seng-siph- (conjecture)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Necessity</td>
<td>-ul li eps- (certainty)</td>
<td>-eya ha- (obligation)</td>
<td>-ul swu iss- (ability)</td>
</tr>
<tr>
<td></td>
<td>-ul/n kes-i- (certainty)</td>
<td>-eya toy- (obligation)</td>
<td>-ul cwul al- (ability)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-un kes-i coh- (desire/goal)</td>
<td>-ul kes-i- (volition)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-umyen ha/siph- (desire)</td>
<td>-koca ha- (volition)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>-ulyeko ha- (volition)</td>
</tr>
</tbody>
</table>

Table 2.1: Periphrastic modal expressions in Korean

Despite their apparent complexity, periphrastic constructions are semantically more transparent than other modal expressions that are already grammaticalized.9

In the literature, not many studies have explored the structure of periphrastic modal constructions. In this section, I will discuss how we should analyze these modal constructions syntactically.

The structure of (i)-type modal constructions is a bound noun construction. Swu, cwul, kes, and tus are bound nouns10 which cannot stand alone. An important thing to note is that bound nouns impose restrictions on the type of predicate which may follow them (Kim and Yang 2007: 164). For example:

    John-NOM come-COMP BN not.exist-DEC/exist-DEC/seem-DEC
    ‘It is unlikely that John will come.’

    John-NOM come-COMP BN do-DEC/not.exist-DEC/seem-DEC

9For example, the pre-final modal/tense particle –keyss– is known to have gone through the grammaticalization process: –key-ha-ess– > –key-ess– > –keyss– (Jeong 2007: 125).
10Bound nouns refer to defective nouns which need to be preceded by a demonstrative, a clause, or another noun (Sohn 1999: 205).
‘It seems that John will come.’

   John-NOM come-COMP BN seem-DEC/exist-DEC
   ‘It seems that John will come.’ (Kim and Yang 2007: 165)

As we can see from (43), the bound noun li allows only the predicate eps– ‘not exist’, the bound noun tus combines only with the auxiliary predicate ha–, and the bound noun kes combines with the predicate kath– ‘seem’. The structure of (44a) is illustrated in (44b):

   Chelswu-NOM game-ACC win-NONP-COMP BN AUX-PAST-DEC
   ‘Chelswu was able to win the game.’

b. 

\[
\begin{align*}
&\text{SentMoodP} \\
&\quad \text{TP}_1 & \text{SentMoodP} \\
&\quad \quad \text{VP}_1 & \text{T}_1 & -\text{ta} \\
&\quad \quad \quad \text{NP} & \text{V}_1 & -\text{ess} \\
&\quad \quad \quad \text{CP} & \text{N} & \text{iss} \\
&\quad \quad \quad \quad \text{TP}_2 & \text{C} & \text{swu} \\
&\quad \quad \quad \quad \quad \text{VP}_2 & \text{T}_2 & -l \\
&\quad \quad \quad \quad \quad \quad \quad \text{sihap-ul iki-} \phi
\end{align*}
\]

Modal constructions with a bound noun consist of two clauses as in (44).\(^{11}\)

\(^{11}\)Sentence final particles mark sentence types in Korean (Pak 2004).
When it comes to (ii)-type modal constructions, what they have in common is that the constructions contain two predicates: one is the main predicate and the other is the auxiliary. In Korean, there are other constructions which contain multiple predicates like periphrastic modal constructions. Two distinct categories are as follows:

(45) a. Two predicates but one CP: compound verb constructions

Yengho-ka kyeytan-ul olu-a-ka-ass-ta.
Yengho-NOM stairs-ACC climb-COMP-go-PAST-DEC
‘Yengho went up the stairs.’

b. Two predicates and two CPs: causative constructions

Yengho-ka Chelswu-lul wus-key hay-ss-ta.
Yengho-NOM Chelswu-ACC laugh-COMP do-PAST-DEC
‘Yengho made Chelswu laugh.’

(45a) is an example of compound verb constructions, and (45b) is an example of causative constructions. The compound verb construction in (45a) is mono-clausal even though the predicate olu-a-ka– (ollaka–) ‘go up’ contains two predicates, olu– ‘climb’ and ka– ‘go’. In contrast, the causative construction in (45b) is bi-clausal and the complementizer –key marks the clause boundary. Now I examine which category in (45) periphrastic modal constructions are closer to. This question is directly related to the question of whether the whole clause is a simple sentence or a complex sentence.

First, let’s assume that the main predicate and the auxiliary predicate in modal constructions behave as a single processing unit and the whole sentence is a simple sentence. First of all, unlike main predicates, an auxiliary does not select a subject argument.

(46) Chelswu-nun hakkyo-ey ka-ya ha-n-ta.
Chelswu-TOP school-LOC go-COMP AUX-NONP-DEC
‘Chelswu must/has to go to school.’
The subject Chelswu in (46) is the argument of ka– ‘go,’ not of the auxiliary ha–.\(^{12}\) In the complex construction, illustrated in (47), however, the auxiliary selects a subject argument: 

\(\text{wuli} \text{ ‘we’ is the argument of the auxiliary.}\)

\[\text{(47) Wuli-nun Chelswu-lul hakkyo-ey ka-key hay-ss-ta.} \]
\[\text{we-TOP Chelswu-ACC school-LOC go-COMP AUX-PAST-DEC} \]
\[\text{‘We made Chelswu go to school.’}\]

This shows that the argument structure of modal constructions is different from that of causative constructions (complex constructions).

Secondly, the fact that an adverb cannot intervene between a complementizer and an auxiliary supports that the complementizer and the auxiliary form a single processing unit.

\[\text{(48) a. Chelswu-nun hakkyo-ey ilccik ka-ya ha-n-ta.} \]
\[\text{Chelswu-TOP school-LOC early go-COMP AUX-NONP-DEC} \]
\[\text{‘Chelswu must/has to go to school early.’}\]

\[\text{b. *Chelswu-nun hakkyo-ey ka-ya ilccik ha-n-ta.} \]
\[\text{Chelswu-TOP school-LOC go-COMP early AUX-NONP-DEC} \]
\[\text{‘Chelswu must/has to go to school early.’}\]

(48b) is ungrammatical because the adverb ilccik ‘early’ cannot modify the auxiliary only. This pattern is more similar to compound verb constructions (mono-clausal) than to causative constructions (bi-clausal).

\[\text{(49) a. Cheli-nun pappi ttwi-e-tani-ess-ta.} \]
\[\text{Chelswu-TOP busily run-COMP-go-PAST-DEC} \]
\[\text{‘Cheli ran around busily.’}\]

\[\text{b. *Cheli-nun ttwi-e pappi tani-ess-ta.} \]
\[\text{Chelswu-TOP run-COMP busily go-PAST-DEC} \]
\[\text{‘Cheli ran around busily.’} \quad (Y. \text{Kim 1993: 161, slightly modified})\]

\(^{12}\)\text{When the subject is halapeci ‘grandfather’, we attach the honorific marker \text{–usi to the main predicate ka–, not to the auxiliary ha–.}\)
As in (49b), compound verb constructions do not allow any adverb to intervene between two predicates. The two predicates form a compound verb and the whole sentence is considered to be a simple sentence. The difference between (48) and (49) is that the adverb modifies the main predicate in (48a) while the adverb modifies the compound verb in (49a).

Third, unlike complex constructions like (50), modal constructions do not allow the negative adverb *an* to appear in front of the auxiliary.\(^{13}\) This argument is similar to the previous one because both of them discuss the possibility of adverb insertion.

\[(50)\]
\begin{enumerate}
\item a. Wuli-nun Cheli-lul an ka-key hay-ss-ta.
   
   we-TOP Cheli-ACC NEG go-COMP AUX-PAST-DEC
   
   ‘We let Cheli not go.’
   
   b. Wuli-nun Cheli-lul ka-key an hay-ss-ta.
   
   we-TOP Cheli-ACC go-COMP NEG AUX-PAST-DEC
   
   ‘We did not let Cheli go.’ \(\text{(Y. Kim 1993: 163, slightly modified\(^{14}\))}\)
\end{enumerate}

\[(51)\]
\begin{enumerate}
\item a. Chelswu-nun hakkyo-ey an ka-ya ha-n-ta.
   
   Chelswu-TOP school-LOC NEG go-COMP AUX-NONP-DEC
   
   ‘Chelswu must not go to school.’
   
   b. *Chelswu-nun hakkyo-ey ka-ya an ha-n-ta.
   
   Chelswu-TOP school-LOC go-COMP NEG AUX-NONP-DEC
   
   ‘Chelswu must not go to school.’
\end{enumerate}

The pattern of (51) is parallel to that of compound verb constructions which are treated as simple sentences. Consider (52):

\(^{13}\)In Kyungsang dialect, however, the negative adverb can intervene in sentences like (51a). (p.c. Pak)

\[(i)\]
\begin{enumerate}
\item ka-ya an ha-na?
   
   go-COMP NEG AUX-INT
   
   ‘You must go, mustn’t you?’
\end{enumerate}

\(^{14}\)Y. Kim (1993: 163) uses *mos* ‘cannot’ instead of *an* ‘not’.
In (52), the negative adverb *an* cannot be located between two predicates in compound verb constructions. We can see that periphrastic modal constructions are more like compound verb constructions than causative constructions.

So far, we have seen that the first view is substantiated by several pieces of evidence. However, there is significant evidence in favor of the opposite argument as well: that periphrastic modal constructions are different from simple sentences, and more like complex sentences.

First, the realization of the honorific morpheme –usi in modal constructions supports that the whole construction consists of two clauses.

   AUX-HON-PAST-DEC
   ‘My grandfather had to meet Chelswu.’

   AUX-PAST-DEC
   ‘My grandfather had to meet Chelswu.’

   AUX-HON-PAST-DEC
   ‘My grandfather had to meet Chelswu.’
As we can see in (53), the subject honorific –usi must be attached within the main predicate, not the auxiliary.\(^{15}\) This pattern is different from that of compound verb constructions. Consider (54):

\[
\begin{align*}
(54) \quad & \text{a. Sacang-nim-un } \text{ku il-ul } \text{mil-e-pwuthi-si-ess-ta.} \\
& \text{chief-BN(HON)-TOP that matter-ACC push-COMP-attach-HON-PAST-DEC} \\
& \quad \text{‘The chief pushed ahead with that matter.’} \\
& \text{b. *Sacang-nim-un } \text{ku il-ul } \text{mil-usi-e-pwuthi-ess-ta.} \\
& \text{chief-BN(HON)-TOP that matter-ACC push-HON-COMP-attach-PAST-DEC} \\
& \quad \text{‘The chief pushed ahead with that matter.’} \\
& \text{c. *Sacang-nim-un } \text{ku il-ul} \\
& \text{chief-BN(HON)-TOP that matter-ACC} \\
& \text{mil-usi-e-pwuthi-si-ess-ta.} \\
& \text{push-HON-COMP-attach-HON-PAST-DEC} \\
& \quad \text{‘The chief pushed ahead with that matter.’} \quad (Y. Kim 1993: 176, translations added)
\end{align*}
\]

In (54), the subject honorific –usi can only be attached to the second predicate. (54b) and (54c) are ungrammatical because, in a simple sentence, it is the second predicate which takes the verbal inflection for the honorific marking. This shows that two predicates mil– ‘push’ and pwuthi– ‘attach’ form a compound predicate and the whole sentence is treated as a simple sentence.

The second piece of evidence involves the NPI and its licensing negation.

\[
\begin{align*}
(55) \quad & \text{a. [Chelswu-nun amwukesto mek-ci anh-aya] ha-n-ta.} \\
& \text{Chelswu-TOP nothing eat-COMP NEG-COMP AUX-NOPP-DEC} \\
& \quad \text{‘Chelswu must not eat anything.’} \\
& \text{b. *[Chelswu-nun amwukesto mek-eya] ha-ci anh-nun-ta.} \\
& \text{Chelswu-TOP nothing eat-COMP AUX-COMP NEG-NOPP-DEC} \\
& \quad \text{‘Chelswu must not eat anything.’}
\end{align*}
\]

\(^{15}\)The honorific morpheme –usi is realized as –si after a vowel-ending stem (phonologically conditioned allomorphs).
Given the hypothesis that there is a clause-mate constraint between NPIs and their licensing negation in Korean, (55a) and (55b) clearly show that the modal sentence consists of two clauses.

Third, the fact that the past tense morpheme can be realized within the main predicate (i.e. the predicate of the embedded clause) shows that the construction is not a simple sentence.

(56) a. Chelswu-nun cemsim-ul mek-eya ha-n-ta.
    Chelswu-TOP lunch-ACC eat-COMP AUX-NONP-DEC
    ‘Chelswu must/has to eat lunch.’

b. Chelswu-nun cemsim-ul mek-eya hay-ss-ta.
    Chelswu-TOP lunch-ACC eat-COMP AUX-PAST-DEC
    ‘Chelswu had to eat lunch.’

c. Chelswu-nun cemsim-ul mek-ess-eya ha-n-ta.
    Chelswu-TOP lunch-ACC eat-PAST-COMP AUX-NONP-DEC
    ‘Chelswu should have eaten lunch.’

    Chelswu-TOP lunch-ACC eat-PAST-COMP AUX-PAST-DEC
    ‘Chelswu had/needed to have eaten lunch.’

(56), however, is not a convincing piece of evidence because tense patterns in complex sentences are not consistent in Korean. For example, some complementizers do not take finite clauses even though the whole sentence is a complex sentence. I take (56) as a piece of evidence that there is a TP within the embedded clause and the whole sentence consists of two clauses.

All of the evidence we saw so far supports the idea that periphrastic modal constructions behave more like complex sentences than simple sentences.

In this section, I discussed some relevant syntactic properties of modal constructions. Based on the above discussion, in this dissertation, I argue that periphrastic modal construc-
tions are syntactically formed by two clauses. A tree diagram will be useful to understand how modal sentences are structured. The structure of (57a) is illustrated in (57b):

(57) a. Chelswu-nun kicha-lul tha-ss-eya ha-n-ta.
   Chelswu-TOP train-ACC take-PAST-COMP AUX-NONP-DEC
   ‘Chelswu should have taken the train.’

b. 

As we can see, the auxiliary predicate ha– is base-generated in V (=V₁), not merged in the modal heads, even though modal expressions in Korean are semantically like modal auxiliaries in English. In order to explain why these modal constructions are semantically mono-clausal, I adopt Choe’s (1988) restructuring rules.

I treat periphrastic modal expressions in Korean as single semantic units, and argue that they function as sentential operators. This is a case where the grammatical category and the semantic category do not coincide. In the next section, I discuss temporal relations between tense and modality.
2.2.2 Temporal Properties of Modal Expressions

Tense is an essential grammatical category in Korean. In some sentences, however, tense does not seem to be encoded.

(58) Onul hanul-i malk-∅-ta.
    today sky-NOM clear-NONP-DEC
    ‘The sky is clear today.’

In (58), no tense is grammatically marked. If we compare this sentence with the same one in the past tense (59), the interpretation of (58) becomes clearer.

(59) Ecey hanul-i malk-ass-ta.
    yesterday sky-NOM clear-PAST-DEC
    ‘The sky was clear yesterday.’

In (59), now the tense is grammatically marked with the –ass morpheme\(^{16}\), and this contrasts with the non-past tense of (58). The postulation of ∅ reflects the fact that tense is a necessary grammatical element in sentences in Korean.\(^ {17}\) Before I move on to discussing the temporal properties of modal expressions, I will briefly discuss the temporal meanings of the temporal markers in Korean. I will focus on two temporal markers: –ess and ∅/nun.

\(^{16}\) The past tense morphemes –ess, –ass, and –ss are allomorphs.

\(^{17}\) The previous literature on the tense system in Korean has focused more on temporal interpretations of root sentences than those of complex sentences (S.-y. Moon 2009: 207). Regarding temporal interpretations of complex sentences, it has been argued that the embedded tense receives a relative temporal meaning while the root tense receives an absolute temporal meaning. As pointed out by Kwon (1992) and S.-y. Moon (2009) independently, however, temporal interpretations of complex sentences are extremely complicated since many of the subordinating/embedding conjunctives are polysemous, and whether or not they combine with tense elements depends on each meaning. That is, embedded tenses are not analyzed in a uniform way; hence, it is difficult to generalize how embedded tenses are interpreted. Korean complementizers (subordinating/embedding conjunctives) are divided into two types, depending on whether or not they may combine with tense elements. Interestingly, the complementizers in priority modal expressions (i.e. –eya, –eto) can combine with tense morphemes, whereas the complementizers in dynamic modal expressions (i.e. –koca, –ulyeko) cannot.
The most controversial issue regarding these two markers is whether they are tense markers or aspect markers. In the dissertation, I analyze –ess as a past tense marker and ∅/nun as a non-past tense marker. First, let’s focus on the past tense marker –ess, and then move on to the non-past tense marker ∅/nun.

The supporting evidence of the argument that –ess is a past tense marker is that –ess is only compatible with a past-time denoting time adverbial. Consider the following example:

(60) Chelswu-ka ecey/#cikum/#nayil ca-ass-ta.
    Chelswu-NOM yesterday/now/tomorrow sleep-PAST-DEC
    ‘Chelswu slept yesterday/#Chelswu is sleeping now/#Chelswu will be sleeping tomorrow.’
    (J. Lee 2011: 13)

In (60), –ess can co-occur with ecey ‘yesterday’ but not with cikum ‘now’ or nayil ‘tomorrow’. This clearly shows that –ess marks pastness. In the literature, however, some authors (Sohn 1995, Nam 1978) argue that –ess has a perfective meaning. Consider (61):

    flower-NOM bloom-?-TRANS die-PAST-DEC
    ‘The flowers died while they were still blooming.’

    flower-NOM bloom-ESS-TRANS die-PAST-DEC
    ‘The flowers bloomed, and then died.’
    (Sohn 1995: 28)

Sohn argues –ess in (61b) marks that the flower blooming is completed; thus, –ess marks the perfectivity not the pastness.\(^{18}\) When –ess is not present, as in (61a), the sentence conveys that the same eventuality is not completed. It seems that, in some contexts, –ess has a perfective aspect meaning rather than a past tense meaning. Then, is (61b) a counterexample for the view that –ess is a past tense marker? E.-H. Lee (2007) and J. Lee (2011)

\(^{18}\)The connective taka means ‘a shift in action or or a transition to another action’ (E.-H. Lee 2007: 5). Sohn (1995) calls –taka the transferentive marker.
argue that (61) is accounted for by the relative tense behavior of –ess in an embedded clause. That is, the embedded tense is interpreted with respect to the eventuality denoted by a matrix clause, not with respect to the utterance time. According to this view, the flower blooming eventuality in (61b) is located in the past with respect to the time of the flower dying eventuality. In (61a), in contrast, the time of the flower blooming eventuality overlaps with the time of the flower dying eventuality. I agree with the argument that –ess in (61b) is not necessarily a perfective marker.

The following example further supports that –ess is a past tense marker.

    Minji-TOP that time book-ACC read-PROG-PAST-DEC
    ‘Minji was reading a book then.’ (E.-H. Lee 2007: 7)

In (62), –ess co-occurs with the progressive marker (i.e. imperfective aspect). As E.-H. Lee claims, if –ess were a perfective marker, it would be difficult to explain how two conflicting aspects occur together. Therefore, I view that –ess is a past tense marker, and the perfective meaning can be derived from its past tense meaning.

The discussion regarding the temporal marker –nun is similar to the discussion of the temporal marker –ess. Consider the following example:

(63) Chelswu-ka #ecey/cikum/nayil ka-n-ta.
    Chelswu-NOM yesterday/now/tomorrow go-NONP-DEC
    ‘Chelswu is going/goes #yesterday/now/tomorrow.’

(63) shows that –nun is compatible with the non-past time adverbials, but not with the past-time adverbial. Similar to the case of –ess, I take (63) as supporting evidence that –nun is a non-past tense marker. The proposal that –nun is a non-past tense marker is controversial, however. Some authors (D.-S. Kim 1988, H. S. Lee 1991) argue that –nun is an imperfective aspect marker. One piece of supporting evidence is the fact that –nun cannot occur with adjectival predicates.
(64)  a. John-un aphu-∅-ta.
    John-TOP be.sick-NONP-DEC
    ‘John is sick.’

    John-TOP be.sick-NONP-DEC
    ‘(intended): John is sick.’
    (Song 1999: 106-7)

    John-TOP be.sick-PROG-DEC
    ‘(intended): John is being sick.’

As we can see from (64b), –nun cannot occur with adjectival predicates. This suggests that –nun is not a non-past marker, but the imperfective marker. This argument is based on the fact that, in Korean, adjectival predicates cannot occur with the progressive aspect, as in (64c). If –nun is a progressive (imperfective) marker, the parallel patterns of (64b) and (64c) are explained.

There are several pieces of evidence that –nun is not an imperfective aspect marker, however. First of all, if we analyze –nun as an imperfective aspect marker, then (63) becomes problematic because we cannot account for how –nun occurs with the temporal adverb nayil ‘tomorrow’. In addition, as Song (1999) argues, if –nun is an imperfective aspect marker, then it should be freely interchangeable with the progressive aspect marker –ko iss–. However, this is not the case.

(65)  a. Ku-nun nayil mikwuk-ey ka-n-ta.
    he-TOP tomorrow U.S.-to go-NONP-DEC
    ‘He goes to the U.S. tomorrow.’
    (Song 1999: 112)

    he-TOP tomorrow U.S.-to go-PROG-DEC
    ‘He is going to the U.S. tomorrow.’
    (Song 1999: 11319)

19 Song (1999) uses –nun cwung-i– for the progressive aspect. The effect is the same.
As we can see from (65), –nun cannot be replaced by the progressive marker –ko iss–. (65b) is ungrammatical.

In order to explain the data in (64), we can say that the marker –nun is used for verbs and it alternates with ∅ when it combines with adjectival predicates (J. Lee 2011). That is, the realization of the null tense in (64a) is due to the distributional constraint. E.-H. Lee (2007: 5, footnote 7) also discusses that the present (non-past) tense is encoded by ∅/nun depending on the predicates. Based on the discussion above, I analyze ∅/nun as a non-past tense marker.

2.2.2.2 THE EMBEDDED TENSE IN MODAL CONSTRUCTIONS

Regarding the embedded tense in modal constructions, I have to examine whether or not the embedded tense contributes to the truth-conditional meaning in that clause. Among others, S.-y. Moon (2009: 248) argues that the embedded –ess in –eya ha– constructions is not the typical past tense since it is not used to indicate the past situation but the past “unreal” situation. In contrast to this argument, I propose that the embedded –ess in –eya ha– constructions is temporal and receives the relative past tense meaning. This is because not all embedded past tense markers in modal constructions contribute to the meaning of unreality.20

20It is worthwhile to mention that the complementizers in dynamic modal expressions usually introduce non-finite clauses. For example, –ulyeko in –ulyeko ha– ‘will’ and –koca in –koca ha– ‘will’ never introduce finite clauses, even though these complementizers project full-fledged CPs.

(i) Chelswu-nun yenghwa-lul po-(*ass)-ulyeko hay-ss-ta.
    Chelswu-TOP movie-ACC see-(*PAST)-COMP AUX-PAST-DEC
    ‘Chelswu intended to watch a movie.’

Syntactically, there is no reason why an overt tense morpheme cannot appear in the embedded clause in (i). But at the same time, we have cross-linguistic evidence that some complementizers introduce non-finite clauses (Rus 2005: 14). What is relevant to my analysis is that the embedded tense, when it is overt, receives a temporal meaning and it determines the time at which the proposition is to hold.
If the embedded tense in modal constructions contributes to the temporal meaning and if modal constructions in Korean are semantically mono-clausal, then the remaining question is how we can account for the fact that two tense markers occur in one clause. In order to solve this puzzle, I argue that the status of embedded clauses in modal constructions is different from that of embedded clauses in other auxiliary constructions (i.e. quotative constructions and SEA constructions), which are analyzed as complex sentences. In non-modal auxiliary constructions like (66), there may appear two nominative-marked subjects: the subject of the embedded clause is *Yengho* while the subject of the matrix clause is *Swumi*.

(66) Swumi-ka Yengho-ka ku kulim-ul kuli-ess-ta-ko
Swumi-ka Yengho-NOM that painting-ACC draw-PAST-DEC-COMP
ha-n-ta.
AUX-NONP-DEC
‘Swumi says that Yengho drew that painting.’

In contrast, there appears to be only one nominative-marked subject in modal sentences.

(67) *Nay-ka Chelswu-ka swukcey-lul hay-∅-ya hay-ss-ta.
I-NOM Chelswu-NOM homework-ACC do-NONP-COMP AUX-PAST-DEC
‘I commanded that Chelswu had to do his homework.’

Given the assumption that the nominative case is licensed by a finite tense, the ungrammaticality of (67) supports that the embedded CP in modal sentences is different from a regular embedded CP. As I discussed in 2.2.1, in this dissertation, I assume that modal constructions are originally bi-clausal; thus, they may employ two tense markers. As a result of the restructuring process, however, modal constructions become mono-clausal. This is the main difference between the syntactic structures of modal constructions and complex constructions.
2.3 Overview of Previous Works on the Interaction between Tense/Aspect and Modals

This section surveys and evaluates the previous studies in which the interaction between modality and tense/aspect has been discussed. I will focus on three such cases: the ‘counterfactual’ reading in modal sentences in English, the ‘actuality entailment’ in modal sentences in French and Hindi, and ‘counterfactuality’ in counterfactual conditionals.

As we have seen in the introduction, modals referring to the past in English (e.g. *might have, should have* and *could have*) yield ‘unreality (contrary to fact)’ interpretations in certain contexts. In contrast, in French and Hindi, the combination of certain modals with perfective morphology gives rise to ‘actualization’ interpretations. Even though these two cases concern the opposite inference, some scholars explain the phenomenon in a similar way. By decomposing the combination of a modal with tense/aspect into two separate operators (the modal operator and the temporal operator), the authors analyze the counterfactual reading and the actuality entailment in terms of a scopal relation between the two operators. Condoravdi (2002) and Hacquard (2006, 2009) each propose such scope-based analysis. When it comes to the actuality entailment, there are other authors who deny such a structural account. Homer (2011), for example, proposes a purely semantic account, and Mari and Martin (2009) propose more pragmatic accounts.

In addition to the ‘counterfactuality’ and ‘actuality’ inferences found in modal sentences, I would like to mention the counterfactuality observed in counterfactual conditionals. Counterfactual conditionals are particularly interesting since we often find cases in which past tense morphology is not interpreted temporally. For this reason, the role of the past tense morphology in counterfactual conditionals has received much discussion (Iatridou 2000, Ippolito 2003, Arregui 2008). These three cases illustrate instances in which modality interacts with tense/aspect components.
Before I move on to the detailed discussion, I would like to briefly mention Cinque’s (1999) scopal hierarchy. Based on cross-linguistic observation that past tense may take scope over a root modal but not above an epistemic modal in the same clause, Cinque proposes that the set of functional projections associated with tense, aspect, and modality is fixed (Stowell 2004, Hacquard 2006). The simplified hierarchy in (68) is from Laca (2008):

\[
\text{ModP}_{\text{epistemic}} > \text{TP}_{\text{(Past)}} > \text{TP}_{\text{(Future)}} > \text{MoodP}_{\text{irrealis}} > \text{ModP}_{\text{alethic}} > [...] \text{ModP}_{\text{volitional}} \\
> [...] \text{TP}_{\text{(Anterior)}} > [...] \text{AspP}_{\text{retrospective}} > [...] \text{AspP}_{\text{prospective}} > \text{ModP}_{\text{obligation}} > \text{ModP}_{\text{permission/ability}}
\]

Cinque’s essential idea is that the semantic distinction is important in deciding the functional category, and hence the position, in which the modal occurs: “where the functional category giving rise to the epistemic reading is located higher up in the tree than the functional category giving rise to the root modal reading, with the functional category for tense located in between” (Stowell 2004: 630). Since the interpretation of modal sentences is not independent of tense or aspect operators, Cinque’s scopal hierarchy which illustrates the scope properties of tense, aspect, and modality will be relevant during the following discussions.

2.3.1 Counterfactuality in Modal Sentences

Condoravdi (2002) provides a unified analysis of temporal interpretations of epistemic and metaphysical modals referring to the present, the past, and the future. The discussion here will be mainly on how she analyzes the ambiguity between the epistemic reading and the metaphysical reading in *might have* sentences. For Condoravdi, the modals referring to the past involve two operators, a temporal operator (PERF) and a modal operator
She proposes that two distinct interpretations of might have constructions are derived from a scope-reversal mechanism between the two operators.

Condoravdi (2002) classifies modals into two groups: modals for the present (present tense modals) and modals for the past (past tense modals). In English, modals for the present (e.g. may, must, might, should, ought to) take the perspective of present, and they have a future orientation optionally with stative predicates and necessarily with eventive predicates (Condoravdi 2002). Modals for the past (e.g. may have, must have, might have, should have, ought to have) take the perspective of present with a past orientation. Unlike modals for the present, modals for the past can have two temporal readings. Condoravdi’s main discussion is on the ambiguity of modals for the past as in (69b).

(69)  
   a. He might win the game.
   b. He might have won the game.

While (69a) has a present perspective with future orientation, (69b) is ambiguous between two readings. (70a) and (70b) are two possible interpretations of (69b).

(70)  
   a. He might already have won the game.
   b. At that time, he might still have won the game.

Condoravdi’s idea is to tie two distinct readings in (69b) to different interpretations of might. Her strategy is to relate the scope relations to the modal flavors. More specifically, Condoravdi (2002) argues that epistemic modals in English may receive either an epistemic interpretation or a metaphysical interpretation, depending on whether the modal takes scope over or under a perfect. According to Condoravdi, (70a) involves an epistemic modality, and has an epistemic reading. The speaker talks about an epistemic possibility about the past from the perspective of the present. On the other hand, (70b) involves a metaphysical modality, and yields a counterfactual reading. The speaker talks about a future possibility
in the past: there was a possibility that the actual world could become a world in which he won the game, but this did not actualize.\textsuperscript{21}

Then, how exactly does her decompositional analysis derive the distinct interpretations as in (70a) and (70b)? By decomposing modals for the past into a modal and a perfect operator, Condoravdi explains the ambiguity with a scope-reversal.

\begin{align*}
(71) & \quad \text{a.} \quad \text{PRES (MIGHT (PERF (he win the game)))} \\
& \quad \text{b.} \quad \text{PRES (PERF (MIGHT (he win the game)))}
\end{align*}

In (71a), the modal \textit{might} takes scope over the perfect, and is interpreted as having the present perspective whereas in (71b), the perfect takes scope over the modal. In (71a), temporal perspective of the modal is the time of utterance and temporal orientation of the modal is prior to the utterance time. In (71b), the perspective of the modal is not the time of utterance but some time in the past (due to the covert perfect raising\textsuperscript{22}) and temporal orientation of the modal is future since the predicate \textit{win} is the eventive predicate (and since the sentence lacks the perfect, which would have a backward-shifting effect). In other words, the past perspective with a future orientation arises when the perfect takes scope over the modal. Now let’s look at the semantics of \textit{He might have won the game}, which involves present tense, the modal, and the perfect. The following semantic definitions are from Condoravdi (2002):

\begin{align*}
(72) & \quad \text{a.} \quad \text{MIGHT: } & \lambda P \lambda t \exists w' [w' \in MB(w, t) \& AT([t, _), w', P)] \\
& \quad \text{b.} \quad \text{PRES: } & \lambda P \lambda w [AT(\text{now}, w, P)] \\
& \quad \text{c.} \quad \text{PERF: } & \lambda P \lambda w \lambda t \exists t' [t' < t \& AT(t', w, P)]
\end{align*}

\textsuperscript{21}This analysis is similar to Mondadori’s (1978), who argues that counterfactuality involves a future possibility in the past.

\textsuperscript{22}I adopt Laca’s (2008: 4) terminology of ‘covert perfect raising’ to refer to Condoravdi’s scope-reversal mechanism.
Given the definitions, the derivation of *He might have won the game* is as follows (Condoravdi 2002: 73, 75, her (27) and (33)):

(73) *He might have won the game.*

a. **PRES (MIGHT$_{MB}$ (PERF (he win the game))):**

\[
\lambda w \exists w'[w' \in \text{MB}(w, \text{now}) & \exists t'[t' \prec \text{now} & w' \in \text{MB}(w, t') & \exists e[[\text{he win the game}](w')(e) & \tau(e, w') \subseteq t']]}
\]

b. **PRES (PERF (MIGHT$_{MB}$ (he win the game))):**

\[
\lambda w \exists w' \exists t'[t' \prec \text{now} & w' \in \text{MB}(w, t') & \exists e[[\text{he win the game}](w')(e) & \tau(e, w') \subseteq [t', _)]}
\]

The semantics in (73a) says that there is a world $w'$ which is epistemically accessible from the base world $w$ at the utterance time, such that the event of his winning the game in $w'$ must be included in a temporal interval that precedes the interval $[\text{now}, _)$. Hence, the winning event precedes the time of utterance. The semantics in (73b) says that there is a time $t'$ which precedes the time of utterance and there is a world $w'$ which is metaphysically accessible from the base world $w$ at some time $t'$ such that the future of $t'$ includes the event of his winning the game. This means that the complement of the modal has a future-shifted interpretation, and his winning in the actual world has not yet been determined at the time of the modal evaluation. According to Condoravdi, the counterfactual interpretation arises from a pragmatic inference induced by the speaker’s choice of a modal for the past (i.e. a conversational implicature). The speaker uses a ‘modal for the past’ instead of a ‘modal for the present’ to expand the domain of metaphysical possibilities and, therefore, to convey that this past possibility is no longer available (Condoravdi 2002: 86).
From this, we can conclude that for Condoravdi, a modal *might*, which has been traditionally classified as ‘epistemic,’ now has two different modal bases, an epistemic modal base and a metaphysical modal base, and the latter is responsible for the counterfactual interpretation.\(^{23}\)

As mentioned above, Cinque (1999) proposes that the set of functional projections associated with tense, aspect, and modality is fixed (Stowell 2004, Hacquard 2006). One may worry that Condoravdi’s scope-reversal conflicts with Cinque’s universal hierarchy in that, according to this hierarchy, epistemic modality takes scope over the past tense. In fact, this issue has been addressed in Stowell (2004: 630). (68) is repeated below:

(74) ModP\(_{\text{epistemic}}\) > TP\(_{\text{(Past)}}\) > TP\(_{\text{(Future)}}\) > MoodP\(_{\text{irrealis}}\) > ModP\(_{\text{alethic}}\) > [...] ModP\(_{\text{volitional}}\) > [...] TP\(_{\text{(Anterior)}}\) > [...] AspP\(_{\text{retrospective}}\) > [...] AspP\(_{\text{prospective}}\) > ModP\(_{\text{obligation}}\) > ModP\(_{\text{permission/ability}}\)

As Stowell discusses, this is not a problem for Condoravdi because *have in might have* is not the past tense but the perfect auxiliary. Moreover, since *might* with a counterfactual reading is not an epistemic modal but a metaphysical modal, Condoravdi’s analysis avoids this problem. Stowell notes that Condoravdi’s metaphysical modality is what Cinque proposes as the alethic modality. In Cinque’s hierarchy, the epistemic modality and the alethic modality occupy different functional categories.

Condoravdi’s scope-based analysis, which is based on a branching world-time model, is attractive, but her analysis is limited to epistemic/metaphysical interpretations of the modal, and the range of data she covers is relatively small. Upon commenting on Condoravdi’s work, Stowell (2004) tries to apply the same scope-reversal analysis to priority modals as well. Examples in (75) are from Stowell (2004: 633):

\(^{23}\)In contrast to Condoravdi, Hacquard (2006: 93) claims that counterfactuality involves two modals, and is derived by the structure of an epistemic modal *might* on top of a counterfactual operator. This account is different from Condoravdi’s account where the modal *might* with a metaphysical accessibility relation yields counterfactuality.
(75)  a. You should have bought that book when you had the chance.

   b. Max ought to have kept his mouth shut at the meeting.

Stowell (2004: 633) notes that the following two readings seem possible: (i) the relevant
deontic obligation held at the past time (past perspective),\textsuperscript{24} and (ii) obligating the subject at
the utterance time to have arranged things in the past (present perspective).\textsuperscript{25} However, the
first reading is much more plausible than the second reading. Moreover, it is not obvious
whether the counterfactual interpretation is derived from covert perfect raising because
the counterfactual interpretation of priority modals is more salient than the counterfactual
interpretation of epistemic modals. It seems to me that the temporal interpretation of the
modal-perfect combination of epistemic modals and priority modals may not be accounted
for in a uniform way; thus, Stowell’s speculation that the scope-reversal analysis can be
extended to priority modals as well is not completely convincing.

Portner (2009: 226) points out that there are three aspects which make Condoravdi’s
proposal not completely satisfying. First, Condoravdi argues that the counterfactual inter-
pretation arises as a conversational implicature. However, counterfactuality is not easily
cancelled.

(76)  ?At that point, he might have won the game, and in fact he did.  (Portner 2009: 226)

Second, Condoravdi’s account is based on the modal’s interpretation with respect to a past
time; however, counterfactuality only arises when a past tense modal is combined with the
perfect auxiliary.

(77)  a. At that point, he could win the game.

   b. At that point, he could have won the game.

\textsuperscript{24}This reading often results in the counterfactual interpretation.
\textsuperscript{25}Stowell (2004: 633) notes that “the relevant semantic judgments are extraordinarily delicate
and difficult to distinguish.”
Unlike (77b), (77a) does not have counterfactual interpretations, even though the modal is morphologically in past form. Third, Condoravdi’s explanation depends on the modal having the force of possibility. However, when it comes to a necessity modal, the past form would be stronger; thus, we cannot extend this account to necessity modals.

(78) a. $\diamond p \rightarrow \text{PAST}(\diamond p)$
    b. $\text{PAST}(\Box p) \rightarrow \Box p$

In addition, Condoravdi’s proposal cannot account for the Korean data, due to their cross-linguistic differences. First of all, scopal properties of temporal and modal operators in Korean are different from those in English.

(79) Jane-un kicha-lul tha-ss-eya ha-n-ta.
     Jane-TOP train-ACC take-PAST-COMP AUX-NONP-DEC
     ‘Jane should have taken the train.’

In Condoravdi’s analysis, there is no tense in the scope of modal (only the perfect have is possible in the scope of the modal). Unlike English, however, Korean simple modal sentences are bi-clausal; therefore, tense can appear in the scope of the modal.

(80) NONP(MODAL(PAST(Jane take the train)))
    -n (-eya ha- (-ess (Jane-i kicha-lul tha-)))

One may argue that the past tense morpheme –ess in the embedded clause marks the aspectual meaning, not the tense meaning, and there is no tense in the scope of modal as in English. However, I discussed in 2.2.2 that I analyze the embedded –ess as a past tense marker for several reasons. For example, as (81) shows, –ess functions as a past tense marker.

(81) Chelswu-nun ecey/*nayil-kkaci swukcey-lul hay-ss-eya
     Chelswu-TOP yesterday/tomorrow-by homework-ACC do-PAST-COMP
     ha-n-ta.
     AUX-NONP-DEC
‘Chelswu should have done his homework by yesterday/*tomorrow.’

The temporal adverbial modification pattern in (81) shows that the past complement is not compatible with non-past adverbials. I take this as a piece of supporting evidence that the embedded –ess marks the past tense in modal sentences in Korean.

Also, the interpretation is different. While English might have/should have sentences are ambiguous, sentences like (79) in Korean always conveys the ‘non-actualization’ interpretation. The status of the inference is different as well. We have seen that Condoravdi argues that the counterfactual interpretation arises as a conversational implicature. In Korean, however, the non-actualization inference is stronger than a conversational implicature because it is not cancellable. The relevant issues will be discussed in Chapter 4.

The above discussion suggests that we have difficulty applying Condoravdi’s scope-based analysis to a bigger set of data, even though this account well explains how we infer two distinct readings from might have. We have seen that the temporal interpretation of the modal-perfect combination of epistemic modals and that of priority modals may not come out uniformly. We have also seen that the scope-reversal mechanism does not work in Korean since the modal constructions are syntactically different and the status of tense-aspect morphology is also different. The last point I’d like to make before leaving this section is that the relevant priority modals which generate counterfactual interpretations are always weak necessity/deliberative modals in English. As we will see in the next chapter, however, it is easy to find cases where strong necessity priority modals give rise to the counterfactual interpretations in Korean.

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26 As noted by Portner (2009), counterfactuality is not easily cancelled, even in English, as shown in (76). If the counterfactual reading is a conversational implicature, the continuation should sound natural; however, (76) is not perfectly natural.
2.3.2 The Interaction of Modality with Aspect (the actuality entailment)

Now I move on to the actuality entailment found in languages like French and Hindi. The actuality entailment is a linguistic phenomenon particular to the languages where a morphological distinction between the perfective and the imperfective is overt. It was Bhatt (1999) who first observed the actuality entailment phenomenon in Hindi. That is, ability modals behave like implicative verbs when they are realized with perfective morphology. Inspired by Bhatt (1999), Hacquard (2006) argues that not only ability modals but also all non-epistemic (root) modals with the perfective morpheme yield the actuality entailment. The interesting correlation between modals and aspect morphology that Bhatt and Hacquard found was that modals with perfective yield the actuality entailment while modals with imperfective have no such entailment. (14) is repeated here (Hacquard 2009: 2):

(82) a. Jane pouvait traverser le lac à la nage, mais elle ne le fit jamais.
    Jane can-past-impf cross the lake by swim, but she NEG it do-past-pfv never

b. Jane apu traverser le lac à la nage, mais elle ne le fit pas.
    Jane can-past-pfv cross the lake by swim, but she NEG it do-past-pfv not

‘Jane could (was able to) swim across the lake, but she didn’t do it.’

The modal pouvoir in (82) has the ability interpretation, which talks about a possibility given the capacities and circumstances of the subject. Since the implicative meaning is not cancellable, it is called the actuality entailment. As (83) shows, however, the same modal with an epistemic interpretation does not yield the actuality entailment even with the perfective morpheme:

(83) a. (Selon la voyante,) Bingley pouvait aimer Jane.
    (According to the fortune teller) Bingley could-impf love Jane

54
Based on these facts, Hacquard asks the following questions: (i) Why is the actuality entailment possible with all root interpretations but not with epistemic interpretations? (ii) How could an aspectual operator affect the modal meaning? and (iii) What is the explanation for the lack of the actuality entailment with imperfective morphology?

For Bhatt, the answer to the first two questions is ultimately the same: what appear to be ability modals are in fact not modals. Instead, he treats them as implicative predicates, and the actuality entailment arises as a conventional implicature. The modal readings come from ABLE (a gloss for sak in Hindi), which is another kind of implicative verb (whose properties are similar to the English verb manage). As for the lack of actuality entailments with the imperfective, he assumes that imperfective morphology comes with an extra modal element, the generic operator (GEN). When GEN appears, there is no actuality entailment.

Hacquard (2006: 69) criticizes Bhatt’s analysis because it does not allow any connection with other interpretations of the same modal. Cross-linguistically, it is attested that the same lexical item can be used to express the whole set of readings (e.g. French pouvoir can be used for ability, circumstantial, teleological, bouletic, deontic, and epistemic possibility). For Hacquard, this ability modal is a true modal, and a combination of a modal and perfective morphology yields the implicative meaning. She argues that, in this way, we can maintain the Kratzerian account while accounting for the actuality entailment phenomenon.

Hacquard extends the theory of the actuality entailment to all modal auxiliaries with circumstantial modal base. The following examples show that a goal-oriented modal with perfective morphology also yields the actuality entailment (Hacquard 2006: 38, her (38) and (39)):
(84)  a. Jane pouvait prendre le train pour aller à Londres, mais elle a pris l’avion.
       Jane could-impf take the train to go to London, but she had taken the plane

       b. Jane a pu prendre le train pour aller à Londres, mais elle a pris l’avion.
       Jane could-pfv take the train to go to London, but she had taken the plane

       ‘Jane could take the train to go to London, #but she took the plane.’ (Hacquard 2006: 38)

(84) illustrates that the actuality entailment is found with the existential modal auxiliary in the perfective. Also, the same pattern is found with the universal counterpart as in (85).

(85)  a. Jane devait prendre le train pour aller à Londres, mais elle a pris l’avion.
       Jane must-past-impf take the train to go to London but she had taken the plane

       b. Jane a dû prendre le train pour aller à Londres, mais elle a pris l’avion.
       Jane must-past-pfv take the train to go to London but she had taken the plane

       ‘Jane had to take the train to go to London, #but she took the plane.’ (Hacquard 2006: 38)

This shows that the actuality entailment phenomenon is possible with both possibility and necessity modal auxiliaries. According to Hacquard (2006), in (84b) there were more options than taking the train while in (85b), taking the train was the only possible option.

From this, we can see that the modals do contribute to the truth condition even though the perfective morphology is responsible for the actuality entailments.

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27 Hacquard discusses that, although both (84b) and (85b) are true in situations where Jane actually took the train and went to London, they are not interchangeable: (84b) is about an actualized possibility while (85b) is about an actualized necessity.
In Hacquard’s analysis, aspect is base-generated as an argument of the verb, and comes with a world variable. Aspect has to move from this base position for type reasons (Hacquard 2006: 55). Based on the assumption that a modal can appear in two positions, either right above tense (epistemic interpretation), or right above the VP (circumstantial interpretation), Hacquard proposes a structural account: when aspect takes scope over the modal, the world variable that comes with aspect needs to be bound by a matrix binder, yielding an actuality entailment (circumstantial interpretation). When the modal element takes scope over aspect, however, the world variable must be bound by the modal which is immediately above it; thus no actual event is forced (epistemic interpretation). In both cases, the modal quantifies over possible worlds. However, there is a difference between epistemic modals and circumstantial modals: epistemic modals combine with a proposition while circumstantial modals combine with a property of events. When it comes to modals with an epistemic interpretation, since they take scope over aspect, they “provide aspect its world of evaluation, and anchor the event to the worlds they quantify over (and not necessarily the actual world)” (Hacquard 2009: 8). This structural account explains why there is no actuality entailment with epistemic interpretations of the same modal auxiliaries. As for the question of why there is no actuality entailment with the imperfective morphology, Hacquard (2009: 7) argues that the imperfective on a circumstantial modal brings in an additional layer of modality, and this is responsible for eliminating the necessity of actualization. This idea is similar to Bhatt (1999) who argues that the presence of imperfective morphology reflects the presence of a generic operator (GEN), and this GEN operator removes the need for an actual event.

Up to now, I summarized Hacquard’s answers to her original questions: root vs. epistemic interpretations, and perfective vs. imperfective morphology. However, this is not the end of her attempt to derive full actuality entailments. Consider the following example (Hacquard 2006: 60, from Kai von Fintel (p.c.)):
(86) Bill mistakenly thought that Mary’s wedding was a funeral.

Hacquard (2006: 60) considers the possibility that we “disagree or misidentify the events,” and asks how the speakers of French take the event in some world to be the same kind of event in the actual world as well. Given the assumption that there is no change in the subject’s perspective, Hacquard assumes that the same event will keep the same descriptions across the worlds. To ensure that the event has the same properties in both the actual world and the accessible worlds, Hacquard (2009: 22) invokes a pragmatic assumption as in (87):

(87) Preservation of Event Description (PED): for all worlds $w_1$, $w_2$, if $e_1$ occurs in $w_1$ and in $w_2$, and $e_1$ is a P-event in $w_1$, then ceteris paribus, $e_1$ is a P-event in $w_2$ as well.

This pragmatic principle states that the same event keeps its description across worlds, thus, the same kind of event occurs both in the actual world and in the worlds quantified over by the modal. If any alteration is needed, the speaker should indicate the modification by some morphological indication (Hacquard 2009: 22).28

(88) Jane a pu s’enfuir, #mais elle ne s’est pas enfuie.  
Jane could-pfv escape but she didn’t escape  
‘Jane could escape, #but she didn’t escape.’

If we consider (88), since the event description holds not only in the modal worlds but in the actual world as well, we can infer that Jane actually escaped. Hacquard concludes that PED safely enables actuality entailments.

Hacquard’s (2006, 2009) proposal seems to solve the puzzles while maintaining a standardized semantics of aspects and modals; however, there have been some objections to her

28According to Hacquard (2009: 24), “PED can only be violated in special circumstances, and modifying a property already established as part of the event description comes at a morphological cost.”
analysis. I will subsequently review three such recent discussions: Portner (2009), Homer (2011), and Mari and Martin (2007, 2009).

The most significant problem raised by Portner (2009) is that Hacquard’s pragmatic assumption does not properly derive the actuality entailment. (86) is repeated below:

(89) Bill mistakenly thought that Mary’s wedding was a funeral.

In Hacquard (2006, 2009), she avoids the unexpected possibility that we “disagree or misidentify the events,” by assuming that the same event will keep the same descriptions across the worlds. Therefore, the event in some other world will be the same kind of event in the actual world as well. However, Portner (2009: 208-9) points out that it is not clear how PED accounts for the lack of the inference that ‘Mary’s wedding is a funeral in the actual world’ in (89). The propositional attitude verb think in (89) evokes possible worlds: there are accessible worlds, which are compatible with Bill’s thoughts, where Mary’s wedding is a funeral. According to PED, the event described by Bill is a funeral across the possible worlds and, consequently, it is a funeral in the actual world as well. For this reason, we cannot simply assume that an event of Jane’s escaping in some other world is the same kind of event in the actual world in (88) (Portner 2009: 208). As pointed out by Portner, it is problematic for Hacquard’s theory if her analysis cannot account for the cases where event identification does not hold.

Somewhat differently from Bhatt (1999) and Hacquard (2006), Portner (2009) claims that the actuality entailment can be treated as a kind of performativity. Performativity is defined as “a situation where a modal causes a root sentence it is in to perform an extra speech act in addition to that which is associated with its ordinary truth-conditional semantics” (Portner 2009: 212). (90) shows how the performativity of an ability modal pouvoir can be represented in a dynamic framework (Portner 2009: 212):
Update potential of *pouvoir*: For any sentence $\phi$ of the form $pouvoir \psi$, the update potential of $\phi$ used in context c with modal base f and ordering source g, $[\phi]_{c,f,g}$, is defined as follows: $cg [\phi]_{c,f,g} = cg \cup [\psi]_{c,f,g} \cup [\phi]_{c,f,g}$.

If we apply this approach to (88), the sentence asserts two things: (i) Jane has the ability to escape, and (ii) she did escape. As Portner (2009: 212) notes, a treatment of actuality entailment as a kind of performativity seems to capture Bhatt’s intuition that there is an element in the sentence that is similar to the implicative verb *manage*.

Independently, Homer (2011: 107) criticizes Hacquard’s analysis for two reasons. First, the actuality entailments occur even when the predicate is not a modal; and second, the presence of the perfective is not sufficient. Focusing on the latter, Homer discusses the interaction between the perfective and stative predicates of eventualities. As pointed out by Homer (2011: 108), by definition, stative predicates are not suitable complements of the perfective. (91) shows the incompatibility of the perfective with stative predicates (example from Homer 2011: 108).

(91) a. #Tout á l’heure, il a été assis/en colère.
   earlier he has been-pfv sitting/angry
   ‘Earlier he has been sitting/angry.’

   b. Tout á l’heure, il était assis/en colère.
   earlier he was sitting/angry
   ‘Earlier he was sitting/angry.’

However, Homer (2011: 108) argues that statives can in fact co-occur with the perfective, and this co-occurrence is always accompanied by an aspectual coercion. In Homer’s proposal, the perfective contributes to transforming a stative predicate into a bounded predicate. In order to show that the aspectual coercion targets the stative predicates in the perfective, he also argues that root modals form stative predicates of eventualities. As a piece of empirical evidence that root modals are stative predicates, Homer (2011: 109) illustrates the
following example: unlike (92a), the stative predicate and the modal predicate are incompatible with the periphrastic progressive \( \text{être en train} \) ‘be in the process of,’ as in (92b) and (92c):

(92)  

a. \( \text{être en train de gagner l’} \) \( \text{élection} \)
    \( \text{be in-the-process-of win the election} \)
    ‘to be in the process of winning the election’

b. \#\( \text{être en train d’ être en colère} \)
    \( \text{be in-the-process-of be angry} \)
    ‘to be in the process of being angry’

c. \#\( \text{être en train de pouvoir gagner l’} \) \( \text{élection} \)
    \( \text{be in-the-process-of can win the election} \)
    ‘to be in the process of being able to win the election’

Homer argues that root modal predicates are stative, therefore if they appear under the perfective, they should be coerced. The actuality entailments with root modals are, in fact, the outcomes of aspectual coercion (semantic enrichment process). In his analysis, then, we can predict that some non-modal stative predicates with the perfective should also give rise to the actuality entailments. In fact, certain stative predicates, when placed in the scope of the perfective, also yield the reading that the event is actualized (Examples from Homer 2011: 111):

(93)  

a. \( \text{La maison a coûté 100 000 euros.} \)
    \( \text{the house cost-pfv 100 000 euros} \)
    ‘The house has cost 100.000 euros.’ (entails that the house was bought)

b. \( \text{La maison coûtait 100 000 euros.} \)
    \( \text{the house cost-impf 100 000 euros} \)
    ‘The house cost 100.000 euros.’ (does not entail that the house was bought)

According to Homer (2011: 111), (93a) not only says that the price of the house was 100.000 euros, but also entails that the house was bought for that price. The imperfective sentence in (93b) does not have such entailment. Homer argues that the entailment in
(93a) results from the aspectual coercion. This argument is against Hacquard (2006) who claims that actuality entailments are restricted to root modals.  

Mari and Martin (2007, 2009) also propose an alternative explanation for actuality entailments, presenting new data which reveals shortcomings for Bhatt (1999) and Hacquard (2006). Mari and Martin make several arguments as to why Hacquard’s analysis is not a completely satisfactory account. First, they observe that non-modal verbs, e.g. illocutionary verbs like *inviter* ‘invite’ and object experiencer verbs like *encourager* ‘encourage’, display behavior similar to that of modal verbs. Examples are from (Mari and Martin 2009: 6):

(94) a. Pierre m’a encouragé à entrer, mais je ne suis pas entrée. *(passé composé)*  
Pierre encourage-pfv to enter but I didn’t enter  
‘Pierre encouraged me to enter, but I didn’t enter.’

b. Pierre nous a invites à tout reconsiderer, mais on ne l’a pas fait.  
Pierre us invite-pfv to all reconsider but we didn’t *(passé composé)*  
‘Pierre invited us to reconsider everything, but we didn’t.’

(95) a. Ce panneau m’a encouragée à entrer, #mais je ne suis pas entrée. *(passé composé)*  
this panel encourage-pfv to enter but I didn’t enter  
‘This panel encouraged me to enter, but I didn’t enter.’

b. Ces nouvelles données nous ont invités à tout reconsiderer, #mais  
these new data us to invite-pfv to all reconsider but we didn’t  
‘This car cost 25,000 dollars.’

Hacquard (2006: 19) also observes such entailment:

(i) Cette voiture a coûté 25,000 dollars.  
this car cost-pfv 25,000 dollars  
‘This car cost 25,000 dollars.’

For Hacquard, the relevant inference in (i) comes from pragmatic reasoning (Homer 2011: 114).
‘These new data invited us to reconsider everything, but we didn’t.’ (*passé composé*)

(96)  
a. Ce panneau m’encourageait à entrer, mais je ne suis pas entrée. (*imparfait*)
this panel encourage-impf to enter but I didn’t enter
‘This panel encouraged me to enter, but I didn’t enter.’

b. Ces nouvelles données nous invitaient à tout reconsidérer, mais
these new data us invite-impf to all reconsider but
we didn’t
‘The discovery of all these data invited us to reconsider everything, but we
didn’t.’ (*imparfait*)

(94) has an agentive reading while (95) and (96) have non-agentive readings. According to Mari and Martin (2009: 6), under their agentive readings, these verbs do not trigger an actuality entailment even with the *passé composé*, as in (94a) and (94b). Under their non-agentive readings, however, they trigger the actuality entailment in the sentences with the *passé composé* only, as in (95a) and (95b). As we can see in (96a) and (96b), the actuality entailment does not arise with the *imparfait*. If non-modal verbs can yield actuality entailments as in (95), then Hacquard’s claim that actuality entailments are triggered only by root modals with the perfective is problematic. Second, they argue that Hacquard’s assumptions about aspect are not from an orthodox view that aspect is a projection intermediate between tense and vP.30 Third, modals do not always trigger the actuality entailment with the perfective morphology. Mari and Martin argue that this is the most significant problem for Hacquard’s proposal. There are at least two contexts where actuality entailments can be cancelled. One such case is when a modal co-occurs with a quantificational temporal modifier (Example from Homer 2011).

30For Hacquard (2006), aspect is base-generated as an argument of the verb.
(97) À plusieurs reprises, Olga a pu soulever un frigo, mais ne l’a pas fait. 
On several occasions, Olga can-past-pfv lift a fridge but NEG it has done
‘On several occasions, Olga could lift a fridge, but he didn’t.’ (Homer 2011: 107)

Another case in which the actuality entailment is not automatically triggered is when the main predicate is a stative predicate.

(98) T’as pu avoir un repas gratuit, et tu ne t’es même pas levé! 
You can-past-pfv have a meal free, and you NEG Refl-past even get up
‘You could have a meal for free, and you didn’t even get up!’ (Mari and Martin 2009: 11)

If the circumstantial reading of the modal with the perfective is sufficient for the actuality entailment, the continuations in (97) and (98) should yield a semantic deviance; however, they do not. Thus, they conclude that stativity seems to be responsible for the cancellation of the actuality entailment.

As the discussion above implies, the actuality entailment phenomenon is more likely to be an implicature than an entailment. The previous studies have shown that the explicit semantics cannot account for the phenomenon and we need some kind of pragmatic account as well. Hacquard’s semantics of the actuality entailment, which relies on a scope-based mechanism, is systematic but it has some shortcomings. For example, Portner (2009) points out that Hacquard’s pragmatic assumption, which is crucial for her entire analysis, is problematic. Mari and Martin (2009) also deny the structural view, and propose an alternative (semantic/pragmatic) analysis, focusing on an ontological distinction between two kinds of abilities: generic abilities and action dependent abilities. Homer’s (2011) analysis shows that actuality entailments are instances of a kind of aspectual coercion, and they are not
caused by the presence of a root modal with the perfective morpheme. In this way, his analysis enables an explanation of the extended set of data.

2.3.3 Counterfactual Conditionals

In this subsection, I review the semantic accounts of counterfactual conditionals and the role of the past tense morphology. There are two different views on the semantic contribution of the past tense morphology in conditionals: fake past vs. temporal past. Iatridou (2000) argues that past tense morphology in counterfactual conditionals does not receive a temporal past interpretation, and proposes that the past tense in conditionals has an “exclusion feature,” which is used to exclude the context worlds.

(99) $T(x) \text{ excludes } C(x)$, where the variable $x$ ranges over time or world.

In (99), $T(x)$ stands for “Topic(x)” (i.e. “the x that we are talking about”) and $C(x)$ stands for “Context(x)” (i.e. “the x that for all we know is the x of the speaker”). According to Iatridou, the exclusion feature which is instantiated by the past tense morphology can range over times or worlds. If it is interpreted in the domain of time, the sentence is interpreted as talking about a time different from the time of utterance. If it is interpreted in the domain of worlds, the sentence is interpreted as talking about worlds different from the actual world (Ippolito 2003). Consequently, the past can be interpreted either temporally or modally. In a simple sentence such as John left, the past is interpreted temporally and talks about a past time at which an event of John’s leaving took place (Iatridou 2000: 268, Ippolito 2003: 149). However, in conditionals like (100a) and (100b), the past tense is interpreted modally (i.e. as excluding the actual world). The examples are from Iatridou (2000: 232):

(100) a. If he were smart, he would be rich.

b. If he had been smart, he would have been rich.
The difference between (100a) and (100b) is that, in (100a) we see one layer of past while in (100b) there are two layers of past occurs. The pluperfect counts as having two layers, the one instantiated by the auxiliary *have* and the one instantiated by the past –*ed* (Han 1996: 9, Ippolito 2003: 149).31 By proposing that the past tense morpheme has the exclusion feature, Iatridou’s analysis seems to successfully account for how we get the counterfactual reading in conditionals.

In contrast to Iatridou’s (2000) analysis, Ippolito (2003) provides a different view on the semantic contribution of the past tense morpheme (Komoto 2011: 628). In Ippolito’s analysis, there are three kinds of subjunctive conditionals in addition to indicative conditionals.32 The following examples show the difference between indicative and the three different kinds of subjunctive conditionals in English (Ippolito 2003: 145-6). Specifically, Ippolito (2003: 146) labels conditionals like (101d) *mismatched past subjunctive counterfactuals* because their verbal morphology does not match the meaning of the temporal adverb.

(101) Types of conditional

a. *Indicative conditionals:*

   If Charlie takes his Advanced Italian test tomorrow, he will pass.

b. *Non-past subjunctive conditionals:*

   If Charlie took his Advanced Italian test tomorrow, he would pass.

c. *Standard past subjunctive conditionals:*

   If Charlie had taken his Advanced Italian test yesterday, he would have passed.

d. *Mismatched past subjunctive conditionals:*

   If Charlie had taken his Advanced Italian test tomorrow, he would have passed.

---

31The idea that perfect *have* is a past tense needs to be examined.

32As pointed out by von Fintel (2011: 5), the difference between indicative and subjunctive conditionals is that indicative conditionals convey that the truth of the antecedent is an open issue whereas subjunctive conditionals convey that the antecedent is false.
Despite their overt past morphology, subjunctive conditionals sometimes talk about the future, as in (101b) and (101d). Ippolito (2003: 146) argues that mismatched past counterfactuals cannot be accounted for in Iatridou’s analysis in which the past tense in subjunctive conditionals is interpreted inside the antecedent.\(^{33}\) Ippolito (2003: 147) points out that “a mismatched past counterfactual must be uttered when the speaker regards the hypothetical event described by the antecedent as unrealizable (impossible),” and tries to show the connection between the two layers of past and the impossibility of the antecedent. As we will see below, in her analysis the extra past tense is the source of the impossibility of the antecedent, and the impossibility of the antecedent is a scalar implicature (Ippolito 2003: 154, 163).

Assuming the possible world semantics and the theory of conditionals developed by Kratzer (1981, 1986, 1991),\(^{34}\) Ippolito (2003: 153-4) proposes an analysis of mismatched past counterfactuals. A conditional is true iff for all the worlds w accessible from the actual world and such that the antecedent is true in w, the consequent is true in w. Her proposal consists of three parts. The first part of her proposal is about the role of the past tense morphology. She proposes that in conditionals like (101d), the past tense cannot be interpreted inside the proposition because it is inconsistent with the time-adverbial. Instead, she argues that the past tense is interpreted as constraining the time argument of the accessibility relation. (102) is the schema of the accessibility relation \(R\), and (103) is the truth conditions for (101d) (\(w_c\) is the actual world and \(t_c\) is the time of utterance):

\[
\begin{align*}
R &= \lambda w.\lambda t.\lambda w'. w' \text{ is accessible from } w \text{ at } t.
\end{align*}
\]

\(^{33}\)Ippolito (2003: 149) notes that Iatridou’s proposal in which one layer of past is interpreted modally and the other layer of past is interpreted temporally has an important consequence. The layer of past that is interpreted temporally locates the hypothetical event in time and, as such, is required to be interpreted inside the proposition expressed by the antecedent.

\(^{34}\)In Kratzer’s theory, “a conditional sentence is analyzed as a tripartite structure: the if-clause is interpreted in the restriction of a possible covert modal operator, whereas the consequent is interpreted in the nuclear scope.” (Ippolito 2003: 154)
(103) \( [(101d)] = 1 \text{ iff } \forall w \in W [w \text{ is accessible from } w_c \text{ at } t_2 \text{ and Charlie takes his Advanced Italian test tomorrow in } w \rightarrow \text{ Charlie passes in } w], \text{ defined only if } t_2 < t_c. \)

(103) says that (101d) is true iff for all the worlds w accessible from the actual world at some contextually salient past time and such that Charlie takes his test tomorrow in w, he passes in w.\(^{35}\) The nature of the modality is metaphysical: the worlds quantified over by the modal operator are worlds compatible with what is possible in the evaluation world at the evaluation time (Ippolito 2003: 160). This way of interpreting the past tense morphology results in shifting the evaluation time to some contextually salient past time.

Second, Ippolito proposes the different felicity conditions for non-past subjunctive conditionals and mismatched past subjunctive conditionals. In her analysis, \( P \) is the set of possible worlds \( w \) in which the conjunction of all the presuppositions of the antecedent is true. \( C_u \) is the set of worlds \( w' \), in which all the propositions true in the Common Ground at \( t_u \) (utterance time) are true. \( C_{t_2<u} \) is the set of worlds \( w' \), in which all the propositions true in the Common Ground at \( t_2 \) (a contextually salient past time). (104) is from Ippolito (2003: 165, her (42) and (45)):

(104) a. Felicity conditions for non-past subjunctive conditionals
\[
P \cap C_u \neq \emptyset
\]

b. Felicity conditionals for mismatched past subjunctive conditionals
\[
P \cap C_{t_2<u} \neq \emptyset
\]

(104a) says that the intersection of \( P \) and \( C_u \) is not empty: the antecedent is not inconsistent with the context set at the time of utterance. This is the felicity condition for non-past subjunctive conditionals. (104b) says that the intersection of \( P \) and \( C_{t_2<u} \) is not empty: the

\(^{35}\)Ippolito (2003: 160) notes that she uses “accessible from the actual world \( (w_c) \)” as shorthand for “compatible with what is possible in the actual world \( (w_c) \).”
antecedent is not inconsistent with the context set at some past time. This is the felicity condition for mismatched past subjunctive conditionals.

Third, Ippolito provides a pragmatic account of the intuition that the antecedent is not true. She proposes that the falsity of the antecedent is a Gricean scalar implicature that derives from a competition between the presuppositions of non-past subjunctive conditionals and the presuppositions of mismatched past subjunctive conditionals. The core idea is that (104a) asymmetrically entails (104b). This means that “being compatible with what the speaker knows at t_u entails being compatible with what he knew at any time earlier than t_u, but not vice versa” (Ippolito 2003: 171). Based on this assumption, she shows that a scalar implicature is derived from the competition between presuppositions, as in (105) ((105) is from Ippolito 2003: 173).

(105) Gricean competition

a. You presupposed: P \cap C_{t_2 < u} \neq \emptyset

b. You didn’t presuppose: P \cap C_u \neq \emptyset

c. Thus: \neg (P \cap C_u \neq \emptyset)

d. P \cap C_u = \emptyset

(105) says that the speaker’s choice to presuppose “less” is accompanied by the conversational implicature that the speaker is not in the position to presuppose “more” (105d) shows that the intersection of the presuppositions of the antecedent and the context at the time of utterance is empty. This means that the presuppositions of the antecedent are not consistent with the context at the time of utterance; therefore, the antecedent cannot be true. Thus, we can explain the impossibility of the antecedent of mismatched past subjunctive conditionals. When it comes to the standard past subjunctive conditionals, Ippolito argues that since there is no temporal mismatch which forces the past to be interpreted within
R, they are ambiguous: either interpreting the past inside the proposition expressed by the antecedent or interpreting the past in the domain of the accessibility relation.

2.3.4 Summary

This section has summarized how modal semantics can be used to account for the counterfactual and actual inferences which arise in the modal-tense/aspect interactions cross-linguistically. This overview helps us how to approach the phenomena in Korean modal sentences, though none of the previous works directly addresses what is at issue in this dissertation. In the next two chapters, I will attempt to develop an analysis which can account for the language-specific properties of Korean modal constructions but not in deviation from the standard Kratzer framework.
Chapter 3

Semantic/Pragmatic Properties of the Modal –ul swu iss–

This chapter examines semantic/pragmatic properties of –ul swu iss– modal constructions. The two main topics to be examined are: (i) interpretations of –ul swu iss– ‘can, may’ modal constructions, focusing on their interaction with temporal components, and (ii) the actuality inference which arises with the ability/permission –ul swu iss– modal. In section 3.1, the general interpretation patterns regarding –ul swu iss– modal constructions are discussed. Like can, may, and must in English, the –ul swu iss– modal in Korean is ambiguous. As we will see shortly, the aspectual class of the predicate in the complement, the property of the subject (animate vs. inanimate), and the tense of the complement together disambiguate the modal meanings. In section 3.2, I will focus on the temporal interpretations of –ul swu iss– constructions. In order to account for the distributional patterns, three distinct semantic entries are proposed. In section 3.3, the actuality inference in ability/permission –ul swu iss– constructions is discussed. After showing that the nature of the actuality inference is a conversational implicature, I discuss how we should derive the implicature. I argue that the implicature relies on the agent’s choice, which is a part of the newly defined semantics of circumstantial –ul swu iss–. My analysis builds on Horn (1984), but improves his argument in that it explains the different strength of the inference between the present and the past.
3.1 INTRODUCTION

When the modal expression –ul swu iss– ‘can, may’ is combined with stative predicates, only the epistemic interpretations are completely natural. Meanwhile, when it is combined with non-stative predicates, all kinds of interpretations, i.e. the epistemic, priority, and dynamic interpretations, are possible.\(^{36}\)

(106)  
\begin{align*}
\text{a. Chelswu-ka pappu-∅-l swu iss-∅-ta.} \\
\text{Chelswu-NOM be.busy-NONP-COMP BN AUX-NONP-DEC} \\
\text{‘It is possible that Chelswu is busy.’ (epistemic)} \\
\text{?‘Chelswu is allowed to be busy.’ (priority)} \\
\text{#‘Chelswu is able to be busy.’ (dynamic)} \\
\end{align*}

\begin{align*}
\text{b. Chelswu-ka sihap-ul iki-∅-l swu iss-∅-ta.} \\
\text{Chelswu-NOM game-ACC win-NONP-COMP BN AUX-NONP-DEC} \\
\text{‘It is possible for Chelswu to win the game.’ (epistemic)} \\
\text{‘Chelswu is allowed to win the game.’ (priority)} \\
\text{‘Chelswu is able to win the game.’ (dynamic)} \\
\end{align*}

(106a) is the –ul swu iss– modal construction with a stative predicate pappu– ‘be busy’ and (106b) is the same construction with a non-stative predicate sihap-ul iki– ‘win the game’.

\(^{36}\)This phenomenon is not limited to Korean. Cross-linguistically, the same modal expression can be used to convey different modal interpretations. For example, may, can, and must in English are ambiguous, as illustrated in (i):

(i)  
\begin{align*}
\text{a. John may swim. (epistemic or priority)} \\
\text{b. Mary can sing. (epistemic, priority, or dynamic)} \\
\text{c. Sam must be at home. (epistemic or priority)} \\
\end{align*}

In order to account for this observed pattern, Bybee et al. (1994: 194) argue that there is a cross-linguistic pattern like (ii) which seems to support the diachronic data:

(ii)  
\begin{align*}
\text{a. ability \rightarrow root possibility \rightarrow permission} \\
\text{b. ability \rightarrow root possibility \rightarrow epistemic possibility} \\
\end{align*}

(ii) shows why we often find the overlapping uses of ability, permission, and epistemic possibility cross-linguistically.
Unlike (106a), (106b) may have an epistemic, priority, or dynamic reading depending on the context. Interestingly, however, the patterns in (106a) and (106b) do not stay the same when this modal expression interacts with tense markers.

First, consider the interpretation patterns when the modal expression –ul swu iss– ‘can, may’ with non-stative predicates interacts with temporal components. Note that the permission reading is less natural than the possibility/ability reading.37

(107) a. Chelswu-ka sihap-ul iki-∅-l swu iss-∅-ta.
   Chelswu-NOM game-ACC win-NONP-COMP BN AUX-NONP-DEC
   ‘It is possible for Chelswu to win the game.’ (epistemic)
   ‘Chelswu is allowed to win the game.’ (priority)
   ‘Chelswu is able to win the game.’ (dynamic)

   Chelswu-NOM game-ACC win-NONP-COMP BN AUX-PAST-DEC
   ‘It was possible for Chelswu to win the game.’ (epistemic)
   ‘Chelswu was allowed to win the game.’ (priority)
   ‘Chelswu was able to win the game.’ (dynamic)

   Chelswu-NOM game-ACC win-PAST-COMP BN AUX-NONP-DEC
   ‘It is possible that Chelswu won the game.’ (epistemic)
   #‘Chelswu is allowed to have won the game.’ (priority)
   #‘Chelswu is able to have won the game.’ (dynamic)

   Chelswu-NOM game-ACC win-PAST-COMP BN AUX-PAST-DEC
   ‘It was possible that Chelswu had won the game.’ (epistemic)
   #‘Chelswu was allowed to have won the game.’ (priority)
   #‘Chelswu was able to have won the game.’ (dynamic)

37 The alternative expressions –eto toy–, –eto coh–, and –eto kwaychah– ‘may’ are used more frequently for the permission reading.
Sentence (107a) talks about either i) an epistemic possibility: ‘Based on what the speaker knows, it is possible for Chelswu to win the game,’ ii) a permission: ‘Based on the rules, Chelswu is allowed to win the game,’ or iii) an ability: ‘Based on Chelswu’s abilities and circumstances now, she is able to win the game.’ Sentence (107b) talks about either i) an epistemic possibility: ‘Based on what the speaker knew, it was possible for Chelswu to win the game,’ ii) a permission: ‘Based on the rules, Chelswu was allowed to win the game,’ or iii) an ability: ‘Based on Chelswu’s abilities and circumstances at some past time, she was able to win the game.’ Sentences (107c) and (107d) are not acceptable with non-epistemic readings. Sentence (107c) talks about an epistemic possibility: ‘Based on what the speaker knows now, it is possible that Chelswu won the game.’ Sentence (107d) also talks about an epistemic possibility only: ‘Based on what the speaker knew, it was possible that Chelswu had won the game.’ Table 3.1 illustrates the interpretation patterns that –ul swu iss– ‘can, may’ with non-stative predicates yields when it interacts with the temporal components.

<table>
<thead>
<tr>
<th>Pattern</th>
<th>Interpretations</th>
</tr>
</thead>
<tbody>
<tr>
<td>(107a) NONP-ul swu iss-NONP-</td>
<td>epistemic reading/priority reading/dynamic reading</td>
</tr>
<tr>
<td>(107b) NONP-ul swu iss-PAST-</td>
<td>epistemic reading/priority reading/dynamic reading</td>
</tr>
<tr>
<td>(107c) PAST-ul swu iss-NONP-</td>
<td>epistemic reading/priority reading/dynamic reading</td>
</tr>
<tr>
<td>(107d) PAST-ul swu iss-PAST-</td>
<td>epistemic reading</td>
</tr>
</tbody>
</table>

Table 3.1: The interpretations of –ul swu iss– ‘can, may’ with non-stative predicates

Next, consider the interpretation patterns when the modal expression –ul swu iss– ‘can, may’ with stative predicates interacts with temporal components.

(108) a. Chelswu-ka pappu-∅-l swu iss-∅-ta.
       Chelswu-NOM be.busy-NONP-COMP BN AUX-NONP-DEC
       ‘It is possible that Chelswu is busy.’ (epistemic)
       ?‘Chelswu is allowed to be busy.’ (priority)
       #‘Chelswu is able to be busy.’ (dynamic)
b. Chelswu-ka pappu-∅-l swu iss-ess-ta.
Chelswu-NOM be.busy-NONP-COMP BN AUX-PAST-DEC
‘It was possible that Chelswu was busy.’ (epistemic)

?’Chelswu was allowed to be busy.’ (priority)

#‘Chelswu was able to be busy.’ (dynamic)

c. Chelswu-ka pappu-ess-ul swu iss-∅-ta.
Chelswu-NOM be.busy-PAST-COMP BN AUX-NONP-DEC
‘It is possible that Chelswu was busy.’ (epistemic)

#‘Chelswu is allowed to have been busy.’ (priority)

#‘Chelswu is able to have been busy.’ (dynamic)

Chelswu-NOM be.busy-PAST-COMP BN AUX-PAST-DEC
‘It was possible that Chelswu had been busy.’ (epistemic)

#‘Chelswu was allowed to have been busy.’ (priority)

#‘Chelswu was able to have been busy.’ (dynamic)

In (108), the predicate in the complement is an adjectival predicate pappu– ‘be busy’. Sentences (108a)-(108d) are compatible with epistemic readings but not with priority or dynamic readings. In (108a) and (108b), both the permission and ability readings are not natural but the permission readings are slightly better than the ability readings. Table 3.2 summarizes this interpretation pattern.

<table>
<thead>
<tr>
<th>Pattern</th>
<th>Interpretations</th>
</tr>
</thead>
<tbody>
<tr>
<td>(108a) NONP-ul swu iss-NONP-</td>
<td>epistemic reading/?priority reading</td>
</tr>
<tr>
<td>(108b) NONP-ul swu iss-PAST-</td>
<td>epistemic reading/?priority reading</td>
</tr>
<tr>
<td>(108c) PAST-ul swu iss-NONP-</td>
<td>epistemic reading</td>
</tr>
<tr>
<td>(108d) PAST-ul swu iss-PAST-</td>
<td>epistemic reading</td>
</tr>
</tbody>
</table>

Table 3.2: The interpretations of –ul swu iss– ‘can, may’ with stative predicates

There are several things that Tables 3.1 and 3.2 tell us. First, the aspectual class of the predicate in the complement matters in modal interpretations. The difference is clear with
(107a-b) and (108a-b). Second, the tense of the complement affects the interpretations of the modal expressions. The non-epistemic reading is not possible in (107c-d) and (108c-d). These two facts may support the idea that the syntactic structures of epistemic, priority, and dynamic modals in Korean are different even though they have the same surface structure. The syntactic discussion will be in section 3.2.2.1.

One more interesting issue that I’d like to address in this chapter is that (107b) gives rise to the actuality inference in addition to the primary modal meanings. The actuality inference arises when the modal base is circumstantial. In the literature, it has been argued that the actuality inference is associated with the ability reading (Bhatt 1999) or the non-epistemic modals (Hacquard 2006). I will examine what the nature of the actuality inference in Korean is and how we can derive this additional inference from the combination of the modal and tense elements.

To summarize, the research questions of this chapter are two-fold: (i) First, I will examine temporal interpretations of –ul swu iss– ‘can, may’ modal constructions. By looking at the interpretation patterns, we will be able to explain why the non-epistemic readings in (107c-d) and (108) are absent or degraded. (ii) Second, I will investigate the actuality inference in (107b), i.e. what the nature of this inference is, and how we can derive this inference. In section 3.2, I will discuss (i) and in section 3.3, I will discuss (ii).

3.2 THE TEMPORAL INTERPRETATIONS OF –ul swu iss– MODAL SENTENCES

In this section, I discuss how tense markers affect the –ul swu iss– ‘can, may’ modal interpretations. In section 3.2.1, I lay out the phenomenon in more detail and in section 3.2.2, I give an analysis of –ul swu iss– modal sentences that accounts for the semantic ambiguity. I propose three semantic entries of the –ul swu iss– modal and argue that each definition pairs with a certain modal flavor of the –ul swu iss– modal.
3.2.1 PHENOMENON

In the previous section, we saw that the –ul swu iss– ‘can, may’ modal sentences with non-stative predicates do not exhibit uniform interpretation patterns when tense markers are involved. In (107a) and (107b), all three modal readings are possible but in (107c) and (107d), only epistemic readings are possible. This means that the non-epistemic modals are not compatible with the past complement. When it comes to the –ul swu iss– ‘can, may’ modal sentences with stative predicates, only epistemic readings are completely natural in (108a-d). In this section, we will look at this phenomenon in more detail.

First of all, I discuss why (107a-b) are compatible with all three of the modal readings while (107c-d) are only compatible with epistemic readings. For simplicity, I will first focus on the tense of the complement and set aside the tense of the modal expression. The reason why I ignore the tense of the modal expression at this point is because the tense of the modal does not contribute to disambiguating modal interpretations. (107) is repeated below:

(109) a. Chelswu-ka sihap-ul iki-∅-l swu iss-∅-ta.
Chelswu-NOM game-ACC win-NONP-COMP BN AUX-NONP-DEC
‘It is possible for Chelswu to win the game.’ (epistemic)
‘Chelswu is allowed to win the game.’ (priority)
‘Chelswu is able to win the game.’ (dynamic)

b. Chelswu-ka sihap-ul iki-∅-l swu iss-ess-∅-ta.
Chelswu-NOM game-ACC win-NONP-COMP BN AUX-PAST-DEC
‘It was possible for Chelswu to win the game.’ (epistemic)
‘Chelswu was allowed to win the game.’ (priority)
‘Chelswu was able to win the game.’ (dynamic)

c. Chelswu-ka sihap-ul iki-ess-ul swu iss-∅-ta.
Chelswu-NOM game-ACC win-PAST-COMP BN AUX-NONP-DEC
‘It is possible that Chelswu won the game.’ (epistemic)

#‘Chelswu is allowed to have won the game.’ (priority)

#‘Chelswu is able to have won the game.’ (dynamic)

Chelswu-NOM game-ACC win-PAST-COMP BN AUX-PAST-DEC
‘It was possible that Chelswu had won the game.’ (epistemic)

#‘Chelswu was allowed to have won the game.’ (priority)

#‘Chelswu was able to have won the game.’ (dynamic)

Let’s focus on (109a) and (109c). In (109a), both the tense of the complement and the
tense of the modal expression are non-past. In (109c), the tense of the complement is past
and the tense of the modal expression is non-past. (109a) allows epistemic, priority, and
dynamic readings but when the embedded tense is past as in (109c), only epistemic reading
is possible. We can stipulate why this is the case. Informally, in (109c), the ability reading
is unavailable because the subject cannot affect the past. Similarly, the priority reading is
not possible because permission necessitates the futurity of the event.

Next, let’s consider the –ul swu iss– ‘can, may’ modal sentences with stative predicates.

(110) a. Chelswu-ka pappu-∅-l swu iss-∅-ta.
Chelswu-NOM be.busy-NONP-COMP BN AUX-NONP-DEC
‘It is possible that Chelswu is busy.’ (epistemic)

?‘Chelswu is allowed to be busy.’ (priority)

#‘Chelswu is able to be busy.’ (dynamic)

b. Chelswu-ka pappu-∅-l swu iss-ess-ta.
Chelswu-NOM be.busy-NONP-COMP BN AUX-PAST-DEC
‘It was possible that Chelswu was busy.’ (epistemic)

?‘Chelswu was allowed to be busy.’ (priority)

#‘Chelswu was able to be busy.’ (dynamic)
As we can see from (110), the epistemic reading is natural with stative predicates regardless of the tense of the complement. With a past complement as in (110c) and (110d), non-epistemic readings are not possible. When the tense of the complement is non-past, as in (110a) and (110b), priority and ability readings show different patterns. That is, the priority reading is unnatural but not completely degraded. Conceptually, the priority reading ‘Mary is allowed to be busy’ sounds ok, but is somewhat odd. I will discuss why it is degraded later on, but at this point, I will treat it as acceptable. The ability reading is unavailable. This suggests the general incompatibility between ability readings and stative predicates. I will discuss why ability readings are not available extensively in section 3.2.2.2.

All of the modal sentences that I discussed so far have an animate (human) subject. In addition to the aspectual class of the complement of the modal, the subject also contributes to the modal interpretations. Now consider the sentences with an inanimate subject.

(111)  

a. Pay-ka kalaanc-∅-ul swu iss-∅-ta.  
   boat-NOM sink-NONP-COMP BN AUX-NONP-DEC  
   ‘It is possible that the boat will sink.’ (epistemic)  
   #‘The boat is allowed to sink.’ (priority)  
   #‘The boat is able to sink.’ (dynamic)
b. Pay-ka kalaanc-∅-ul swu iss-ess-ta.
   boat-NOM sink-NONP-COMP BN AUX-PAST-DEC
   ‘It was possible that the boat would sink.’ (epistemic)

   #‘The boat was allowed to sink.’ (priority)
   #‘The boat was able to sink.’ (dynamic)

c. Pay-ka kalaanc-ass-ul swu iss-∅-ta.
   boat-NOM sink-PAST-COMP BN AUX-NONP-DEC
   ‘It is possible that the boat sank.’ (epistemic)

   #‘The boat is allowed to have sunk.’ (priority)
   #‘The boat is able to have sunk.’ (dynamic)

   boat-NOM sink-PAST-COMP BN AUX-PAST-DEC
   ‘It was possible that the boat had sunk.’ (epistemic)

   #‘The boat was allowed to have sunk.’ (priority)
   #‘The boat was able to have sunk.’ (dynamic)

In (111), the only available reading is the epistemic reading and the non-epistemic readings are not compatible with an inanimate subject. The pattern in (111) is similar to (110). Unlike (110), however, the permission reading is missing in (111a-b) since the permission reading relies on the animate/inanimate property of the subject. The ability reading is absent in (111) because the subject does not have control over the action.

Let’s summarize the above facts that we observed from sentences in (109), (110), and (111):

<table>
<thead>
<tr>
<th></th>
<th>Epistemic</th>
<th>Priority</th>
<th>Dynamic</th>
</tr>
</thead>
<tbody>
<tr>
<td>past complements</td>
<td>v</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>stative predicates</td>
<td>v</td>
<td>v</td>
<td>x</td>
</tr>
<tr>
<td>inanimate subjects</td>
<td>v</td>
<td>x</td>
<td>x</td>
</tr>
</tbody>
</table>

Table 3.3: Interpretation patterns of the –ul swu iss– modal
As Table 3.3 shows, non-epistemic readings are more limited than epistemic readings of the same modal expression. The goal of the next section is to give an analysis which accounts for why non-epistemic readings are unavailable in certain grammatical contexts.

3.2.2 Analysis

In this section, I will investigate whether the semantic asymmetry in –ul swu iss– constructions arises due to their structural differences or whether it is purely semantic. When it comes to modal auxiliaries in English, Lyons (1977: 841) notes that epistemic and deontic uses of *may*, *can*, and *must* in English differ fundamentally in that epistemic modal verbs are intransitive while deontic modals are transitive. Similarly, Brennan (1993) argues that the syntax of epistemic modals is like that of raising constructions while the syntax of dynamic modals is like that of control constructions.\(^{38}\) In addition, Cinque (1999) proposes that the semantic category correlates with which functional category the modal occurs in. Regarding my primary puzzle identified above, several authors (Ha 2007, Chung 2007 among others) argue that the source of this ambiguity is attributed to structural differences. As the discussion proceeds, we will see that Korean data lends some support to the argument that the epistemic-circumstantial dichotomy is associated with the syntactic structure of modals. Though there is a correlation between the syntax of modality and modal interpretation, in this dissertation, I claim that what identifies –ul swu iss– modal interpretations are three distinct semantic entries.

3.2.2.1 Syntax

There are several pieces of evidence that –ul swu iss– modal constructions have different structures depending on their interpretations. The first piece of evidence comes from the subject honorification. That is, the honorific morpheme –usi in iss– is impossible with

\(^{38}\)Wurmbrand (1999) challenges this idea, and argues that all modal verbs must be raising verbs.
an epistemic interpretation while it is possible with a circumstantial interpretation (S.-S. Kim 2010: 5). The example sentences in (112) are from S.-S. Kim (2010: 5, glosses slightly modified):

that person(HON)-NOM that problem-ACC solve-COMP BN AUX-DEC
‘It is possible that that person will solve the problem.’ (possibility)
‘That person is able to solve the problem.’ (ability)

b. Ku pwun-i ku mwuncey-lul phwu-si-l swu
that person(HON)-NOM that problem-ACC solve-HON-COMP BN
iss-ta.
AUX-DEC
‘It is possible that that person will solve the problem.’ (possibility)
‘That person is able to solve the problem.’ (ability)

c. Ku pwun-i ku mwuncey-lul phwu-l swu
that person(HON)-NOM that problem-ACC solve-COMP BN
iss-usi-ta.
AUX-HON-DEC
#‘It is possible that that person will solve the problem.’ (possibility)
‘That person is able to solve the problem.’ (ability)

d. Ku pwun-i ku mwuncey-lul phwu-si-l swu
that person(HON)-NOM that problem-ACC solve-HON-COMP BN
iss-usi-ta.
AUX-HON-DEC
#‘It is possible that that person will solve the problem.’ (possibility)
‘That person is able to solve the problem.’ (ability)

(112) shows that the sentence is ambiguous when the honorific morpheme –usi appears in the complement, as in (112b), while the sentences lack the epistemic reading when –usi appears in the modal expression, as in (112c) and (112d). This suggests that ku pwun ‘that person’ and the –usi-marked predicate are not in agreement when interpreted as epistemic readings. If the subject of iss– is ku pwun ‘that person’ in (112c) and (112d), there is no
reason for honorific marking in *iss–* to be unacceptable. If the honorific marking appears in the embedded predicate, as in (112b), the sentence is ambiguous. (112b) suggests that *ku pwun* ‘that person’ is the subject of the embedded predicate *phwul–* ‘solve’ and there is no matrix subject in epistemic modal constructions. When the DP moves to the higher clause because of EPP, it is the DP [Ku pwun-i ku mwuncey-lul phwu-l swu] ‘the possibility that that person will solve the problem’, not the DP [ku pwun] ‘that person’. 39 Since there is no referential NP which agrees with the honorific marking on the matrix predicate, the epistemic reading is not possible in (112c) and (112d). When it comes to the ability reading, the DP [ku pwun] occupies the higher [Spec,TP] which can agree with the honorific marking on the matrix predicate; hence, the ability reading is available.

The second piece of evidence is the NPI distribution in –*ul swu iss–* modal constructions. Ha (2007) observes that the Korean possibility modal –*ul swu iss–*, which has two readings depending on the context, loses a non-epistemic reading with a subject NPI *amwuto* ‘anyone’.

(113) Mary-ka maykcwu-lul masi-l swu iss-ta.  
Mary-NOM beer-ACC drink-MOD-DEC  
‘It is possible that Mary will drink beer.’ (possibility)  
‘Mary is capable of drinking beer.’ (ability)  
(Ha 2007: 312)

In (113), the modal sentence can have either a possibility reading or an ability reading. When the sentence is negated and the subject is replaced by an NPI such as ‘anyone’, however, it loses a non-epistemic reading. (114a) is a sentence with a short-form negation and (114b) is a sentence with a long-form negation.

---

39 It could be that the DP [ku pwun] ‘that person’ moves, but it is not an argument in the matrix clause. Assuming that honorific marking depends on being an argument, the epistemic reading is not possible in (112c) and (112d). This corresponds to standard subject-to-subject raising. However, Kim (2010) argues that epistemic modal constructions are not true subject-to-subject raising by showing the interpretation patterns of *ka*-marked NP and *nun*-marked NP in matrix and embedded clauses.
Given that there is a clause-mate condition between NPIs and negation in Korean, we can explain the epistemic/non-epistemic asymmetry in (114) by assigning distinct structural features to epistemic and non-epistemic readings of modals.

Chung (2007) also discusses the NPI distribution in –ul swu iss– modal constructions, and proposes the following structures for epistemic and root (circumstantial) modal constructions.

(115) a. Epistemic modal: 
\[ VP \left[ DP/CP \left[ TP DP...V-ul \right] swu \right] [v, iss] \]

b. Root modal: 
\[ i_{vP} DP; v \left[ DP/CP \left[ TP PRO...V-ul \right] swu \right] [v, iss] \] (Chung 2007: 640)

(115) says that the subject of –ul swu iss– modal constructions with epistemic readings is base-generated in the embedded clause while the subject of –ul swu iss– modal constructions with ability readings is base-generated as PRO in the embedded clause and controlled by the matrix subject. Based on (115), the NPI distribution is explained.

(116) a. Epistemic modal: 
\[ DP/CP \left[ NPI_{subj} ...YP... Neg-V-ul \right] swu \] \_t \_i iss...

b. Root modal: *NPI_{subj} [DP/CP [PRO ...YP... Neg-V-ul] swu] iss...  (Chung 2007: 644)
In (116a), since the NPI and its licenser are in the same clause, the NPI is licensed.\(^{40}\) In (116b), however, the NPI is in the matrix clause and Neg is in the embedded clause; hence, the NPI is not licensed.

These two pieces of evidence support the argument that the distinction between epistemic and dynamic modal readings is derived from their different structures. Following Ha (2007) and Chung (2007), I postulate two different modal structures based on the assumption that the predicate \(iss\)-- is ambiguous. That is, epistemic modality involves an intransitive predicate \(iss\)-- while circumstantial modality involves a transitive predicate \(iss\)--. As Chung (2007) convincingly argues, the transitive predicate takes a subject and a clausal complement as arguments (whose subject is PRO controlled by the matrix subject) while the intransitive predicate takes a clausal complement as its argument.

However, syntactic accounts cannot explain why the tense morphemes are not allowed in the complements of non-epistemic modals. Both modals are bi-clausal, so they would accommodate TPs in the complement. In addition, the discussion above does not separate the priority readings from the ability readings. In order to account for the semantic asymmetry, I complement the syntactic argument with richer semantic and pragmatic grounds. In the next section, I will propose that the \(-ul\ swu\ iss\--\) modal in fact has three semantic entries depending on its three meanings (epistemic, permission, and ability), and argue that the modal interpretations are determined by their semantic entries.

3.2.2.2 Semantics

Based on the syntactic discussion, now I turn back to the interpretation patterns of \(-ul\ swu\ iss\--\) modal constructions. Before analyzing the semantic restrictions on the modal, let’s

\(^{40}\) According to Chung (2007: 640), the predicate \(iss\)-- in the epistemic modal constructions is an intransitive predicate that subcategorizes for a CP/DP. The CP/DP moves for an EPP reason.
talk conceptually about why certain readings are not available as shown in Table 3.3. Table 3.3 is repeated here:

<table>
<thead>
<tr>
<th></th>
<th>Epistemic</th>
<th>Priority</th>
<th>Dynamic</th>
</tr>
</thead>
<tbody>
<tr>
<td>past complements</td>
<td>v</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>stative predicates</td>
<td>v</td>
<td>v</td>
<td>x</td>
</tr>
<tr>
<td>inanimate subjects</td>
<td>v</td>
<td>x</td>
<td>x</td>
</tr>
</tbody>
</table>

Table 3.4: Interpretation patterns of the –ul swu iss– modal

First, I will discuss the interpretation patterns in (109) where the tense of the complement affects the modal flavors. Next, I will discuss the interpretation patterns in (110) where the stativity is crucial in determining the interpretations. Finally, I will discuss the interpretation patterns in (111) where the subject of the modal sentence is considered. Based on the distributions, I propose new semantic entries for non-epistemic –ul swu iss– modal constructions.

We saw that the non-epistemic readings are not possible with the past complement. (109) is repeated below.

(117) a. Chelswu-ka sihap-ul iki-∅-l swu iss-∅-ta.
Chelswu-NOM game-ACC win-NONP-COMP BN AUX-NONP-DEC
‘It is possible for Chelswu to win the game.’ (epistemic)
‘Chelswu is allowed to win the game.’ (priority)
‘Chelswu is able to win the game.’ (dynamic)

b. Chelswu-ka sihap-ul iki-∅-l swu iss-ess-∅-ta.
Chelswu-NOM game-ACC win-NONP-COMP BN AUX-PAST-DEC
‘It was possible for Chelswu to win the game.’ (epistemic)
‘Chelswu was allowed to win the game.’ (priority)
‘Chelswu was able to win the game.’ (dynamic)

c. Chelswu-ka sihap-ul iki-ess-ul swu iss-∅-ta.
Chelswu-NOM game-ACC win-PAST-COMP BN AUX-NONP-DEC
‘It is possible that Chelswu won the game.’ (epistemic)

#‘Chelswu is allowed to have won the game.’ (priority)

#‘Chelswu is able to have won the game.’ (dynamic)

Chelswu-NOM game-ACC win-PAST-COMP BN AUX-PAST-DEC
‘It was possible that Chelswu had won the game.’ (epistemic)

# ‘Chelswu was allowed to have won the game.’ (priority)

# ‘Chelswu was able to have won the game.’ (dynamic)

In order to talk about the lack of non-epistemic readings in (117c-d), the nature of past needs to be discussed. As we know, past is fixed as either P or not-P. If P is true, not-P is necessarily false. In (117c-d), the complement is in the past tense, i.e. Chelswu’s winning the game is in the past. This information can be compatible with the speaker’s epistemic knowledge regardless of the facts in the actual world. Hence, the epistemic reading is ok. As for non-epistemic readings, however, the subject cannot act on winning the game since whether he won or not is already fixed. The fact that the subject cannot affect the past is the reason why the priority reading and the ability reading are not available. Whether the subject is able to act on something or not is part of the semantics/pragmatics of both the priority and the ability reading. The goal of this section is to make this intuitive explanation more precise.

The next example is about stativity. What is stativity? Stative predicates are those that describe something temporally continuous. I use Dowty’s (1986) temporal semantics to define stativity. In Dowty’s work, the crucial property that defines stativity is the subinterval property. Others use different criteria to define stativity. For example, Lakoff (1966) sub-classifies all verbs according to whether or not the predicates can form progressive, perfective, or imperative, and uses these tests as criteria for stativity. For my discussion, using the subinterval property to define stativity is enough, because the differences among
Vendler’s (1957) four classes, i.e. states, activities, accomplishments, and achievements, are not relevant. According to Dowty (1986: 42), stativity is defined as in (118).

(118) A sentence $\varphi$ is stative iff it follows from the truth of $\varphi$ at an interval $I$ that $\varphi$ is true at all subintervals of $I$.

For example, *be sick* is stative because, if Mary was sick yesterday, then she was sick at all subintervals of yesterday. I will use Dowty’s definition in (118) to distinguish stative predicates from non-stative predicates.

Given this, can we conceptually explain why stativity is incompatible with ability readings and somewhat unnatural with priority readings? (110) is repeated below.

(119) a. Chelswu-ka pappu-∅-l swu iss-∅-ta.
Chelswu-NOM be.busy-NONP-COMP BN AUX-NONP-DEC
‘It is possible that Chelswu is busy.’ (epistemic)

?’Chelswu is allowed to be busy.’ (priority)

#‘Chelswu is able to be busy.’ (dynamic)

b. Chelswu-ka pappu-∅-l swu iss-ess-ta.
Chelswu-NOM be.busy-NONP-COMP BN AUX-PAST-DEC
‘It was possible that Chelswu was busy.’ (epistemic)

?’Chelswu was allowed to be busy.’ (priority)

#‘Chelswu was able to be busy.’ (dynamic)

c. Chelswu-ka pappu-ess-ul swu iss-∅-ta.
Chelswu-NOM be.busy-PAST-COMP BN AUX-NONP-DEC
‘It is possible that Chelswu was busy.’ (epistemic)

#‘Chelswu is allowed to have been busy.’ (priority)

#‘Chelswu is able to have been busy.’ (dynamic)

Chelswu-NOM be.busy-PAST-COMP BN AUX-PAST-DEC

88
‘It was possible that Chelswu had been busy.’ (epistemic)

‘Chelswu was allowed to have been busy.’ (priority)

‘Chelswu was able to have been busy.’ (dynamic)

To have the ability to P is to have intrinsic (or developed) properties that when you act on them, you effectuate P in normal circumstances. A person’s ability is realized when the person acts upon it. That is, to realize ability necessarily requires some action. For example, we can truthfully say the sentence John swims only when his intentional kicking of his legs and moving of his arms in the water result in swimming. For stative predicates, however, the subject cannot agentively P. For example, the subject cannot agentively be tall or be busy. This is why the ability reading in (119a-b) is not available. As for permission readings, it is not completely unavailable but somewhat degraded. Conceptually, permission requires some future action, and this future action must be accomplished by some agentive subject. However, the stative predicate be busy cannot assign agentivity to the subject. This is why stative predicates and permission do not go together.\(^{41}\) Then why is the permission reading in (119a-b) only degraded, and not out entirely? I argue that this is due to semantic coercion: a non-agentive subject receives the agentive interpretation in some contexts like this, which is parallel to the way non-agentive subjects are used with stative predicates. For example, in the sentence The computer is busy, we can make the subject the computer get an agentive reading by anthropomorphizing it. Of course, if coercion is possible to rescue the permission reading, one might wonder why it does not lead to the ability reading being acceptable too. That failure is because agentivity is more closely connected to the definition of ability modals. I will discuss this in more detail later.

Now let’s move on to the examples in (111) where the subject is inanimate. Examples are repeated below.

\(^{41}\)The reason why the non-epistemic readings are not possible with the past complements, as in (119c-d), is mentioned with (117).
(120) a. Pay-ka kalaanc-∅-ul swu iss-∅-ta.
   boat-NOM sink-NONP-COMP BN AUX-NONP-DEC
   ‘It is possible that the boat will sink.’ (epistemic)
   #‘The boat is allowed to sink.’ (priority)
   #‘The boat is able to sink.’ (dynamic)

b. Pay-ka kalaanc-∅-ul swu iss-ess-ta.
   boat-NOM sink-NONP-COMP BN AUX-PAST-DEC
   ‘It was possible that the boat would sink.’ (epistemic)
   #‘The boat was allowed to sink.’ (priority)
   #‘The boat was able to sink.’ (dynamic)

c. Pay-ka kalaanc-ass-ul swu iss-∅-ta.
   boat-NOM sink-PAST-COMP BN AUX-NONP-DEC
   ‘It is possible that the boat sank.’ (epistemic)
   #‘The boat is allowed to have sunk.’ (priority)
   #‘The boat is able to have sunk.’ (dynamic)

   boat-NOM sink-PAST-COMP BN AUX-PAST-DEC
   ‘It was possible that the boat had sunk.’ (epistemic)
   #‘The boat was allowed to have sunk.’ (priority)
   #‘The boat was able to have sunk.’ (dynamic)

Just like (117) and (119), inanimate subjects are fine with epistemic readings but not with priority or ability readings. Why is this the case? Inanimate subjects are intrinsically non-agentive, and non-agentive subjects cannot control their actions. This is why ability and permission readings are not natural with inanimate subjects. Moreover, coercion cannot apply to create an appropriate meaning for the priority and dynamic readings in this case.

Based on these intuitions, I propose that we need to have restrictions on the modal when it has a circumstantial modal base. Circumstantial modal bases are about the facts in the actual world. Circumstantial facts are different from epistemic facts which depend on
the speaker’s knowledge. Facts about the actual world become circumstantial facts regardless of the speaker’s knowledge or belief. As we have seen already, epistemic readings are available in all of the contexts discussed. That means that we have no restrictions on epistemic modal bases. Thus we predict that, for (117), (119), and (120), the epistemic reading is available. We have no stipulation that would rule out such a reading. Meanwhile, the presuppositions for the circumstantial readings will be linked to the semantics, which will in turn explain why certain readings are unavailable in certain contexts. Eventually, I will suggest three different lexical entries for –ul swu iss–.

Proposal for circumstantial modal base

I propose the following: In order for –ul swu iss– to have either an ability reading or a permission reading, the subject must be animate and agentive, and P needs to be an available option. The two requirements for both readings are stated as follows:

(121) When f is a circumstantial modal base, \[ x \rightarrow ul swu iss\rightarrow in w at t \] \[ f \] is defined only if (i) x is a potential agent\(^{42}\) of the event described by the predicate P and (ii) \( \cap f(w, t) \cap P \neq \emptyset \) & \( \cap f(w, t) \cap \neg P \neq \emptyset \)

(121) says that in order for –ul swu iss– to have non-epistemic readings, the subject must be a potential agent of the event described by the main predicate and the modal base must be compatible with both P and not-P. What I propose with (121) is that agentivity, stativity, and pastness constrain the choice of modal base. Now I will go through examples in (117), (119), and (120), showing why (i) and (ii) are necessary.

First of all, in (117), the past complement is not compatible with the circumstantial modal base because the actual world is fixed as either a P-world or a not-P-world. That is, if f is circumstantial, it violates (121ii) because two options are no longer available. In

\(^{42}\)Since these are modal sentences, x does not necessarily take the action P.
the example where the predicate is stative, as in (119), permission readings are sometimes possible and ability readings are impossible. For (119c-d), both permission readings and ability readings are not available because they fail to satisfy (121ii). Additionally, they fail to satisfy the agentivity requirement in (121i) because the stative predicate *pappu*—‘be busy’—fails to assign agentivity to the subject. Since this is the case, then the permission reading in (119a) and (119b) should not be available either. However, we get the permission reading in (119a) and (119b) even though it is not completely natural. I argue that this is due to semantic coercion: a non-agentive subject receives the agentive interpretation. Ability readings are not available with the stative predicate *pappu*—‘be busy’. Like permission readings, ability readings violate (121i). This may prompt us to ask whether the same semantic coercion (i.e. non-agentive subjects being used with predicates that take agents) occurs with ability readings. My answer to this question is no, the reason being that (121i) is directly related to the semantics which will be given shortly. In the example in which the subject is not animate, as in (120), the subject does not have agentivity and cannot be coerced into being agentive. In this case, (121i) is not satisfied for non-epistemic readings.

**The quantificational force of *–ul swu iss*—**

Now I will discuss quantificational force. The standard definitions of *–ul swu iss*—‘can, may’ treat it as an existential quantifier, regardless of modal flavor. I agree with the standard definitions that the quantificational force of epistemic/permission modals is existential. For ability modals, however, I claim that the existential meaning is not correct. Kenny (1975, 1976) also argues that ability *can* cannot be described as a possibility operator. I will briefly discuss Kenny’s objections to standard modal logic (Horty 2001: 20).

In many modal logics with a possible world semantics, possibility operators often satisfy the following two theses:

\[(122) \quad \text{a. } A \supset \Diamond A\]
b. ♦ (A ∨ B) ⊃ (♢A ∨ ♢B)

Kenny argues that, unlike deontic, epistemic, and doxastic logics, ability modals do not satisfy either of the theses in (122). Kenny’s counterexample to (122a) is the case in which a poor dart player with only dumb luck hits the bull’s-eye. It is true that he hits the bull’s-eye, but it is hard to say that he has the ability to do so. As a counterexample to (122b), Kenny considers the case where a dart player is able to hit the dartboard but is not skillful enough to control the placement. In this case, it is true that the player can hit either the top half or the bottom half of the dartboard. If we describe it using logical symbols: ♦(p ∨ q). However, it seems false to say that the player has enough skill that he can control which half of the dartboard he hits. Therefore, ♦(p ∨ q) → (♦p ∨ ♢q) is false. Kenny’s counterexamples support the idea that the notion of ability should be treated differently from other possibility operators. Ultimately, Kenny argues that dynamic modality is not a modality. I thus take Kenny’s work to represent motivation for analyzing ability modals as not possibility modals. After I develop my analysis of –ul swu iss–, I evaluate how it accounts for the problems Kenny raises for existential analyses of ability modals.

Related to the discussion above, I’d like to point out that ability is a unique sort of modality. Unlike priority modals for obligation/permission, dynamic modals for ability do not have a strong counterpart. That is, we have strong modals must and should as opposed to a weak one can among priority modals, while we only have can for ability readings. Of course, the lexeme will belongs to dynamic modals and conveys a stronger modal meaning, but it is not used to convey ability readings. The contrast between will and can is not just the modal force. Will as a modal conveys meanings of intend to or be willing to. This shows the uniqueness of ability modals; they are neither strong nor weak in strength or degree,
Formal analysis of –ul swu iss– modals

Version 1: ability as a special kind of modal

Standard definitions of ability modals treat them as existential quantifiers.

\[(123) \ [\ul swu \ iss–ability]_{f,g} = \lambda P \lambda w. \exists w' [w' \in \text{Best}_{g\text{stereotypical}}(w) \cap f_{\text{circ}}(w)) \& w' \in P] \]

(123) says that the sentence is true if and only if in some world \(w'\) which is compatible with the modal base, \(P\) is true in \(w'\). However, to treat the ability modal as an existential modal is not correct. For example, the sentence \(This \ elevator \ can \ lift \ 1500 \ lbs\) does not convey a single possibility but a more generic situation. More specifically, the sentence does not mean that it is possible that this elevator will lift 1500 lbs, but it means that this elevator lifts 1500 lbs in all situations in which someone puts 1500 lbs in it, pushes the button, and normal operating conditions hold. The elevator’s capability cannot be described as accidental or a one-time event. I claim that ability is always about choosing to act and always being able to make \(P\) hold; thus, we need to make it a universal quantifier. We also need to add in the “choosing” component to the definition of this ability modal:

\[(124) \ [\ul swu \ iss–ability]_{f,g} = \lambda P \lambda x \lambda w. \forall w' [w' \in \text{Best}_{g\text{stereotypical}}(w) \cap f_{\text{circ}}(w)) \& x \text{ chooses } P \text{ in } w' \rightarrow P(x, w')=1] \]

(124) says that \([\ul swu \ iss–ability]\) is true if and only if for all the best circumstantially accessible worlds \(w'\) where \(x\) chooses \(P\), \(P\) is true in \(w'\). “Best” is determined by the stereotypical ordering source. Having the stereotypical ordering source, \(P\) is a more reasonable expectation than \(\neg P\) in \(w'\). “\(x\)’s choosing \(P\)” means that \(x\) makes an effort to bring about \(P\). I argue that, for the ability reading, the quantificational force is universal because every time

---

43The status of will as a modal is controversial. Even if we classify will as a modal, we still have to determine whether it is an epistemic modal, a metaphysical modal, or a dynamic modal. Will is also used to indicate future tense.
the conditions are met, the ability should be realized. This is a refinement on the traditional
definition of ability modals.

Now I show how my analysis is better than the standard analysis, by showing that my
semantic entry solves the two problems raised by Kenny (1975, 1976). The first problem
was that the existential analysis cannot explain the case where a poor dart player with
only dumb luck hit the bull’s-eye. If the player hit the bull’s-eye once, then the sentence
it is possible that he hits the bull’s-eye is true. In reality, however, his accidental hitting of
the bull’s-eye does not mean that he has the ability to hit the bull’s-eye. With the refined
definition, which uses the universal quantifier instead of the existential quantifier, as in
(124), this problem is solved. (124) does not allow a single chance of hitting, but requires
that every time he throws the dart (when appropriate circumstances hold), he hit the bull’s-
eye. The second problem raised by Kenny was that the dart player’s lack of control of
the placement is not reflected in the existential analysis. In order to solve this problem, I
proposed that the agent’s choosing be a crucial part of the definition. Having agent’s choice
and the universal quantification, the semantics in (124) leads CAN (A ∨ B) ⊃ (CAN A ∨
CAN B) to not be a theorem. Let’s revisit the dartboard example. CAN (A ∨ B) means that,
if the player chooses to hit either the top half or the bottom half, all the best worlds are
hitting-either-the-top-half-or-the-bottom-half worlds.

\( (125) \quad \forall w'[w' \in \text{Best}_{\text{stereotypical}(w)}(\cap f_{\text{circ}}(w)) \& x \text{ chooses to hit the top half or the bottom half in } w' \rightarrow w' \in \text{hitting the top half or the bottom half} ] \)

CAN A means that, if the player chooses to hit the top half, all the best worlds are hitting-
the-top-half worlds. Similarly, CAN B means that, if the player chooses to hit the bottom
half, all the best worlds are hitting-the-bottom-half worlds.

\( (126) \quad a. \quad \forall w'[w' \in \text{Best}_{\text{stereotypical}(w)}(\cap f_{\text{circ}}(w)) \& x \text{ chooses to hit the top half in } w' \rightarrow \\
w' \in \text{hitting the top half} ] \)
b. \[ \forall w' \left[ w' \in \text{Best}_{\text{f}\text{sterotypical}}(w) \cap f_{\text{circ}}(w) \right] \land x \text{ chooses to hit the bottom half in } w' \rightarrow w' \in \text{hitting the bottom half} \]

(125) \supset (126a) \lor (126b) does not hold because (125) includes the cases where the agent chooses to hit the bottom half but hits the top half while (126) does not allow these cases.

The lack of ability readings with stative predicates, as in (119), is also explained by this “choosing” component in (124). When the predicate is stative, the subject lacks agentivity and does not have control over the action; hence, the subject cannot choose between \( P \) and \( \neg P \). This is why (119) lacks ability readings.

Next we will reconsider the interaction between the modal –ul swu iss– and tense. The definition in (124), however, does not incorporate temporal information. We need a time argument in addition to a world argument to more precisely investigate the main puzzle of why the tense of the complement matters in –ul swu iss– modal constructions. In discussing temporal interpretations of modal sentences, it has been noted that modality involves two times: (i) the time from which the modal background is accessed, and (ii) the time at which the situation described by the complement of the modal holds. In Condoravdi’s (2002) terminology, (i) is referred to as the temporal perspective and (ii) as the temporal orientation. Demirdache and Uribe-Etxebarria (2010) call them MOD-T and SIT-T, respectively. Following Demirdache and Uribe-Etxebarria, I will refer to (i) as MOD-T and (ii) as SIT-T. In addition to these two times, the time of utterance is always given as the present. I assume that in Korean, MOD-T is determined by the tense of the modal expression, and SIT-T is set by the embedded tense, which is realized within the main predicate. The definitions of Korean tenses are as follows:

(127)  
\[ [\emptyset/nun_{\text{NONP}}] = \lambda P \lambda t \lambda w. \exists t'[t' \geq t \land P(w, t')] \]

b. \[ [\text{ess}_{\text{PAST}}] = \lambda P \lambda t \lambda w. \exists t'[t' < t \land P(w, t')] \]
For root clauses, t is given as now, and for embedded clauses, t is the tense of the matrix clause. When the non-past tense determines the modal time, it means that sentence has the present perspective, not the future perspective. That is, \( t' = t \), not \( t' \succ t \).

In order to derive the meanings of modal constructions, the definition of the –ul swu iss– modal now incorporates a time argument in addition to a world argument, as in (128).

(128) \[ \text{[–ul swu iss–ability]}^{f,g} = \lambda P \lambda x \lambda t \lambda t' \lambda w. \forall w'[w' \in \text{Best}_{g\text{stereotypical}(u,t)}(\cap f_{\text{circ}}(w, t)) & x \text{ chooses } P(t') \text{ in } w' \text{ at } t \rightarrow P(x, w', t')=1] \]

(128) is a revised version from (124).

So now, we have a semantic entry of ability readings in (129) with a definedness condition that we saw in (121):

(129) \[ \text{[–ul swu iss–ability]}^{f,g} \text{ defined iff (121) is satisfied.} \]

If defined, \( \lambda P \lambda x \lambda t \lambda t' \lambda w. \forall w'[w' \in \text{Best}_{g\text{stereotypical}(u,t)}(\cap f_{\text{circ}}(w, t)) & x \text{ chooses } P(t') \text{ in } w' \text{ at } t \rightarrow P(x, w', t')=1] \]

Now we get the meaning of ability sentences having non-past MOD-T and non-past SIT-T as follows:

(130) \[ \text{[P-NONP-ul swu iss–ability-NONP]}^{f,g} = \lambda x \lambda t \lambda w. \exists t'[t' = t & \forall w'[w' \in \text{Best}_{g\text{stereotypical}(u,t')} (\cap f_{\text{circ}}(w, t')) & x \text{ chooses } \exists t''[t'' \succeq t' & P(t'')] \text{ in } w' \text{ at } t' \rightarrow P(x, w', t'')=1] \]

(130) says that \([P-NONP-ul swu iss–ability-NONP]\) is true if and only if for all the best circumstantially accessible worlds \( w' \) at \( t' \) where \( x \) chooses \( P \) at \( t' \), \( P \) is true in \( w' \) at \( t'' \).

For the case where the complement of the modal is in the past tense (past SIT-T), the presupposition in the definedness conditions cannot be satisfied.

(131) \[ \text{[P-PAST-ul swu iss–ability-NONP]}^{f,g} = \lambda x \lambda t \lambda w. \exists t'[t' = t & \forall w'[w' \in \text{Best}_{g\text{stereotypical}(u,t')} (\cap f_{\text{circ}}(w, t')) & x \text{ chooses } \exists t''[t'' \prec t' & P(t'')] \text{ in } w' \text{ at } t' \rightarrow P(x, w', t'')=1] \]
With past complements, as in (131), the sentence is undefined because of the presupposition failure. (121ii) is not satisfied because the agent’s choice in w’ at t’ cannot affect the past; hence, “x chooses $\exists t'[t' \prec t' \& P(t')]$ in w’ at t’” is not possible. Therefore, the sentence does not have ability readings with a past complement.

Next consider the case where the modal is in the past tense. Since MOD-T is the one which determines the time in which the accessibility relation holds, we need to introduce the time argument to move this accessibility time backward.

(132) $[P\text{-NONP-}ul\text{ swu iss–ability-PAST}]_{f,g} = \lambda x \lambda t \lambda w. \exists t'[t' \prec t \& \forall w'[w' \in \text{Best}_{\text{stereotypical}}(w, t')]$ $(\cap f_{\text{circ}}(w, t')) \& x \text{ chooses } \exists t''[t'' \succeq t' \& P(t'')] \text{ in } w' \text{ at } t' \rightarrow P(x, w', t')=1$]

(132) says that $[P\text{-NONP-}ul\text{ swu iss–ability-PAST}]$ is true if and only if for all the best circumstantially accessible worlds $w'$ at $t'$ (which is prior to $t$) where $x$ chooses $P$ at $t'$, $P$ is true in $w'$ at $t''$.

Now consider the case where both MOD-T and SIT-T are in the past tense.

(133) $[P\text{-PAST-}ul\text{ swu iss–ability-PAST}]_{f,g} = \lambda x \lambda t \lambda w. \exists t'[t' \prec t \& \forall w'[w' \in \text{Best}_{\text{deontic}}(w, t')]$ $(\cap f_{\text{circ}}(w, t')) \& x \text{ chooses } \exists t''[t'' \prec t' \& P(t'')] \text{ in } w' \text{ at } t' \rightarrow P(x, w', t')=1$]

If the complement of the modal is in the past tense, the diversity requirement is not satisfied, as in (131). According to (121ii), we cannot expect a truth value; therefore, the sentence does not have an ability reading.

Now let’s turn to permission readings of $–ul\text{ swu iss–}$. Unlike ability readings, the quantification force is now existential as in standard definitions.

(134) $[-ul\text{ swu iss–permission}]_{f,g}$ is defined iff (121) is satisfied.

If defined, $[-ul\text{ swu iss–permission}]_{f,g} = \lambda P \lambda t \lambda t' \lambda w. \exists w'[w' \in \text{Best}_{\text{deontic}}(w, t)](\cap f_{\text{circ}}(w, t')) \& P(w', t')=1$]

$[-ul\text{ swu iss–permission}]$ is true if and only if in some world $w'$ which is circumstantially accessible from the base world $w$ at $t$ and ordered by the deontic ordering source, $P$ is true in
w’ at t’. For permission readings, unlike ability readings, the agent’s choice is not part of the meaning, and the force of quantification is existential. The sentence is not compatible with past complements, and it is because the sentence is undefined with regard to permission readings.

In contrast to non-epistemic readings, past complements are compatible with epistemic readings.

\[
\left(\neg{\text{ul swu iss--epistemic}}\right)_{\mathcal{J}} = \lambda P \lambda t \lambda t' \lambda w. \exists w' [w' \in \text{Best}_{\text{stereotypical}}(w, t) \cap \text{f}_{\text{epis}}(w, t)) \& P(w', t') = 1]
\]

For epistemic readings, we do not need to have the presuppositions in (121), and x’s choosing P at t is not part of the meaning. Epistemic modals do not have any restriction, so sentences are interpreted with epistemic readings. The semantics in (135) is similar to the one in (134). The difference is in the type of the modal base and the ordering source.

In the above proposal, “choosing” applies to ability readings of –ul swu iss–. This proposal allows us to explain how “x chooses P” leads to the presuppositions in (121), in that choosing implies both \(\Diamond P \land \Diamond \neg P\) and agentivity. That is, if someone chooses to do something, it means that the subject is an agent and there are options to choose from in the first place. So, it ultimately explains the facts in the examples in (117), (119), and (120) pertaining to ability. In this version, we do not need to incorporate the “choosing” component in the definition for priority readings, since the lack of such readings in (117), (119), and (120) is explained by the presuppositions in (121).

**Version 2: choosing applies not only to ability but also to permission readings**

The proposal above treats ability readings as a special kind of modal reading by incorporating “x chooses P” in the definition of ability –ul swu iss– ‘can’. In the literature, however, it is more typical to distinguish circumstantial readings from epistemic readings,
and classify priority and dynamic readings in the same category. Along with this prevailing idea, we can propose the following: “choosing” applies to all circumsitual readings, and the difference lies in the force of quantification. This view sounds intuitively on the right track if we realize that permission presupposes ability. The sign *You can park here* permits drivers to park here. Granting permission presupposes both possibility and ability. Possibility and ability together presuppose the agent’s choosability. This proposal emphasizes the fact that permission, ability, and choosability are connected to one another. In fact, languages attest this conceptual connection between permission and choice. In Japanese, for example, modal expressions to describe permission are conveyed by a conditional construction like *It’s ok if you P* (Barker 2010: 13). Similarly, in Korean, there is another common way to express permission in addition to the modal *–ul swu iss–*.\(^{44}\) Consider (136):

(136) Ka-to coh-∅-ta/kwanchanh-∅-ta.
  go-even.though be.good-NONP-DEC/be.ok-NONP-DEC
  ‘Even though you go, it is good/it is ok.’

(136) shows that, in this language, permission is expressed by two parts: (i) a possible option is given to the agent, and (ii) the agent’s choosing this option is okay. The connection between permission and choice is quite obvious if we consider (i) and (ii). I take this as valid evidence to support that permission readings have “choice” as a crucial part of their meaning.

From this, we can revise the semantic entry of permission readings and make it similar to that of ability readings. The standard definition of *–ul swu iss–* ‘can, may’ is repeated below:

\[^{44}\text{To explain why we have multiple expressions for the same meaning, it is possible that performativedescriptive permissions may use different modal expressions. I leave this for future study.}\]
(137) \([-\text{ul swu iss}_{\text{permission}}]\)^f,g = \lambda P \lambda t \lambda t' \lambda w. \exists w' [w' \in \text{Best}_{\text{deontic}}(w, t) \& P(w', t') = 1]

Now we incorporate “choosing” in permission readings.

(138) \([-\text{ul swu iss}_{\text{permission}}]\)^f,g = \lambda P \lambda x \lambda t \lambda t' \lambda w. \exists w' [w' \in \text{Best}_{\text{deontic}}(w, t) \& \exists x \text{ chooses } P(t') \text{ in } w' \text{ at } t \& P(x, w', t') = 1]

(138) says that \([-\text{ul swu iss}_{\text{permission}}]\) is true if and only if there is some world w’, which is circumstantially accessible from the base world w and ranked highest by the deontic ordering source, in which x chooses P in w’ at t’. Now, I need to show why the definition in (138) is better than the definition in (137). First, (138) unifies all the circumstantial readings by making “x chooses P” an important part of the definition. I mentioned earlier that it is more typical to group priority modality and dynamic modality together since both modalities use the circumstantial modal base. Second, (138) explains additional pragmatic facts regarding permission. For example, the sentence You cannot swim in this river disallows us to swim in this river. If the agent intentionally chooses to swim, it is illegal because the sign does not permit swimming. Imagine, however, the situation where the agent fell into the river by accident and swam to avoid drowning. In this situation, the agent’s swimming is not illegal even though the sign bans swimming. The difference between the two cases is the intention of the agent. By saying that the agent’s choice is part of permission readings, the definition in (138) makes the distinction between intentional acts and unintentional acts explicit.

If we accept (138), we do not need to posit presuppositions to distinguish non-epistemic readings from epistemic readings. What is crucial in determining modal flavor is the “choosing” part in the definitions of circumstantial readings. Now we need to discuss what choosing means, and how its introduction into the semantics can get rid of the presupposi-
tions in (121). The specific questions to be asked are: how choosing relates to the agentivity presupposition and how it relates to the diversity (P or not-P) presupposition.

The notion of choice is a modal concept. If an agent chooses P, then there should be some reasons to choose P. The reasons could be to satisfy a desire (bouletic), to meet a goal (teleological), or to follow a rule (deontic). Usually, the motivation for choosing P comes from some sort of priority background, and the notion of choice is comparative in nature because P leads to better outcomes than not-P. Following Portner (2004), in which he argues that imperatives contribute to the addressee’s To-Do List, I claim that the notion of choice in permission and ability readings contributes to the agent’s To-Do List. The To-Do List functions to impose an ordering to the worlds, and according to this ordering, the agent determines what to choose and commit to. According to Portner (2007: 352), “the To-Do List of an agent is a set of properties”, and it is mutually assumed among the participants that the agent will do each of these properties. Unlike Portner’s To-Do Lists, however, the To-Do Lists for the agent of ability and permission modal sentences are not the public commitments of the agent, but more private commitments of the agent. I will call them the private To-Do Lists.

Now let’s consider the conditions in the context when the agent x chooses P. The meaning of choosing consists of two parts:

(139) Definition of chooses: x chooses P in w at t iff

a. The diversity requirement: P and not-P are in the set of x’s options in w at t.45 (This is related to the diversity presupposition in (121ii))

b. The agentivity requirement: P goes onto x’s private To-Do List in w at t. (This is related to the agentivity presupposition in (121i)).

---

45 This is similar to the decision problem. According to Cariani et al. (2011: 21), the decision problem identifies the set of actions from which the agent has to choose in that world.
(139a) requires that P and other alternative properties be available. (139b) means that x agentively chooses P. From (139a) and (139b), we infer that x thinks that P is better than the other options based on bouletic or teleological ordering (priority-oriented). That is, the worlds where x does P are better than the other worlds.

For ability readings, the ordering source is stereotypical. Based on (139), the ability readings are derived from the following reasoning: If P, among others, goes onto x’s private To-Do List, P(x) is true in all stereotypically accessible worlds. For permission readings, we saw that the ordering source is deontic: a goal (teleological) or a personal desire (bouletic). Based on (139), the permission readings are derived as follows: If P, among others, goes onto x’s private To-Do List, P(x) is true in some teleologically/bouletically accessible world.

The above discussion accounts for the distributional patterns of –ul swu iss– modal constructions. Specifically, the proposed semantic entries explain why certain readings are unavailable as illustrated in Tables 3.5 and 3.6.

<table>
<thead>
<tr>
<th>Pattern</th>
<th>Interpretations</th>
</tr>
</thead>
<tbody>
<tr>
<td>(117a) NONP-ul swu iss-NONP-</td>
<td>epistemic reading/priority reading/dynamic reading</td>
</tr>
<tr>
<td>(117b) NONP-ul swu iss-PAST-</td>
<td>epistemic reading/priority reading/dynamic reading</td>
</tr>
<tr>
<td>(117c) PAST-ul swu iss-NONP-</td>
<td>epistemic reading</td>
</tr>
<tr>
<td>(117d) PAST-ul swu iss-PAST-</td>
<td>epistemic reading</td>
</tr>
</tbody>
</table>

Table 3.5: The interpretations of –ul swu iss– ‘can, may’ with non-stative predicates

<table>
<thead>
<tr>
<th>Pattern</th>
<th>Interpretations</th>
</tr>
</thead>
<tbody>
<tr>
<td>(119a) NONP-ul swu iss-NONP-</td>
<td>epistemic reading/?priority reading</td>
</tr>
<tr>
<td>(119b) NONP-ul swu iss-PAST-</td>
<td>epistemic reading/?priority reading</td>
</tr>
<tr>
<td>(119c) PAST-ul swu iss-NONP-</td>
<td>epistemic reading</td>
</tr>
<tr>
<td>(119d) PAST-ul swu iss-PAST-</td>
<td>epistemic reading</td>
</tr>
</tbody>
</table>

Table 3.6: The interpretations of –ul swu iss– ‘can, may’ with stative predicates
Based on the proposed definitions, in the next section, I move on to discussing the extra inference (i.e. actuality inference) which arises in (117b).

Summary: definitions

The definition of choosing

(140) Definition of chooses: x chooses P in w at t iff

a. The diversity requirement: P and not-P are in the set of x’s options in w at t.

b. The agentivity requirement: P goes onto x’s private To-Do List in w at t.

The three entries of –ul swu iss–

(141) \([-ul \text{ swu iss}_{\text{ability}}^{f,g} = \lambda P \lambda x \lambda t \lambda t' \lambda w. \forall w' [w' \in \text{Best}_{\text{stereotypical}}^{f}((w, t)) \cap f_{\text{circ}}(w, t) \wedge x \text{ chooses } P(t') \in w' \text{ at } t \rightarrow P(x, w', t')=1] \]

(142) \([-ul \text{ swu iss}_{\text{permission}}^{f,g} = \lambda P \lambda x \lambda t \lambda t' \lambda w. \exists w' [w' \in \text{Best}_{\text{deontic}}^{g}((w, t)) \cap f_{\text{circ}}(w, t) \wedge x \text{ chooses } P(t') \in w' \text{ at } t \& P(x, w', t')=1]] \]

(143) \([-ul \text{ swu iss}_{\text{epistemic}}^{f,g} = \lambda P \lambda t \lambda t' \lambda w. \exists w' [w' \in \text{Best}_{\text{stereotypical}}^{g}((w, t)) \cap f_{\text{epis}}(w, t) \wedge P(w', t')=1] \]

Now we have two necessary conditions in the definition of choosing, so there is no need to have a definedness condition for circumstantial modals.

3.3 The Actuality Inference

In this section, I focus on the extra inference (i.e. actuality inference) which arises within circumstantial –ul swu iss– modal constructions. This is when the modal expression is realized in the past tense while the complement is in the non-past tense.
3.3.1 PHENOMENON

The construction that I investigate is illustrated as below:

(144) Chelswu-ka kicha-lul tha-∅-l swu iss-ess-ta.
Chelswu-NOM train-ACC ride-NONP-COMP BN AUX-PAST-DEC

a. ‘It was possible for Chelswu to take the train.’ (epistemic)
b. ‘Chelswu was allowed to take the train.’ (priority)
c. ‘Chelswu was able to take the train.’ (dynamic)

Unlike epistemic readings, upon hearing (144b) and (144c), the proposition that Chelswu took the train is often accepted to have happened. It is interesting that modal sentences enable us to talk about an already realized event as well as a possible one. This phenomenon is found in English as well.46

(145) a. It was possible for John to swim across the Potomac River.

b. John was allowed to swim across the Potomac River.

c. John was able to swim across the Potomac River.

The listener of (145b) and (145c) infers that John actually swam across the Potomac River at some past time. In fact, (145b) and (145c) often convey two propositions: (i) John had the permission to swim across the Potomac River or the speaker had the ability to swim across the Potomac River, and (ii) he actually did it.

As for the nature of the actuality inference in languages like French and Hindi, Bhatt (1999) and Hacquard (2006) identify this phenomenon as the actuality entailment. Since L. Moon (2012) found that the actuality inferences in English are correlated with sentence level features such as the presence of intensifying adverbs and the type and tense of the matrix verb. The context that L. Moon investigates is when the ability modal is embedded under a matrix clause.

(i) Mayra knew that Jeff could see the mountain. 

(L. Moon 2012: 1)

In (i), for example, the modal auxiliary could licenses the inference that Jeff actually saw the mountain. Unlike L. Moon, I confine my interest to modal sentences in which the modal predicate is in the matrix clause.

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the inference is not cancellable, they call it the entailment. However, the similar kind of inference found in Korean and English behaves differently from those languages in which the perfective and imperfective aspects are distinct. In Korean and English, the inference is a conversational implicature at best, since the interpretation is dependent on the context and it is cancellable/defeasible. I will now discuss some properties of the actuality inference. Here, I will demonstrate them with the ability modal because the ability reading is more natural than the permission reading.

First, the actuality inference in Korean conveys the at-issue content and new information.

(146) A: Chelswu-ka ecey sihap-ul iki-ess-ni?
       Chelswu-NOM yesterday game-ACC win-PAST-INT
       ‘Did Chelswu win the game yesterday?’

       B: Chelswu-ka sihap-ul iki-∅-l swu iss-ess-ta.
          Chelswu-NOM game-ACC win-NONP-COMP BN AUX-PAST-DEC
          ‘Chelswu was able to win the game.’

In (146), A’s question is a yes-no question; however, B answers with a modal sentence, not with either yes or no. If we think that the conversation in (146) is acceptable, even though it is not completely natural, we can say that B’s response provides new information that Chelswu won the game. It is at-issue because the content addresses the question under discussion.

Second, the actuality inference is cancellable.

(147) Chelswu-ka sihap-ul iki-∅-l swu iss-ess-ta. Kulentey
       Chelswu-NOM game-ACC win-NONP-COMP BN AUX-PAST-DEC but
       ci-ess-ta.
       lose-PAST-DEC
       ‘Chelswu was able to win the game. But he lost.’

In (147), the speaker cancels the inference that Chelswu won the game without making the discourse inconsistent. If the modal sentence had an epistemic reading not an ability
reading, the continuation of but he lost would sound odd because an epistemic reading ‘it is possible that Chelswu won the game’ implies that the speaker does not know the result.

Third, the actuality inference is reinforceable.


‘Chelswu was able to win the game. So he won.’

(148) shows that the inference that Chelswu won the game can be reinforced, and the sentence does not sound redundant.

From this, we can see that the actuality inference in Korean is not an entailment but a conversational implicature. Cross-linguistically, this actuality inference is found when the ability modal interacts with the past tense or perfective aspect. Then, we can ask the question of what the plausible explanation for this association between the ability modal and the actuality inference is. After reviewing previous analyses which talk about the actuality entailment in different languages, I ultimately propose a semantic/pragmatic analysis of the actuality implicature based on the semantic entries discussed in section 3.2.

3.3.2 APPLYING PREVIOUS ANALYSES TO THE KOREAN DATA

Given that the nature of the actuality inference in Korean is a conversational implicature, now we need a formal explanation for this phenomenon. Previous studies focus on the actuality entailment, not the actuality implicature phenomenon. Even though the nature is not the same, I will review some previous proposals and investigate whether we can apply their analyses to the Korean data. As for the actuality entailment, there are two main approaches in the literature. The first approach is a structural account. Bhatt (1999) and Hacquard (2006, 2009, 2011) argue that the modal constructions with the perfective and imperfective morphology have different syntactic structures, and the presence/absence of
the actuality entailment is due to their scopal differences. That is, the actuality reading is derived only when the modal is below Aspect, as discussed in detail in section 2.3.2. As for the lack of the actuality entailment with the imperfective morphology in French and Hindi, the authors argue that it is the result of having the GEN (generic) operator between Tense and Aspect. The second approach is what Mari and Martin (2007, 2009) and Homer (2011) pursue. Mari and Martin’s account is a semantic-ontological account which distinguishes two kinds of ability. In Homer’s proposal, the actuality entailment results from a semantic process, known as *aspectual coercion*. He argues that modals are stative predicates, and since the perfective aspect requires a bounded eventuality, the perfective modal sentence in turn receives the actuality reading. I will review each proposal and try to apply the previous accounts to the actuality inference phenomenon in Korean, despite the different linguistic facts. As we will see, neither approach solves the actuality inference problem in Korean; thus, I propose a semantic/pragmatic analysis to account for the actuality inference case in Korean.

### 3.3.2.1 Structural Accounts (Bhatt, Hacquard)

In Hacquard’s (2006, 2009, 2014) theory, an actual event in French modal sentences is implied only when the perfective aspect that quantifies over the VP event scopes over the modal.

(149) Brown a pu tirer dans le mille.
Brown can-past-pfv hit a bull’s-eye
‘Brown could (PFV) hit a bull’s-eye.’

According to Hacquard (2014: 9), (149) is defined iff $t_c$ provides time $t < t_c$, and if defined, the sentence is true iff $\exists e[e \in w \land \tau(e) \subseteq t \land \exists w' \in \text{Best}_{g(w)}(\cap f(w))]: \text{Brown hit bull’s-eye(e)(w’)}$. In Hacquard’s analysis, aspect is base-generated as an argument of the verb, and comes with a world variable. This world variable needs to be bound locally. The
requirement that the world variable needs to be bound locally is satisfied only when a modal immediately above an aspect marker binds the world argument. If an aspect marker is above the same modal, we do not get an actuality entailment. Hacquard’s explanation works for French because there is one layer of tense and aspect in the syntax, and the modal and VP are in the same clause. This is not the case in Korean. In Korean modal constructions, there are two potential positions for tense and aspect since the constructions contain, syntactically, two CPs. I will summarize the linguistic facts that make French and Korean actuality phenomena different.

<table>
<thead>
<tr>
<th></th>
<th>French</th>
<th>Korean</th>
</tr>
</thead>
<tbody>
<tr>
<td>aspects</td>
<td>The perfective and imperfective aspects are distinct.</td>
<td>Korean does not manifest the same perfective-imperfective distinction in the past tense as French.</td>
</tr>
<tr>
<td>actuality inference</td>
<td>entailment</td>
<td>conversational implicature</td>
</tr>
<tr>
<td>modal structure</td>
<td>one CP</td>
<td>two CPs</td>
</tr>
</tbody>
</table>

Table 3.7: Actuality inferences in French and Korean
The most striking difference is in the aspect. The Korean modal –ul swu iss– cannot occur with the imperfective aspect markers. In French, perfective and imperfective ability modals have different morphological forms. (14) is repeated for convenience.

(150) a. Jane pouvait traverser le lac à la nage, mais elle ne le fit jamais.
   Jane can-past-impf cross the lake by swim, but she NEG it do-past-pfv
   never

   b. Jane a pu traverser le lac à la nage, mais elle ne le fit pas.
   Jane can-past-pfv cross the lake by swim, #but she NEG it do-past-pfv
   not
   ‘Jane could (was able to) swim across the lake, but she didn’t do it.’ (Hacquard 2009: 2)

Paired with this morphology, (150a) does not have the actuality reading while (150b) does. In Korean, however, there is no “can-past-impf” vs. “can-past-pfv” distinction like in French, and consequently, the actuality reading is not encoded grammatically in Korean.

(151) Chelswu-nun swuyenghay-se kang-ul kenne-∅-l swu
    Chelswu-TOP swim-and river-ACC cross-NONP-COMP BN
    swu
    AUX-PAST-DEC

---

Korean has two types of imperfective constructions and these are –e iss– (resultative) and –ko iss– (progressive/resultative).

<table>
<thead>
<tr>
<th>imperfective aspects</th>
<th>transitive</th>
<th>intransitive</th>
</tr>
</thead>
<tbody>
<tr>
<td>progressive</td>
<td>–ko iss–</td>
<td></td>
</tr>
<tr>
<td>resultative</td>
<td>–e iss–</td>
<td>–ko iss–</td>
</tr>
</tbody>
</table>

    Chelswu-NOM meal-ACC eat-PROG-PAST-DEC
    ‘Chelswu was eating his meal.’

    Chelswu-NOM game-ACC win-NONP-COMP BN AUX-PROG-PAST-DEC
    ‘Chelswu was being able to win the game.’

As we can see in (ib), the –ul swu iss– modal itself cannot be realized with the imperfective aspect.
‘Chelswu was able to swim across the river.’

(151) has one semantic meaning that Chelswu had the ability to swim across the river, and the extra inference that he actually swam across it is a pragmatic meaning. Given Hacquard’s analysis, one possible account would be that the ability sentence with the past morpheme –ess always gives rise to the actuality inference, but the inference can be cancelled depending on the context. The cancellation of the inference is due to the GEN operator in the syntax in past ability modal sentences. When there is no GEN operator, the actuality inference is there. If GEN is the only possible explanation for the actuality inference for the Korean data, the structural account does not seem to say much because the scopal relation between the modal element and tense/aspect is not possible. I conclude that the syntactic argument based on those languages with a perfective/imperfective distinction is not an adequate one for Korean.

3.3.2.2 Semantic/Pragmatic Views (Mari and Martin, Homer)

Mari and Martin (2007, 2009) distinguish ability into two types: generic and action-dependent abilities, and relate this distinction to the distinction between the perfective and imperfective aspect. According to Mari and Martin, when pouvoir ‘can’ is in the perfective aspect, it can denote either a bounded generic ability or an action-dependent ability, and the actuality entailment is associated with the action-dependent ability (Mari et al. 2013: 65). This idea of Mari and Martin hints at an answer to the question of why the past ability sentences in Korean do not always give rise to the actuality inference. That is, an ability sentence in Korean is ambiguous between the generic and specific ability, and it is only with the specific, action-dependent ability that the actuality inference arises. However, we cannot apply Mari and Martin’s idea to Korean because aspect in Korean is not clearly distinguished like it is in French. For Mari and Martin, these two kinds of abilities are
associated with the imperfective and the perfective aspect, which respectively denote an unbounded period of time and a bounded period of time. Due to these linguistic facts, it is difficult to motivate a similar argument for Korean.

For the same reason, Homer’s (2011) aspectual coercion view is not a plausible option either. Coercion means “contextual reinterpretation”. Unlike the structural account, under this theory, the lack of certain readings is due to the reinterpretation process, not the cancellation process. Homer assumes that modals are stative predicates and the perfective aspect requires a bounded eventuality. Because of this incompatibility between the stative predicate and the perfective aspect, the perfective ability modal sentence in turn receives the actuality reading to satisfy the bounded eventuality requirement. To make the coercion theory work in Korean, we need to assume that –ess carries a perfective meaning. As I discussed in Chapter 2, however, I analyzed –ess as a past tense marker not as a perfective aspect marker, and showed that the perfective meaning of –ess can be explained by the relative tense theory. Even when we view the marker –ess as a perfective aspect marker, a problem still remains because, being a conversational implicature, the presence of the actuality inference should be cancellable depending on the context, but the coercion view would make the actuality inference stronger than a conversational implicature because it is derived from the grammatical component. I conclude that we cannot apply aspectual coercion to the phenomenon in Korean, despite similarity to Homer’s data.

3.3.3 Proposal

So far, we have seen that neither a scope analysis nor an aspectual coercion approach to the actuality entailment can adequately account for the Korean data. I argue that the actuality inference in permission/ability modal sentences in Korean is best accounted for by semantic meanings and pragmatic reasoning. My proposal for the actuality implicature will
use the newly defined semantic entries of the permission/ability –ul swu iss– modal in section 3.2. I showed that my new definitions capture the intuitive facts that permission/ability presupposes an open choice (diversity requirement) and this choice is controlled by an agentive subject (agentivity requirement). These conditions are necessary for the definition of choosing, which is the crucial part of the semantic entries for circumstantial modals. The definition of choosing is repeated below.

(152) Definition of chooses: \( x \) chooses \( P \) in \( w \) at \( t \) iff

a. **The diversity requirement**: \( P \) and not-\( P \) are in the set of \( x \)'s options in \( w \) at \( t \).

b. **The agentivity requirement**: \( P \) goes onto \( x \)'s private To-Do List in \( w \) at \( t \).

In the case of (144) in which we get the actuality inference, the modal is in the past tense while the complement is non-past (i.e. MOD-T is past and SIT-T is non-past).

(153) \[ \text{[P-NONP-ul swu iss--ability-PAST]}^{f,g} = \lambda x \lambda t \lambda w. \exists t'[t' \prec t \& \forall w'[w' \in \text{Best}_{gstereotypical}(w,t')] \big( \cap f_{circ}(w, t') \big) \& x \text{ chooses } \exists t''[t'' \succeq t' \& P(t'')] \text{ in } w' \text{ at } t' \rightarrow P(x, w', t'')=1 \]\n
(153) says that \([\text{P-NONP-ul swu iss--ability-PAST}] \) is true if and only if for all the best circumstantially accessible worlds \( w' \) at \( t' \) (which is prior to \( t \)) where \( x \) chooses \( P \) in \( w' \) at \( t' \), \( P \) is true in \( w' \) at \( t'' \). As for the permission reading, we saw the following definition:

(154) \[ \text{[P-NONP-ul swu iss--permission-PAST]}^{f,g} = \lambda x \lambda t \lambda w. \exists t'[t' \prec t \& \exists w'[w' \in \text{Best}_{gdeontic}(w,t')] \big( \cap f_{circ}(w, t') \big) \& x \text{ chooses } \exists t''[t'' \succeq t' \& P(t'')] \text{ in } w' \text{ at } t' \& P(x, w', t'')=1 \]\n
\([\text{P-NONP-ul swu iss--permission-PAST}] \) is true if and only if in some world \( w' \) which is circumstantially accessible from the base world \( w \) and \( t' \) (which is prior to \( t \)) and ordered by the deontic ordering source where \( x \) chooses \( P \) in \( w' \) at \( t' \), \( P \) is true in \( w' \) at \( t'' \).

My explanation for the actuality implicature lies in the “\( x \) chooses \( P \)” part. In order to account for the actuality implicature phenomenon, I argue that there is an extra implicature that \( x \) does choose \( P \) under normal conditions. Due to this implicature which arises in the
antecedent, P is true. If, however, this implicature conflicts with the context of the utterance, then this implicature may get cancelled.\footnote{This cancellation is different from undefinedness. Sentences like (144) still satisfy two conditions in (152).} For example, if the interlocutors are aware of some reason for why the agent did not choose P, then the sentence does not give rise to the actuality inference and only has the modal meaning of had the ability to (as opposed to actually did).\footnote{In this case, both the factual knowledge and morphological clues help the hearer derive the correct inference (Ziegeler 2006: 141).} In this theory, the was able to modal sentence is not ambiguous between had ability to and actually did. It has only one semantic entry, but the presence/lack of the actuality inference depends on the context.

Now I move on to discussing what kind of implicature this extra implicature $x$ does choose $P$ results in. In order to explain the implicature phenomenon, I will use Horn (1984) in which he discusses the Q-principle and the R-principle. The Q-based implicature means that a weaker expression (W) implicates the negation of a stronger counterpart (S). For example:

\begin{enumerate}
\item[(155)] It is possible that John solved the problem. $\Rightarrow$ John didn’t solve the problem. (Horn 1984: 15)
\end{enumerate}

Upon hearing (155), we derive the meaning that, for all the speaker knows, John didn’t solve the problem. It is possible $P$ implicates that it is not $P$. This is an example of Q-based implicature. In contrast, the R-based implicature is generated by the reasoning that a weaker expression (W) implicates a stronger counterpart (S). The following citation illustrates Horn’s R-inference:

\begin{enumerate}
\item[(156)] ...if I ask you whether you can pass me the salt, in a context where your abilities to do so are not in doubt, I license you to infer that I am doing something more than asking you whether you can pass the salt – I am in fact asking you to do it. (A speaker who says ‘...p...’ may license the R-inference that he means ‘...more
than p...’. If I know for a fact that you can pass me the salt, the yes-no question is pointless; the assumption that I am obeying the Relation maxim allows you to infer that I mean something more than what I say.) (Horn 1984: 14)

(157) is an example of R-based implicature.

(157) John was able to solve the problem. $\Rightarrow$ John solved the problem. (Horn 1984: 15)

In (157), was able to gets strengthened and means actually did. Here, the principle of relevance is responsible for the inference. Horn’s specific example above is very much like my original puzzle. The ability reading becomes the actuality reading. I will use Horn as a previous analysis, and build on my argument using Horn’s discussion. Let’s turn back to the Korean data.

    AUX-PAST-DEC
    ‘Chelswu was able to swim across the river.’

In (158), the actuality implicature that Chelswu actually swam across the river is a R-based implicature as it involves strengthening. As we will see shortly, my analysis on this actuality implicature is not different from Horn’s idea, but it is more detailed.

I mentioned that the actuality implicature arises when the modal is in the past tense. The pastness in the modal makes the ability exist in some past time (a past ability). It is interesting to compare a present ability and a past ability, and discuss why past ability/permission sentences give rise to the actuality implicature more often than present ability/permission sentences. We see that there is a difference in their strengthening effects.

Consider the following examples:

(159) a. John is able to swim. ?$\Rightarrow$ John will swim.
    b. John was able to swim. $\Rightarrow$ John swam.
The actuality implicature in (159a) is weaker than that in (159b). Horn’s explanation for (157) will predict that (159a) has the same effect as (159b). However, ability implicatures arise more easily with the past. This fact is not explained in Horn’s account.

In my analysis, what affects the strength of the actuality inference is the time of choosing P. For (159a), the time of choosing is the present while for (159b), it is in the past. The time of choosing P is past in (159b) because MOD-T is prior to the utterance time. So, x’s choosing P is located at \( t' \prec t \).

(160) \[ \text{\( [P\text{-NONP-ul swu iss_{ability-PAST}]^{f,d} = \lambda x \lambda t \lambda w. \exists t'[t' \prec t \& \forall w'[w' \in \text{Best}_{\text{g stereotypical}}(w,t')] \cap f_{\text{circ}}(w,t')] \& x \text{ chooses } \exists t''[t'' \geq t' \& P(t'')] \text{ in } w' \text{ at } t' \rightarrow P(x, w', t'') = 1 \]}

(160) says that \( [P\text{-NONP-ul swu iss_{ability-PAST}]^{f,d} \) is true if and only if for all the best circumstantially accessible worlds \( w' \) at \( t' \) (which is prior to \( t \)) where x chooses P at \( t' \), P is true in \( w' \) at \( t'' \). I argue that, due to “x chooses P at \( t' \)”, the sentence is more likely to have actuality implicatures. Consider the following question-answer pairs in (161) and (162):

(161) A: Will John win?
B: John is able to win.

In (161), B’s response is about John’s present ability. Even though B’s response would answer the question whether John will win, we do not get the actuality implicature. This information can answer the question because his ability is directly related to what is going to happen in the future. However, John’s ability to win does not guarantee John’s winning because the future is unknown. Therefore, the actuality inference is weak.

(162) A: Did John win?
B: John was able to win.

In (162), B’s response is about John’s past ability. Unlike (161), the response does not give enough information as to whether \( was \text{ able to} \) is being used to talk about merely a past
ability of John. The speaker A is asking for the information of whether John won or not. In this case, we can infer that the speaker B conveys a strong implicature that John actually won.

If we compare (161) and (162), it is clear that the actuality inference is much stronger in *was able to* than in *is able to*. I relate the agent’s present/past choice to actualize his/her ability with the strength of the actuality implicature. Pertaining to this idea, there are two things to be discussed. First, a past ability is more likely to be a specific, time-bound ability while a present ability is more likely to be a generic ability.\(^{50}\)

(163) a. John was able to lift the rock.
   b. John is able to lift the rock.

When it is bounded and specific as in (163a), we get the actuality implicature. When it is generic as in (163b), we do not. However, it does not mean that the association between tense and the kind of ability is fixed. For example, the interpretation of ability as generic or specific often depends on the kind of predicate in the complement. If the complement of the modal contains an accomplishment or an achievement predicate, the modal sentence is more likely to receive a perfective meaning (Ziegeler 2006: 179). This is not always the case, however.

(164) John was able to lift a 50 pound rock.

Even though the tense of the modal is the past tense, (164) is interpreted as an unbounded generic ability. This is because the predicate of the complement, *lift a 50 pound rock*, contains an indefinite object. In this case, it is not necessarily an actualized ability. John may have not tried to lift a 50 pound rock, but if he had tried, he could have because John was strong enough. So, we can conclude that, with habitual or generic readings, the actuality

\(^{50}\)Even without modals, generic uses of sentences are marked by the present tense (Thomason 2005). There is a close association between genericity and the present tense.
The ability together with pastness gives rise to the actuality inference. The above discussion can be summarized as below:

<table>
<thead>
<tr>
<th></th>
<th>past</th>
<th>non-past</th>
</tr>
</thead>
<tbody>
<tr>
<td>episodic/event reading</td>
<td>implicature</td>
<td>??implicature</td>
</tr>
<tr>
<td>habitual/generic reading</td>
<td>??implicature</td>
<td>??implicature</td>
</tr>
</tbody>
</table>

Table 3.8: Past vs. Non-past abilities and actuality inferences

The “x chooses P at t’” implicature is triggered strongly when t’ is past and with the event/episodic reading while it is not normally triggered with the habitual/generic reading regardless of the time of t’. Then, how does the “x chooses P at t’” implicature give rise to the actuality implicature? Following Horn, I argue that it is by the R-principle ‘say no more than you must’. For example, in a context like (162), the information that John had the ability to win is not enough because it does not answer A’s yes-no question. Here, by the maxim of relevance, the hearer can infer that the sentence says more than the literal meaning. Being a conversational implicature, however, the actuality inference may not arise in other contexts.

However, in order to account for the distinction between episodic/event readings and habitual/generic readings, the above discussion is not enough. I will need to explain why only episodic/event readings, not habitual/generic readings, give rise to the actuality inference. I argue that, in modal sentences which yield the actuality inference, the ordering source is empty. As a result, for the episodic/event readings, all circumstantially accessible
worlds include the actual world while for the habitual/generic readings, the best accessible worlds may not include the actual world.

In sum, I argue that the actuality inference depends on the agent’s choice. It connects the ability to the actuality. This idea is different from Hacquard (2006, 2009, 2014), Homer (2011), and Mari and Martin (2007, 2009) because, in their proposals, the actuality is dependent on the perfective aspect on the modal. The actuality inference pattern is also different because, according to Hacquard, the actuality entailment phenomenon in French is found with all of the non-epistemic modals with a universal force, but in Korean, the same modal with a permission reading having an existential force also gives rise to the actuality inference, and the nature of the inference in both constructions is a conversational implicature. This fact supports my argument that the crucial component in ability/permission modal constructions is “x chooses P”. Both the actualized ability and the actualized permission rely on this component in their semantic entries.

3.3.4 ANOTHER KIND OF ABILITY MODAL –ul cwul al–

Korean has another kind of ability modal –ul cwul al–. As introduced in Table 2.1, this modal expression occupies the same cell with –ul swu iss–, both being necessity modals and having a dynamic flavor. Consider (165):

(165) a. Maikhul-i theynisu chi-l swu iss-∅-ta.
   Michael-NOM tennis play-COMP BN AUX-NONP-DEC
   ‘Michael can play tennis.’

   b. Maikhul-i theynisu chi-l cwul a-n-ta.
   Michael-NOM tennis play-COMP BN know-NONP-DEC
   ‘Michael can play tennis.’  
   (J. H. Lee 2006: 3, glosses modified)

As discussed in J. H. Lee (2006), these two modal expressions have the same modal meaning: Michael has the ability to play tennis. J. H. Lee discusses, however, that even

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51The bound noun *cwul* has meanings of ‘assumed fact’ or ‘method’ (Sohn 1999: 205).
though both (165a) and (165b) are used to talk about the agent’s ability, we need to distinguish these two ability modal expressions. One striking difference is illustrated in (166):

(166) a. Maikhul-i onul theynisu chi-l swu iss-ta.
    Michael-NOM today tennis play-COMP BN AUX-NONP-DEC
    ‘Michael can play tennis today.’

    Michael-NOM today tennis play-COMP BN know-NONP-DEC
    ‘Michael can play tennis today.’ (J. H. Lee 2006: 3, glosses modified)

As we can see from (166b), –ul cwul al– is not compatible with a temporal adverbial. We get the same judgement with a locative adverbial phrase as in (167).

(167) a. Maikhul-i sikkulewun kos-eyse kongpwu ha-l swu
    Michael-NOM noisy place-LOC study do-COMP BN
    iss-ta.
    AUX-NONP-DEC
    ‘Michael can study at a noisy place.’

b. *Maikhul-i sikkulewun kos-eyse kongpwu ha-l cwul
    Michael-NOM noisy place-LOC study do-COMP BN
    a-n-ta.
    know-NONP-DEC
    ‘Michael can study at a noisy place.’ (J. H. Lee 2006: 65, glosses modified)

As with a temporal adverbial, –ul cwul al– is not compatible with a locative adverbial. According to J. H. Lee (2006: 66), this is because –ul cwul al– only has an ‘individual-level (atemporal) ability’ reading, while –ul swu iss– is ambiguous between a ‘stage-level (temporally-bound) ability’ reading and an ‘individual-level (atemporal) ability’ reading. Since –ul cwul al– does not have a temporally-bound ability reading, it is not compatible with onul ‘today’ or sikkulewun kos-eyse ‘at a noisy place’.

The distinction between –ul swu is– and –ul cwul al– lines up with my analysis. As predicted, when it comes to the actuality inference, they show different patterns. Unlike –ul swu is–, past tense on –ul cwul al– does not yield the actuality inference.
   Michael-NOM tennis play-COMP BN know-PAST-DEC  
   ‘Michael could play tennis.’

(168) has the ability modal meaning (i.e. was able to) but does not give rise to the actuality inference. The lack of the actuality inference in (168) is related to the fact that –ul cwul al– is always interpreted as an individual-level ability reading. In the previous section, I discussed that the actuality inference with the ability modal is derived when it is interpreted as an episodic, event reading. Since –ul cwul al– always has a generic reading, the modal sentence does not give rise to the actuality inference.

Palmer (2001: 77) discusses that we can find distinct expressions to convey two kinds of ability, cross-linguistically. One such example is found in French.

(169) Il sait nager.  
   he know.3sg.PRES.INDIC to swim  
   ‘He can swim.’ (Palmer 2001: 78)

In (169), the verb savoir in French is used to express ‘know how to’, which should be distinguished from a modal verb pouvoir ‘be able to’. We can find another example in Chinese. In Chinese, both hui and neng are used to indicate ability, both being translated as can in English. However, hui is used to express ‘know how to’ while neng is used to express general ability. Mun (2007: 84) summarizes Palmer’s (2001) discussion as follows:

<table>
<thead>
<tr>
<th></th>
<th>know how to</th>
<th>general ability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mandarin</td>
<td>hui</td>
<td>neng</td>
</tr>
<tr>
<td>French</td>
<td>savoir</td>
<td>pouvoir</td>
</tr>
<tr>
<td>Lisu</td>
<td>kwú</td>
<td>kwhu</td>
</tr>
</tbody>
</table>

Table 3.9: A cross-linguistic pattern of ability modals

Even though it is difficult to say savoir in French is a modal verb (Palmer 2001: 77), it is included in Table 3.9 to show that languages have two distinct forms to express two types of
ability. Given that Korean also has two kinds of ability modals, we can add another example of having distinct expressions to express two kinds of ability in a language. We can also say that expressions that indicate general ability are used to imply the actualization of the complement.
In this chapter, I discuss the non-actualization inference which arises in –eya ha– modal constructions in Korean. Section 4.1 introduces the research questions and general properties of the –eya ha– modal. In section 4.1.1, I lay out the complete data and address the puzzles involved in the priority modal constructions, and in section 4.1.2, I explore the properties of a necessity priority modal –eya ha–, including a brief description of the flavors and strength of –eya ha–. Section 4.2 examines the nature of the non-actualization inference in –eya ha– modal constructions. The non-actualization inference arises from –eya ha– modal constructions with past complements and is stronger than a conversational implicature. In order to correctly capture the nature of such an inference, in section 4.2.1, I try to use the traditional classification which categorizes inference types into entailments, presuppositions, conversational implicatures, and conventional implicatures. After showing that the uncancellable non-actualization inference does not belong to any of the traditional categories, in section 4.2.2, I argue that we need a different classification which uses a distinction between at-issue and not-at-issue meanings. Using Tonhauser et al’s (2013) classification, I show that the non-actualization inference in Korean priority modal constructions belongs to class C. Section 4.3 is devoted to a formal analysis for the non-actualization inferences. In my analysis, the non-actualization inference which belongs to class C arises from the semantic entry of –eya ha–. My proposal builds on the analysis presented for the –ul swu iss– modal, as “x chooses P” is part of semantics of the –eya ha– modal. Unlike
the –ul swu iss– modal, however, I introduce new machinery to shift the reference time backwards. That is done by decomposing the modal into a modal and a choosing operator, and the choosing itself incorporates a time argument. In section 4.4, I discuss the actuality inference which arises in had to sentences, and in section 4.5, I apply the proposed analysis to other modal constructions in Korean.

4.1 INTRODUCTION

The phenomenon that I am investigating in this dissertation is the non-actualization inference which arises in the priority modal constructions. In section 4.1.1, I illustrate the interpretation patterns, focusing on how this modal expression interacts with tense markers. It is interesting to examine which combinations of the modal and tense markers give rise to the unexpected inference. After I address the main puzzle, in section 4.1.2, I discuss the general properties of the Korean priority modal –eya ha–, including which flavors the modal –eya ha– expresses and how strong this modal is.

4.1.1 PHENOMENON

The –eya ha– modal in Korean is a priority modal, which is mainly used to express a deontic obligation. Sometimes, however, this modal does not merely express a deontic obligation, but rather implicates that the proposition expressed by the complement of the modal has not been actualized in the real world. This is when the complement of this modal is in the past tense. Consider the following example:

(170) Chelswu-nun swukcey-lul hay-ss-eya ha-n-ta.
Chelswu-TOP homework-ACC do-PAST-COMP AUX-NONP-DEC
‘Chelswu should have done his homework.’

When uttered out of the blue, sentences like (170) seem to describe an unrealized obligation. The non-actualization inference found in (170) is unexpected given the fact that
priority modal sentences like *must P* or *should P* are used to express necessities, not to convey either *P* or *¬P*.

The following examples illustrate all possible patterns when the modal expression interacts with tense morphemes.

(171) a. Chelswu-nun swukcey-lul hay-∅-ya ha-n-ta.
   Chelswu-TOP homework-ACC do-NONP-COMP AUX-NONP-DEC
   ‘Chelswu must/has to do his homework.’

b. Chelswu-nun swukcey-lul hay-∅-ya hay-ss-ta..
   Chelswu-TOP homework-ACC do-NONP-COMP AUX-PAST-DEC
   ‘Chelswu had to do his homework.’

c. Chelswu-nun swukcey-lul hay-ss-eya ha-n-ta.
   Chelswu-TOP homework-ACC do-PAST-COMP AUX-NONP-DEC
   ‘Chelswu should have done his homework.’

d. Chelswu-nun swukcey-lul hay-ss-eya hay-ss-ta.
   Chelswu-TOP homework-ACC do-PAST-COMP AUX-PAST-DEC
   ‘Chelswu had/needed to have done his homework.’

A deontic modal has to do with obligations and permissions, and quantifies over the set of accessible worlds in which certain rules of the base world hold. Sentence (171a) talks about Chelswu’s obligation to do his homework at the time of utterance. Sentences (171b), (171c), and (171d) talk about Chelswu’s obligation pertaining to the past. (171b) often implies that this obligation was actualized, and (171c) and (171d) imply that this past obligation was not actualized. This is summarized below:

<table>
<thead>
<tr>
<th>Pattern</th>
<th>Interpretations</th>
</tr>
</thead>
<tbody>
<tr>
<td>(171a) NONP-eya ha-NONP-</td>
<td>obligation reading</td>
</tr>
<tr>
<td>(171b) NONP-eya ha-PAST-</td>
<td>obligation reading + (actuality inference)</td>
</tr>
<tr>
<td>(171c) PAST-eya ha-NONP-</td>
<td>obligation reading + non-actualization inference</td>
</tr>
<tr>
<td>(171d) PAST-eya ha-PAST-</td>
<td>obligation reading + non-actualization inference</td>
</tr>
</tbody>
</table>

Table 4.1: The interpretations of –eya ha– ‘must, have to’
(171a) has the primary reading of deontic obligation but does not yield any extra inference. In contrast, (171b)-(171d) may give rise to a secondary inference in addition to the obligation reading. In (171b), we may get the actuality inference while, in (171c) and (171d), we get the non-actualization inference. Since (171a)-(171d) use the same modal expression in the same sense (deontic obligation), it seems that the realization of the temporal components contributes to these unexpected inferences. Before turning to details on the status of the actuality/non-actualization inferences found in –eya ha– constructions and their derivation, I will first discuss semantic properties of the priority modal –eya ha–, including which flavors the modal –eya ha– expresses and how strong it is.

4.1.2 Properties of the Priority Modal –eya ha–

As discussed in Chapter 2, the –eya ha– modal encodes necessity. Unlike the necessity modals must, should, and have to in English, however, the –eya ha– modal in Korean is not compatible with epistemic interpretations and is limited to priority interpretations. In this respect, this modal expression is more like need to in English. Given that this modal is used exclusively for priority interpretations, questions arise as to which subflavors it can express and how strong this necessity modal is. Concerning the subflavors of the priority modal –eya ha–, as (172) illustrates, this modal expression can be used to express every kind of priority interpretation – deontic, teleological, and bouletic – depending on the context.

(172) a. (Kyochik-ey uyhamyen) haksayng-tul-un kyopok-ul
school.law-to according student-PL-TOP school.uniform-ACC
ip-∅-eya ha-n-ta.
wear-NONP-COMP AUX-NONP-DEC
‘(According to the school law,) students must/have to wear school uniforms.’
(deontic)
‘(In order to get well soon,) John must/has to go to the hospital.’ (teleological)

c. (Chokhollis-ul cohaha-nikka) ne-nun chokhollis-ul mek-∅-eya chocolate-ACC like-because you-TOP chocolate-ACC eat-NONP-COMP ha-n-ta. AUX-NONP-DEC
?’(Since you like chocolate,) you must/have to eat some chocolate.’ (bouletic)

Among the three of them, the deontic and teleological interpretations are more common and natural than the bouletic interpretation in –eya ha– constructions.

In terms of the strength of modality, due to the meaning of the morphological component (a complementizer or a connective ending) –eya, which is used to convey that the clause is a necessary condition, it is quite clear that this modal is associated with the force of necessity.

(173) Minswu-nun nayil kyosil-ul chengsohay-ya ha-n-ta.
Minswu-TOP tomorrow classroom-ACC clean-COMP AUX-NONP-DEC
#Kulentey an hay-to toy-n-ta.
but NEG do-COMP AUX-NONP-DEC
‘Minswu must/has to clean the classroom tomorrow. #It is okay not to do it.’

The example (173) shows that the priority modal –eya ha– has the force of necessity: if we attempt to say that the negation of the complement of the modal is permissable, the sentence becomes contradictory.

In Table 2.1 in Chapter 2, I assumed that modality in Korean comes in with either necessity or possibility; therefore, I did not further divide necessity modals. As discussed in 2.1.2.2, however, it has been proposed that the modal force distinction between necessity and possibility is too simple, since not all necessity modals bear the same strength (Sloman

(174) After using the bathroom, everyone ought to wash their hands; employees have to.

(von Fintel and Iatridou 2008: 116)

As shown in (174), necessity modals have to and ought to are somehow different in strength. To capture the relative weakness of the latter, von Fintel and Iatridou (2008: 118) propose that ought to says that the complement is true in all of the very best among the favored worlds, while have to says the complement is true in all of the favored worlds. In von Fintel and Iatridou’s proposal, weak necessity modals are often sensitive to two ordering sources. For example, in the case of goal-oriented modals, the first ordering source is determined by the proposition introduced by an in order to-clause, and the second ordering source is determined by considering how this goal should be achieved. Rubinstein (2012), however, raises a problem in determining the division between primary and secondary ordering sources, and argues that the distinction between strong necessity and weak necessity lies in the sensitivity to collective commitment. Horn (1972: 102) also notes that while should and ought to are used to imply weak obligation or suggestion, must and have to imply strong obligation. For Horn, whether the complement of a modal is true in all of the favored worlds or most of the favored worlds distinguishes strong from weak necessity (von Fintel and Iatridou 2008: 118).

Each of their arguments differs from one another, but they use similar diagnostics to decide whether a certain necessity modal is strong or weak. One such diagnostic is to test whether a modal sentence implies that the complement of the modal is the only option and no other means exist or that there exist other means but the complement of the modal is better than all alternatives. To test the strength of the necessity modal expression in question, following Rubinstein, I elaborate a scenario in which there is more than one
alternative that could fulfill the goal, and see if a modal sentence with –eya ha– is felicitous in that context.

(175) You have a meeting in Pusan tomorrow. There are four different modes of transportation to get there: flying, taking a train, taking a bus, and driving your own car.

a. #Ne-nun kicha-lul tha-ya ha-n-ta.
you-TOP train-ACC take-COMP AUX-NONP-DEC
‘You must/have to take a train.’

you-TOP train-ACC take-COMP BN-NOM good-NONP-DEC
‘You should/ought to/had better to take a train.’

The expression –nun kes-i coh– corresponds to weak necessity modals should, ought to, or had better to in English. In this scenario, the sentence (175a) is not very natural since it sounds too strong, while (175b), in which the speaker makes a suggestion rather than a strong obligation, sounds felicitous. However, in the contexts where there is only one option, the grammaticality flips.

(176) You have a meeting in Pusan tonight. There are other means of transportation, but you are planning to get there in an hour so that you can prepare for the presentation before the meeting. In this case, taking a plane is the only option.

a. Ne-nun pihayngki-lul tha-ya ha-n-ta.
you-TOP plane-ACC take-COMP AUX-NONP-DEC
‘You must/have to take a plane.’

b. #Ne-nun pihayngki-lul tha-nun kes-i coh-∅-ta.
you-TOP plane-ACC take-COMP BN-NOM good-NONP-DEC
‘You should/ought to/had better to take a plane.’
In this scenario, (176a) is more natural than (176b). (176b) is not infelicitous, but there is a feeling that the speaker is hesitant to rule out options for the addressee for the sake of politeness.

From the above observation, it is now clear that the necessity modal –eya ha– in Korean is a strong necessity modal. However, this does not mean that the modal expression –eya ha– is the same as must or have to in every respect. For example, unlike the strong necessity counterpart must, –eya ha– may take a past complement, as in (177a). Also, it can be followed by a clause which conveys that the addressee is not going to follow this obligation, as in (177b).

(177)  a. Ne-nun pihayngki-lul tha-ss-eya ha-n-ta.
you-TOP plane-ACC take-PAST-COMP AUX-NONP-DEC
‘You should have taken a plane.’

    b. Ne-nun pihayngki-lul tha-∅-ya ha-n-ta. Ne-nun
you-TOP plane-ACC take-NONP-COMP AUX-NONP-DEC you-TOP
an tha-l kes-i-ciman.
NEG take-COMP BN-COP-but
‘You must/have to take a plane, but you are not going to.’

Ninan (2005) argues that should, but not must, can take a past complement, and only should can be followed by a clause like but you are not going to. Ninan attributes the contrast between should and must to the performativity: must is inherently performative while should is not. Portner (2009) makes a similar claim that some modals are inherently

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52In addition to –eya ha– ‘must, have to’ and –nun kes-i coh– ‘should, ought to, had better to’, Korean has another form of necessity priority modal: –eya-man ha– ‘must, have to.’ If an emphatic particle –man ‘only, even’ is attached to the complementizer –eya, the modal expression sounds a bit stronger. However, the meaning difference is subtle, and it seems that the stronger necessity meaning of –eya-man ha– ‘must, have to’ arises due to compositionality. That is, the meaning is simply derived from the combination of lexical meanings of –eya ha– ‘must, have to’ and –man ‘only.’ Since –eya ha– is already a strong necessity modal, this extra strength which is added by –man ‘only’ seems semantically vacuous and has a pragmatic effect.
performative and some are not. Performative modals are defined as follows (Portner 2009: 137, 212):

(178) **Performative modals**

Performative modals are those which, by virtue of their conventional meaning, determine a speech act for sentences they are contained in other than, or in addition to, that associated with the sentence’s clause type.

Given this definition, what (177) tells us is that, even though –eya ha– is a strong necessity modal, this modal does not have performativity as a conventional meaning; hence, sentences with –eya ha– are often used to describe an obligation on the subject (i.e. as an ought-to-do modal). Performativity in –eya ha– constructions seems to be an additional inference, e.g. a conversational implicature, rather than a conventional meaning of –eya ha–. Since it is a conversational implicature, it may not arise with a past complement, as in (177a), or it may be cancelled when followed by a contradicting clause, as in (177b). Or, we can say that when the modal is used performatively, the same modal is used as an ought-to-be modal. The differences between ought-to-do and ought-to-be will be discussed later when relevant in section 4.3.

### 4.2 The Status of the Non-Actualization Inferences

Based on the discussion of the general semantic properties of the –eya ha– modal, in this section, I examine what the nature of the non-actualization inferences found in –eya ha– constructions is. In section 4.2.1, I employ the traditional classification of inference types, which classifies inferences into entailments, presuppositions, conversational implicatures, and conventional implicatures. After showing that this classification is not adequate for the
non-actualization inference which arises from sentences like (170), in section 4.2.2, I introduce a newer classification which has been developed to analyze semantic contributions which do not fit into these traditional categories.

4.2.1 **A Traditional Classification**

In this section, I examine the nature of the non-actualization inferences found in –eya ha– constructions and try to classify them according to the traditional classification. The examples in (171) are repeated here for convenience.

(179) a. Chelswu-nun swukcey-lul hay-∅-ya ha-n-ta.
   Chelswu-TOP homework-ACC do-NONP-COMP AUX-NONP-DEC
   ‘Chelswu must/has to do his homework.’

   b. Chelswu-nun swukcey-lul hay-∅-ya hay-ss-ta.
   Chelswu-TOP homework-ACC do-NONP-COMP AUX-PAST-DEC
   ‘Chelswu had to do his homework.’

   c. Chelswu-nun swukcey-lul hay-ss-eya ha-n-ta.
   Chelswu-TOP homework-ACC do-PAST-COMP AUX-NONP-DEC
   ‘Chelswu should have done his homework.’

   d. Chelswu-nun swukcey-lul hay-ss-eya hay-ss-ta.
   Chelswu-TOP homework-ACC do-PAST-COMP AUX-PAST-DEC
   ‘Chelswu had/needed to have done his homework.’

As mentioned earlier, (179c) and (179d) imply that Chelswu did not do his homework.\(^{53}\)

I need to determine the relation between what is overtly said in (179c-d) and these unexpected inferences.

When discussing any implication relations between A and B (in any context where A implies B), traditionally, four types of implication relations are given as possible options: entailments, presuppositions, conversational implicatures, and conventional implicatures.

\(^{53}\)I mentioned that (179b) often implies that Chelswu actually did his homework. The actuality inference in (179b) will be discussed in section 4.4.
Types of implication relations

a. Entailments: A entails B if and only if whenever A is true, B is true (Chierchia and McConnell-Ginet 2000: 19).

b. Presuppositions: If A presupposes B, then A not only implies B but also implies that the truth of B is somehow taken for granted, treated as uncontroversial (Chierchia and McConnell-Ginet 2000: 28). In Stalnaker’s (1974) terms, presuppositions are part of the common ground.

c. Conversational implicatures: A conversationally implicates B if and only if a hearer can infer from the speaker’s use of A that the speaker implies B, by virtue of the general principles of communication (the Cooperative Principle, the conversational maxims, Principle of Communicative Efficiency, R, Q-Principles). (Grice 1975, Sperber and Wilson 1986, Levinson 2000, Horn 1984).

d. Conventional implicatures: A conventionally implicates B if and only if B follows from the meanings of the words in A, but B is not part of what is said (Grice 1975) or the at-issue content of A (Potts 2005).

In the literature, an entailment, which is a logical inference, is also referred to as ‘what is said’ (Grice 1975), an ‘assertion’ (Stalnaker 1978), an ‘at-issue meaning’ (Potts 2005), or more generally, a ‘descriptive meaning.’ A presupposition is characterized as something that is taken for granted or a precondition for felicitous use of the sentence (Chierchia and McConnell-Ginet 2000: 350, 352). A conversational implicature refers to an inference which is calculated by general principles of communication (Grice 1975, Levinson 2000, Horn 1984, Sperber and Wilson 1986). A conventional implicature is an inference which is triggered by certain lexical items or syntax. The notion of conventional implicature was first introduced by Grice (1975), but expanded and modified by Potts (2005). According to Grice, a conventional implicature is an inference which is triggered by certain lexical items...
like *but* or *therefore*, but Potts excludes those lexical items from the list of CI triggers. A conventional implicature is not always straightforward because it shares some properties with presuppositions. For this reason, a conventional implicature has been equated to a presupposition by some authors (Karttunen and Peters 1979: 11^54^, Gazdar 1979). Potts (2005), in contrast, distinguishes these two, and argues that the main difference between them is that a conventional implicature may convey new information, whereas a presupposition is backgrounded.

Turning back to the data set, I will test whether the non-actualization inferences in (179c) and (179d) belong to any of the categories in (180). I begin with (179c).^55^ First, I test whether the non-actualization inference in (179c) is cancellable.

(181) Chelswu-nun swukcey-lul hay-ss-eya ha-n-ta. (=179c)
Chelswu-TOP homework-ACC do-PAST-COMP AUX-NONP-DEC

#Silceylo/kulayse hay-ss-ta.
in fact/so do-PAST-DEC

‘Chelswu should have done his homework. #In fact/so, he did it.’

In (181), contradicting the non-actualization with *in fact* or *so* clause is infelicitous. (181) shows that the non-actualization inference in (179c) is not cancellable.

Next I test whether the non-actualization inference in (179c) can provide new information. Sentences like (179c) can be used to convey some information which is not part of the common ground.

(182) A: Chelswu-nun why honna-ko iss-ni?
Chelswu-TOP why being.scolded-PROG-INT

‘Why is Chelswu being scolded?’

^54^For Karttunen and Peters, the term ‘conventional implicatures’ is used to refer to conventionally triggered presuppositions.

^55^The tense mismatch (between an embedded past tense and a matrix present tense) fact here is interesting because when tense agreement happens, it is the embedded tense which copies the feature of the matrix tense.
As we can see, the interlocutors can infer the non-actualization inference without overtly saying it. In (182), the speaker A asks a question as to why Chelswu is being scolded by a teacher. By uttering a priority modal sentence (with a past complement), B conveys that Chelswu did not do his homework. This is possible only when the non-actualization inference is not something that the hearer is expected to know already. If this information was already in the common ground, then the sentence is uninformative and the whole discourse is infelicitous. From this, we can see that the non-actualization inference can contribute new information.

Finally, I show whether the non-actualization inference in (179c) is affected by negation.

(183) Chelswu-ka swukcey-lul hay-ss-eya ha-nun-kes-un
     Chelswu-NOM homework-ACC do-PAST-COMP AUX-NONP-BN-CF
     ani-ta.
     NEG-DEC
     ‘It is not the case that Chelswu should have done his homework.’

In (183), the non-actualization inference in (179c) persists under negation, and it is still the case that Chelswu did not do his homework. Focusing on this behavior of the non-actualization inference in (179c), I would like to discuss the projectable property in more detail. (183) behaves as Potts would predict for expressives or appositives (conventional implicature).56

56Unlike CIs or presuppositions, however, it is hard to tell whether this inference is affected by a conditional.

(i) ?Chelswu-ka swukcey-lul hay-ss-eya ha-n-ta-myen talun
     Chelswu-NOM homework-ACC do-PAST-COMP AUX-NONP-DEC-if other
     haksaying-tul-to hay-ss-eya ha-n-ta.
     students-PL-too do-PAST-COMP AUX-NONP-DEC
Next consider (179d). (179d) also gives rise to the non-actualization inference in addition to the obligation modal meaning. First, I test whether this inference is context-dependent.

    Yenghi-and Tongswu-TOP yesterday movie-ACC see-to go-PAST-DEC
    Kulentey Chelswu-nun swukcey-lul hay-ss-eya hay-ss-ta.
    but Chelswu-TOP homework-ACC do-PAST-COMP AUX-PAST-DEC
    ‘Yesterday, Yenghi and Tongswu went to see a movie. But Chelswu had/needed
to have done his homework.’

    Kulentey Chelswu-TOP yesterday all.day.long tv-ACC watch-PAST-DEC but
    Chelswu-nun (sasil) swukcey-lul hay-ss-eya hay-ss-ta.
    Chelswu-TOP (in fact) homework-ACC do-PAST-COMP AUX-PAST-DEC
    ‘Yesterday, Chelswu watched tv all day long. But, (in fact,) Chelswu had/needed
to have done his homework.’

(184) shows that the non-actualization inference is context-dependent.

Second, I test whether the non-actualization inference in (179d) is cancellable.

‘If Chelswu should have done his homework, other students should have done it too.’

In (i), the non-actualization inference in the antecedent does not seem to persist. (i) implies that Chelswu did not do his homework and other students did not do their homework either. Consider the next example:

(ii) ?Chelswu-ka swukcey-lul hay-ss-eya ha-n-ta-myen ku-nun
    Chelswu-NOM homework-ACC do-PAST-COMP AUX-NONP-DEC-if he-top
    pel-ul pat-ul kes-i-ta.
    punishment-acc receive-COMP BN-COP-DEC
    ‘If Chelswu should have done his homework, he will be punished.’

In this case, the sentence does not sound natural because the non-actualization inference of the antecedent is not as obvious as the obligation interpretation. As (i) and (ii) show, it is difficult to test whether the inference survives under a conditional. What I’d like to emphasize here is that the non-actualization inference which arises in (179c) is different from (179d). We saw that the non-actualization inference in (179d) does not survive under negation while the same inference in (179c) persists under negation.
In (185), either *so he did it*-clause or *but he didn’t do it*-clause is consistent with the prior sentence (179d). The above example shows that the non-actualization inference is cancellable.

Third, whether the inference contributes new information or not is tested.

(186) A: Chelswu-to ecey phathi-ey ka-ss-ni?
    Chelswu-too yesterday party-LOC go-PAST-INT
    ‘Yesterday, did Chelswu go to the party too?’

B: Chelswu-nun ecey swukcey-lul hay-ss-eya hay-ss-ta.
    Chelswu-TOP yesterday homework-ACC do-PAST-COMP AUX-PAST-DEC
    ‘Yesterday, Chelswu had/needed to have done his homework.’

As in (179b), B’s response gives new information that he did not do his homework without explicitly answering A’s question.

Last, we can test whether the non-actualization inference in (179d) is affected by negation.

(187) Chelswu-ka swukcey-lul hay-ss-eya ha-n-kes-un
    Chelswu-NOM homework-ACC do-PAST-COMP AUX-PAST-BN-CF
    ani-ta.
    NEG-DEC
    ‘It is not the case that Chelswu had/needed to have done his homework.’

In (187), the non-actualization inference in (179d) does not always arise; therefore, we can say that the inference does not persist under negation.
Based on the above tests, it is tempting to conclude that the non-actualization inference in (179d) is a conversational implicature. This conclusion is misleading, however. The relatively weak non-actualization inference compared to (179c) is due to the fact that the sentence (179d) is ambiguous. The ambiguity arises because the embedded tense can be interpreted in two different ways.

(188) Chelswu-nun swukcey-lul hay-ss-eya hay-ss-ta.
     Chelswu-TOP homework-ACC do-PAST-COMP AUX-PAST-DEC
(i) ‘Chelswu had to do his homework.’
(ii) ‘Chelswu had/needed to have done his homework.’

We get the reading (i) when we interpret the embedded tense as vacuous (as a result of the sequence of tense) and the reading (ii) when we interpret the embedded tense as semantically real. In (188i), the embedded past is copied from the matrix tense. In spite of the presence of the embedded past tense, the interpretation is the same as (179b). In (188ii), however, we interpret the embedded past as real. In this case, the embedded tense is interpreted as past relative to the matrix tense. I argue that the uncancellable non-actualization inference arises with (ii). The embedded past tense makes the complement of the modal precede the modal time, and this sequence gives rise to the non-actualization inference. The nature of the non-actualization inference in (ii) is the same as (179c), but since (188) can be interpreted in two different ways, the non-actualization inference of (188) is not perceived as being as strong as (179c).  

Interestingly, as in sentences with the actuality entailment (Portner 2009: 212), sentences like (179c) and (188ii) seem to convey two propositions: (i) Chelswu had an obligation to do his homework, and (ii) He did not do it. Similar to the actuality entailment case

57 Note that (179c) unambiguously generates the non-actualization inference. We can see that the combination of the embedded past tense with –eya ha– ‘must’ seems responsible for the non-actualization inference.
(Portner 2009: 213), the non-actualization inference persists in embedded clauses. I will illustrate with (179c) because of the ambiguity of (179d). (179c) is embedded in (189).

(189) Yenghi-nun Chelswu-ka swukcey-lul hay-ss-eya
    Yenghi-TOP Chelswu-NOM homework-ACC do-PAST-COMP
    ha-n-ta-ko malhay/sayngkakhay-ss-ta.
    AUX-NONP-DEC-COMP say/think-PAST-DEC

‘Yenghi said/thought that Chelswu should have done his homework.’

(189) implies that ‘Yenghi said/thought that Chelswu did not do his homework.’ When embedded under verbs of saying (e.g. malha– ‘say’) as well as propositional attitude verbs (e.g. sayngkakha– ‘think’), (179c) invariably conveys the two propositions (i) and (ii).

According to Karttunen and Peters (1979), a verb of saying is a presupposition plug. If the non-actualization inference were a presupposition, (189), which embeds (179c), would lack this inference. However, the inference survives. This means that the non-actualization inference is not a presupposition.

4.2.1.1 THE PROPERTIES OF INFERENCE TYPES

At this point, it is relevant to discuss the properties of inference types and examine the nature of the non-actualization inference. Table 4.2 below summarizes the properties of entailments, presuppositions, conversational implicatures, and conventional implicatures.

<table>
<thead>
<tr>
<th>Inference types</th>
<th>cancellable</th>
<th>projectable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entailments</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>Presuppositions</td>
<td>?</td>
<td>yes</td>
</tr>
<tr>
<td>Conversational implicatures</td>
<td>yes</td>
<td>?</td>
</tr>
<tr>
<td>Conventional implicatures</td>
<td>yes</td>
<td>yes</td>
</tr>
</tbody>
</table>

Table 4.2: The properties of inference types

If we focus on the non-cancellable property of the non-actualization inference, this interpretation in (179c) seems to be either an entailment or a conventional implicature. And if
we focus on its behavior under semantic operators, the non-actualization inference seems to be either a conventional implicature or a presupposition. If it is an entailment, it means that (179c) asserts two things: Chelswu’s obligation and its non-actualization. However, there is an intuition that the obligation reading and the non-actualization inference are different in terms of at-issueness. That is, while the obligation reading is at-issue (foregrounded), the non-actualization reading is not (backgrounded). We can test this by constructing a discourse eliciting a direct response. According to Kadmon (2001: 12), only the non-backgrounding content can elicit direct responses, such as *Yes, I agree, No, I don’t think so, Is that so?* and *Perhaps.* For example (Kadmon 2001: 12):

\[(190)\]  
A: The king of France is bald.  
B: Yes./Right./I agree./No, I don’t think so./Is that so/?/Perhaps.

B in (190) is talking about the baldness, not about whether or not there is a king of France. This is because the baldness is foregrounded while whether there is a king of France is backgrounded. Let me consider the priority modal sentence in question and see whether or not the non-actualization inference elicits a direct response.

\[(191)\]  
A: Chelswu-nun swukcey-lul hay-ss-eya ha-n-ta.  
Chelswu-TOP homework-ACC do-PAST-COMP AUX-NONP-DEC  
‘Chelswu should have done his homework.’

B1: Na-to kulehkey sayngkakha-n-ta.  
I-too so think-NONP-DEC  
‘I think so (he was obliged to do it), too.’

I-TOP so think-COMP NEG-NONP-DEC  
‘I don’t think so (he was obliged to do it).’

In (191), B can agree or disagree with A about the proposition that ‘Chelswu was obliged to do his homework,’ not the proposition that ‘he did not do his homework.’ The fact that direct responses *I agree* or *I don’t think so* cannot target the non-actualization reading
suggests that the status of this inference is different from the at-issue, foregrounded content (the obligation reading). From this, we can confirm that the non-actualization inference in (179c) is not-at-issue and backgrounded.

Related to this property, I would like to add some discussion on the reinforceable property of the non-actualization inference in (179c). In the previous example (182), the response is more natural if speaker B says ‘Chelswu should have done his homework, but he did not do it.’ As Grice notes, a conversational implicature is reinforceable, while an entailment, a presupposition, and a conventional implicature are not. Focusing particularly on conventional implicatures, Potts argues that they can never be reinforced since the reinforcement gives rise to a sense of redundancy. As (192) shows, however, the non-actualization inference in question seems to be followed felicitously by a reinforcement.

The first clause in the following example is (179c):

(192) a. Chelswu-nun swukcey-lul hay-ss-eya ha-n-ta.
Chelswu-TOP homework-ACC do-PAST-COMP AUX-NONP-DEC

Kulentey an hay-ss-ta.
but NEG do-PAST-DEC

‘Chelswu should have done his homework. But he didn’t do it.’

b. Chelswu-nun swukcey-lul hay-ss-eya ha-∅-nuntey,
Chelswu-TOP homework-ACC do-PAST-COMP AUX-NONP-CONJ

an hay-ss-ta.
NEG do-PAST-DEC

‘Chelswu should have done his homework, but he didn’t do it.’

As we can see from both (192a) and (192b), the non-actualization inference, which arises in priority modal sentences with a past complement, can be explicitly said as a subsequent clause without making the discourse redundant; thus, the inference can be reinforced. This suggests that it is incorrect to conclude that the non-actualization is a conventional implicature. Sadock (1978) independently notes that only conversational implicatures can be
However, we have seen that this inference cannot be a conversational implicature since it cannot be cancelled. It seems that the backgroundedness property of the non-actualization inference makes the inference reinforceable. Being somehow backgrounded, the non-actualization inference is less prominent than the at-issue assertion; hence, it can be reinforced. Moreover, it is intuitive that this inference comes about from the linguistic items or syntax (like most presuppositions or conventional implicatures) than from general principles of conversational exchange (like conversational implicatures).

If we consider the backgroundedness property, it is assumed that entailments or conversational implicatures are not backgrounded while presuppositions are. When it comes to a conventional implicature, Potts (2005: 33) argues that it is not assumed to be part of the common ground since it functions to “introduce new, but deemphasized material”. Somewhat confusingly, Potts argues that conventional implicatures are not-at-issue but not backgrounded either (the anti-backgrounding requirement). If we focus on the fact that the non-actualization inference is backgrounded, it is more like a presupposition, and if we focus on the fact that the non-actualization inference is not-at-issue, it is more like a conventional implicature.

4.2.1.2 Presuppositions vs. Conventional Implicatures

For the current discussion, to distinguish a presupposition from a conventional implicature is crucial; yet, the distinction between these two does not seem very clear. As mentioned above, some authors (Karttunen and Peters 1979, Gazdar 1979) have argued that presuppositions and conventional implicatures are synonymous, and these terms can be used interchangeably (Heim 1990). Bach (1999) questions the existence of conventional implicature altogether, and argues that there is no need to have a class of meaning such as

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58Since conventional implicatures are not reinforceable, the not-at-issue meaning here is backgrounded in a different way from other not-at-issue meanings (e.g. Grice- or Potts-type CIs).
conventional implicature since what Grice calls conventional implicatures (e.g. *but*) are in fact at-issue meanings. Potts (2005), in contrast, makes an explicit argument that conventional implicatures are distinct from other classes of meaning, including presuppositions. As mentioned above, I find the behavior of the non-actualization inference in (179c) similar to what Grice and Potts classify as conventional implicatures or what Karttunen and Peters call implicative meanings (presuppositions). Even though the existence of conventional implicature is highly debated (Horn 2004), assuming that conventional implicatures form their own class of meaning, I will briefly review Grice’s and Potts’ views on conventional implicatures, and based on their arguments, I will show that the non-actualization inference in (179c) shares similar properties with conventional implicatures, though it does not exhibit all of them.

Although it was Potts (2005) who greatly expanded Grice’s (1975) concept of conventional implicature, Grice’s original description of the class of conventional implicature is somewhat different from Potts’.

(193)  *Grice’s description of conventional implicature*

In some cases the conventional meaning of the words used will determine what is implicated, besides helping to determine what is said. If I say (smugly), *He is an Englishman; he is, therefore, brave*, I have certainly committed myself, by virtue of the meaning of my words, to its being the case that his being brave is a consequence of (follows from) his being an Englishman. But while I have said that he is an English, and said that he is brave, though I have certainly indicated, and so implicated, that this is so. I do not want to say that my utterance of this sentence would be, *strictly speaking*, false should the consequence in question fail to hold. So *some* implicatures are conventional, unlike the one with which I introduced this discussion of implicature.  

(Grice 1975: 44-45)
According to Grice, conventional implicatures are associated with the conventional meaning of lexical items like but. Being conventional, they are not derived by conversational backgrounds; hence, they are non-calculable. Also, they are neither truth-conditional nor cancellable.

Acknowledging Grice’s identification of conventional implicatures, Potts develops the theory of conventional implicatures by introducing new data such as supplements (e.g. appositives, parentheticals) and expressives (e.g. expressive adjectives, epithets, honorifics). In his theory, a conventional implicature is a secondary entailment which is distinct from what is said (to use Potts’ term, an at-issue entailment). In Potts’ theory, what a conventional implicature resembles the most is an at-issue entailment, not a presupposition. Unlike an at-issue content (an entailment), however, a conventional implicature is irrelevant to the truth conditions of the proposition. For example (Potts 2005: 32, his (2.38)):

(194) Lance Armstrong, an Arkansan, has won the 2003 Tour de France!

In (194), the at-issue meaning ‘Lance Armstrong has won the 2003 Tour’ is not affected by the fact that Lance Armstrong is in fact a Texan.

The central properties of conventional implicatures that Potts extracts from Grice’s description are listed in (195):

(195) Properties of conventional implicatures (Potts 2005: 11, his (2.10))

a. CIs are part of the conventional meaning of words.

b. CIs are commitments, and thus give rise to entailments.

c. These commitments are made by the speaker of the utterance ‘by virtue of the meaning of’ the words he chooses.

d. CIs are logically and compositionally independent of what is ‘said (in the favored sense)’, i.e. independent of the at-issue entailments.
Among these properties, as Salmon (2011: 3418, footnote 4) notes, (195c) is Potts’ (2005) innovative property, which was not present in Grice’s primary description. According to Potts, conventional implicatures are always speaker-oriented; therefore, even when the sentence is used in indirect speech or embedded under attitude verbs, the implicature-bearer is still the speaker. The following example from Potts shows this speaker-oriented property of CI:

(196) Sheila believes that Chuck, a confirmed psychopath, should be locked up. #But Chuck isn’t a confirmed psychopath. (Potts 2005: 117, his (4.60))

Potts gives (196) as empirical evidence for (195c). In (196), the speaker cannot contradict the content expressed by the appositive (*a confirmed psychopath*), because it is the speaker’s belief, not Sheila’s. Potts claims that this is one of the key properties of CIs but something Grice overlooked. As has been pointed out by Salmon (2011: 3419), however, (195c) has been challenged as unsustainable by Amaral et al. (2007) and Salmon (2009). Amaral et al. (2007: 734), for example, argue that Potts’ generalization that all CIs are speaker-oriented needs to be reexamined in that we can easily find contexts where the CI is not speaker-oriented. The example below involves a CI which is triggered by the non-restrictive relative clause:

(197) Joan believes that her chip, which she had installed last month, has a twelve year guarantee. (Amaral et al. 2007: 736, their (27))

According to Amaral et al. (2007: 736), the CI in (197) is taken to report Joan’s belief, not the speaker’s. It seems that CIs are not as homogeneous as Potts would expect, as Amaral et al. point out.

Another difference between Grice’s and Potts’ theory is that even though Grice argues that lexical items like *but* are typical conventional implicature triggers, Potts does not treat them as conventional implicature triggers. The reason for excluding these lexical items
from the class of CIs is because he believes that “no lexical item contributes both an at-issue and a CI meaning” (Potts 2005: 48). Since but has the at-issue meaning of and and a CI meaning of contrasting two properties, Potts argues that it cannot belong to the class of CIs.

Though they have different views on the status of lexical items such as but or therefore and Grice does not specify the speaker-oriented property, Potts and Grice agree on other key properties of conventional implicatures: they are conventional, non-calculable, non-cancellable, and non-truth conditional. These properties make conventional implicatures very different from conversational implicatures but similar to presuppositions. Horn (2004: 4) also notes that “detachable but non-cancellable aspects of meaning that are neither part of, nor calculable from, what is said are conventional implicatures, akin to pragmatic presuppositions (Stalnaker 1974).” As we can see from Table 4.3, the properties of conventional implicatures greatly overlap with those of presuppositions, and this fact makes it difficult to determine the nature of the non-actualization inference in modal sentences like (179c).

<table>
<thead>
<tr>
<th></th>
<th>Presuppositions</th>
<th>Conventional implicatures</th>
</tr>
</thead>
<tbody>
<tr>
<td>conventional</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>detachable</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>P-family test</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>truth-conditional</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>cancellable</td>
<td>?</td>
<td>no</td>
</tr>
<tr>
<td>independent from at-issue</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>backgrounded</td>
<td>yes</td>
<td>no</td>
</tr>
</tbody>
</table>

Table 4.3: Presuppositions vs. Conventional implicatures

I will briefly summarize the similarities and differences between a conventional implicature and a presupposition, beginning with their overlapping properties. First, unlike conversational implicatures, both are conventional meanings which arise from particular words.
or constructions (Potts 2005, Levinson 1983). Second, both are detachable in the sense of Grice. If an inference is directly attached to certain linguistic forms or constructions, we characterize the inference as detachable (Levinson 1983: 223). Presuppositions and conventional implicatures are dependent on certain words or syntax; therefore, they are detachable. In contrast, conversational implicatures are not conventionally associated with particular linguistic expressions but are attached to the semantic content; therefore, they are non-detachable (Grice 1975). Third, they show similar behaviors under the P-family test (behavior under negation, questions, or in the antecedent of a conditional): under the P-family test, presuppositions and conventional implicatures tend to remain constant.

Despite the above similarities, I argue, conventional implicatures and presuppositions should be distinguished. As Table 4.3 shows, these two categories differ in some aspects. First, conventional implicatures are independent from at-issue meanings while presuppositions are not independent from the at-issue content (Potts 2005: 32). Second, while conventional implicatures are not cancellable or defeasible, presuppositions are (Potts 2005: 34). In the literature, I found a lot of disagreement on the defeasibility of presuppositions, but it seems that researchers more or less agree on the argument that presuppositions are defeasible (Chierchia and McConnell-Ginet 2000, Kadmon 2001). Among others, Potts (2005: 34) notes that cancellation of a presupposition arises when the presupposition conflicts with the demands of the context. Finally, conventional implicatures are not backgrounded and often give supplementary information, while presuppositions do not usually add new information. Rather, presuppositions are generally assumed to be part of the common ground and taken for granted by interlocutors.\footnote{As discussed earlier, in addition to these three, Potts would add speaker-orientedness as another distinction between presuppositions and conventional implicatures. But since this point is not valid, as several authors point out, I will not include this as one of the major distinct properties.}
The remaining question is whether the non-actualization inference in (179c) belongs to any of the inference types. The following is the list of general properties of the non-actualization inference in (179c).

- Non-cancellable
- Introducing new information
- Part of what is said, but backgrounded
- Reinforceable

Even though the modal-tense interaction does not seem to be similar to *but, therefore, or even* intuitively, the aforementioned properties show that the non-actualization inference shares some properties with conventional implicatures (e.g. non-cancellability). However, this CI-like inference does not perfectly follow the general properties of conventional implicatures in Potts’ theory and/or Grice’s theory. For example, we saw that this CI-like inference is freely reinforceable unlike Grice’s and Potts’ CIs. The non-actualization inference also shares some properties with presuppositions (e.g. not-at-issueness). Unlike presuppositions, however, the non-actualization inference provides new information. This suggests that we need to adopt a newer classification which incorporates the distinction between at-issue and not-at-issue meanings. Within this new system, we will be able to explain a wider range of cross-linguistic data in a unified way.

4.2.2 Inference Types in Modal Sentences

In this section, I discuss that the variety of inferences which arise in modal sentences can be classified in a systematic way. First, I introduce Tonhauser et al.’s (2013) diagnostics to classify the projective contents. Based on this discussion, I analyze the relationship between the inference types and the role of tense/aspect, and show that the non-actualization inference in –eyah– modal sentences belongs to Tonhauser et al.’s class C.
4.2.2.1 A NEWER CLASSIFICATION REGARDING INFERENCE TYPES

The traditional classification in (180) has been revisited recently because semantic contributions which do not fit into these traditional categories have been found. As Murray (2014) notes, “recent work on evidentials, modals, parentheticals, appositives, expressives, not-at-issue content and illocutionary mood, has provided a variety of analyses for such phenomena.” Consider the following examples (Murray 2014: 3):

(198) a. Floyd won the race, I hear. (evidential parenthetical)
   b. Tivi, who is a cat, likes to chase her tail. (appositive)
   c. Did Floyd win the race? (marking of illocutionary mood)

Many recent analyses on examples like (198) are based on a distinction between what is at-issue and what is not-at-issue. As we will see shortly, the current discussion contributes to this line of research.

I am going to use Tonhauser et al.’s (2013) classification which discusses the status of meaning types in a different way, and I will expand my analysis based on their classification. Focusing particularly on the projection behaviors, Roberts (2010) argues that the traditional taxonomy is not valid because not all that projects is presupposed. In line with this idea, Roberts et al. (2009), Simons et al. (2010), and Tonhauser et al. (2013) have claimed that “we need a more general theory of projection, which subsumes non-presuppositional projection and also considers projection across a wide range of languages” (Roberts 2010: 4). Among others, Tonhauser et al. (2013) establish distinctions among projective contents on the basis of a series of diagnostics. They argue that projective content is divided into four subclasses, as in Table 4.4.

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60Roberts (2010) notes that the same point has been discussed by Chierchia and McConnell-Ginet (2000) and Potts (2005).
According to Tonhauser et al. (2013), *strong contextual felicity* refers to the condition in which the target implication is triggered felicitously only with certain contexts. When triggers are associated with a strong contextual felicity constraint, using those triggers is acceptable in a context where the addressee has previous knowledge about the implication. If the cell of *strong contextual felicity* is *yes*, it means that the implication cannot be accommodated, and we always need previous knowledge. If *no*, then the implication can be accommodated even when there is no established context. *Obligatory local effect* refers to the way in which the projective content interacts with the embedding operators like propositional attitude verbs, modals, and conditionals. To test this property, the authors look into the interaction between a belief-predicate (e.g. *think*) and the projective content of the embedded clause.

As an illustration of a strong contextual felicity, consider the following example in Guaraní.

(199) Context: Julia and Maria work in a bakery and their boss, who is generally strict but fair, is called Marko. One day, he calls Julia into his office. When she emerges, she says to Maria:

*Pe aña memby* Márko ko’āga oi-pota a-mba’apo iñ-hermáno that devil child Marko now A3-want A1SG-work B3-brother karnisería-pe. butcher.shop-in
‘That bastard Marko now wants me to work in his brother’s butcher shop.’ (Tonhauser et al. 2013: 76)

The sentence is acceptable in a context where the addressee is not familiar with the speaker’s opinion of the referent. Thus, (199) shows that expressives in Guaraní are not associated with a strong contextual felicity. Now I compare this with the case in which the relevant Guaraní triggers are associated with a strong contextual felicity constraint.

(200) Context: Malena is eating her lunch, a hamburger, on the bus going into town. A woman who she doesn’t know sits down next to her and says:

#Ñande-chofeur o-karu empanāda avei.
A1PL.INCL-driver A3-eat empanada too

#‘Our bus driver is eating empanadas too.’ (Tonhauser et al. 2013: 78)

In (200), avei ‘too’ conveys that somebody besides the bus driver is eating empanadas. Since Malena is eating a hamburger and nobody else is known to be eating empanadas, the utterance is judged to be unacceptable. This shows that the implication conveyed by avei ‘too’ is associated with a strong contextual felicity constraint.

To diagnose the obligatory local effect feature, consider the following example.

(201) Context: The speaker has just visited Juan’s mother and knows that she is healthy.

a. Juan oi-mo’ā i-sy hasy-ha haá=katu na-’añeté-i.
Juan A3-think B3-mother N3.sick-NOM and=CONTR NEG-true-NEG
‘Juan thinks that his mother is sick but that’s not true.’

b. #Juan oi-mo’ā i-sy hasy-ha ha oi-mo’ā avei i-sy
Juan A3-think B3-mother B3.sick-NOM and A3-think also B3-mother
nda-hasy-i-ha.
NEG-B3.sick-NEG-NOM
#‘Juan thinks that his mother is sick and he also thinks that she is not sick.’ (Tonhauser et al. 2013: 95-6)
According to Tonhauser et al., the belief-predicate *think* creates a local context distinct from the global utterance. Because of the local context which is created by the belief-predicate, (201a) is not contradictory. In (201b), however, the sentence is not acceptable because the speaker holds contradictory propositions.

So far, I discussed Tonhauser et al.’s two main criteria with some examples. Now we will look at what kinds of projective contents belong to each class in Table 4.4. First of all, the triggers of class A are associated with strong contextual felicity and give rise to obligatory local effect. These include pronouns and *too*. The triggers of class B are not associated with strong contextual felicity and do not have the obligatory local effect feature. Class B includes expressives, appositives, and non-restrictive relative clauses. This class is similar to Potts’ conventional implicature. The triggers of class C are not associated with strong contextual felicity, but give rise to obligatory local effect. The contents in class C subsume factive presuppositions, the polar implication of *almost*, and the prejacent implication of *only*. Lastly, the triggers of class D are associated with strong contextual felicity but do not give rise to obligatory local effect. Class D is associated with focus.

### 4.2.2.2 Different Types of Inferences in Modality-Tense/Aspect Interaction

I find Tonhauser et al.’s classification useful because they give a unified criterion for all the meanings that are projected but not necessarily presuppositional. But since their main questions are not about modal-tense interactions, I will start my discussion with Table 4.5, which summarizes the relevant meaning types in Korean and their properties.

<table>
<thead>
<tr>
<th>Inference Type</th>
<th>Default</th>
<th>Non-Actualization Inference</th>
<th>Actuality Inference</th>
<th>Unreality Inference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Past Meaning</td>
<td>at-issue entailment</td>
<td>not-at-issue entailment</td>
<td>conversational implicature</td>
<td>presupposition</td>
</tr>
<tr>
<td></td>
<td>temporal actuality</td>
<td>temporal counterfactuality</td>
<td>temporal actuality</td>
<td>modal (fake past)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>counterfactuality</td>
</tr>
</tbody>
</table>

Table 4.5: Classification of meanings in Korean
The default meaning type is derived when the temporal operator has a semantic meaning. For example, an at-issue entailment of the sentence *John ate an apple* is ‘John’s eating an apple happened at some time in the past’. It is clearly an entailment and it is at-issue because “the content is directly relevant to the conversation at hand” (Roberts et al. 2009: 4). In Korean, there is the same kind of example.

    Chelswu-NOM apple-ACC eat-PAST-DEC
    ‘Chelswu ate an apple.’

In (202), the past marker –ess is a semantic past and the inference is an at-issue entailment, as in English.

An example of the non-actualization inference is the inference which arises in sentences like (179c).

(203) Chelswu-nun swukcey-lul hay-ss-eya ha-n-ta. (=179c)
    Chelswu-TOP homework-ACC do-NONP-COMP AUX-NONP-DEC
    ‘Chelswu should have done his homework.’

In (203), the combination of a modal and the past tense in the complement gives rise to the non-actualization entailment. Similarly, in English, *John should have won the game* where the combination of a modal and perfect *have* gives rise to the counterfactual inference ‘John did not win the game.’

When it comes to the actuality inference in Korean, we saw in Chapter 3 that the inference which arises in the combination of the ability modal with past tense in Korean is a conversational implicature.

(204) Chelswu-nun tayhak-ul colepha-l swu iss-ess-ta.
    Chelswu-TOP college-ACC graduate-COMP BN AUX-PAST-DEC
    ‘Chelswu was able to graduate from the college.’

Being a conversational implicature, the inference that Chelswu actually graduated from the college can be cancelled; hence, the sentence in (204) can be followed by either *so she did*
or but she didn’t. The phenomenon is similar to that of English.\textsuperscript{61} In English \textit{Yesterday, I was able to eat 5 apples} conversationally implicates that I actually ate 5 apples.

Lastly, an example which belongs to the unreality inference is in (205).

(205) I wish I had a car.

In (205), the inference that I don’t have a car is presupposed. In English, this kind of counterfactual inferences arises due to the predicate \textit{wish} and the past tense. Because the past tense in (205) does not contribute to the temporal meaning, it is often referred to as “fake tense”. Unlike English, there is no predicate like \textit{wish} in Korean. Consider the following example:

(206) Na-nun cha-ka iss-ess-umyen ha-n-ta.
I-TOP car-NOM have-PAST-COMP AUX-NONP-DEC
‘I wish I had a car.’

(206) is the corresponding sentence to (205) in English. Here, the \textit{wish}-meaning is expressed by the periphrastic modal construction, which is a combination of the complementizer and the auxiliary predicate. Like in English, what triggers this presupposition is the past tense –\textit{ess}. This construction in Korean is syntactically similar to (203) and the inference it triggers is similar, too.

I will classify the non-actualization inference, the actuality inference, and the unreality inference in Table 4.5 based on Tonhauser et al.’s discussion: How is each type associated with the two main criteria? First, the non-actualization inference is not associated with a strong felicity condition because the counterfactual inference does not need previous knowledge. The inference can be accommodated in the context. When it comes to obligatory local effect, the counterfactual inference projects and therefore gives rise to local effect. Based on these facts, the non-actualization inference belongs to class C. Second, the actuality inference, which is an actuality implicature in Korean, is also not associated with

\textsuperscript{61}In languages like French and Hindi, the actuality inference is an entailment.
a strong felicity condition. The inference projects, so it is associated with obligatory local
effect. Lastly, the counterfactual inference in wish-sentences is not associated with a strong
felicity condition and projects in the local context. We found that all three types, the non-
actualization inference, the actuality inference, and the unreality inference, belong to class
C. This is problematic because the properties of these three types are clearly different as
Table 4.6 shows. Applying the tests from section 4.2.1, Table 4.6 below summarizes three
different meanings, which arise in modal-tense interactions in Korean, and their properties.

<table>
<thead>
<tr>
<th>meaning types</th>
<th>old vs. new information</th>
<th>at issue vs. not-at-issue</th>
<th>cancellability</th>
</tr>
</thead>
<tbody>
<tr>
<td>actuality inference (able)</td>
<td>new</td>
<td>not-at-issue</td>
<td>cancellable</td>
</tr>
<tr>
<td>non-actualization inference (should)</td>
<td>new</td>
<td>not-at-issue</td>
<td>not cancellable</td>
</tr>
<tr>
<td>unreality inference (wish)</td>
<td>old</td>
<td>not-at-issue</td>
<td>not cancellable</td>
</tr>
</tbody>
</table>

Table 4.6: Meaning types in Korean

Focusing on English, we find that the non-actualization inference which arises in should
have-sentences and the unreality inference which arises in wish-sentences behave differ-
ently. In Korean, however, the two inferences are closely related both syntactically and
semantically.

Table 4.6 suggests that the diagnostics developed by Tonhauser et al. need further refine-
ments. However, I limit my job in this dissertation to discussing the derivation of the non-
actualization inference, and leave the research topic of developing some diagnostics to
subdivide different types of inferences in class C for future study.

4.2.2.3 THE NON-ACTUALIZATION INference: CLASS C

At this point, I will show why the non-actualization inference in (179c) belongs to
class C with specific examples. First, I will test whether the non-actualization inference in
constructions like (179c) is associated with strong contextual felicity.

(207) Minswu-nun mikwuk-ey ka-ss-eya ha-n-ta.
Minswu-NOM U.S.-LOC go-PAST-COMP AUX-NONP-DEC
‘Minswu should have gone to the States.’

Sentence (207) can be uttered felicitously even when the hearer did not know that Minswu was obliged/suggested to go to the States, and that he didn’t go. Thus, the non-actualization inference in (207) is not associated with the strong contextual felicity constraint. Next, the local effect is tested.

(208) Yengswu-nun Minswu-ka mikwuk-ey ka-ss-eya
Yengswu-TOP Minswu-NOM U.S.-LOC go-PAST-COMP
ha-n-ta-ko sayngkakha-n-ta.
AUX-NONP-DEC-COMP think-NONP-DEC

‘Yengswu thinks that Minswu should have gone to the States.’

As seen in (208), when embedded under the belief-predicate, the implication that ‘Minswu didn’t go to the States’ is understood as part of the attitude holder’s (i.e. Yengswu) epistemic state. Thus, it can be said that the non-actualization inference projects locally and is not cancellable. In addition, we need to test whether this local effect is obligatory. Consider the following example:

(209) #Yengswu-nun Minswu-ka mikwuk-ey ka-ss-eya
Yengswu-TOP Minswu-NOM U.S.-LOC go-PAST-COMP
ha-n-ta-ko sayngkakha-ko Minswu-ka mikwuk-ey
AUX-NONP-DEC-COMP think-NONP-CONJ Minswu-NOM U.S.-LOC
ka-ss-ta-ko sayngkakha-n-ta.
go-PAST-DEC-COMP think-NONP-DEC

#‘Yengswu thinks that Minswu should have gone to the States, and he also thinks
Minswu went to the States.’

As in (208), because the belief-predicate creates the local context, the non-actualization inference in the first conjunct projects. The reason why (209) is infelicitous is that the projective inference and the second conjunct contradict each other. This leads us to conclude that the non-actualization inference has a local effect which is obligatory.
In this section, I showed that if we use the classification of Tonhauser et al. (2013), the non-actualization inference belongs to class C: these inferences are not associated with strong contextual felicity but have obligatory local effect since they are “part of the conventional content of the clause in which they occur – hence are locally entailed to be true” (Roberts 2010: 22). Based on this discussion, in the next section, I move on to the discussion of how the non-actualization inference in priority modal sentences in Korean should be formally implemented. Not many previous studies have provided a formal model of projective meanings. Potts (2005) proposed a formal analysis for conventional implicatures and Murray (2014) analyzed evidentials with update semantics, but their proposals are not completely capable of accounting for the interpretation in question. Unlike appositives, epithets or evidentials, the not-at-issue inference in priority modal sentences does not result from certain lexical items. Rather, the inference is derived from the interaction between tense and the modal component. As we will see shortly, in my analysis, the non-actualization inference arises due to the semantic entry of –eya ha–, together with the contribution of the pastness.

4.3 A Model of a Not-at-Issue Entailment

To account for the non-actualization inference in –eya ha– modal constructions, I base my analysis on the semantic entries proposed in the previous chapter. Because the –eya ha– modal is semantically different from the –ul swu iss– modal, I will need to modify the semantics. The following definitions of –ul swu iss– are what we saw in Chapter 3.

The three entries of –ul swu iss–

\[ [-ul \text{ swu iss} - \text{ability}]^{f,g} = \lambda P \lambda x \lambda t \lambda t' \lambda w. \forall w' [w' \in \text{Best}_{g}^{\text{stereotypical}}(w, t) \cap \text{f}_{\text{circ}}(w, t)) \& x \text{ chooses } P(t') \text{ in } w' \text{ at } t \rightarrow P(x, w', t') = 1] \]
I’d like to remind the readers that “x chooses P” is the crucial part of the semantic entries of the circumstantial –ul swu iss–, and the “x chooses P” component in the semantics should satisfy the two following requirements.

Definition of chooses: x chooses P in w at t iff

a. The diversity requirement: P and not-P are in the set of x’s options in w at t.

b. The agentivity requirement: P goes onto x’s private To-Do List in w at t.

I will incorporate “x chooses P” into the semantic entry of –eya ha– as well. Consequently, these two requirements will be relevant to the –eya ha– modal. The –eya ha– modal is used to talk about obligations; thus, we expect that the semantics for the obligation modal will be like those of the –ul swu iss– modal with permission readings, both being priority modals, but the force of quantification is universal because –eya ha– is a necessity modal.

Based on (211), I propose the following semantics for the –eya ha– modal.

Definition of [–eya ha–obligation] (preliminary)

\[
[-\text{eya ha–obligation}]^{f,g} = \lambda P\lambda x\lambda t\lambda t'\lambda w. \forall w' [w' \in \text{Best}_{\text{deontic}(w,t)}(\cap f_{\text{circ}}(w, t)) & x \text{ chooses } P(t') \text{ in } w' \text{ at } t \to P(x, w', t')=1]
\]

In (214), [–eya ha–obligation] is true if and only if all the best worlds where x chooses P in w’ at t, then P is true in w’ at t’. Like the semantic entry of –ul swu iss– permission, the agent’s choosing is part of the obligation modal meaning.
In my analysis, I argue that the agentivity requirement and diversity requirement in (213), which define the meaning of choosing, are the important components for the non-actualization inference in obligation modal sentences. Obligation modal sentences refer to sentences in which the speaker imposes an obligation on some agent. The obligation sentences should satisfy the diversity requirement in (213a) because we assume that the obligation has not been fulfilled and needs to be. When it comes to the agentivity requirement in (213b), the obligation sentences should satisfy the agentivity requirement as well, because the obligation sentence needs some subject(s) which are capable of fulfilling the obligation. When we discuss the interaction of the modal with tense, the diversity requirement is particularly important because whether both P and not-P are possible or not changes over time. This point (the modal meaning is dependent on time) is closely related to the nature of obligation.

4.3.1 Obligation Sentences

In general, obligation statements are future-oriented. When we impose an obligation on someone, we expect that the obligation will be fulfilled after the sentence is uttered. Let me consider the simple case:

(215) Minswu-nun cwungkwuk-ey ka-∅-ya ha-n-ta.
    Minswu-TOP China-LOC go-NONP-COMP AUX-NONP-DEC
    ‘Minswu must/has to go to China.’

What we can learn from (215) is that Minswu’s going to China is required, and this requirement presupposes that Minswu’s leaving has not been fulfilled at the time of utterance. The tense of P in (215) is non-past. In –eya ha– modal sentences like (215), the obligation is future-oriented when the predicate is non-stative. The explanation for obligations on actions like (215) is straightforward. Now I move on to two types of obligations on states, and see if obligations on states share similar properties with obligations on actions.
First, consider obligation sentences with stative predicates.

(216) Minswu-nun samwusil-ey iss-∅-eya ha-n-ta.  
Minswu-TOP office-LOC be-NONP-COMP AUX-NONP-DEC  
‘Minswu must/has to be in his office.’

In (216), the time of fulfilling the obligation overlaps with the time of utterance. This is problematic because the diversity requirement is not met. Then, does it mean that, in obligation sentences with stative predicates, the time of fulfilling the obligation always overlaps with the time of utterance? The following example in (217) shows that this is not always so.

(217) Nayil, Minswu-nun samwusil-ey iss-∅-eya ha-n-ta.  
tomorrow Minswu-TOP office-LOC be-NONP-COMP AUX-NONP-DEC  
‘Tomorrow, Minswu must/has to be in his office.’

Unlike (216), in (217), the time of fulfilling the obligation is future-oriented. The only difference from (216) is the presence of a temporal adverbial *nayil* ‘tomorrow’. This shows that the time of fulfilling the obligation does not always overlap with the time of utterance even when stative predicates are used. What remains problematic is that, for (216), the diversity requirement does not seem to be satisfied. However, I argue that both P and not-P are still possible even in (216). This is because, in order to fulfill the requirement, the agent still needs to choose to maintain P at the time of utterance. In other words, the stative obligation requires the agent to fulfill the obligation at all times during an interval which extends into the future. For example, if Minswu is in his office when (216) is uttered, then he needs to choose to stay there. If he is not in his office at the time of utterance, he needs to choose to be there. Wyner (2004) also discusses that obligations on states are interpreted as obligations to maintain the described property. (216) satisfies both of the requirements of choosing.

Second, consider another kind of obligation on states, in which the agent is not obvious:
Stative obligations like (218) seem problematic because the agent x is not in the sentence. In order to solve this puzzle, I argue that for some obligation sentences, the potential agent x in (214) should be the addressee, not the subject of the sentence. In this way, we can say that, even though the potential agent does not appear in the sentence, the sentence still satisfies the agentivity requirement. As for the diversity requirement, like (216), (218) is interpreted as an obligation to maintain the described property. (218) also satisfies both of the requirements of choosing.

Based on the discussion of obligations on states, I modify the semantics in (214) to derive the correct meanings of the obligation sentences. We need to posit two different semantic entries.

(219) Subject-oriented $\llbracket \text{–eya ha–obligation} \rrbracket^f,g = \lambda P \lambda x \lambda t \lambda t' \lambda w. \forall w' [w' \in \text{Best}_g^{\text{deontic}}(w, t) \cap f_{\text{circ}}(w, t)) \& x \text{ chooses or chooses to maintain } P(t') \text{ in } w' \text{ at } t \rightarrow P(x, w', t')=1$]

In (219), I revised the “x chooses P” in the semantics in (214) to “x chooses or chooses to maintain P”.

For addressee-oriented obligations, the potential agent is the addressee, not the subject, and it comes from the context c.

(220) Addressee-oriented $\llbracket \text{–eya ha–obligation} \rrbracket^{f,g,c} = \lambda P \lambda x \lambda t \lambda t' \lambda w. \forall w' [w' \in \text{Best}_g^{\text{deontic}}(w, t) \cap f_{\text{circ}}(w, t)) \& \text{addressee}_c \text{ chooses or chooses to maintain } P(t') \text{ in } w' \text{ at } t \rightarrow P(w', t')=1$]

In this case, the obligation to be fulfilled necessitates the subject of the sentence; therefore, the requirement is a proposition in (220). This is different from (219), in which the require-
ment is a property. In (218), for example, the requirement on the addressee is to maintain ‘the room to be clean’, not to maintain ‘to be clean’.

If we compare subject-oriented obligations and addressee-oriented obligations, we find that there is a difference in the type of complement. That is, the former is more like a control structure which needs a subject argument while the latter is a raising structure which has only one argument (propositional). In the literature, some authors have argued that obligations on states should be treated differently from obligations on actions. Hacquard (2006), for example, argues that *ought-to-do* and *ought-to-be* deontics should be distinguished. According to Hacquard, there are fundamental distinctions between the two classes, evidenced by their syntactic and semantic properties. First, *ought-to-do* deontics are subject-oriented while *ought-to-be* deontics are addressee-oriented. Second, the former patterns with dynamic modals while the latter patterns with epistemic modals. Third, only the former gives rise to the actuality entailment in French. Lastly, only the latter can be used performatively. *Ought-to-do* deontics are used to describe an obligation on the subject. My semantics in (219) and (220) would provide evidence in favor of Hacquard’s analysis. For Hacquard, the distinctions between the two types are particularly important because they are crucial features in the actuality entailment phenomenon in French. However, since the focus of this dissertation is to analyze the modal’s interaction with tense, and since the non-actualization inferences which arise with past complements show the same phenomenon regardless of the types of obligations, I will not further discuss the differences between the two types.

4.3.2 Obligation Sentences with Past Complements

I discussed that both obligations on states and obligations on actions satisfy the two requirements of choosing. They satisfy the diversity requirement in that P and not-P are in the set of the agent’s (subject or addressee) options, and the agentivity requirement in that
P goes onto the agent’s To-Do List. Obligations in general are future-oriented. This is not always the case, however. We can find cases where the obligations are not expected to be fulfilled in the future. Now consider the case where the tense of the complement is past.

(221) Minswu-nun cwungkwuk-ey ka-ss-eya ha-n-ta.
    Minswu-TOP China-LOC go-PAST-COMP AUX-NONP-DEC
    ‘Minswu should have gone to China.’

In (221), Minswu’s going to China cannot be fulfilled in the future. The obligation is about the past, not about the future. In (221), it is not the case that both P and not-P are possible; hence, the diversity requirement in (213a) is not satisfied. If so, then the sentence should be undefined. The problem is, however, that the sentence is still grammatical. What’s more interesting is that it gives rise to the non-actualization inference.² Intuitively, the sentence is counterfactual because “it puts a present obligation to bring about a past state of affairs” (Hacquard 2006: 43). In this section, I will need to explain the grammaticality of the sentence and the derivation of the non-actualization inference with past obligation sentences.

An assumption of not-P

Related to the diversity requirement in (213a), I’d like to discuss the status of the two possibilities (i.e. P or not-P). So far, the two possibilities had the same status. What I want

²With a past complement, all kinds of obligation sentences, including obligation on states and addressee-oriented obligation, behave in the same way. The obligation sentences with a past complement invariably give rise to the non-actualization inference.

(i) Minswu-nun samwusil-ey iss-ess-eya ha-n-ta.
    Minswu-TOP office-LOC be-PAST-COMP AUX-NONP-DEC
    ‘Minswu should have been in his office.’

(ii) Pang-i kkaykkuthay-ess-eya ha-n-ta.
    room-NOM be.clean-PAST-COMP AUX-NONP-DEC
    ‘The room should have been clean.’

Like (221), (i), and (ii) give rise to the non-actualization inference.
to argue here is that P and not-P do not have the same status and there is a bias towards not-P. Not-P is the default assumption because, when the speaker utters an obligation statement, he assumes that without putting P on the agent’s To-Do List, not-P will be the case. In other words, if the agent does not choose P, then it will lead to not-P.

In understanding the difference between the two possibilities in (213a), the main idea of non-monotonic logic may be helpful. In the non-monotonic framework, we derive the conclusion based on the assumptions. This conclusion is a defeasible inference because when we learn that this assumption is not valid, it is retracted.

In the case of obligation sentences, x must P defeasibly implicates that x will P on the assumption that x has not P yet. The default assumptions like this may get cancelled if some information in the context conflicts with them; otherwise, they remain as default assumptions. In other words, depending on the context, some of the assumptions survive and some get retracted. Suppose that we adopt this perspective. Then we’d say that, for (215), Minswu has not gone to China is a default assumption due to the bias towards not-P. This bias towards not-P is relevant for future-oriented obligations like (215), but it is not as important as in the cases like (221). I propose that this bias plays a crucial role in past obligation sentences.

Let us begin by talking about the meaning of sentences like (221) informally. We can describe its meaning as in (222), in which the modal time is non-past (matrix tense) and the situation time is past (embedded tense).

(222) Given t’ ≺ t₀, it is required that Pᵣᵣ.

In (222), the modal time is the time of utterance but the orientation is not the future. Rather, this obligation should have been fulfilled some time in the past. The past is fixed, so the presupposition of (221) should be different from that of (215). As discussed in Chapter 3, there is a general assumption about the past:
Given \( t' \prec t_0 \), either \( P_{t'} \) or \( \neg P_{t'} \).

We know (223) because, in the actual world, \( P \) and \( \neg P \) cannot co-occur. Regarding the past events, as in (221), \( P \) and not-\( P \) in (213a) are in conflict because we already know that the past is either \( P_{t'} \) or \( \neg P_{t'} \).

Then, how can we incorporate this idea within the semantic entry in (219)? The problem with (219) is that, according to the definition, the obligation sentences with past complements like (221) satisfy (213b), but not (213a); thus, the sentences are not defined. However, we discussed that this conclusion is problematic, because the sentence (221) still has semantic value, unlike \(-ul swu iss-\) modal sentences with past complements.\(^{63}\) In addition, it gives rise to the non-actualization inference. How can an assumption of not-\( P \) solve the problem? In order to solve this problem, I argue that the modal \(-eya ha-\) consists of two components, a modal and a choosing, and that this decomposition mechanism enables the embedded tense to shift the relevant time. In the previous chapter, I argued that the tense of the complement determines the situation time, and the “choosing” component is a part of the modal. According to the new proposal, the embedded past tense shifts the choosing time, not the time of the complement, backwards. This decomposition is crucial because it will in turn make (213a) be satisfied. Once (213a) is satisfied, we can move on to discussing how we can get the non-actualization inference. A more detailed analysis is provided in the next section.

4.3.3 THE DECOMPOSITION OF THE MODAL

In order to capture the past-oriented sentences like (221), the new semantics that I propose decomposes the modal into a modal and a choosing operator, and the choosing

\(^{63}\)In Chapter 3, we saw that \(-ul swu iss-\) modal sentences lack circumstantial readings when the tense of the complement is past. This is because the sentence fails to satisfy the diversity requirement in (213a).
itself occupies a syntactic position in the structure. In doing so, the tense of the complement can scope over “x chooses P”. In other words, the tense of the complement can affect not only the situation time, but also the choosing time. This is illustrated below:

(224) a. Chelswu-nun kicha-lul tha-ss-eya ha-n-ta.
    Chelswu-TOP train-ACC take-PAST-COMP AUX-NONP-DEC
    ‘Chelswu should have taken the train.’

b. 

   \[ \begin{array}{c}
   \text{TP}_1 \\
   \text{MOD} \quad \text{T}_1 \\
   \text{TP}_2 \quad \text{MOD} \\
   \text{VoiceP} \quad \text{T}_2 \\
   \text{VP} \quad \text{Voice} \\
   \text{choose} \\
   \text{kicha-lul thal} \\
   \text{tha} \\
   \end{array} \]

In (224b), for simplicity, I merged –eya and ha– as a result of the restructuring process; hence, there is a MOD instead of a CP and a VP. Choosing occupies a head below the embedded tense as Voice (Kratzer 1996). The reason I assume choosing as Voice is that choosing is related to the (agentive) external argument. In the Korean syntactic literature, VoiceP is assumed as a functional head which is used to introduce the external argument.
In (224a), the agent’s choosing to take the train at some past time would lead to the best accessible worlds. However, in the actual world, the agent did not choose, so we get the non-actualization inference. With the new semantics, the modal sentence satisfies the diversity requirement in (213a) because at the choosing time, two options were still available and the worlds could evolve into either taking-the-train-worlds or not-taking-the-train-worlds. Based on this idea, now I turn to modify the semantics in (219). The semantics of –eya ha– is revised as follows:

Definitions of [–eya ha–obligation] (revised) and [choose]

(225)  [–eya ha–obligation] = \lambda P \lambda t \lambda w. \forall w'[w' \in \text{Best}_{\text{deontic}}(w, t) \cap \text{f}_{\text{circ}}(w, t)] \rightarrow P(w, t) = 1$

(226)  [choose] = \lambda P \lambda x \lambda t \lambda w. x \text{ chooses or chooses to maintain } P \text{ in } w \text{ at } t$

Now the modal is decomposed into [–eya ha–obligation] in (225) and [choose] in (226). As we can see in (226), the choosing itself incorporates a time argument t.

Then, let’s turn back to the case in which we get the non-actualization inference as a not-at-issue entailment, as in (224a).

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An example of a true passive sentence in Korean is as follows (Jung 2014: 209):

(i) Mokumhayngsa-ka (casentanchey-ey uyhay) yel-li-ess-ta.

fundraising event-NOM (charity-by) open-PAS-PAST-DEC

‘A fundraising event was held (by the charity).’

In Jung (2014), the author investigates whether Korean has two distinct syntactic heads for v and Voice, and argues that, in a passive sentence like (i), the passive morpheme –li occupies the v head and there is a separate projection VoiceP in which the by-agent is hosted. For modal constructions like (224a), I assume that there is a single functional head above VP; hence, VoiceP is sufficient.

This additional Voice (choosing) head is similar to v head in Larson (1988). In the literature, VP is selected by v/Voice and vP/VoiceP is selected by T. The syntactic/semantics properties of the choosing head need further study.
In (227), since the Voice head (choose) is below the embedded tense marker, the reference time \(t''\) is introduced by the embedded past tense marker. In this configuration, the introduction of the new reference time makes the time of choosing shift backwards. Consequently, both \(P\) and not-\(P\) become available at that time.

As discussed in section 4.2.1, (188ii) also gives rise to the non-actualization inference because the complement is past. (188) is repeated below:

(228) Chelswu-nun swukcey-lul hay-ss-eya hay-ss-ta.
     Chelswu-TOP homework-ACC do-PAST-COMP AUX-PAST-DEC
     (i) ‘Chelswu had to do his homework.’
     (ii) ‘Chelswu had/needed to have done his homework.’

As mentioned, sentences with past SIT-T and past MOD-T are ambiguous, depending on whether the embedded past is semantically real or vacuous. The semantics of (228ii) is shown in (229).

(229) \[
\langle P\text{-choose-PAST-eya ha}_-\text{obligation-PAST} \rangle_{\text{f,g}} = \lambda x \lambda t \lambda w. \exists t' [t' = t & \forall w' [(w' \in \text{Best}_{\text{deontic}}(w, t')) & \exists t'' [t'' < t & x \text{ chooses or chooses to maintain } P \text{ in } w' \text{ at } t'']] \rightarrow P(x, w', t') = 1]
\]

The above semantics is for (229), where the embedded past tense is semantically real, and this is when the non-actualization inference is uncancelable. When the embedded past tense is vacuous, i.e. (228i), then the sentence is the same as having non-past SIT-T and past MOD-T. This case will be discussed in section 4.4.

The steps of how we reach the conclusion that the past obligation sentences give rise to the non-actualization are as follows:
(230) a. Presupposition: \( \forall t'[t' \prec t_0, P_{t'} \lor \neg P_{t'}] \)

b. Presupposition: \( \forall t''[t'' \prec t', x \text{ does not choose } P \text{ at } t''] \)

There is a presupposition that the agent did not choose P at any time in the past.

This bias is strong, so it cannot be overridden by the context.

c. Presupposition: \( \forall t''[t'' \prec t', x \text{ does not choose } P \text{ at } t''] \rightarrow \forall t'[P(t')=0] \)

d. From (230a) to (230c), we get the inference: \( \forall t'[P(t')=0] \).

To conclude, necessity priority modal sentences with past complements in Korean invariably yield non-actualization inferences. What we need to focus on is the conflict between \( \exists t''[t'' \prec t' \& x \text{ chooses or chooses to maintain } P \text{ in } w' \text{ at } t''] \rightarrow P(x, w', t')=1 \) in (227) and the presupposition \( \forall t''[t'' \prec t', x \text{ does not choose } P \text{ at } t''] \) in (230b). The presupposition in (230b) exists in –eya ha– constructions regardless of tenses. But, as we will see in section 4.4, this assumption does not have an effect if \( t' \preceq t'' \).

Even though the non-actualization inference sounds like an epistemic or metaphysical interpretation, it is not incompatible with modal interpretations having circumstantial modal base. Contra Condoravdi’s (2002) proposal in which she claims that the counterfactual reading of might have involves a metaphysical modal base, I argue that the –eya ha– modal invariably quantifies over deontically/teleologically/bouletically accessible worlds and bears priority modal interpretations. I showed that what is responsible for the non-actualization inference is the way that the modal interacts with tense.

I need to discuss why priority modal sentences are used to convey the non-actualization inference. Having circumstantial modal bases, priority modal sentences are used to talk about laws, rules, goals, or desires. (221) involves a deontic accessibility relation, which has to do with the regulations. However, the term ‘non-actualization’ seems to imply that it is based on the speaker’s knowledge or evidence about the past situation or how the world has already turned out to be, which are more relevant to epistemic or metaphysical modality.
than priority modality. In accordance with this intuition, we have seen that, in order to yield the non-actualization inference, the event of Minswu’s going to China should precede the time of utterance. This means that the non-actualization inference depends on the speaker’s knowledge at the utterance time about the past situation, based on the assumption that facts about the past are settled as either true or false.

Pragmatically, presuppositions are related to the notion of felicity. That is, presuppositions are preconditions which are required for an utterance to be felicitous. From now on, I will show how the felicity/infelicity of the presuppositions of past obligation sentences is illustrated within the context. Depending on whether our world is \( P_{t'} \) or \( \neg P_{t'} \) given \( t' \prec t_0 \), we get the different judgments. First, consider the use of (221) in the context where the actual world is \( P_{t'} \):

(231) Chelswu got a cold last week, so he went to the hospital but he is still sick. John knows that Chelswu went to the hospital. Now John says:

a. #Chelswu-nun pyengwen-ey ka-ss-eya ha-n-ta.
   Chelswu-TOP hospital-LOC go-PAST-COMP AUX-NONP-DEC
   ‘Chelswu should have gone to the hospital.’

b. Chelswu-nun (tto) pyengwen-ey ka-∅-ya ha-n-ta.
   Chelswu-TOP again hospital-LOC go-NONP-COMP AUX-NONP-DEC
   ‘Chelswu must/has to go to the hospital (again).’

The sentence with a past complement does not have a plausible function since the sentence cannot realistically serve to place an obligation on Chelswu. In other words, the presupposition that Chelswu did not go to the hospital (\( \neg P \)) is not consistent with the context set; hence, it is infelicitously used. This presupposition failure makes the sentence infelicitous. In the case where the actual world turned out to be \( \neg P_{t'} \), however, sentences can be used to convey the non-actualization inference.
Chelswu got a cold last week, but he didn’t go to the hospital. John knows that Chelswu didn’t go to the hospital. Now John says:

a. Chelswu-nun pyengwen-ey ka-ss-eya ha-n-ta.
   Chelswu-TOP hospital-LOC go-PAST-COMP AUX-NONP-DEC
   ‘Chelswu should have gone to the hospital.’

b. Chelswu-nun pyengwen-ey ka-∅-ya ha-n-ta.
   Chelswu-TOP hospital-LOC go-NONP-COMP AUX-NONP-DEC
   ‘Chelswu must/has to go to the hospital.’

The presupposition of (232a) that Chelswu did not go to the hospital (¬P) does not conflict with the context; hence, the use of (232a) is felicitous, and the function of (232a) is to reproach or criticize.

In addition to this non-actualization interpretation, an indirect speech act arises due to the conflict between its temporal interpretation and illocutionary forces. Priority modal sentences are used for various illocutionary forces: obligation, advice, suggestion, or desire. The choice of illocutionary force is context-dependent. Among these actions, it is not felicitous for the speaker to give advice, suggest, or place an order about the past at the present time (Portner 2009: 190). This makes priority modal sentences with past tense morphology indirectly perform an action of ‘criticism’ or ‘regret’ rather than ‘advice,’ ‘suggestion,’ or ‘obligation.’

To sum up, –eya ha– modal sentences with a past complement, e.g. (221), have an obligation modal meaning as a sentence meaning (descriptive meaning), the non-actualization inference as a not-at-issue meaning (implicative meaning), and ‘criticism’ or ‘regret’ arises as an additional speech act (performative meaning), instead of an imperative-like speech act.

---

66This additional speech act depends on the speaker’s intentions so it is possible that these intentions are not discernible to the hearer (Stanford Encyclopedia of Philosophy).
4.4 The Actuality Inference in *had to* Modal Sentences

Now I turn to the construction in which the actuality inference arises in addition to the obligation reading. (179b) is repeated for convenience:

(233) Chelswu-nun swukcey-lul hay-∅-ya hay-ss-ta.
    Chelswu-TOP homework-ACC do-NONP-COMP AUX-PAST-DEC
    ‘Chelswu had to do his homework.’

(233) has the primary obligation reading and the extra inference that he actually did do his homework. In the literature, S.-y. Moon (2009: 248) also discusses the contrast between *had to* and *had/needed to have*. (234) is from S.-y. Moon (2009: 248, translations added):

(234) a. Pwutangha-n il-ul tangha-eto wuli-nun chimmwuk-ul unfair-ADN matter-ACC suffer-even.though we-TOP silence-ACC
cikhi-∅-eya hay-ss-ta.
    keep-NONP-COMP AUX-PAST-DEC
    ‘Even though we suffer unfair matters, we had to keep silence.’

b. Kuttay wuli-nun amwuli ekwulha-eto chimmwuk-ul
    at.that.time we-TOP no.matter.how treat.unfairly-even.though silence-ACC
cikhi-ess-eya hay-ss-ta.
    keep-PAST-COMP AUX-PAST-DEC
    ‘At that time, no matter how unfair, we had/needed to have kept silence.’

S.-y. Moon argues that, unlike (234b), (234a) does not give rise to the non-actualization inference. Similar to my analysis, she claims the non-actualization inference in (234b) is derived due to the embedded past tense marker. Since it is the embedded past tense marker, in her analysis, both *should have* and *had/needed to have* invariably give rise to the non-actualization inference as an entailment. Even though she does not address the extra inference that (234a) may give rise to, in this section, I will focus on the nature of such an inference and how we can derive this inference from the proposed semantic entry.

Now I discuss the status of the actuality inference in (233). First, by adding some explicit material, we can test whether this inference is context-dependent.
Yenghi-wa Tongswu-nun ecey yenghwa-lul po-le ka-ss-ta.
Yenghi-and Tongswu-TOP yesterday movie-ACC see-to go-PAST-DEC
Kulentey Chelswu-nun swukcey-lul hay-∅-ya
but Chelswu-TOP homework-ACC do-NONP-COMP
hay-ss-ta.
AUX-PAST-DEC
‘Yesterday, Yenghi and Tongswu went to see a movie. But Chelswu had to do his homework.’

Chelswu-nun ecey halwucongil thipi-lul po-ass-ta. Kulentey Chelswu-TOP yesterday all.day.long tv-ACC watch-PAST-DEC but Chelswu-nun (sasil) swukcey-lul hay-∅-ya hay-ss-ta.
Chelswu-TOP (in fact) homework-ACC do-NONP-COMP AUX-PAST-DEC
‘Yesterday, Chelswu watched tv all day long. But, (in fact,) Chelswu had to do his homework.’

The modal sentence in (235a) yields the actuality inference, whereas the same modal sentence in (235b) does not. This shows that the actuality inference is not linguistically triggered, but heavily context-dependent.

Second, we can test whether the actuality inference is reinforceable. (236) shows how the implicature which arises in (235b) is reinforced.

all.night homework-ACC do-PAST-DEC
‘Chelswu had to do his homework. So, he stayed up all night doing his homework.’

As we can see from (236), the sentence can be followed by so he did without making the sentence sound redundant. Again, the actuality inference in (233) behaves like a conversational implicature, which depends on the speaker’s intention or the context.

Next, the following dialogue shows whether the actuality inference contributes new information.
In (237), the speaker B gives new information that ‘Chelswu did his homework’ without explicitly saying that. From all of the above tests, we can conclude that the non-actualization inference in (233) is a conversational implicature.

Based on the discussion, I need to explain why there is no non-actualization inference in (233) and we often get the actuality inference from (233). Similar to the analysis of was able to in Chapter 3, my explanation lies in the semantic entries of (225) and (226). (225) and (226) repeated below:

(238) \([\text{–eya ha–obligation}]^{f,g} = \lambda P \lambda t \lambda w. \forall w'[w' \in \text{Best}_{\text{deontic}}(w,t) \cap f_{\text{circ}}(w,t)) \rightarrow P(w,t)=1\] 

(239) \([\text{choose}] = \lambda P \lambda x \lambda t \lambda w. x \text{ chooses or chooses to maintain } P \text{ in } w \text{ at } t\]

The lack of the non-actualization inference in (233) is due to the embedded tense. In the case of (233), the choosing time and the modal time coincide; hence, \(t'' = (\geq) t'\). The semantics of (233) is given as follows:

(240) \([\text{P-choose-NONP-eya ha–obligation–PAST}]^{f,g} = \lambda x \lambda t \lambda w. \exists t'[t' \prec t \& \forall w'[(w' \in \text{Best}_{\text{deontic}}(w,t')) \cap f_{\text{circ}}(w, t')) \& \exists t''[t'' \geq t' \& x \text{ chooses or chooses to maintain } P \text{ in } w' \text{ at } t'')] \rightarrow P(x, w', t'')=1]\]

In this configuration, a presupposition that \(\forall t''[t'' \prec t', x \text{ does not choose } P \text{ at } t'']\) in (230) does not play a role in deriving the non-actualization inference due to the fact that \(t'' \geq\)
t’. This result follows the hypothesis and analysis that the embedded past tense marker contributes to the non-actualization inference.

(240) says that \([P\text{-choose-NONP-eya ha}_{\text{obligation-PAST}}]\) is true if and only if for all the best circumstantially accessible worlds \(w’\) at \(t’\) (which is prior to \(t\)) where \(x\) choose \(P\) at \(t”\) (which is also prior to \(t\)), \(P\) is true in \(w’\) at \(t’\). Similar to the analysis of \(\text{was able to}\), I argue that there is an extra implicature that \(x\) does choose \(P\) under normal conditions.\(^{67}\) Due to this implicature which arises in the antecedent, \(P\) is true. If \(x\) does choose \(P\) at \(t’\) \((≺ t)\), then \(P\) at \(t’\) \((≺ t)\). But this does not exclude the possibility that the best accessible worlds do not include the actual world. In order to make sure the actual world is one of the best worlds, I add an assumption that, in modal sentences which yield the actuality inference, the ordering source is empty, and this will make all circumstantially accessible worlds include the actual world. This is how we derive the actuality inference from \(\text{had to}\) modal sentences.

4.5 Applying the Analysis to Other Modals in Korean

In Chapter 3, I discussed the possibility priority modal –ul swu iss–\(\text{permission}\). From now on, I will examine if the analysis for the necessity priority modal –eya ha– is problematic for the possibility priority modal –ul swu iss–\(\text{permission}\). The puzzle is, if the embedded tense can scope over the choosing time, how does it prohibit the permission sentence with a past complement from having the non-actualization inference? I proposed that in order for –ul swu iss– to have a permission reading, the subject must be animate and agentive, and \(P\) needs to be an available option. I will repeat what is relevant for the current discussion.

(241) Chelswu-ka sihap-ul iki-ess-ul swu iss-∅-ta.
Chelswu-NOM game-ACC win-PAST-COMP BN AUX-NONP-DEC

\(^{67}\)As discussed in section 4.3, in the case of obligation sentences, \(x\) must \(P\) defeasibly implicates that \(x\) will \(P\) on the assumption that \(x\) has not \(P\) yet.
I discussed that (241) does not have a permission reading because P is not an available option, based on the semantic entry in (242).

(242) \[[-ul swu iss–_{\text{permission}}]^{f,g} = \lambda P \lambda x \lambda t \lambda w. \exists w' [w' \in \text{Best}_{\text{deontic}}(w, t) \cap f_{\text{circle}}(w, t)) \& x \text{ chooses } P(t') \text{ in } w' \text{ at } t \& P(x, w', t') = 1] \]

However, if we adopt the idea that the modal consists of two components, the modal and the choosing, and if the embedded tense can affect the time of choosing, then the –ul swu iss– permission may give rise to the non-actualization inference as well. Informally, the reading is something like: At some past time, Chelswu had a choice to win or not win the game but she did not choose; hence, she did not win. This reading is not possible in (241).

In my analysis, choosing is tense-related. The possibilities to choose P or not-P depend on time. In order to account for this asymmetry between a necessity priority modal and a possibility priority modal, I argue that the functional head choosing is not in the syntax of –ul swu iss– modal constructions for the following reason: there is a difference between the two modals in terms of the bias. I mentioned that in obligation sentences, there is a strong bias towards not-P. That is, without putting P on the agent’s To-Do List, not-P will then be the case. I would say that it is weaker in permission sentences than in obligation sentences. That is, in obligation sentences, the consequence is serious if the agent does not perform what is in his To-Do List. In permission sentences, however, the consequence is not serious because it gives an option which does not have to be followed. Consequently, the association between permission and choosing is weak. So, we do not need to posit a functional category of choosing in the syntax.

Related to the above discussion, I argue that there is a presupposition that constrains the choosing time in –ul swu iss– modal constructions.

(243) \[\neg \exists t'' [t'' < t' \& x \text{ chooses } P \text{ at } t' (= \text{modal time})] \]
(243) says that there is no time that precedes the modal time. Due to (243), the situation time always follows the modal time. This fact is evidenced by the grammar. The embedded past tense is not allowed in permission sentences. The tense pattern of –ul swu iss– contrasts with the –eya ha– obligation sentences, e.g. (221), in which the past complement is allowed.

In addition to the tense fact, there are many ways in which the necessity priority modal –eya ha– and the possibility priority modal –ul swu iss– are grammatically different. Unlike –eya ha– modal sentences, –ul swu iss– modal sentences do not allow inanimate subjects. Also, –ul swu iss– modal sentences are not very natural with stative predicates. All of these properties are related to the notion of choosing. From these facts, I argue that the semantics of –eya ha– will not affect the semantics of –ul swu iss–.

Before I finish this section, I will briefly discuss whether the decomposition analysis may be applied to other periphrastic modal expressions in Korean. Table 2.1 is repeated below:

<table>
<thead>
<tr>
<th>Possibility</th>
<th>Epistemic</th>
<th>Priority</th>
<th>Dynamic</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>–un/l moyang-i-</td>
<td>-eto toy-</td>
<td>-ul swu iss-</td>
</tr>
<tr>
<td></td>
<td>(conjecture)</td>
<td>(permission)</td>
<td>(ability)</td>
</tr>
<tr>
<td></td>
<td>–ul swu iss-</td>
<td>-eto coh-</td>
<td>–ul swu iss-</td>
</tr>
<tr>
<td></td>
<td>(conjecture)</td>
<td>(permission)</td>
<td>(permission)</td>
</tr>
<tr>
<td></td>
<td>–un/l kes kath-</td>
<td>-eto kwaynchanh-</td>
<td>-ul swu iss-</td>
</tr>
<tr>
<td></td>
<td>(conjecture)</td>
<td>(permission)</td>
<td>(permission)</td>
</tr>
<tr>
<td></td>
<td>–un/l tus-ha-</td>
<td>-ul swu iss-</td>
<td>(permission)</td>
</tr>
<tr>
<td></td>
<td>(conjecture)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>–un/l seng-siph-</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(conjecture)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>–un/l tus-siph-</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(conjecture)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Necessity</td>
<td>–ul li eps-</td>
<td>-eya ha-</td>
<td>-ul swu iss-</td>
</tr>
<tr>
<td></td>
<td>(certainty)</td>
<td>(obligation)</td>
<td>(ability)</td>
</tr>
<tr>
<td></td>
<td>–un/l kes-i-</td>
<td>-eya toy-</td>
<td>–ul swu iss-</td>
</tr>
<tr>
<td></td>
<td>(certainty)</td>
<td>(obligation)</td>
<td>(ability)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-un kes-i coh-</td>
<td>-ul swu iss-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(desire/goal)</td>
<td>(ability)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-umyen ha/siph-</td>
<td>-ko ca ha-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(desire)</td>
<td>(volition)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>-ulyeko ha-</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(volition)</td>
</tr>
</tbody>
</table>

Table 4.7: Periphrastic modal expressions in Korean

Among these expressions in Table 4.7, the bold-faced modal expressions are those which allow past complements and may give rise to the non-actualization inference. Since the decomposition was motivated by the presence of the past morpheme in the complement, I speculate that the decomposition may be applied to circumstantial modal sentences which
allow the past tense morpheme in the complement. I will leave the investigation of the non-actualization inference of each bold-faced modal expression for future study.

\[\text{As we can deduce from Table 4.7, the decomposition can be applied to some priority modals but not to dynamic modals. The complementizers in priority modal expressions (i.e. } -\text{eya, } -\text{eto, } -\text{umyen}) \text{ can combine with tense morphemes, whereas the complementizers in dynamic modal expressions (i.e. } -\text{koca, } -\text{lyeko}) \text{ cannot.}\]
CHAPTER 5

CONCLUSION

In this dissertation, I examined the interpretations of modal expressions focusing on their interaction with tense. Particularly, I investigated meanings of two periphrastic modal constructions in Korean. One involves a possibility modal –ul swu iss– ‘can, may’ and the other involves a necessity priority modal –eya ha– ‘must, have to’. These modal expressions show interesting interpretation patterns when they interact with tense. The –ul swu iss– modal in Korean can receive various kinds of interpretations: epistemic, priority, and dynamic. With past complements, however, the same modal does not allow circumstantial readings. In addition, when –ul swu iss– ‘can, may’ is realized in the past tense, the actuality inference arises in addition to the primary modal interpretation. Chapter 3 was devoted to answering these questions. When it comes to the necessity priority modal –eya ha– ‘must, have to’, when it interacts with past tense, the non-actualization inference arises. The nature and strength of the non-actualization inference varies depending on the realization of tense markers in the constructions. I primarily focus on the construction where the non-actualization inference is not merely a conversational implicature, but a not-at-issue entailment. We saw in Chapter 4 that the uncancellable non-actualization inference is derived from the proposed semantic entries which decompose the modal into two components.

The main contribution of the current work was to analyze the interpretations of periphrastic modal constructions with respect to tense from a formal semantic perspective. I claimed that the interpretations of modal constructions can be uniformly derived from
the semantic meanings and some pragmatic reasoning. The following subsections briefly summarize the crucial assumptions on which my analysis is based, my proposal including the new semantic entries, and implications of my analysis.

5.1 ASSUMPTIONS

The notion of modality in Korean has been confused with other grammatical categories such as mood or clause type. This is because the definition of modality has not been well-established in the literature. In consequence, what is included in the category of modality and what is not varies depending on the author. For example, Park (2006) defines modality as “the speaker’s attitude towards the proposition expressed” following Lyons (1977: 452), and argues that pre-final particles and final particles express modality while adverbs and periphrastic constructions do not. The following examples are from Park (2006: 13-15, emphasis/translations added):

(244) a. Ecey Yenghi-ka pyengwon-ey ka-te-la. 
yesterday Yenghi-NOM hospital-LOC go-MOD-DEC
‘I saw that Yenghi went to the hospital yesterday.’

b. Yenghi-ka hakkyo-ey ka-ney.
Yenghi-NOM school-LOC go-MOD
‘Now I know that Yenghi goes to school.’

c. Amato ku-nun cwuk-ess-ul kes-i-ta.
maybe he-TOP die-PAST-COMP BN-COP-DEC
‘He may have died.’

d. Haksayng-un kongpwu-lul yelsimhi hay-ya ha-n-ta.
student-TOP study-ACC hard do-COMP AUX-NONP-DEC
‘Students must/have to study hard.’

For this reason, most of the studies on modality in Korean have focused on the pre-final or final particles which contain some kind of modal meanings (Park 2006).
According to Park, (244a) and (244b) convey modality while (244c) and (244d) do not. She excludes (244c) because the meaning of amato ‘maybe’ comes from the lexical meaning and (244d) because the periphrastic expression –eya ha– does not convey the speaker’s attitude but describes the subject’s obligation. J. Kim (1998), on the other hand, argues that (244d) still conveys modal meanings but (244c) does not.

In this dissertation, I defined modality as a grammatical category which allows us to talk about possibilities and necessities. These modal meanings are formally analyzed with the notion of possible worlds. I adopted Kratzer’s ordering semantics which is based on modal logic to capture the meaning of modal expressions. With this definition, we can say that there is a variety of ways to express modality, including verbal morphology, auxiliaries, and adverbs. Therefore, all of the sentences in (42a-d) belong to modality. The main focus of the dissertation was on periphrastic constructions like (244d).

Given the above assumption, I discussed the relevant syntactic assumptions. Syntactically, periphrastic modal constructions are not easy to analyze because of their peculiar behaviors. The status of the auxiliaries in the periphrastic constructions is controversial: whether it is a part of the periphrastic expressions or a main predicate of the matrix clause. I assumed that periphrastic modal expressions are, strictly speaking, like auxiliary constructions, but semantically like modal auxiliaries in English.

5.2 –ul swu iss– AND THREE DISTINCT SEMANTIC ENTRIES

In Chapter 3, I explored the meanings of the possibility modal –ul swu iss– ‘can, may’. I showed that –ul swu iss– ‘can, may’ gives rise to three distinct modal interpretations, i.e. epistemic, priority, and dynamic, but certain readings disappear in certain grammatical contexts. I developed a formal semantic analysis which can capture the distinct interpretations and argued that the semantic asymmetry arises due to three distinct semantic entries.
In my proposed semantics, epistemic, priority, and dynamic modals differ in the force of the quantification, and whether the agent’s choosing P is part of the definition or not. I showed that the notion of choosing is responsible for the presence/lack of circumstantial readings in certain grammatical contexts.

The three entries of –ul swu iss–

\[
[-ul swu iss_{ability}]^{f,g} = \lambda P \lambda x \lambda t \lambda t' \lambda w. \forall w'[w' \in \text{Best}_{g\text{stereotypical}}(w,t) \cap f_{\text{circ}}(w,t)] & x \text{ chooses } P(t') \text{ in } w' \text{ at } t \rightarrow P(x, w', t')=1
\]

\[
[-ul swu iss_{permission}]^{f,g} = \lambda P \lambda x \lambda t \lambda t' \lambda w. \exists w'[w' \in \text{Best}_{g\text{deontic}}(w,t) \cap f_{\text{circ}}(w,t)] & x \text{ chooses } P(t') \text{ in } w' \text{ at } t & P(x, w', t')=1]
\]

\[
[-ul swu iss_{epistemic}]^{f,g} = \lambda P \lambda t \lambda t' \lambda w. \exists w'[w' \in \text{Best}_{g\text{stereotypical}}(w,t) \cap f_{\text{epis}}(w,t)] & P(w', t')=1]
\]

As we can see from the above definitions, “x chooses P” is the crucial part of the semantic entries of the circumstantial –ul swu iss–. The “x chooses P” component in the semantics should satisfy the two following requirements.

The definition of choosing

\[
\text{Definition of chooses: } x \text{ chooses } P \text{ in } w \text{ at } t \text{ iff}
\]

\[a. \text{ The diversity requirement: } P \text{ and not-}P \text{ are in the set of } x's \text{ options in } w \text{ at } t.\]

\[b. \text{ The agentivity requirement: } P \text{ goes onto } x's \text{ private To-Do List in } w \text{ at } t.\]

I also discussed that we get the actuality inferences with the past-tensed –ul swu iss– ‘can, may’ having circumstantial modal bases. I discussed that the nature of this inference is a
conversational implicature and the actuality inference is derived by Horn’s R-based reasoning. In order to derive the actuality implicature, I argued that there is an extra implicature that \( x \) does choose \( P \) under normal conditions. Due to this implicature which arises in the antecedent, \( P \) is true. I also showed that the agent’s present/past choice to actualize his/her ability is associated with the strength of the actuality implicature, and this was not accounted for by Horn’s R-based reasoning.

5.3 \( −eya \ ha− \) AND THE DECOMPOSITION OF THE MODAL

In Chapter 4, I discussed the non-actualization inferences which arise with the necessity priority modal \( −eya \ ha− \) ‘must, have to’ interacting with pastness. In order to analyze the nature of the inference, I tried to classify the non-actualization inference according to the traditional taxonomy and Tonhauser et al.’s (2013) taxonomy. The non-actualization inferences in question were classified into two different types. One type is a cancellable conversational implicature and the other type is an uncancellable, entailment-like inference. I focused primarily on the latter type. After showing that the uncancellable non-actualization inference does not fit in the traditional classification, I argued that the at-issue vs. not-at-issue distinction works better for the current purpose.

I argued that the expected interpretations of modal sentences can be derived from the semantics of tense and modality. As in the definition of \( −ul \ swu \ iss− \) ‘can, may,’ proposed in Chapter 3, I incorporated “x chooses P” into the semantic entry of \( −eya \ ha− \) as well. Accordingly, the two requirements in (248) were relevant to the \( −eya \ ha− \) modal. In order to derive the non-actualization inference, I introduced new machinery to shift the reference time backwards. That is done by decomposing the modal into a modal and a choosing operator, and the choosing itself incorporates a time argument.
The –eya ha– modal is used to talk about obligations; thus, we expect that the semantics for the obligation modal will be like that of the –ul swu iss– modal with permission readings, both being priority modals, but the force of quantification is universal because –eya ha– is a necessity modal.

**Definitions of [–eya ha– obligation] and [choose]**

\[
[-\text{eya ha-obligation}]^{f,g} = \lambda P t \lambda w. \forall w' [w' \in \text{Best}_{g\text{deontic}}(w, t)] (\cap f_{circ}(w, t)) \rightarrow P(w, t) = 1
\]

\[
[\text{choose}] = \lambda P \lambda x \lambda t \lambda w. x \text{ chooses or chooses to maintain } P \text{ in } w \text{ at } t
\]

Now the modal is decomposed into \([-\text{eya ha-obligation}]\) in (249) and \([\text{choose}]\) in (250). As we can see in (250), the choosing itself incorporates a time argument \(t\). The introduction of the new reference time makes the time of choosing shift backwards. Consequently, both \(P\) and not-\(P\) become available at that time.

The priority modal construction in which the complement is past yields the non-actualization inference.

\[
[P-PAST-\text{eya ha-obligation-NOP}]^{f,g} = \lambda x \lambda t \lambda w. \exists t' [t' = t \& \forall w' [(w' \in \text{Best}_{g\text{deontic}}(w, t)) (\cap f_{circ}(w, t)) \& \exists t'[(t' < t' \& x \text{ chooses or chooses to maintain } P \text{ in } w' \text{ at } t'')] \rightarrow P(x, w', t') = 1]
\]

\[
[P-PAST-\text{eya ha-obligation-PAST}]^{f,g} = \lambda x \lambda t \lambda w. \exists t' [t' < t \& \forall w' [(w' \in \text{Best}_{g\text{deontic}}(w, t)) \& \exists t'[(t' < t' \& x \text{ chooses or chooses to maintain } P \text{ in } w' \text{ at } t'')] \rightarrow P(x, w', t') = 1]
\]

The steps of how we reached the conclusion that the past obligation sentences give rise to the non-actualization inference are as follows:

\[
(a) \text{ Presupposition: } \forall t' [t' < t_0, P_{t'} \lor \neg P_{t'}]
\]
b. Presupposition: \( \forall t''[t'' \prec t', x \text{ does not choose } P \text{ at } t''] \)

There is a presupposition that the agent did not choose \( P \) at any time in the past.

This bias is strong, so it cannot be overridden by the context.

c. Presupposition: \( \forall t''[t'' \prec t', x \text{ does not choose } P \text{ at } t''] \rightarrow \forall t'[P(t')=0] \)

d. From (253a) to (253c), we get the inference: \( \forall t'[P(t')=0] \).

To conclude, necessity priority modal sentences with past complements in Korean invariably yield non-actualization inferences. What we need to focus on is the conflict between
\( \exists t''[t'' \prec t' \& x \text{ chooses or chooses to maintain } P \text{ in } w' \text{ at } t''] \rightarrow P(x, w', t')=1 \) in (251) and (252) and the bias \( \forall t''[t'' \prec t', x \text{ does not choose } P \text{ at } t''] \) in (253b). Due to this bias, the default assumption \( \exists t''[t'' \prec t' \& x \text{ chooses or chooses to maintain } P \text{ in } w' \text{ at } t''] \) in (249) is retracted and, in turn, we get the non-actualization inference.

5.4 Implications

We saw that certain combinations of the modal and the tense/aspect morphology often force unexpected inferences (counterfactual or actual inference) cross-linguistically. This dissertation presented empirical evidence for such cases, and gave an analysis of how to derive those unexpected inferences, with particular focus on Korean. Then we can ask whether the formal analyses proposed in this dissertation can be extended to similar phenomena in other languages.

One of the novel proposals was to incorporate “choosing” into the semantics of ability, permission, and obligation readings. It seems to me that the two requirements in the definition of choosing hold generally; hence, it seems that incorporating “x chooses P” into priority/dynamic modals is readily applicable. However, motivating the choosing head in the structure in necessity priority modal (obligation) sentences needs further consideration.
In Korean, we find the choosing head only in necessity priority modal sentences, but not in possibility priority modal sentences. This is evidenced by the tense patterns below:

(254)  

a. Chelswu-nun tuleka-ss-ul swu iss-∅-ta.  
    Chelswu-TOP enter-PAST-COMP BN AUX-NONP-DEC  
    ‘Chelswu is allowed to have entered.’ (permission)

b. Chelswu-nun tuleka-ss-eya ha-n-ta.  
    Chelswu-TOP enter-PAST-COMP AUX-NONP-DEC  
    ‘Chelswu is obliged to have entered.’ (obligation)

The past complement is compatible with obligation readings but not with permission readings. I argued that only in the cases like (254b), the choosing head exists in the structure. In order to motivate the decomposition of the modal, we need to examine whether the same tense pattern is found in other languages as well.

When it comes to the actuality inference, I discussed that Korean distinguishes two kinds of ability: –ul swu iss– ‘can/be able to’ and –ul cwul al– ‘know how to’. We saw that this pattern is found in French and Chinese as well. For example, Chinese uses distinct dynamic modals hui and neng to express different types of ability. I would like to study whether the same tense pattern is observed in these languages. The Korean ability modal –ul swu iss– ‘can’ shows the following inference pattern.

<table>
<thead>
<tr>
<th></th>
<th>past</th>
<th>non-past</th>
</tr>
</thead>
<tbody>
<tr>
<td>episodic/event reading</td>
<td>implicature</td>
<td>??implicature</td>
</tr>
<tr>
<td>habitual/generic reading</td>
<td>??implicature</td>
<td>??implicature</td>
</tr>
</tbody>
</table>

Table 5.1: Past vs. Non-past abilities and actuality inferences

We can investigate whether neng but not hui is related to the actuality inference like Korean. In the case of Chinese, the actuality inference will be derived from the interaction between modals and aspect, and there is literature on this. I would like to investigate cross-linguistic
similarities and differences in the nature of inferences and the derivation mechanisms. I will leave further exploration of these issues for future study.
BIBLIOGRAPHY


