

# Comparison of Two Conditional Connectives *-(u)myen* and *-ta/la-myen* in Korean

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**Jae-Il Yeom. 2004. Comparison of Two Conditional Connectives *-(u)myen* and *-ta/la-myen* in Korean.** *Language and Information* 8.1, 137–161. In this paper, I will look at two conditional connectives in Korean and point out differences between *-(u)myen* and *-ta/la-myen* in their distributions and semantics. One of the differences is that *-ta/la-myen* always allows epistemic interpretation, whereas *-(u)myen* allows epistemic interpretation only when the event time of the antecedent clause is in the past or present. A second difference is that only *-(u)myen* is used in purely temporal and habitual conditionals. A third difference is that the modality marker *-keyss*, which can have volitional or predictive interpretation with *-(u)myen*, cannot have predictive interpretation with *-ta/la-myen*. I propose that *-ta/la-myen* has the operator of settledness, which is defined with respect to the speech time, and explain the differences listed based on the semantics of settledness. (Hongik University)

**Key words:** Korean conditional, *-myen*, settled, temporal relation, epistemic, metaphysical

## 1. Introduction

Of all conditional connectives in Korean, *-(u)myen* is the most general, and least restricted one in use. A lot of studies on Korean conditionals are more focused

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on this morpheme than any other. One of the main issues on this conditional connective is what is the crucial difference between *-(u)myen* and *-ta/la-myen*.<sup>1</sup> A generalization that is proposed by some Korean linguists (Bak, S. (1988), Lee, C. (1979), etc.) is that *-ta/la-myen* tends to be used in counterfactuals and *-(u)myen* in indicative conditionals. This claim seems to be supported by examples like the following.

- (1) nay-ka say(-i)-la-myen/??say(-i)-myen ne-eykey nala kal-theyn-tey.  
I-NOM bird(-be)-DEC-if/bird(-be)-if you-to fly go-MOD-DEC.<sup>2</sup>  
If I were a bird, I would fly to you.
- (2) ney-ka keki-ey se iss-umyen/??iss-ta-myen, kong-ey  
you-NOM there-at stand be-if/be-DEC-if ball-by  
mac-ulkesi-ta.  
hit-MOD-DEC  
If you stands there, you will be hit by a ball.

In Korean, the tenses of counterfactuals are not backshifted from the relevant time, as in English: a counterfactual conditional of a present or past situation is not marked morphologically as past or past perfect. Whether a conditional is indicative or counterfactual is determined by considering whether the antecedent clause of the conditional is compatible or contradictory with the context. In (1) it is clear that the speaker cannot be a bird. So the conditional is taken to be a counterfactual. Here only *-la-myen* seems to be allowed. In (2) the speaker is likely to be able to see the hearer standing at the place. In this case the conditional with *-ta-myen* seems awkward. From observations like this, some linguists conclude that *-ta/la-myen* tends to be used in counterfactuals.

Such a tendency is just a tendency. A counterfactual conditional can be expressed simply with *-(u)myen* and an indicative conditional is formed with *-ta/la-myen*. In most cases, they are interchangeable.

- (3) nay-ka taithonglyeng-i(-la)-myen ilakhu-ey kwuntay-lul phakyenha-ci  
I-NOM president-be-if Iraq-to army-ACC send-NOMINAL  
ahn-ulkesi-ta.  
not-MOD-DEC  
If I were the President, I wouldn't send the army to Iraq.
- (4) chelswu-ka nuktay-i(-la)-myen, yenghi-nun yewu-i-ta.  
Chelswu-NOM wolf-be-if Yenghi-TOP fox-be-DEC  
If Chelswu were a wolf, Yenghi would be a fox.

<sup>1</sup> The vowel *u* in *-(u)myen* is used when the preceding verb ends with a consonant. The other connective has two variants. The usual form is *-ta-myen*, and *-la-myen* is used after the copula verb *-i*.

<sup>2</sup> In this paper the following abbreviations are used for grammatical morphemes:

acc(usative case)	comp(lementizer)	dec(larative mood)
hort(ative mood)	imp(erative mood)	int(errogative mood)
mod(ality)	nom(inative case)	nominal(izer)
past (tense)	perf(ective)	pres(ent tense)
prog(ressive)	rel(ativizer)	top(ic)

Both examples are counterfactuals and either -(u)myen or -ta/la-myen is acceptable. If there is some preference of one form over the other, it may be related to stylistic preference.<sup>3</sup>

- (5) ecey mili il-ul kkutmachi-ess-ta-myen, cikum i  
 yesterday in\_advance work-ACC finish-PAST-DEC-if now this  
 kosayng-ul ha-ci anh-ulkesi-ta. (formal)  
 trouble-ACC do-NOMINAL not-MOD-DEC  
 If you had finished this work in advance, you would not be in trouble now.

- (6) ecey mili il-ul kkutmachi-ess-umyen, cikum i  
 yesterday in\_advance work-ACC finish-PAST-if now this  
 kosayng-ul an-h-ci.  
 trouble-ACC not-do-DEC (informal)  
 If you had finished this work in advance, you would not be in trouble now.

The sentence ending of *-ulkesi-ta* is rather formal and it goes well with *-ta/la-myen*. The declarative ending *-ci* is informal. It favors -(u)myen.

The use of -(u)myen and -ta/la-myen is not consistent and systematic with respect to the distinction of indicative/counterfactual conditionals. In this paper, I will show that crucial differences between the two conditional connectives lie in temporal relations between the antecedent clause and consequent clause. So I will look into temporal relations between antecedent clauses and consequent clauses in conditionals with -(u)myen and -ta/la-myen, together with morphological differences and distributions of the two conditional connectives, and claim that the morpheme *-ta/la* is related to the meaning of settledness. All the restrictions on the use of *-ta/la-myen* can be explained on the basis of the existence of the settledness operator.

This paper is organized as follows. In the next section, I will look at possible sequences of morphemes with -(u)myen and -ta/la-myen and the interpretations of the morpheme *-keyss* in combinations with the two connectives. The modality marker *-keyss*, which can have the meaning of volition and prediction with -(u)myen, only gets the meaning of volition when combined with -ta/la-myen. The morphological comparison is followed by the comparison of the two conditional connectives with respect to their distributions in other types of conditionals and in temporal relations between the antecedent clause and consequent clause. The next section is devoted to the temporal interpretation of conditionals. In this

<sup>3</sup> The example (1) is peculiar in that -(u)myen is quite disfavored. I suppose that the reason seems to be that the noun *say* 'bird' is a one-syllable word ending with a vowel.

- i. cikum-i pam-i-myen, ... ('if it is/were night now, ...')
- ii. ?ikes-i pay-myen, ... ('if this is/were a boat, ...')
- iii. ?i kulca-ka sa-myen, ('if this letter is/were 4, ...')

When a noun ends with a vowel, the copula *-i* tends to be deleted. The speaker may feel that a short noun with no copula is too simple and condensed an expression to convey what (s)he wants to say.

section it is shown that in indicative and counterfactual conditionals the tenses of the antecedent clause and consequent clause are not structurally dependent on each other. If there is any restriction on them, it is only semantic restriction. The next two sections contain the main claims of this paper. One claim is that *-ta/la-myen* has the settledness operator which optionally fixes the time of the antecedent clause to the speech time and leads to the epistemic reading of the conditional. The other claim is that *-(u)myen* always shifts the reference time to the event time of the antecedent clause. I show that all other differences can be explained by the presence of the settledness operator.

## 2. Comparisons in the Morphological Patterns

In Korean, eventive predicates cannot be used without a tense marker in independent clauses.

- (7) yenghi-nun cikum/nayil ttena-n-ta.  
Yenghi-TOP now/tomorrow leave-PRES-DEC  
Yenghi leaves now/tomorrow.
- (8) yenghi-nun ecey ttena-ss-ta.  
Yenghi-TOP yesterday leave-PAST-DEC  
Yenghi left yesterday.
- (9) \*yenghi-nun cikum/nayil ttena-ta.  
Yenghi-TOP now/tomorrow leave-DEC  
Yenghi leave now/tomorrow.

From these three examples, we can see that *-(nu)n* can be used as a tense marker for the present (and the future),<sup>4</sup> and that a tense marker is necessary in independent clauses for eventive predicates.<sup>5</sup>

The modality marker *-keyss* can occur with much restriction in independent clauses except with present tense.<sup>6</sup> It cannot combine with the present tense marker *-(nu)n*.

- (10) yenghi-nun/na-nun cikum/nayil ttena>(\*n)-keyss-ta.  
Yenghi-TOP/I-Top now/tomorrow leave-(PRES)-MOD-DEC  
Yenghi is likely to leave now/tomorrow.

<sup>4</sup> The morpheme *-(nu)n* is a tense marker for present tense, but it is used to denote a future event when the event is established as a plan. The same use of present tense is also observed in English, as in *The boat leaves tomorrow*.

<sup>5</sup> *-(nu)n* does not combine with stative predicates. This implies that *-(nu)n* may be an aspectual marker, but I will simply assume that it is a present tense marker for eventive predicates. One anonymous reviewer points out that some stative verbs like *al* 'know' can combine with *-(nu)n*, but it should be noted that they can also combine with the progressive marker *-ko iss*, which is typical of eventive predicates. Their aspectual characterization awaits further study.

<sup>6</sup> There is another modality marker *-(u)lkesi*, which is widely used in the consequent clause of a conditional, but is not used in the antecedent clause. A lot of studies have been done on semantic differences between the two modality markers. See Lee, K. (1978), Sung, K. (1979), Kim, C. (1980), Lee, N. (1981), etc.

- (11) yenghi-nun ecey ttena-ss-keyss-ta.  
 Yenghi-TOP yesterday leave-PAST-MOD-DEC  
 Yenghi is likely to have left yesterday.

The meaning of *-keyss* here is prediction, but it can have the meaning of volition when the sentence has a first person subject and is present tense.

The morphological difference between the two conditional connectives is that one has the declarative mood marker *-ta/la* and the other does not. Considering this difference, I will abbreviate a conditional with *-ta/la-myen* as CTM and a conditional with *-(u)myen* as CM. The conditional connective *-(u)myen* can combine with past tense or modality, but not with present tense, whereas *-ta/la-myen* combines with present tense, past tense, or modality. In a CTM, it is quite natural that *-ta* combines with any tense marker or a modality marker, as in an independent clause. The patterns are given below.

- (12) CMs
- 
- mek-umyen (eat-if)  
 \*mek-nun-umyen (eat-PRES-if)  
 mek-ess-umyen (eat-PAST-if)  
 mek-keyss-umyen (eat-MOD-if)  
 ??mek-ess-keyss-umyen (eat-PAST-MOD-if)
- CTMs <sup>7</sup>
- 
- \*mek-ta-myen (eat-DEC-if)  
 mek-nun-ta-myen (eat-PRES-DEC-if)  
 mek-ess-ta-myen (eat-PAST-DEC-if)  
 mek-keyss-ta-myen (eat-MOD-DEC-if)  
 \*?mek-ess-keyss-ta-myen (eat-PAST-MOD-DEC-if)

I will discuss each of the differences shown in (12). As shown in the patterns, one difference between CMs and CTMs is that the former does not allow the present tense marker *-(nu)n*. This is illustrated in an actual sentence below.

- (13) yenghi-ka cikum/nayil ttena-(n-ta)-myen kyothonghoncap-ul  
 Yenghi-NOM now/tomorrow leave-(PRES-DEC)-if heavy\_traffic-ACC  
 phiha-lkesi-ta.  
 avoid-MOD-DEC  
 If Yenghi leaves now/tomorrow, he will avoid heavy traffic.

<sup>7</sup> *-ta/la-myen* can be taken to be a reduced form from a more complex form. The same reduction can be observed in the combinations of *-myen* plus other mood markers. The patterns are given below.

- i. mek-ess-ta(-ko ha)-myen eat-PAST-DEC(-COMP do)-if  
 mek-ula(-ko ha)-myen eat-IMP(-COMP do)-if  
 mek-ca(-ko ha)-myen eat-HORT(-COMP do)-if  
 ?mek-ess-nya(-ko ha)-myen eat-PAST-INT(-COMP do)-if (rarely used)

In this paper, I only discuss the conditional with the declarative mood marker *-ta*. In the patterns, *-ha* literally means 'do', but the actual meaning does not seem to be fixed. This paper is only devoted to the exploration of its meaning when combined with the declarative mood marker.

In this example, the present tense marker *-n* can occur only if the declarative mood marker occurs. I suppose that clause-endings have a templatic property and that a tense marker is obligatory when the declarative mood marker *-ta* occurs. As will be clear, the semantics of the present tense marker in CTMs does not play a role in determining the event time of the antecedent clause.

Both *-(u)myen* and *-ta/la-myen* can be followed by the past tense marker *-(a/e)ss*. In Korean, *-(a/e)ss* is taken to be a perfective aspect marker or to be a past tense marker. I will not look into this problem. I will simply show that *-(a/e)ss* can be used in a conditional as a past tense marker. Consider the following examples.

(14) kicha-ka cikum tochakha-ess-ta.  
train-NOM now arrive-PERF-DEC  
The train has just arrived.

(15) ?? chelswu-ka cikum ca-ss-ta.  
Chelswu-NOM now sleep-PAST-DEC  
Chelswu (has) just slept.

In (14), *-ess* is used with *cikum* 'now', so this shows that the morpheme could be taken to be a perfective aspect marker: the train has arrived and that it is now here. In (15), on the other hand, *-ess* cannot be used with the adverb *cikum*. This shows that it is undoubtedly a past tense marker here and is not compatible with *cikum*.

The possible meaning of *-(a/e)ss* depends on the aspectual types of the verbs it combines with. And we can say that the verb *ca* 'sleep' does not allow *-(a/e)ss* to be used as a perfective aspect marker. So we can say that the verb *ca* 'sleep' does not combine with a perfective marker. The example below shows that the same verb can occur with *-(a/e)ss* in a conditional.

(16) chelswu-ka yeki-eyse ca-ss-umyen, chwu-ess-ulkesi-ta.  
Chelswu-NOM here-at sleep-PAST-if cold-PAST-MOD-DEC  
If Chelswu slept here, he may have felt cold.

Both CMs and CTMs allow a modal marker *-keyss* in the antecedent clause, but its meaning is not the same in both constructions. The modal marker can convey the meaning of both epistemic (or, predictive) and volitional modality in CMs, whereas it only has volitional meaning in CTMs.<sup>8</sup> Consider the following examples of CMs.

(17) yenghi-ka ikes-ul sa-keyss-umyen kakyek-ul pissakey pnull-ela.  
Yenghi-NOM this-ACC buy-MOD-if, price-ACC expensively call-IMP  
(predictive)

If Yenghi is likely to buy this, put a high price on it.

<sup>8</sup> When *-keyss* expresses predictive meaning in the antecedent clause of a conditional, the consequent clause tends to be imperative. This should be pursued furthermore in a later study.

- (18) ney-ka ikes-ul sa-keyss-umyen, ton-ul kaci-ko o-ala.  
 you-NOM this-ACC buy-MOD-if money-ACC bring-and come-IMP  
 (volitional)

If you are willing to buy this, bring (your) money.

Both predictive and volitional meanings are allowed here. On the other hand, the same morpheme only expresses volitional meaning in CTMs, which is illustrated below.

- (19) yenghi-ka ikes-ul sa-keyss-ta-myen kakyek-ul pissakey pwul-ela.  
 Yenghi-NOM this-ACC buy-MOD-DEC-if, price-ACC expensively call-IMP  
 (volitional)

If Yenghi is willing to buy this, put a high price on it.

Note that *-keyss* does not make the tense of the clause the future because predictive meaning expresses ‘prediction from the perspective of the present’ and volition is also a current state of the subject.

In CMs and CTMs, the sequence of a tense marker followed by a modality marker is not readily acceptable, though the same sequence is fine in independent clauses, as shown in (11). In this sequential pattern, the modality marker *-keyss* only has the meaning of prediction. Considering the observation that *-keyss* does not have the meaning of prediction even without the past morpheme when combined with *-ta/la-myen*, we can assume that the restriction on prediction reading comes from the semantics of *-ta/la-myen*. Then the question remains why *-(u)myen* with the past morpheme plus the modality morpheme sounds a little awkward, while it allows the prediction reading without the past morpheme. We can understand the meaning of such a sequence as having a prediction reading. I do not think the awkwardness is not a matter of grammaticality. I suppose that awkwardness with the sequence comes from infrequency. More frequently, we use *...-(a/e)ss-ulkes kath-umyen* (*...-PAST-NOMINAL likely-if* ‘if ... is likely to have V-en’). Frequent use of this alternative form seems to make the shorter compact form unnatural.<sup>9</sup>

### 3. Other Differences between CMs and CTMs

Conditionals can be classified into *a*) purely temporal conditionals, *b*) habitual conditionals, and *c*) hypothetical conditionals which again can be divided into *i*) indicative and *ii*) counterfactual conditionals. Purely temporal conditionals are

<sup>9</sup> One anonymous reviewer actually suggests the following example as a grammatical one.

- i. chelswu-ka mikwuk-ey tochakha-ess-keyss-umyen na-eykey cenhwaha-e.  
 Chelswu-NOM U.S.-in arrive-PAST-MOD-if I-to call-DEC  
 If it is likely that John arrived in the U.S., call me.

It seems to me that the sentence is not used quite extensively, though the meaning is quite understandable.

ones in which there is no supposition about whether the event in question occurs.<sup>10</sup> It is believed that the event is going to occur. What the conditional is concerned with is when the event occurs.

- (20) chelswu-ka 20 sal-i toy-myen, kwuntay-ey ka-lkesi-ta.  
 Chelswu-NOM 20 year-NOM become-if army-to go-MOD-DEC  
 When Chelswu becomes 20 years old, he will go to army.

Here the speaker assumes that Chelswu will become 20 years old sometime. The antecedent clause is used to indicate the point of time at which the event occurs. Habitual conditionals are ones in which there is some regularity between two events or situations.<sup>11</sup> These two conditionals are not typical types of conditionals, but only *-(u)myen* can be used in these constructions. This will help us see its differences from *-ta/la-myen*.

Despite many other similarities, there are crucial differences between the two conditionals. In this section, we will look at some distributional and interpretational differences. First, *-(u)myen* can be used in purely temporal conditionals and habitual conditionals, while *-ta/la-myen* cannot. This is shown below.

- (21) (purely temporal conditional)

ney-ka sinho-lul ha-(\*n-ta)-myen nay-ka lokeys-ul  
 you-NOM signal-ACC do-(PRES-DEC)-if I-NOM rocket-ACC  
 palsaha-keyss-ta.  
 fire-MOD-DEC

When you give the signal, I will fire the rocket.

- (22) (present generic)

pom-i o-(\*n-ta)-myen kkoch-i phi-n-ta.  
 spring-NOM come-(PRES-DEC)-if flowers-NOM blossom-PRES-DEC

When spring comes, flowers blossom.

- (23) (past generic)

nalssi-ka coh-(\*ta)-(u)myen san-ey ka-ss-ta.  
 weather-NOM good-(DEC)-if mountain-to go-PAST-DEC

When the weather was good, I used to climb the mountain.

<sup>10</sup> Classification of conditionals is not unanimous. In general the term "conditional" is reserved for hypothetical conditionals in my classification. Dudman (1991) uses the term "hypothetical" only to refer to part of indicative conditionals. On the other hand, Quirk et al. (1985) uses the same term to cover subjunctives in Lewis (1973) including no indicative conditionals. I use the term "conditional" more extensively because the same morpheme is used to express more extensive relations than conditionals proper, like purely temporal and habitual sentences. I use the term "purely temporal" because, as will become clear in the discussion below, hypothetical conditionals are also temporal though they are basically modal.

<sup>11</sup> A lot of semanticists believe that genericity is another example of modality involving possible worlds, but Cohen (1999) claims that genericity is a matter of frequency. The conclusion of this paper does not hinge on any particular analysis of generic sentences.



In these examples, -(n)-ta is not allowed. This shows that all CTMs are hypothetical, whereas CMs may, or may not, be hypothetical. Note that purely temporal conditionals always combine with a tenseless clause. A past tense clause cannot combine with -(u)myen in purely temporal reading. A purely temporal clause with past tense is expressed by *ttay* ‘when’ instead of -(u)myen. The antecedent clause of a habitual (that is, generic) conditional is always combined with -myen with no tense marker, as shown above. The observations so far indicate that if -(u)myen combines with a past tense clause, the conditional always becomes hypothetical.

Second, both can be used in hypothetical conditionals, but they show a difference in temporal relations between the antecedent and consequent clauses in cases where the antecedent clause is tenseless or has present tense. Both CMs and CTMs are used in counterfactuals and indicative conditionals. So the distinction between counterfactual and indicative conditionals is not of much help. There is another way of distinguishing hypothetical conditionals: epistemic vs. metaphysical. Epistemic conditionals are always indicatives and metaphysical conditionals are indicatives or counterfactuals.<sup>12</sup> Epistemic modality has to do with a knowledge or information state of an agent. Even if a situation is already settled, an agent may, or may not, know that it is the case.<sup>13</sup> Then for the agent, the situation and the opposite are still open possibilities. A statement with epistemic modality is one which the agent makes when (s)he makes an inference about what the world is like from what (s)he knows about the world. Epistemic conditionals are concerned with the relations between those epistemic possibilities. Metaphysical modality has to do with how the world may turn out to be, regardless of whether an agent knows it or not. A statement with metaphysical modality is one which simply describes what the world will be or would (have) be(en) like when something is supposed. Metaphysical conditionals can be regarded as relations between possible worlds. Counterfactuals are a typical case of metaphysical modality. Facts relevant are already known, which excludes the possibility of epistemic modality, but something contrary to the facts are supposed. Then we guess what the world would be like. Some indicative conditionals are also metaphysical because they are statements about what the world will be like when we suppose that something holds in the future. Epistemic conditionals are always indicative conditionals.

<sup>12</sup> Various terms are used to distinguish these two: to list some, *closed* vs. *open* (Funk 1985), *hypothetical* vs. *conditional* (Dudman 1989), *predictive* vs. *non-predictive* (Dancygier 1998), *epistemic* vs. *predictive* (Kaufmann 2001), etc. In this paper I follow the terms used in Condoravdi (2002).

<sup>13</sup> One anonymous reviewer complains about the use of the term “agent”, but in the semantic society it is a general convention to use it as denoting a person who knows or believes something. The agent may be the speaker or hearer, but it is not necessarily the case. If John believes that he is a genius, John is the agent of the epistemic modality.

Abstract words may not be of much help. Take (24) for an example.

- (24) ecey pi-ka o-ass-umyen kyengki-ka chwuysotoy-ess-ulkesi-ta.  
 yesterday rain-NOM come-PAST-if game-NOM be.canceled-PAST-MOD-DEC  
 If it rained yesterday, the game must have been canceled (epistemic)  
 If it had rained yesterday, the game would have been canceled. (meta-physical)

Suppose that the speaker (and the hearer) do(es) not know whether or not it rained yesterday. Then in the speaker's information state, yesterday's raining or being clear are both open possibilities, regardless of whether it actually rained yesterday. So the speaker can suppose that it rained yesterday. This leads to the epistemic interpretation of the conditional. On the other hand, it is also possible that the speaker and the hearer know that it was clear yesterday. In this case the speaker can suppose that the world was contrary to what actually was the case. Then the world would have been different from the world in which the game was actually played. In this case the same conditional can be said to be a metaphysical (and so counterfactual here) interpretation. In English, the two readings show different morphology, but Korean does not show any morphological difference. Which modality is involved is a semantic and pragmatic matter.

In (24), both the antecedent and consequent clauses have past tense markers, and the times of events in both clauses are sequential: the event of raining precedes that of the game being canceled. One of the characteristics of epistemic conditionals is that the event of the antecedent clause may follow that of the consequent clause, because in an information state we can speculate a previous state/event from a later state of affairs. This is illustrated in (25).

- (25) (CM/CTM)  
 chelswu-ka kippe-ha-(y)ess-umyen/kippe-ha-(y)ess-ta-myen sihem-ey  
 Chelswu-NOM happy-do-PAST-if/happy-do-PAST-DEC-if exam-at  
 hapkyekha-ess-ulkesi-ta.  
 pass-PAST-MOD-DEC

If Chelswu showed happiness, he must have passed the exam.

In both the CM and CTM of (25), the event of Chelswu's passing the exam precedes that of his showing happiness. This shows that CMs and CTMs allow epistemic readings when the antecedent and consequent clauses are past tense. This is contrasted with CMs with no tense marker in the antecedent clause. One such example is given below.

- (26) chelswu-ka ??kippe-ha-myen sihem-ey hapkyekha-ess-ulkesi-ta.  
 Chelswu-NOM happy-do-if exam-at pass-PAST-MOD-DEC  
 If Chelswu shows happiness, he must have passed the exam.

In this example the antecedent clause has no tense marker and the event time of the antecedent clause cannot follow that of the consequent clause. In CMs,

when the antecedent clause is tenseless, the only reading is a metaphysical one. In the metaphysical interpretation of a conditional, the temporal relation between the antecedent clause and the consequent clause is constrained by causal relation. The situation in the consequent clause occurs in the condition that the situation in the antecedent clause holds. So the event in the consequent clause cannot precede that in the antecedent clause.

CTMs are compared with CMs in this respect. With present tense in the antecedent clause, the epistemic reading is possible in which the event in the antecedent clause follows that of the consequent clause. Consider the following example.

- (27) chelswu-ka kippe-ha-n-ta-myen sihem-ey hapkyekha-ess-ulkesi-ta.  
 Chelswu-NOM happy-do-PRES-DEC-if exam-at pass-PAST-MOD-DEC  
 If Chelswu shows happiness, he must have passed the exam.

Together with other CTMs, this example shows that CTMs always allow epistemic readings, even when the event time of the antecedent clause is in the future. This is related to the third difference.<sup>14</sup>

Third, when the event time of the antecedent clause is the future, the antecedent clause in a CM has the forward-shifting effect, but that in a CTM does not necessarily shift the reference time to the future.<sup>15</sup>

- (28) nayil pi-ka o-myen cip-eyse swuy-ca. (CM)  
 tomorrow rain-NOM come-if home-at rest-HORT  
 If it rains tomorrow, let's take a rest.
- (29) nayil pi-ka o-n-ta-myen cip-eyse swuy-ca. (CTM)  
 tomorrow rain-NOM come-PRES-DEC-if home-at rest-HORT  
 If it rains tomorrow, let's take a rest.

In (28), the antecedent clause has the forward-shifting effect, so the event of taking a rest is expected to occur after it starts to rain tomorrow. In (29), on the other hand, the antecedent clause does not have the forward-shifting effect. The event of taking a rest can occur today or tomorrow. We can attribute this difference to the presence or absence of the declarative mood marker.

The event time of a stative predicate can overlap with the reference time, so a state predicate may not have the forward-shifting effect. Then it is predicted that a CM with a stative predicate in the antecedent clause allows the epistemic reading. This is confirmed by the following example.

<sup>14</sup> Basically I follow Reichenbach (1947) in using the terms speech time and event time, but reference time is used to account for narrative ordering, as in Partee (1984), Hinrichs (1986), and Dowty (1986). In conditionals, the antecedent clause has the role of shifting the reference for the consequent clause to a time just after the event time of the antecedent clause.

<sup>15</sup> Even in CMs, if the predicate is stative, the antecedent clause does not necessarily have the forward-shifting effect. As is well-known, a stative predicate always provides the possibility of the state overlapping with another event or state.

- (30) chelswu-ka acik cip-ey iss-umyen ecey kwaum-ul  
 Chelswu-NOM still bed-in be-if yesterday excessive\_drinking-ACC  
 ha-(y)ess-ulkesi-ta.  
 do-PAST-MOD-DEC  
 If Chelswu is still in bed, he must have drunk too much last night.

However, we can find examples in which a CM with a stative predicate in the antecedent clause does not allow the epistemic reading, as illustrated in (31). This can still be contrasted with a CTM with a stative predicate in the antecedent clause.

- (31) ? chelswu-ka pay-ka kophu-myen cemsim-ul kell-ess-ulkesi-ta.  
 Chelswu-NOM belly-NOM hungry-if lunch-ACC skip-PAST-MOD-DEC  
 If Chelswu is hungry, he may have skipped lunch.
- (32) chelswu-ka pay-ka kophu-ta-myen cemsim-ul  
 Chelswu-NOM belly-NOM hungry-DEC-if lunch-ACC  
 kell-ess-ulkesi-ta.  
 skip-PAST-MOD-DEC  
 If Chelswu is hungry, he may have skipped lunch.

Bak (1988) claimed that (*u*)*myen* is used only if the speaker can decide the factivity of the antecedent clause. His claim may be supported by some examples like (31) because the speaker may not be able to decide whether Chelswu is hungry. However, we can find an example which does not support his claim.

- (33) chelswu-nun kheyikh-ul cohaha-ci ahn-ciman, pay-ka  
 Chelswu-TOP cake-ACC like-NOMINAL not-but belly-NOM  
 kophu-myen i kheyikh-ul mek-ulkesi-ta.  
 hungry-if this cake-ACC eat-MOD-DEC  
 Chelswu does not like cake, but if he is hungry, he will eat this cake.

The same predicate as the one in (31) has no problem with (*u*)*myen*. Note that this conditional is taken to have a metaphysical reading, while (31) is an epistemic conditional. From these examples, we suppose that if a CM with a stative predicate of present tense is to be given an epistemic reading, the state denoted by the predicate must be able to be an observable fact.<sup>16</sup>

<sup>16</sup> There are cases where a CM with present tense in the antecedent clause and the past tense in the consequent clause can be given a metaphysical reading. Consider the following sentence.

- i. chelswu-ka chencay-i-myen ku mwuncey-lul phwu-ess-ulkesi-ta.  
 Chelswu-NOM genius-be-if the problem-ACC solve-ACC-MOD-DEC  
 If Chelswu is a genius, he would have solved the problem.

The antecedent clause has no tense marker, and the consequent clause has a past tense marker. Individual-level predicates like *being a genius* do not have any particular event time. Being a genius holds regardless of when the agent solves a problem, as long as the agent is alive. So even when Chelswu solved the problem, it is true that Chelswu is a

In this section we have seen three facts about the uses of CMs and CTMs: *i*) CMs can be used as purely temporal or habitual conditionals, *ii*) CTMs always allow epistemic readings, while CMs allow such readings only when the antecedent clause is past or present tense, and, *iii*) closely related to this fact, in CMs the antecedent clause with a future event time always shifts the reference time to the future, whereas in CTMs the antecedent clause with a future event time optionally shifts the reference time for the consequent clause to the future. Before we try to explain these facts, we need to see how conditionals are interpreted with respect to temporal relations. This will be discussed in the next section.

#### 4. Temporal Interpretation of Conditionals

In Korean, the tense of an embedded clause depends on the tense of the main clause in many cases. Below I give each example of attitude contexts and relative clauses.

- (34) chelswu-nun yenghi-ka o-n-ta-ko malha-ess-ta.  
 Chelswu-TOP Yenghi-NOM come-PRES-DEC-COMP say-PAST-DEC  
 Chelswu said that Yenghi was coming.
- (35) chelswu-nun yenghi-ka cwu-nun ton-ul pat-ass-ta.  
 Chelswu-TOP Yenghi-NOM give-REL<sub>pres</sub> money-ACC receive-PAST-DEC  
 Chelswu got the money Yenghi gave (him)

In (34), the verb in the attitude context has a present tense marker, but the event time becomes the past because the main clause has past tense. In (35), the verb *cwu* ‘give’ is combined with a morpheme which makes the preceding clause a relative clause. I will call such a morpheme a *rel(ativizer)*. Korean has three relativizers each of which is associated with a tense: *nun* (present tense), *-(u)l* (future tense), and *-(u)n* (past tense). The relativizer in (35) is one with present tense, but the event time of giving (him) the money is determined by the tense attached to the main verb *pat* ‘get’.<sup>17</sup>

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genius. In some sense, the present tense is a case of double access in the sense of Ogihara (1995, 1999), and Abusch (1997).

<sup>17</sup> I am not claiming that the event time of a relative clause is always dependent on the tense of the main clause, as pointed out in Lee, C. (1987). Consider the following example.

- i. chelswu-nun yenghi-ka cikum manna-nun haksayng-ul ecey manna-ss-ta.  
 Chelswu-TOP Yenghi-NOM now meet-REL<sub>pres</sub> student-ACC yesterday meet-PAST-DEC  
 Chelswu met yesterday the student who Yenghi is meeting now.

The event time of Yenghi’s meeting the student is in the present, as literally indicated by the morpheme, independently of the past tense in the main clause. The tense of a relative clause is only optionally dependent on the tense of the main clause.

The same thing happens in habitual conditionals, too.

(36) ( ... V-if, ... V-PRES; present generic)

pom-i o-myen kkoch-i phi-n-ta.  
spring-NOM come-if flowers-NOM blossom-PRES-DEC

When spring comes, flowers blossom.

(37) ( ... V-if, ... V-PAST; past generic)

nalssi-ka coh-umyen san-ey ka-ss-ta.  
weather-NOM good-if mountain-to go-PAST-DEC

When the weather was good, I used to climb the mountain.

Even in past habituals, the tense of the antecedent clause has no tense marker. The tense of the whole sentence and the antecedent clause is determined by that of the consequent clause.<sup>18</sup>

In indicative and counterfactual conditionals, however, the tense of the antecedent clause does not depend on that of the consequent clause. The event time of the antecedent clause is totally dependent on the speech time plus the tense marker of the antecedent clause. To see this I will first look at a case where the antecedent and consequent clauses are past tense. In (24) and (25), we can see that there is no restriction on temporal ordering between the events. In (24) the event time of the antecedent clause precedes that of the consequent clause, and in (25) the order is the opposite. The actual order between them is determined pragmatically. The reason is that the event times are bound by different operators, as shown below.

- (38) a.  $\mathbf{Q}(\lambda w' \exists t' \exists e [w' \in MB(w, t) \ \& \ t' \prec t \ \& \ R(w')(e) \ \& \ \tau(e, w) \subseteq t' \cap Y])$   
 $(\lambda w'' \exists t'' \exists e' [t'' \prec t \ \& \ \exists! x [G(w'')(x) \ \& \ BC(w'')(e')(x) \ \& \ \tau(e', w'') \subseteq t'']])$   
 b.  $\mathbf{Q}(\lambda w' \exists t' \exists e [w' \in MB(w, t) \ \& \ t' \prec t \ \& \ SH(w')(e)(c) \ \& \ \tau(e, w) \subseteq t']])$   
 $(\lambda w'' \exists t'' \exists e' [t'' \prec t \ \& \ \exists! x [E(w'')(x) \ \& \ P(w'')(e')(x)(c) \ \& \ \tau(e', w'') \subseteq t'']])$   
 (R: rain, Y: yesterday, G: game, BC: be canceled, SH: show happiness, E: exam, P: pass)

Here  $\mathbf{Q}$  is the existential or universal operator which quantifies over sets of possible worlds.  $MB$  is a modal base which constitutes the domain of quantification. If the conditional is epistemic, it is a set of epistemic alternatives. If the conditional is metaphysical, it is a set of possible worlds which are accessible from the actual world at the speech time and are ordered with respect to closeness to the actual world.<sup>19</sup>  $\tau(e, w)$  gives the time of the event  $e$  in the possible world  $w$ . The

<sup>18</sup> Dudman (1991) dubs conditionals like this adverbial conditionals. But he also includes hypothetical conditionals under this label, regarding the tenses in hypotheticals do not have independent temporal interpretations. But as shown above, tenses in hypothetical conditionals have some degree of independence, compared with habitual conditionals. So the two types of conditionals must be distinguished.

<sup>19</sup> See Lewis (1973) and Stalnaker (1968) more details of accessibility and closeness.

time variable  $t'$  and  $t''$ , which are both past, are bound by different existential operators. So there is no constraint on their temporal ordering. If the modality is epistemic, there is no semantic restriction on their order. But if the relevant modality is metaphysical, their order is constrained by the causal relation between the antecedent and consequent clause.

When the antecedent clause is past and the consequent clause has no tense marker, as in (39), the event time of the antecedent clause always precedes, or overlaps with, that of the consequent.

- (39) ecey pi-ka o-ass-umyen cikum ttang-i  
 yesterday rain-NOM come-PAST-if now ground-NOM  
 cec-eiss-ulkesi-ta.  
 wet-PERF-MOD-DEC  
 If it rained yesterday, the ground will be wet now.

To represent the event time of the consequent clause, we need to know how the event time of a tenseless predicate is interpreted. A tenseless predicate can be interpreted as present or future, as shown below.

- (40) nalssi-ka cikum/nayil coh-umyen kongwen-ey ka-lkesi-ta.  
 weather-NOM now/tomorrow good-if park-to go-MOD-DEC  
 If the weather is good now/tomorrow, (we/I/they) will go to the park.

In (40), the tenseless verb in the antecedent clause is interpreted to denote a situation in the present or future. As suggested in Quirk et al. (1985), such a verb is interpreted as NON-PAST. For these cases, we assume that the tenseless verb in a hypothetical conditional has abstract “non-past” tense, which is defined as follows:

$$(41) \text{ [[NON-PAST]}]^{w,t} = \lambda P_{\langle w,t \rangle} \exists t' [t \preceq t' \ \& \ P(w)(t') = 1]$$

Here  $w$  is the actual world and  $t$  is the speech time. NON-PAST is the time simultaneous with, or after, the speech time. In (40), the state of the weather being good is simultaneous with the speech time, as indicated by *cikum* ‘now’, or in the future, as indicated by *nayil* ‘tomorrow’.

Assuming the abstract NON-PAST, the meaning of (39) can be represented as follows:

$$(42) \mathbf{Q}(\lambda w' \exists t' [t' \prec t \ \& \ \exists e [R(w')(e) \ \& \ \tau(e, w') \subseteq t']]) \\
 (\lambda w'' \exists t'' [t \preceq t'' \ \& \ \exists ! x [Ground(w'')(x) \ \& \ Wet(w'')(e) \ \& \ \tau(e, w'') \subseteq t'']])$$

Here  $t'$  is in the past and  $t''$  is in the nonpast. So the event time of the antecedent clause precedes that of the consequent clause. This does not mean that the event time of the consequent clause is semantically dependent on the event time of the antecedent clause. Consider the following example.

- (43) ?? ecey pi-ka o-ass-umyen ttang-i cec-ulkesi-ta.  
 yesterday rain-NOM come-PAST-if ground-NOM wet-MOD-DEC  
 If it rained yesterday, the ground will be wet now.

The temporal ordering is the same as (39), but the conditional is awkward. The event of raining and that of the ground getting wet has a causal relation which does not take much time, not as long as one day. The awkwardness of (43) comes from pragmatic factors.

Finally, consider (44) as a case where the antecedent clause has no tense marker and the consequent clause is past. If the antecedent clause is dependent on the consequent clause temporally, the former must be interpreted as past. But this is not the case. The antecedent clause is interpreted as nonpast, with no dependence on the consequent clause.

- (44) ?? nalssi-ka      coh-umyen kongwen-ey ka-ss-ulkesi-ta.  
 weather-NOM good-if      park-to      go-PAST-MOD-DEC

If the weather is good, (we/I/they) will have gone to the park.

This conditional does not have a reading in which the event time of the consequent clause is dependent on the antecedent clause. If it does, the event time of going to the park could be some time in the future but before the time of the weather being good when the event time of the weather being good is in the future. Such a reading is not obtained.

From the discussion so far we have seen that in indicative and counterfactual conditionals of CMs the tenses of the antecedent and consequent clauses are interpreted independently of each other unless they are restricted by the modality involved in the conditionals. We have seen in the previous section that in epistemic readings of conditionals there is no restriction on the temporal ordering between the antecedent and consequent clauses, whereas in metaphysical readings the temporal order is constrained by some causal relation between them. Still we have a question of why CMs do not allow epistemic readings when the event time of the antecedent clause is in the future, whereas CTMs always allow epistemic readings. To answer this question, we have to decide when a conditional can be interpreted as epistemic.

## 5. Supposition of Settledness in CTMs

One of the main differences between CMs and CTMs is that CTMs always allow epistemic readings while CMs allow epistemic readings only when the antecedent clause conveys a situation which holds in the past or present. Such a situation can be supposed to be established as a fact. I will claim that epistemic readings are closely related to a well-established notion of **settledness**, and that when a situation is established as a fact, it naturally can lead to the epistemic reading. A question about CTMs is why they always allow epistemic readings. I claim that CTMs has an extra operator which ensures an epistemic reading regardless of what situation occurs in the antecedent clause. To explain the asymmetric behavior of CMs, we need a forward-branching model of world and time proposed by Thomason (1984).

In the forward-branching model, a state of affairs at a time *t* can develop into two different states of affairs from some point of time on. Then the two



different states of affairs have the same history up to the time  $t$ . Suppose we have a set of possible worlds each of which has a full history of itself. In this model the total number of the possible worlds does not change. Given a time  $t$  we can group the worlds into sets of worlds which have the same history up to  $t$ . The relation between possible worlds which have the same history up to a time  $t$  is an equivalence relation which has the following property.

- (45) Let  $W$  and  $T$  be a set of possible worlds and a set of times respectively. For all  $t \in T$ ,  $\simeq_t$  is an equivalence relation and for all  $t, t' \in T$  and  $w, w' \in W$ , if  $w \simeq_t w'$  and  $t' < t$ , then  $w \simeq_{t'} w'$ .

That  $w$  and  $w'$  are in the equivalence relation with respect to a time  $t$ ,  $w \simeq_t w'$ , means that  $w$  and  $w'$  are identical up to the point of time  $t$  and at some point of time after  $t$  the two possible worlds diverge. They are called *historical alternatives* of  $w$  (or,  $w'$ ). Given a time  $t$ , possible worlds can be grouped into equivalence classes. In the forward branching model, the equivalence relation is backward monotonic. So if two worlds are in an equivalence relation with respect to a time  $t$ , then they are in an equivalence relation with respect to any time before  $t$ .

Now let's see how the forward-branching model explains the asymmetry in epistemic readings of CMs, and what operator is involved in CTMs. I will discuss the former first. Epistemic readings are ones in which an agent in a certain information state makes an inference about unknown facts based on known facts. Here unknown facts are what are established as facts metaphysically but are unknown to the agent. In the center of the notion of unknown fact lies the notion of settledness. The notion of settledness is introduced by Prior (1967) and further discussed in Thomason and Gupta (1981) and van Frassen (1981).<sup>20</sup> Here I will define settledness. The notion of settledness can be defined in terms of historical alternatives of a possible world at a time.

- (46) Settledness

A sentence  $\phi$  is **settled** at a world  $w$  and a time  $t$  iff it is true at all historical alternatives of  $w$  at  $t$ .

If a sentence is settled in  $w$  at  $t$ , it is true in all possible worlds which have the same history as  $w$  up to  $t$ . If the evidence for its truth is in the past or in the present, it is always settled. This is called historical necessity. The reason that past (or present) situations are always settled because they hold at all historical alternatives of the time in question. Note that a set of historical alternatives of a possible world becomes smaller as time goes because sharing a longer history is a stronger condition than sharing a shorter history. This indicates that a situation settled at time  $t$  is always settled after  $t$ . A sentence with future tense can be verified by a situation in the future. In this case, it is not necessarily settled even if it is true in the actual world  $w$ . This is because the model is a forward-branching one. For example, suppose that it is true in  $w$  at  $t$  that  $\phi$  holds at some time later than  $t$ . This does not mean that it is settled at  $t$  because there are historical

<sup>20</sup> A similar notion is verifiability, which is discussed within the intuitionistic logic in Crouch (1993).

alternatives of  $w$  at  $t$  which branch from  $w$  after  $t$  and deviate from  $w$ . This is contrasted with the normal necessity operator, which can be defined with respect to a future situation.

According to the definition of settledness, a past sentence 'it was the case that  $\phi$ ' is always settled at a time  $t$  in a possible world  $w$  if it is true in  $w$ . If the whole sentence is true at  $t$  in  $w$ ,  $\phi$  holds at a time  $t'$  earlier than  $t$  in the world  $w$ . Then it holds in every historical alternative of  $w$  at  $t'$ , which means that it is settled at time  $t'$ . Since the set of historical alternatives of  $w$  at  $t$  is smaller than that of historical alternatives of  $w$  at  $t'$ . So the sentence is settled at  $t$  too. When  $\phi$  is a sentence of future tense, it cannot be settled metaphysically because possible worlds always branches in the future into worlds in which  $\phi$  holds and worlds in which  $\phi$  does not hold. But an agent can believe that it is true. This will ensure the settledness of the sentence in some way. Even in this case, to ensure the settledness of a future sentence, we need another operator which restricts the domain of quantification furthermore into a set of possible worlds so that even a future sentence can be settled. This will be discussed again below.

Now let's go back to conditionals. To get the epistemic reading of a conditional, the modal base must be a set of epistemic alternatives, but the reference time must be kept to the speech time because the truth of an epistemic conditional is determined by facts which have been known up to the speech time. A conditional is a statement about the current incomplete knowledge state. The antecedent clause has the role of supposing that the information in the antecedent clause becomes a known fact, and the consequent clause is a conclusion we can get at the current knowledge state from the supposition. So if a conditional is to be given an epistemic reading, the antecedent clause must suppose that it is settled as a fact at the current knowledge state, and must not shift the reference time for the consequent clause to the future or the past. From the semantics of an epistemic reading of a conditional, we can say the following generalization.

- (47) An epistemic reading of a conditional is possible only if it is supposed that the antecedent clause is settled at the speech time.

In the epistemic reading of a conditional, the antecedent clause has the role of restricting the domain of quantification to a set of possible worlds in which the antecedent clause is settled at the speech time. If the antecedent clause does not satisfy this condition, the conditional cannot be give an epistemic reading.<sup>21</sup>

Now we are ready to deal with the observations we have made in Section 3. We have seen that when the event time of the antecedent clause is in the past or the present, both a CM and a CTM allow epistemic readings as well as metaphysical readings. On the other hand, when the event time of the antecedent clause is in the future, a CM does not allow the epistemic reading. A CTM is contrasted with

<sup>21</sup> Condoravdi (2002) assumes that the evaluation time of the epistemic reading is always the present tense. On the other hand, Boogaart (2003) gives some evidence from Dutch that the evaluation time of epistemic readings can be past with respect to the speech time. I suppose that such a possibility is not excluded from the beginning, but that it is rather an exception than a rule. One reviewer suggests the possibility that (47) is not a generalization but part of the definition. This is not the case, considering Boogaart (2003).

a CM in this respect: the antecedent clause with the present tense has almost the same temporal interpretation as in a CM with no tense marker, but a CTM with the future event time in the antecedent clause is allowed to have the epistemic reading. If the generalization in (47) is correct, the antecedent clause ' $\phi$ -ta/la-myen' is a clause of supposing that 'it is settled that  $\phi$ ': that is, -ta/la-myen has the settledness operator in it. In the previous section, it is pointed out that -ta/la-myen is a reduced form of -ta/la-ko ha-myen '-DEC-COMP do-if'. Here the light verb ha 'do' can be taken to mean 'be settled'.<sup>22</sup> This operator has the role of keeping the reference time for the consequent clause to the speech time.

In a CTM, even if the antecedent clause is supposed to be settled, it does not necessarily lead to the epistemic reading of the conditional. We have seen that CTMs can have metaphysical readings as well as epistemic readings. So settledness must not exclude the possibility of metaphysical interpretation even though it makes the epistemic reading possible with a future event time. I will show that both readings are possible even with the settledness operator. Let's take a look at (24), as a case in which the antecedent clause is in the past. The meaning representation is given below.

$$(48) \quad \mathbb{Q}(\lambda w' \in MB(w, t) [\forall w'' [w' \simeq {}_t w'' \rightarrow \exists t' \exists e [t' < t \ \& \ R(w')(e) \ \& \ \tau(e, w'') \subseteq t']] \\ (\lambda w''' \exists t'' \exists e' [t'' < t \ \& \ \exists! x [G(w''')(x) \ \& \ BC(w''')(e')(x) \ \& \ \tau(e', w''') \subseteq t'']])$$

First, I will show that the conditional can be given an epistemic reading. One characteristic of an epistemic reading is that both the antecedent clause and the consequent clause must be settled at the speech time: that is, the rough meaning is that if the antecedent clause is settled, the consequent clause will be settled. In (48), where the antecedent clause is settled, I need to show that the consequent clause can be also settled. Suppose that  $MB(w, t)$  is a set of epistemic alternatives for the epistemic reading.<sup>23</sup> In (49), the meaning of the consequent clause, which is given in (a), entails (b) because a past sentence is automatically settled. The meaning (b) in turn entails (c) because the set of historical alternatives of a possible world at  $t'' (< t)$  is larger than the set of historical alternatives at  $t$  and if something holds in a larger set, it holds in a smaller set, too. In short, something that was settled in the past is settled at the speech time.

$$(49) \quad \begin{array}{l} \text{a. } \lambda w''' \exists t'' \exists e' [t'' < t \ \& \ \exists! x [G(w''')(x) \ \& \ BC(w''')(e')(x) \ \& \ \tau(e', w''') \subseteq t'']] \\ \text{b. } \lambda w''' \exists t'' \exists e' [t'' < t \ \& \ \forall w'''' \in \{w'''' \in W | w''' \simeq {}_{t''} w''''\} \\ \quad \exists! x [G(w''''(x) \ \& \ BC(w''''(e')(x) \ \& \ \tau(e', w'''')) \subseteq t'']] \\ \text{c. } \lambda w''' \exists t'' \exists e' [t'' < t \ \& \ \forall w'''' \in \{w'''' \in W | w''' \simeq {}_t w''''\} \\ \quad \exists! x [G(w''''(x) \ \& \ BC(w''''(e')(x) \ \& \ \tau(e', w'''')) \subseteq t'']] \end{array}$$

<sup>22</sup> This cannot be extended to other mood markers: for example, -la-myen '-IMP-if' is the reduced form of -la-ko ha-myen '-IMP-COMP do-if', but it does not mean something like 'it is settled that ...'

<sup>23</sup> The modal base with respect to a possible world at a time may be a set of epistemic alternatives as in epistemic conditionals, or a set of possible worlds restricted by closeness as in metaphysical conditionals. As I said, Korean does not have morphological difference between epistemic and metaphysical conditionals. Which set is involved in a conditional is dependent on the context which determines the reading of the conditional. Settledness is one of the factors given by the context.

Here (49c) is the meaning that it is settled at  $t$  that the game was canceled. So the antecedent and consequent clauses are all settled sentences at the speech time, and so the whole conditional becomes an epistemic conditional.

The representation (48) can be given a metaphysical reading too. Suppose that  $MB(w, t)$  is a set of historical alternatives of  $w$  at  $t$  for metaphysical interpretation. In (48), the domain of the quantifier  $\mathbf{Q}$  is a set of possible worlds  $w'$  such that in every historical alternative  $w''$  of  $w'$  at  $t$  it rained at  $t'(< t)$ . The condition on  $w'$  is satisfied only if it rained  $t'(< t)$  in  $w'$  itself, because historical alternatives have the same past. So the domain of the quantifier  $\mathbf{Q}$  is the set of possible worlds in which it rained at  $t'(< t)$ . So the representation (48) can be reduced to the following.

$$(50) \mathbf{Q}(\lambda w' \in MB(w, t) \exists t' \exists e [t' < t \ \& \ R(w')(e) \ \& \ \tau(e, w') \subseteq t']]) \\ (\lambda w''' \exists t'' \exists e' [t'' < t \ \& \ \exists! x [G(w''')(x) \ \& \ BC(w''')(e')(x) \ \& \ \tau(e', w''') \subseteq t'']])$$

This is exactly the representation of the metaphysical reading of the conditional. The reasoning behind this is that if 'it was the case that  $\phi$ ' is settled at a time  $t$ , it entails that  $\phi$  holds at some point of time  $t'(< t)$ . In general, sentences in (a) entail those in (b) in (51–53).

- (51) a. It is settled that it was the case that  $\phi$ .  
 b. It was the case that  $\phi$ .
- (52) a. It is settled that it is the case that  $\phi$ .  
 b. It is the case that  $\phi$ .
- (53) a. It is settled that it will the case that  $\phi$ .  
 b. It will the case that  $\phi$ .

So the meaning of settledness does not exclude the possibility of metaphysical interpretation.

In (27), the event time of the antecedent clause can be taken to be in the future, but the antecedent clause supposes that it is settled at the speech time, and the consequent clause claims that Chelswu passed the exam under the supposition. The consequent clause is a past sentence, so it naturally follows that the past sentence is settled at the speech time. Hence the whole conditional can be taken to be an epistemic conditional. Metaphysical interpretation is excluded because of the pragmatic restriction on temporal ordering between the antecedent clause and consequent clause. In this example, the antecedent clause seems to give the impression that the reference time is actually shifted to the future. But the actual reference time for the consequent clause is the speech time. The consequent clause is not interpreted with respect to the event time of showing happiness. So we can maintain that the reference time still remains at the speech time, just like other epistemic conditionals. The impression comes from the semantic relation in which 'it is settled that it will be the case that  $\phi$ ' entails 'it will be the case that  $\phi$ '. This is discussed in what follows.

Now let's look at (29), as a case where the event time of the antecedent clause is in the future. As I pointed out, the event time of taking a rest can be today

or tomorrow. The meaning representation of a hortative sentence has not been discussed, so I will only discuss the interpretation of the antecedent clause, which is given below.

$$(54) \quad \lambda w' \in MB(w, t) [\forall w'' \in \{w'' | w' \simeq_{t'} w''\} \\ \exists t' \exists e [t \preceq t' \ \& \ R(w'')(e) \ \& \ \tau(e, w'') \subseteq (T \cap t')]] \quad (T: \text{tomorrow})$$

Here settledness is part of the meaning of the antecedent clause, and the consequent clause is a hortative sentence which has a causal relation to the antecedent clause. This shows again that the settledness of the antecedent clause does not mean that the conditional has epistemic interpretation. Even though it is not an epistemic conditional, settledness plays a role. The antecedent clause provides two times: one is the time of settledness and the other the time of it raining. The ambiguity of the conditional comes from the two possibilities of the reference time for the consequent clause. This is because 'it is settled that it will be the case that  $\phi$ ' entails 'it will be the case that  $\phi$ '. From the former, the reference time for the consequent clause can be today, and from the latter, the reference time for the consequent clause can be tomorrow. This reading is represented as follows:

$$(55) \quad \lambda w' \in MB(w, t) \exists t' [t \preceq t' \ \& \ \exists e [R(w')(e) \ \& \ \tau(w, e) \subseteq (t' \cap T)]]$$

The relevant time in the antecedent clause is  $t'$ , which is tomorrow, so the event time of taking a rest becomes sometime tomorrow.

As I pointed out above, if a future sentence is settled, there should be some other modality involved. This is true of the epistemic reading as well. To take (29) for example, we do not know whether it rains tomorrow. If we believe that it will rain tomorrow, or if it is settled that it will rain tomorrow, the belief is based on the prediction of a weather forecast. This provides another modality in the interpretation of the conditional.

We have seen above that *-keyss* cannot be used in CTMs with the meaning of prediction. We have not discussed the semantics of *-keyss* in this paper, but the basic meaning of prediction is that the relevant situation is not settled. It is awkward to suppose that something not yet settled is settled. I cannot show this awkwardness by a formal representation, but we can observe the distinction of settledness and prediction. In English, a future event can be expressed by present tense or by an auxiliary of prediction.

(56) The train leaves at 12:30 tomorrow.

(57) The train will leave at 12:30 tomorrow.

(56) is used when it is settled by the time table, which provides a modality for settling a future situation, that the train leaves at the specified time. On the other hand, (57) is used when there is nothing settled about the leaving of the train. This shows that the modality of prediction excludes the possibility of being settledness.

In this section I have claimed that CTMs have a settledness operator which always ensures the possibility of epistemic interpretation as well as metaphysical interpretation.

## 6. Shifting Effect of $-(U)myen$

We have observed that CMs allow epistemic interpretation only when the antecedent clause convey some situation the event time of which is in the past or the present. We have also seen that if the antecedent clause is in the future, it not only excludes the possibility of epistemic interpretation but the reference time for the consequent clause is shifted to the future. From this observation, we can suppose that  $-(u)myen$  invariably shifts the reference time to a time just after the event time of the antecedent clause. Then we need to explain how a CM with past tense or with a stative predicate overlapping with the speech time gets epistemic readings, which we get from the perspective of the speech time. I will explain this with an example with a CM in the past tense. The meaning of the conditional in (24) can be represented as in (50), which is repeated here for convenience. Here the time variable  $t''$  shifts the reference time to the past, and the consequent clause can be related to this past time even though the actual time of the consequent clause is determined independently of the antecedent clause.

Now it is necessary to show how the reference time can be shifted to the speech time from the past. If it rained in a world  $w'$  at  $t''$  such that  $t'' < t$ , it rained in any historical alternatives of  $w'$  at  $t''$ . Then it rained in any historical alternative of  $w'$  at  $t$  because the former set of historical alternatives is a superset of the latter. This simply means that once an event occurred in the past, it is settled at the present as well as at the time the event occurred. In general, (b) entails (a) in (51–52), but not in (53). In (24), the antecedent clause and consequent clause are past tense, and so they are taken to be settled at the speech time. This allows it to have epistemic interpretation.

$$(50') \mathbf{Q}(\lambda w' \in MB(w, t) [\forall w'' \in \{w'' | w' \simeq_t w''\} \exists t'' \exists e [t'' < t \& R(w')(e) \& \tau(e, w'') \subseteq t'']]) \\ (\lambda w''' [\forall w'''' \in n\{w'''' | w''' \simeq_t w''''\} \exists t'' \exists e' [t'' < t \& \\ \exists! x [G(w''''')(x) \& BC(w''''')(e')(x) \& \tau(e', w''''') \subseteq t'']]])$$

So the antecedent clause and consequent clause can be taken to be settled at the speech time.

Contrary to cases like this, CMs with the future event time in the antecedent clause do not allow epistemic readings. If a situation occurs in the possible world  $w$  at time  $t'$  such that  $t < t'$ , then it will be settled in  $w$  at  $t'$ . Note again that the historical alternatives of  $w$  at  $t$  is a superset of the historical alternatives at a later time. When the time is shifted from the future to the present, the size of the set of historical alternatives gets bigger. So it is not guaranteed that the situation holds in every world in the superset. That is, 'it will be the case that  $\phi$ ' does not entail 'it is settled that it will be the case that  $\phi$ '. This excludes the possibility of epistemic interpretation of a future sentence.

I have shown that CMs invariably shift the reference time to the event time of the antecedent clause. So it is quite natural to use  $-(u)myen$  in purely temporal conditionals. Purely temporal conditionals are used when the antecedent clause conveys some situation which is surely believed to hold at the actual world at a time in the future. The only part that is supposed in the antecedent clause is about the time the situation holds. We can assume that the modal base is just

the singleton set of the actual world. Then the semantics of -(u)myen is simply taken to have the effect of shifting the reference time for the consequent clause to a time just after the event time of the antecedent clause whatever the modal base is. The conditional connective -ta/la-myen has the operator of settledness, which requires the reference time to be the speech time. So it is not compatible with a purely temporal conditional, the only meaning of which is to shift the reference time to some other time than the speech time.

Finally, only -(u)myen is used in habitual conditionals, as shown in (22). It would rather be easy to first explain why -ta/la-myen is not used in habitual conditionals. The operator of settledness itself is defined with respect to the speech time. On the other hand, the antecedent clause of a habitual conditional is tenseless. Assuming the semantics of generic sentences by Asher and Morreau (1995) and extending it into the interpretation of habitual conditionals, a habitual conditional is a sentence which asserts the consequent clause to be true *whenever* the antecedent clause holds in all normal worlds in which the antecedent clause hold.<sup>24</sup> If -ta/la-myen is used in the antecedent clause of a habitual conditional, it should mean something like 'At all times in all normal worlds in which the antecedent clause holds, if the antecedent clause is settled at the speech time, the consequent clause holds.' But settledness is defined with respect to the speech time. So it is not compatible with the semantics of habitual conditionals, which requires the generic operator to quantify over all times in which the antecedent clause holds. On the other hand, -(u)myen has no problem because it shifts the reference time to whenever the antecedent clause holds. So when the generic operator quantifies over times and worlds, -(u)myen shifts the reference time to any time that the antecedent clause holds in normal worlds in which the antecedent clause holds.

## 7. Conclusion

Preferences between -(u)myen and -ta/la-myen are influenced sometimes by the frequency of some fixed expressions and other times by stylistic variations, so I cannot explain all the distributional preferences of the two conditional connectives. In this paper, I have tried to find more rigorous and consistent differences. I claimed that -(u)myen has the effect of shifting the reference time for the consequent clause, while -ta/la-myen has an extra operator of settledness, which is defined with respect to the speech time. The semantics of this operator always allows CTMs to be epistemic conditionals if other conditions are met, and has the effect of optionally shifting the reference time for the consequent clause. I suppose that other selectional preferences are accidental and pragmatic.

<sup>24</sup> This is too strong for some generic sentences. There are generic sentences which can be expressed by the existential quantification over times and worlds. Even in this case the relevant times over which the generic operator quantifies over is not a particular time, and not the speech time either. So it is not compatible with the semantics of settledness.

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