The Semantics of \textit{-ketun} in Korean*

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The conditional connective \textit{-ketun} in Korean has some restrictions in both the antecedent clause and the consequent clause. In the antecedent clause the event or state denoted by the predicate must be perceptible. There are some exceptions to this restriction. The exceptional cases are where the event or state denotes a personal feeling on the part of the addressee (or addresser, in some cases). From these observations, it is concluded that the antecedent clause must be an event or state which can be directly experienced by the addressee (or, addresser). In the consequent clause, the mood must be imperative, hortative or promissive. When the mood is declarative or interrogative, the modality must be volitional. These moods or modality can be characterized as something that can be satisfied by some action on the part of the addresser or addressee. The relation between these two restrictions is that the antecedent clause changes the knowledge state of the addresser or addressee based on direct experience of something, and the addresser or addressee sets a goal and a plan for achieving the goal. And the consequent clause is an action included in the plan. This is the basic semantics of the conditional connective \textit{-ketun}. I give a more specific representation of this semantics in this paper.

\textbf{Key words:} Korean conditional connective, perceptibility, direct experience, conditional imperative, speech act

1. Introduction

Among Korean conditional connectives, \textit{-ketun} is the most peculiar one in that it shows the most restrictions in its use. It has been observed that the consequent clause of a conditional with a conditional connective \textit{-ketun} tends to have imperative, hortative or promissive mood. It is pos-

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sible to use it in a declarative or an interrogative sentence, but it does so only with some restrictions on the person of the subject and the modality of the consequent clause. The reasons behind these restrictions have been unexplained. In this paper, I will show how the two restrictions are related to each other.

In Korean a conditional can be used in four different ways: a purely temporal conditional, a generic conditional, an indicative conditional and a counterfactual conditional. A -ketun-conditional, however, cannot be used as a counterfactual. Consider the following examples.

(1) pom-i toy-ketun isaha-ca!
    spring-nom become-if move-hort

    When spring comes, let's move.

(2) sonnim-tul-i o-ketun insa-lul cal hay-la!
    customer-pl-nom come-if bow-acc well do-imp

    If customers come, make bows to them politely!

(3) nwu-ka na-lul chac-ketun eps-ta-ko hay-la!
    someone-nom I-ace look-for-if absent-dec-comp say-imp

    If someone looks for me, tell him/her I am out.

(4) ??pata-ka ywukci-i-ketun, yenghi-eykey talye ka-la!
    sea-nom land-be-if Yenghi-to run go-dec

    If the sea were a land, run to Yenghi.

Sentence (1) is an example of a purely temporal conditional. A purely temporal conditional is normally translated with when in English, as in (1). The background knowledge is that spring is sure to come. In this use of a conditional there is no real supposition. For this reason this use is

1) In this paper, I use the following abbreviations:
   (i) case markers: nom(inative case), acc(usative case);
       mood markers: dec(larative mood), int(ergative mood), imp(erative mood), hort(ative mood), prom(issive mood);
       others: mod(ality), pl(ural), past (tense), hon(orative), top(ic), prog(ressive), comp(lementizer)

2) One reviewer says that this sentence is fine in a context where Yenghi is in the area which is falsely known to be a sea and later realizes that it is actually a land. But in that case, the sentence is not counterfactual.
not normally included in the category of conditionals, but all conditional
connectives in Korean can be employed in this use unless their seman-
tics is incompatible with it. Sentence (2) is an example of a generic
conditional. Here the event of a customer's visiting happens repetitively,
and whenever it happens the addressee is told to make a bow to the
customer politely. Sentence (3) is an indicative conditional, where the
antecedent clause expresses a real supposition. In (3) the background
knowledge is that someone might or might not look for the speaker, and
the speaker makes a supposition that someone looks for the speaker. The
connective -ketun is allowed in these three uses, but it is not allowed in
a counterfactual, as shown in (4). For this reason, A -ketun-conditional is
(1990), and I, C.-Ch. (2004). This also follows from the semantics of
-ketun, which will be given in this paper.

The paper goes in the following order. In section 2, I discuss the re-
strictions on the moods or modality in the consequent clause of a
-ketun-conditional. Section 3 deals with the restrictions on the events or
states in the antecedent clause. In section 4, I give the semantics of a
-ketun-conditional. Then follows a brief concluding section.

2. Moods in -ketun-Conditionals

2.1. Non-propositional Moods

In this section, I will discuss the restrictions on the mood and modal-
ity of a -ketun-conditional. It has been observed that -ketun-conditionals
usually come with an imp(erative), hort(ative) or prom(issive) mood.
This is illustrated in the following examples.

(5) nalssi-ka coh-aci-ketun san-ey ka-{la/ca/ma}.3)
weather-nom good-become-if mountain-togo-{imp/hort/prom}

3) I am discussing only three moods here, but -ketun also allows a declarative or an inter-
rogative mood with the modality of volition, which will be discussed shortly. There are
other endings used as similar mood markers which are allowed in -ketun-conditionals.
Here are such endings: -kela = imperative, -lita = promissive, -ci = imperative, declarative
or interrogative with volition, -llay = declarative or interrogative with volition. In this pa-
per, I will only deal with sentences with the mood markers -la 'imp,' -ca hort' and -ma
'prom.'
If the weather becomes good, \{∅/let's/I promise to\} climb the mountain.

In Korean -(a/e)la is a typical imperative marker. Here -la can often be omitted in an informal style of speech. -ca and -ma are hortative and promissive markers respectively. Imperatives, hortatives and promissives all have one thing in common: they have felicity conditions rather than truth-conditions. 4)

Traditionally, a sentence like an imperative is analyzed as consisting of a sentence radical, which corresponds to the propositional content, and an illocutionary force, which indicates what the speaker wants to do with the propositional content, following the tradition of bipartition analysis of speech act (Cf. Stenius (1967), Searle (1969), Searle and Vanderveken (1985), Vanderveken (1990), etc.) Searle and Vanderveken give felicity conditions for illocutionary forces. For example, in the case of a promise like (6), the propositional content is that John will come to the party, and the felicity conditions are that John think that the addressee wants him to act in such a way that the propositional content can be true, and that he believe that he can, and is willing to, act in such a way.

(6) John: I will come to the party.

Imperatives, hortatives and promissives all have the felicity condition that the speaker has the volition to make himself/herself or the addressee intend to act in such a way that the propositional content will be true.

It has also been observed that declaratives can be used in -ketun-conditionals with the modality of volition. If someone has the volition of doing something, the event must be agentive. But there is a further restriction than the agentivity of the event. The subject must be 1st person. This is shown below.

(7) (Agentive)
   a. ??ney-ka o-ketun na-nun kippu-{lkesi/keyss}-ta
      you-nom come-if l-top happy-mod-dec
      If you come, I will be happy.

4) This can be understood as saying that meanings of declaratives are defined as their truth-conditions, while meanings of imperatives, hortatives and promissives are defined with their felicity conditions plus their propositional content.
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b. ??chelswu-ka tuleo-ketun mwun-i tathi-lkesi-ta.
   chelswu-nom enter-if door-nom close-mod-dec
   If Chelswu comes in, the door will be closed.

(8) (1st person)
   nayil nalssi-ka coh-aci-ketun {na/??chelswu}-nun san-ey ka-keyss-ta.
   weather-nom good-become-if {I/Chelswu}-top mountain-to go-mod-dec
   If the weather becomes better, I/Chelswu will climb the mountain.

In (7a) the predicate kippu 'be happy' is stative. The modality markers -(u)lkesi and -keyss express prediction or volition. When the predicate is stative, the mood marker can only express prediction, and the sentence becomes awkward. In (7b) the inanimate subject mwun 'the door' cannot be the agent of the event denoted by the predicate tathi 'be closed,' so the modality becomes prediction. In (8), the external argument of the predicate is an Agent. Even in this case, the subject must be 1st person. Otherwise the modality marker could not express volition unless the clause is embedded.5) When the speaker expresses his or her own voli-

5) The following sentence is an example in which a subject other than 1st person is the subject of volition.
   (i) chelswu-nun [ pro cip-ey ka-keyss-ta-ko] malhay-ss-ta.
       chelswu-top home-to go-mod-dec-comp say-past-dec
       Chelswu said that he would go home.
       In this sentence pro is the subject of the embedded clause, which is bound by the subject of the whole clause Chelswu. The root subject is 3rd person, but the modality marker -keyss is interpreted as expressing Chelswu's volition. The embedded clause must be interpreted with respect to a different context from the main context, as follows:

   (ii) λc[Chelswu said λc [ he would go home]]
       Here c and c' are contexts. In the meaning representation, the main clause is interpreted with respect to the main context c and the embedded clause is with respect to a different context c'. Chelswu is the speaker with respect to c; so the modality of volition is possible.
       The fact that a volitional sentence is embedded in a propositional sentence does not mean that it is propositional. We know that an imperative also can be embedded in a propositional sentence.

   (iii) Chelswu-nun memchwu-la-ko malhay-ss-ta.
       chelswu-top stop-imp-comp say-past-dec
       Chelswu said to stop.
       The embedded imperative must have the denotation which can be incorporated into the proposition denoted by the whole sentence, but it is not propositional itself.
tion, the meaning of the sentence is not propositional. It rather has the felicity condition for its proper use, as do imperatives, hortatives and promissives. The fact that volitional statements require 1st person is evidence that it is a type of speech act: a speech act is an act that is carried out by the speaker at the utterance context. That is, by the sentence of volition, the speaker or the addressee is committed to an action which will make the propositional content true, at the utterance context. In this respect, a sentence with a volitional marker is similar to imperatives or other speech acts by which at the utterance context the speaker require someone's intention to act in such a way that the propositional content will be true.

So far I have discussed moods and a modality which can be used in -ketun-conditionals. They have one thing in common: they all have felicity conditions rather than truth-conditions, and all express the speaker's volition to change the future actions on the part of the addressee or the addressee. Their meanings can be summarized as follows:

(9) a. **imperatives** the speaker's volition to change the addressee(s) future actions  
    b. **hortatives** the speaker's volition to change future actions of the individuals including the speaker and the addressee(s)  
    c. **promissives** the speaker's volition to change his/her own future actions for the sake of the addressee(s)  
    d. **declaratives with the speaker's volition**: the speaker's volition to change his/her own future actions

They all express the speaker's volition to change his/her own and/or the addressee(s)' future actions, but the agents of the future actions vary with the types of mood. Imperatives are used to change the addressee(s)' actions, hortatives those of the speaker and the addressees, promissives the speaker's for the benefit of the addressee(s), and declaratives with the speaker's volition his or her own future actions.

2.2. Interrogatives

It has been a general observation that interrogatives do not occur in -ketun-conditionals. However, some interrogatives are mentioned as examples of -ketun-conditionals. If we look at the subjects that are al-
owed in interrogative -ketun-conditionals together with the interrogative endings, we can see that interrogative conditionals with -ketun are not special at all. They share the same properties as imperatives, hortatives and promissives. The only difference is that the speaker asks whether the addressee(s), not the speaker, have the volition to make the addressee or the addressee(s) act in such a way that the propositional content will be true? And if they violate some restrictions imposed in -ketun-conditionals, they get much worse. So interrogative -ketun-conditionals are considered as legitimate -ketun-conditionals, even if to some Koreans they may not be as good as imperatives or hortatives.

There are two types of questions that can be used in -ketun-conditionals. One is a question by which we ask the addressee(s)' volition on his or her own future actions, and the other a question by which we ask the addressee(s)' volition on the speaker's future actions. I will discuss the two questions with examples which end with the interrogative endings -nya and -(u)lkka. The former is a simplistic and typical interrogative ending. In order to express the meaning of volition, -nya must be preceded by the volition modality marker -keyss and the subject must be 2nd person.

(10) {??na/ne/??chelswu}-nun nalssi-ka phwuli-ketun ka-keyss-nya?
   {I/you/chelswu}-top weather-nom get_warm-if go-mod-int


(i) ku-ka o-ketun ka-lkka-yo?
   he-nom come-if go-int-hon
   Shall we go if he comes?

He takes this example to be an alternative form of a hortative. However, the mood is a matter of form: the sentence ends with an interrogative mood marker. And the sentence can be understood as meaning 'Shall I go if he comes?' Hortatives always require 1st person plural subjects. This shows that his explanation is not convincing. Cang, K-K. (1999) also gives more examples, but he takes them to be rhetoric interrogatives. One example is given below.

(ii) ku salam-i cip-ey iss-ketun mwue-la-ko malha-l-kka-yo?
   the person-nom home-at be-if what-dec-comp say-mod-int-hon
   If the person is at home, what will you say?

This sentence does not seem to be a rhetoric question. This must be considered really as an interrogative -ketun-conditional.

7) There are cases where a hearer is one person but the referent of you is not just the hearer but a group of people including the hearer. The group is the addressee. Similarly, one speaker speaks for a group of people, and the latter is the addressee.
Will [I/you/Chelswu] go if it gets warmer?

(11) ??ne-nun nalssi-ka phwuli-ketun ka-(ss)-nya?
    you-top weather-nom get_warm-if go-(past)-int
    Did/do you go if it gets warmer?

(12) ??ne-nun nalssi-ka phwuli-ketun kippu-keyss-nya?
    you-top weather-nom get_warm-if happy-mod-int
    If the weather gets warm, will be you happy?

In (10) the interrogative mood marker -nya is preceded by the volition modality marker -keyss. If the subject is other than 2nd person, the modality marker -keyss will have the meaning of prediction rather than volition, but prediction is not compatible with the use of -ketun. When the subject is 2nd person, -keyss has the meaning of volition and the sentence becomes natural. By the sentence with a 2nd person subject, the speaker asks the hearer whether the addressee has the volition to change his or her own future actions. Without the modality marker of volition, the sentence becomes odd, as shown in (11). For this reason, the predicate must be agentive. For a similar reason, sentence (12) is odd: the predicate is stative and -keyss has the meaning of prediction.

Let's consider the other interrogative ending -l-kka which includes a modal operator in it. The modality can be prediction or volition. And in the case of volition reading, we can get two possible readings depending on whose volition it is. One volition reading expresses the addressee's volition, and the other the subject's volition. The reading in which the speaker asks the addressee's volition can be obtained only when the subject is 1st person.

(13) nay-ka ka-l-kka?
    I-nom go-mod-int
    Shall I go?

(14) ney-ka ka-l-kka?
    you-nom go-mod-int
    Will you go?
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(15) chelswu-ka ka-l-kka?
    chelswu-nom go-mod-int
    Will Chelswu go?

When the subject is 1st person, the speaker asks the hearer whether the addressee wants the speaker to change his or her own future actions. The question is not about the subject's volition. When the subject is 2nd person, the speaker is supposed to ask the hearer about the addressee's volition, but in such a case \(-keyss-nya\) would be used instead. So the sentence with a 2nd person subject and \(-l-kka\) only has the reading of prediction. When the subject is 3rd person, \(-l-kka\) has the meaning of prediction, and might have the meaning of volition. In the volition reading, however, the speaker only asks the hearer about the subject's volition, not about the addressee's. As we will see shortly, a \(-ketun\)-conditional with \(-l-kka\) only allows the volition reading which is concerned with the addressee's volition. This shows that \(-l-kka\) in a \(-ketun\)-conditional has the meaning of asking the hearer about the addressee's volition on the speaker's future actions.

Since a \(-ketun\)-conditional requires the reading of the addressee's volition, it is expected that a \(-ketun\)-conditional with \(-l-kka\) requires only a 1st-person subject with an agentive predicate.

(16) ku chinkwu-lul manna-ketun {nay/??ney/??chelswu}-ka mwue-la-ko malha-l-kka?
    The friend-acc see-if {I/you/chelswu}-nom what-dec-comp say-mod-int
    If I see the friend, what shall {I/you/chelswu} say?

(17) ??ku chinkwu-lul manna-ketun nay-ka kippu-l-kka? (stative)
    the friend-acc see-if I-nom happy-mod-int
    If I see the friend, shall I be happy?

8) A 3rd person subject with the interrogative ending of \(-l-kka\) can have the reading of volition when conjoined with a sentence with a 1st-person subject.

( i) nay-ka ka-l-kka, (hokun) chelswu-ka ka-l-kka?
    I-nom go-mod-int (or) chelswu-nom go-mod-int
    Shall I go or shall Chelswu go?

By this sentence, the speaker asks the hearer whether the addressee wants the speaker or Chelswu to go. I do not have any explanation of why this is possible.
In (16), only the 1st-person subject is allowed. By the sentence, the speaker asks the hearer whether the addressee wants the speaker to change his or her own future actions. In (17) the predicate kippu 'be happy' is stative, and the ending -l-kka only has the meaning of prediction. The modality of prediction is not compatible with the use of -ketun.

From the discussion so far, we can get the generalization that by a -ketun-conditional interrogative the speaker asks the hearer about the addressee's volition on the future action of the speaker or the addressee. When -keyss is used, only a 2nd-person subject is allowed as the agent of volition. When -l-kka is used, only a 1st-person subject is allowed. The meanings of the interrogatives with -ketun can be summarized as follows:

(18) a. -keyss-nya: (the speaker asks the hearer) whether the addressee wants to change his or her future actions
    b. -l-kka: (the speaker asks the hearer) whether the addressee wants the addressee(s) to change his or her own future actions

As I mentioned, there are some Koreans who do not like -ketun-conditionals with interrogative endings. But these conditionals can be considered legitimate. There are a lot of parallelism between declaratives and interrogatives in -ketun-conditionals. First, the modality must be volition, and the predicate must be agentive. Second, the person of the subject is restricted: a 1st person subject is required in declaratives, while an interrogative with -keyss requires a 2nd person subject and -l-kka requires a 1st person subject. The fact that only 1st or 2nd person subject is allowed implies that they are uttered to accomplish some speech acts in the speech context. The difference in person comes naturally from the difference between declaratives and interrogatives. This indicates there is no reason to rule out interrogative -ketun-conditionals. If some Koreans do not like these interrogatives, it could be because they are used less frequently.

3. Restriction on the Antecedent Clause

3.1. Restriction of Perceptibility

In the previous section, I have talked about the restriction on the
mood or modality of the consequent clause of a -ketun-conditional. In this section I will discuss restrictions on the antecedent clause of a -ketun-conditional. First, the antecedent clause must convey an event or state which is perceptible at the event time of the consequent clause, when the subject is not the same as that of the consequent clause. There has been previous studies which suggest that the antecedent of a -ketun-conditional is related to (in)perceptibility. Se, Th.-L. (1988) relates the morpheme -ke to the meaning of being not perceived yet at the moment of utterance and the meaning of possibility. Cang, K.-H. (1985) suggests that -tu means the process of knowing through seeing, feeling, hearing, etc. Based on the morphological analyses and meaning composition, Koo, H.-C. (1989, 1990) proposed that the meaning of -ketun as the hypothetical condition of knowing something which has been in the state of not being perceived yet but which is later perceived, regardless of the volition of the perceiver.9)

To show the restriction of perceptibility on the predicate in the antecedent clause of a -ketun-conditional, I will employ some tests. In Korean, some psychological verbs have alternative forms which have different aspectual properties.10)

(19) alternative forms of psychological verbs

<table>
<thead>
<tr>
<th>stative</th>
<th>nonstative</th>
</tr>
</thead>
<tbody>
<tr>
<td>kippu 'be happy'</td>
<td>kippu-e ha 'happy do'</td>
</tr>
<tr>
<td>tep 'be hot'</td>
<td>tep-e ha 'hot do'</td>
</tr>
</tbody>
</table>

The verb kippu is a stative verb, whereas kipp(u)-e ha is an action predicate. The same aspectual alternation can be observed in the other verbs. The aspectual difference can be observed in the following examples.

(20) a. ??chelswu-ka kippu-koiss-ta.
    chelswu-nom happy-prog-dec
    Chelswu is being happy.


b. chelswu-ka kippe ha-koiss-ta.
    chelswu-nom happy do-prog-dec
    Chelswu is showing his happiness.

The verb *kippu* is stative and is not compatible with the progressive. On the other hand, *kippe ha* can be used in the progressive.

Psychological state verbs express some internal psychological states which cannot be observed externally. On the other hand, *e ha* has the semantics of changing a state verb into an action verb, and the event denoted by an action verb is accompanied by some observable events which indicate a person’s feelings. This aspectual change results in the difference in acceptability of *-ketun*-conditionals. This is illustrated in the following.

(21) a. ??emeni-kkeyse hayngbokha-si-ketun te memwul-ela.
    mother-nom happy-hon-if more stay-imp
    If Mother is happy, stay longer.

b. emeni-kkeyse hayngbokhay-ha-si-ketun te memwul-ela.
    mother-nom happy-do-hon-if more stay-imp
    If Mother is showing happiness, stay longer.

Mother’s state of being happy expressed by ‘kippu’ cannot be observed, while Mother’s showing her happiness expressed by ‘kippe-ha’ can. Only the latter can be used in the complement of *-ketun*.

Someone might think that no stative predicates can occur in the complement of *-ketun*. But this is not the case. Consider the following examples.

(22) a. kay-ka pay-ka holccokha-ketun pap-ul cwu-ela.
    dog-nom belly-nom thin-ketun food-acc give-imp
    If the dog’s belly looks empty, give (him) some food.

b. ??kay-ka pay-ka kopu-ketun pap-ul cwu-ela.
    dog-nom belly-nom hungry-ketun food-acc give-imp
    If the dog is hungry, give (him) some food.

Having a ‘thin belly’ (having a belly that *looks* empty) is a state just like being hungry, but the sentence with the predicate *holccokha* ‘thin’ is fine. A difference is that a ‘thin belly’ can be observed, while simply be-
ing hungry cannot.

In Korean, \(-a/e)ss\) is considered to be a morpheme of past. On the other hand, some uses of the same morpheme are considered to be markers of perfectiveness. In such uses, the sentence implies the resulting state holds at the time of utterance. However, if the same morpheme is used twice in a sequence, the sentence is interpreted as a past perfective and it is implied that the resulting state does not hold any more. This is illustrated below.

(23) chelswu-ka latio-lul kochi-ess-ta.
    chelswu-nom radio-acc repair-past-dec
    Chelswu has repaired the radio (and it works well.)

(24) chelswu-ka latio-lul kochi-ess-ess-ta.
    chelswu-nom radio-acc repair-past-past-dec
    Chelswu had repaired the radio (but it doesn’t work well now.)

Suppose that Chelswu once repaired a radio and that the two sentences are uttered in this situation. In (23), where \(-a/e)ss\) is used once, it is implied that the radio works well now. On the other hand, in (24) the morpheme is used twice and it is implied that the radio does not work anymore now. This difference can be employed to test whether the restriction of perceptibility holds in the complement of \(-ketun\).

(25) chelswu-ka latio-lul kochi-ess-ketun kacyewa-la.
    chelswu-nom radio-acc repair-past-if bring-imp
    If Chelswu has repaired the radio, bring it.

(26) ??chelswu-ka latio-lul kochi-ess-ess-ketun kacyewa-la.
    chelswu-nom radio-acc repair-past-past-if bring-imp
    If Chelswu had repaired the radio, bring it.

The fact that a radio set is repaired can be observed by seeing that it works well now, so (25) is fine. On the other hand, the fact that the radio had been repaired cannot be perceived because the radio does not work at the moment. This leads to the awkwardness of (26). This is another piece of evidence for the restriction of perceptibility.

I do not say that two \(-a/e)ss's\) is not compatible with \(-ketun\). The cru-
cial thing is whether the resulting state is observable when the speaker utters the sentence. So even when -{a/ess} is used twice, if the resulting state is observable, the conditional with -ketun is fine. This is illustrated in the following:

(27) chelswu-ka moin-ey o-ass-ess-ketun, tto cenhwahaci ma-la.
     chelswu-nom meeting-at come-past-past-if again call not-imp
     If Chelswu came to the meeting, don't call him again.

The sentence is understood as implying that Chelswu left some observable evidence that he came to the meeting, like a signature in the register. This sentence sounds odd if it is assumed that there is no such evidence.

There are cases which seem to be exceptions to the restriction of perceptibility. There are examples in which the predicate in an antecedent clause denotes an invisible state. One such example is ttokttokha 'be bright.'

(28) chelswu-ka ttokttokha-ketun, elyewun mwuncye-lul cwu-ela.
     chelswu-nom bright-if difficult problem-acce give-imp
     If Chelswu is bright, give him a difficult problem.

Being bright is an invisible state, but the sentence is fine. This seems to be a clear exception to the restriction of perceptibility. We might want to revise the restriction slightly. It is, however, more likely that there are some perceptible events or situations that the addressee can observe to see that Chelswu is bright. This can be confirmed by the following example.

(29) ?ney-ka ttokttokha-ketun, ku mwuncye-lul phwul-ela.11)
     you-nom bright-if the problem-acce solve-imp
     If you are bright, solve the problem.

This sentence is awkward. A difference from (28) is that the subject is 2nd

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11) One anonymous reviewer says this sentence is okay when I posit the epistemic operator in the antecedent clause, assuming some operator like 'you think/claim.' The use of wemph{cengmal} 'really' facilitates such an assumption. It is very difficult to say whether the absolute degree of acceptability, but (29) is less acceptable than (28) and (30). I think I need to give some explanation to that difference.
person. You can come to know someone else's brightness by some observable evidence from some direct contacts with him or her, but your own brightness is not known to you by some externally observable evidence. (29) is awkward because it is like saying that the addressee comes to know his or her own brightness by some externally observable evidence. The property of one's being bright is supposed to be already known to oneself without any external experience with oneself. Then (28) is fine because Chelswu's brightness is supported by his observable behavior. So this example does not invalidate the restriction of perceptibility. Here we have to note that the restriction of perceptibility is a pragmatic condition. Even if a predicate inherently denotes an invisible state, it can be used in the antecedent clause of a -ketun-conditional when it is assumed that there is some observable evidence that supports the state.

3.2. Restriction of Direct Experience

There is one real exception to the restriction of perceptibility. When the subjects of the antecedent and consequent clauses are the same and the invisible states are personal feelings, the restriction is lifted. Consider the following examples.

(30) (ney-ka) pay-ka kophu-ketun pap-ul mek-ela.
   (you-nom) belly-nom hungry-ketun food-acc eat-imp
If you are hungry, eat some food.

(31) ??{nay/chelswu}-ka pay-ka kophu-ketun, pap-ul cwu-ela.
   {I/chelswu}-nom belly-nom hungry-if food-acc give-imp
If {I/chelswu} am/is hungry, give me/him some food.

In these sentences, the mood is imperative and the implicit subject of the consequent clause is 2nd person. In the first example, the subject of the antecedent clause is also 2nd person, and the predicate representing a personal feeling like hunger is allowed in the antecedent clause, even though the state of hunger is not observable. In (31), where the subject

12) Nam, K.-Sh. (1972) and Yang, I.-S. (1972) take them as a separate category.
13) Lee, Ch.-Y. (1984) pointed out that predicates which denote personal feelings allow only 1st person subjects in declaratives, while 2nd person subjects are allowed in -ketun-conditionals. He says that this is because the speaker makes a supposition and so
of the antecedent clause is other than 2nd person, the personal feeling of hunger is not allowed in the antecedent clause.

In -ketun conditionals with the interrogative mood marker -l-kka, the subject must be 1st person in the consequent clause. Then it is expected that the restriction of perceptibility is lifted when the subject of the antecedent clause is 1st person. This is exactly what is actually observed in the following examples.

(32) nay-ka nacwungey pay-ka kophu-ketun pap-ul mek-ul-kka?
    I-nom later belly-nom hungry-if food-acc eat-mod-int
    Shall I eat some food when I am hungry later?

(33) ??{ney/chelswu}-ka pay-ka kophu-ketun pap-ul cwu-l-kka?
    {you/chelswu}-nom belly-nom hungry-if food-acc give-mod-int
    If you/Chelswu are/is hungry, shall I give you/him some food?

In (32) the subject of the antecedent clause is 1st person and the personal feeling of hunger is fine with -ketun. In (33), on the other hand, the subject is 2nd or 3rd person and the sentence becomes odd with the same predicate.

These examples show that the restriction of perceptibility may not be applied when the subjects of the antecedent clause and consequent clause are the same. The reason seems easy to guess: the subject of the consequent clause is the one who is supposed to change his or her own future actions. If the agent is to determine on what condition he or she will change their own future actions, he or she must be able to determine whether the condition holds or not. In the case of perceptible situations, the agent can determine by perception. In the case of personal feeling, the subject of the predicate must be the same as the agent and the agent can determine whether the condition holds by personal experience.

Note that the restriction of perceptibility is not completely nullified even when the subjects of the antecedent clause and the consequent clause are the same. In (29), the sentence becomes odd when the predicate denotes the state of brightness. Being bright is not what is felt

the subject does not have to be the speaker. However, he does not explain why 3rd person subjects are not allowed, either.
personally. It is not what is observable either. The awkwardness of the sentence implies that the restriction of perceptibility still works when the state in the antecedent clause is not what is personally felt. So the condition of being personally felt is another restriction which applies when the restriction of perceptibility does not work.

We can summarize the observations of the restrictions on the antecedent clause of a \textit{-ketun}-conditional so far as follows:

(34) Restriction on the antecedent clause of a \textit{-ketun}-conditional: (temporary)
\begin{itemize}
  \item The event/state in the antecedent clause must be perceptible to the subject of the consequent clause.
  \item If the subjects of the antecedent and consequent clauses are the same, the event/state in the antecedent clause may be something that can be personally felt.
\end{itemize}

There seems to be a common factor between external perception and internal feeling. Both allow an agent to come to know something from direct experience: a way of knowing something external from direct experience is to perceive it, while to know something internal from direct experience is to feel it personally. Therefore the two restrictions can be integrated into one:\textsuperscript{14)}

(35) Restriction on the antecedent clause of a \textit{-ketun}-conditional: (final)
The event/state in the antecedent clause must be something that the agent in the consequent clause can DEKNOW (= come to know from direct experience).

\textsuperscript{14)} One anonymous reviewer points out a problem with the idea of “direct experience” suggesting that in the following example, the addressee does not have to actually see the war break out.

(i) cwungtong-ey cencayng-i ilena-ketun cwusik-ul sa-la.
\textit{Middle\textunderscore East} in war-nom break-if stocks-acc buy-imp.
If a war breaks out in the Middle East, buy some stocks.

But notice that the predicate in the antecedent clause must be perceptible. This reminds us of the use of a proper name. The referent of a proper name is fixed by a baptismal act, and subsequent uses succeed in referring to that referent by being linked by a causal chain to that original baptismal act. Similarly, an original event can be taken to be perceived by perceiving the events which are in causal chains of events originating from the original event.
I will abbreviate 'come to know from direct experience' as DEKNOW. As I have pointed out, the meaning of 'from direct experience' is just a pragmatic condition, not a semantic one. So in the discussion below, I will focus on the meaning of 'come to know,' or simply KNOW. KNOW is different from the English verb *know* in two respects. First, it should be neutral to the aspectual distinction of stativity and non-stativity. Second, when we use the term KNOW, it should not trigger the presupposition that the complement is a fact, unlike the verb *know* in English.\(^{15}\) If it did, the presupposition would be expected to project to the main context and \(\phi\) would be taken to be a fact, contrary to actual observations. KNOW with no factual presupposition is generally taken to be believe, but in Korean *al* 'know,' which does not trigger a presupposition that the complement clause is a fact, is still semantically different from *mit* 'believe.' Semantically that one knows something entails that one believes it, but not vice versa. For this reason, I will continue to use KNOW with no factual presupposition.

The restriction given in (35) is a condition for felicitous use of *-ketun*. When the condition is not met, the sentence is infelicitous rather than false. So I claim that it is a presupposition. To make this explicit, we can split the meaning of the antecedent clause of a *-ketun*-conditional into the content and the restriction, roughly as follows:

\[
\begin{align*}
(36) \quad & a. \quad \phi \text{-ketun}, \psi \\
& b. \quad \phi_i & \text{PRESUP(DEKNOW}(a, p_i)) \rightarrow \psi(a)
\end{align*}
\]

A *-ketun*-conditional (36a) is interpreted as (36b). Here PRESUP is the operator of presupposition, and \(p\) is a propositional variable which takes a proposition as its antecedent. In this representation, it is bound by \(\phi\). The binding relation is represented by the subscript index \(i\). The restriction DEKNOW\((a, p_i)\) is not taken to be part of assertion, but a condition triggered by the use of *-ketun*. A condition triggered by the use

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\(^{15}\) In Korean, *al* 'know' has two properties. It can be used in progressive. And in some uses, it does not trigger the presupposition that the complement is a fact.

(i) na-nun John-i tochakhay-ss-ta-ko al-[ko iss]-ta.
I-top John-nom arrive-past-dec-comp know-prog-dec
I know/believe that John has arrived.

In this example, the verb *al* is used in progressive and the sentence does not trigger the presupposition that John has arrived.
of an expression is defined as presupposition. So there is no problem in regarding the restriction in (35) as presupposition. In the representation, the assertion part \( \phi_i \) prohibits the presupposition \( \text{PRESUP(DENONOW}(a, p_i)) \) from projecting to the main context, because in that case, the variable \( p_i \) would be unbound.

3.3. Other Evidence for the Operator (DE)KNOW

From the restriction on the antecedent clause of a \(-ketun\)-conditional I have proposed that the meaning of \(-ketun\) itself contains the operator of (DE)KNOW. I will give more evidence for the operator \'(DE)KNOW.' One piece of evidence comes from the fact that the operator has a separate time of event which is expected to be different from that of the event/state denoted by the antecedent clause. Especially when the latter is in the past, the time of (DE)KNOWing must be different from that of the event in the antecedent clause. On the other hand, when the event in the antecedent clause is in the future, the time of (DE)KNOWing must be the future, that is, at the same time as the event time of the antecedent clause or after it. The reason is simple. Past events leave perceptible evidence so that an agent can perceive them at the time of utterance or after them. In contrast, future events can be perceived or experienced only in the future, after they occur. This is exactly what is observed in the following.

(37) cinan pam-ey pi-ka o-ass-ketun, swuy-ela.
   last night-at rain-nom come-past-if rest
   If it rained last night, take a rest (today).

(38) nayil pi-ka o-ketun, swuy-ela.
    tomorrow rain-nom come-if rest-imp
    If it rains tomorrow, take a rest (tomorrow).

In the first example, the event of raining last night does not affect the time of (DE)KNOWing it. As I said, the consequent clause always specifies the agent’s future actions, and the antecedent clause is the condition for the actions. So the time of (DE)KNOWing the event/state in the antecedent clause is always non-past. So the event of taking a rest is expected to occur today or later. In the second example, on the other
hand, the event of raining will occur at some time tomorrow. Then the
hearer is expected to know that event from direct experience tomorrow
or after that. So the time of taking a rest will also occur tomorrow or af­
ner that. Comparing the two examples, we can see that only a future
event has the effect of shifting the time of knowing to the time of event
in the antecedent clause or to the time after that. This is predicted when
the operator (DE)KNOW exists in the meaning of -ketun.16)

This also seems to be related to the impossibility of counterfactuals
with -ketun. Counterfactuals are conditionals by which the speakers
make unreal suppositions about the present or past, and make pre­
dictions, or reason, about the results based on causal relations between
events or states in given contexts. In a -ketun-conditional, the event or
state in the antecedent clause may be past or present, but there is an
operator of perception or personal feeling in the antecedent clause
which takes the event/state as its complement and shifts the time of
event to the future. The existence of the operator prevents the event/
state in the antecedent clause from having direct causal relationship to
the event/state in the consequent clause. And perception or personal
feeling is part of the presupposition, so the event/state is something that
is presupposed to be perceived or personally felt if it holds, not some­
thing unreal which is presupposed not to be perceived or personally felt.
So this operator makes this connective incompatible with a counter­
factual. The meaning of the operator constitutes part of the semantics of
-ketun.17)

A second piece of evidence for (DE)KNOW is observed when the sub­
jects of the antecedent and consequent clauses are the same person.
Suppose that there is a fly on the desk and you want to catch it or have
it caught. In this situation you might say one of the following.

(39) a. nay-ka sinmwun-ul tul-{ko iss}-umyen kukes-ul phali-lul
cap-keyss-ta.

16) Remember that in an epistemic conditional, the event time of the consequent clause can
precede that of the antecedent clause.

17) The fact that -ketun always selects a type of mood or modality which is related to future
actions also excludes the possibility of a -ketun-conditional as a counterfactual. A counter­
factual is an assertion of a causal relation between two unreal events/states, not a rela­
tion between an event/state and an action.
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I-nom newspaper-acc carry-prog-if it-with fly-acc catch-mod-dec
If I have a newspaper in my hand, I will catch the fly with it!

\textbf{b. ney-ka sinmwun-ul tul-{ko iss}-umyen kukes-ulo phali-lul cap-ala!}
you-nom newspaper-acc carry-prog-if it-with fly-acc catch-imp
If you have a newspaper in my hand, catch the fly with it!

In (39) the two conditional sentences are fine. In (40), on the other hand, the conditionals sound a little awkward. The only difference is that the latter include \textit{-ketun}, which has the meaning of 'x KNOW'. Those in (40) sound awkward because the speaker says the agents may not know that they have a newspaper in their own hands. The conditionals in (39) do not cause this kind of pragmatic awkwardness. Only whether the agents have a newspaper in their hands is the issue. Whether the agents will know that they do, when they do, is not the issue. The comparison of the conditionals above shows that \textit{-ketun} has the meaning of (DE)KNOW.

3.4. Summary

It has been discussed that there is a restriction of \textit{direct experience} on the antecedent clause of a \textit{-ketun}-conditional. We also have seen that a \textit{-ketun} conditional has the restriction on the mood or modality of the consequent clause which requires the agent to change his or her future actions according to the addressee's volition. Then what is the relation between the addressee's direct experience of some situation and his/her changing a future action? The connective \textit{-ketun} selects the mood of imperative, hortative or promissive, or the modality of the speaker's volition. These have one common property. According to
Vanderveken (1990), one factor of classifying speech acts is the notion of direction of fit between expressions ("words") and reality ("world"). Assertion is a case where words have to fit a state of affairs (= a possible world). The moods and modality that come with -ketun are cases where the world is required to fit the words by the future actions of the participants, but not vice versa. For a certain goal, an agent, whether an addressee or an addresser, has a certain plan to achieve the goal. Even if we are to achieve the same goal, the plan for the goal can change as the situation changes. The antecedent clause is the supposition of the situation change. The use of -ketun ensures the agent's cognitive state to change, which ensures his/her future plan to change. Then an action, which is part of the plan, also changes. This idea is schematically represented as follows:

\[(41) \quad (S: \text{Speaker/Addresser, } H: \text{Hearer/Addressee, } O: \text{Others})\]

\[a. \quad \phi\text{-ketun, } \psi \left\{\begin{array}{l}
(i) - la \\
(ii) - ca \\
(iii) - ma \\
(iv) - keys s - ta
\end{array}\right.\]

\[b. \quad \phi_i & \text{PRESUP(\text{DEKNOW})}
\left(\begin{array}{l}
(i) H \\
(ii) S + O \\
(iii) S \\
(iv) S
\end{array}\right) \rightarrow
\psi \in \left\{\begin{array}{l}
(i) H \\
(ii) S + O \\
(iii) S \\
(iv) S
\end{array}\right\} \text{\'s plan}\]

(41a) can be interpreted as (41b). Here \(\phi\) is the antecedent clause, and \(\psi\) the consequent clause. Promissives and sentences with the modality of the speaker's volition seem to have the same meaning structure, but they differ in preparatory conditions. In promissives, the proposed action is supposed to be good for the hearer. A sentence with the speaker's volition does not have such conditions.

Let's consider interrogative conditionals. These are cases where a

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18) Vanderveken (1990) claims that an illocutionary force is defined by six parameters: illocutionary point depending on the direction of fit, mode of achievement of illocutionary point, propositional content conditions, preparatory conditions, sincerity conditions and degree of strength.
speech act is embedded in another: a clause of the speaker's volition is embedded in a question. If we focus on the embedded speech act, the structural pattern of meaning is the same as the cases above.

\( \phi \)-ketun, \( \psi \left\{ (i) \right\} = \text{keyss - nya?} \)

\( b. (S \text{ asks } H) \text{ whether } \phi_i \text{ & PRESUP(DEKNOW}(\left\{ (i) \right\} H, S, p_i)) \)

\( \rightarrow \psi \in \left\{ (i) \right\} H \text{ plan} \)

I have not specified the meaning of question, but by the interrogatives the speaker asks whether the addressee (or the speaker) will include \( \psi \) in his/her plan as the result of DEKNOWing content of the antecedent clause. Ignoring the meaning of question, a conditional interrogative has the same meaning structure as those of other moods or modality above. In all cases the agent of DEKNOW in the antecedent clause is the same as the actor in the consequent clause. This indicates that knowing (by direct experience) that \( \phi \) causes the agent to include \( \phi \) in his/her plan. This is quite natural: unless your cognitive state changes, you will not decide to change your plan.

4. Analysis of -ketun-Conditionals

4.1. Relative Scopes of Operators

Following the standard analysis of speech acts, we assume that a sentence consists of a sentence radical and a modal element which is generally realized as mood. They correspond to the propositional content and illocutionary force in their semantics. Cf. Stenius (1967), Searle (1969), Vanderveken (1990), etc.

In giving the semantics of a -ketun-conditional, we need to specify the role of the antecedent clause in the semantics of the conditional. Most discussion of conditionals has been devoted to conditional declaratives, and the role of the antecedent clause has not been an issue. When the mood is not a declarative, the meaning relation between the antecedent and consequent clauses is not unanimously agreed on. Questions are the
most frequently discussed phenomenon in dealing with such an issue.

According to Hamblin (1973), the meaning of a question is the set of the meanings of its possible answers. Groenendijk and Stokhof (1984, 1989) implement this idea as sets of equivalence classes of possible worlds each of which corresponds to a possible answer. A simple Yes/No-question partitions the set of possible worlds into two, each corresponding to the affirmative and negative answers. A question is whether B's statement in (43) is an answer to the question.

(43) A: If Fred comes to the party, will Sue come too?
    B: Fred isn't coming.

In one analysis, the conditional question is assumed to partition possible worlds into three blocks: one is the set of possible worlds in which Fred does not come to the party, another the set of possible worlds in which Fred comes to the party and Sue comes too, and the last the set of possible worlds in which Fred comes to the party and Sue does not come. In this analysis, B's statement in (43) is an answer to A's question in the sense that it selects the first block, excluding the last two blocks. In another analysis, B's reply in (43) is not an answer to the conditional question. In this analysis, the conditional question presupposes that it is possible that the antecedent clause is true, and the issue raised by the question is whether Sue will come or not. B's reply in (43) is only the denial of the presupposition, not an answer to the current issue. This analysis seems to be intuitively correct.19)

In this paper, I discuss imperatives. The correct analysis of conditional imperatives is expected to shed light on the correct analysis of conditional interrogatives. To give the semantics of an imperative, we need to make some assumptions. We assume that an imperative is derived from a proposition and two operators, following Segerberg (1990). One operator is $\delta$, which takes a proposition and yields a corresponding action. The other operator is COMM, which takes an action into a command. So

19) There is some evidence for this analysis. For a counterfactual conditional question, the negation of the antecedent clause cannot be considered as an answer. It is simply the presupposition (or implicature) of the counterfactual. Furthermore, a conditional question is a Yes/No question, but if the negation of the antecedent clause is taken to be an answer, the question is not a Yes/No question. There is other evidence for supporting this analysis, but I will not go into this further.
COMM $\delta p$ stands for 'making $p$ true (= an action corresponding to the proposition $p$) is commanded.' To deal with conditional imperatives, it is necessary to determine relative scopes of these two operators with respect to the antecedent and consequent clauses.

Piwek (2000) discussed such an issue. Consider the following example.

(44) Make a cross, if you encounter a vampire.

In Classical Logic the formula $p \rightarrow q$ is considered as equivalent to $\neg p \land q$. Hamblin (1987) and Piwek (2000) suggest the possibility that in order to satisfy the command, the addressee avoids a vampire. That is, the action denoted by the negation of the antecedent clause can be a way of satisfying a conditional imperative. However, this is not a valid possibility. We have seen that the restrictions on the antecedent clause of a -ketun-conditional is different from those on the consequent clause. The antecedent clause of a -ketun-conditional does not have to denote an action. When it denotes a state, there is no option for taking the negation of the antecedent clause to be an action to satisfy the conditional imperative. Consider the following example.

(45) Make a cross, if you are horrified.

In this example, the if-clause denotes a state, not an action. So the if-clause does not convey an action which can satisfy the conditional command. This shows that in a conditional imperative, the antecedent clause must not be part of an action.

We can say similar things about a -ketun-conditional.

(46) a. pang-i etwup-ketun, pwul-ul khye-la.
room-nom dark-if light-ace turn_on-imp
If the room is dark, turn on the light.

(47) b. (the room is dark)$_i$ $\land$ PRESUP(DEKNOW($a$, $p_i$)) $\rightarrow a$ turn on the light!
$\neg$(the room is dark)$_i$ $\land$ PRESUP(DEKNOW($a$, $p_i$))) $\lor a$ turn on the light!

The meaning of (46a) can be represented as in (46b). Here $a$ is the
addressee. I have not specified the scope of the command operator COMM here, but it is clear that (the room is dark) is a state, so it cannot be an action. The presupposition part cannot be an action, either. So in a -ketun-conditional, only the consequent clause can be an action.

The next question is whether the antecedent clause is part of the command. In declaratives, we often find examples in which the antecedent clause is not part of the proposition relevant in a speech act but modifies the speech act.

(47) If you are hungry, you will like these sandwiches.

(48) If you are hungry, there are some sandwiches in the fridge.

In the first example, the assertion is the cause-effect relation between the antecedent and consequent clauses. In the second example, on the other hand, the assertion is only the consequent clause, and the antecedent clause gives the condition for the assertion being made. This can be represented as follows:

(49) If you are hungry, ASSERT(there are some sandwiches in the fridge)

A conditional imperative might have two possible scopes of COMM, so (50) could be interpreted as in (51), given below.

(50) If $\phi$, $\delta \psi$!

(51) a. If $\phi$, COMM($\delta \psi$)
   b. COMM(if $\phi$, $\delta \psi$)

However, I cannot think of any example of a conditional imperative which has the meaning in (51a). 20) (46) only has the following meaning.

20) We could find an example which seems to have such a meaning structure. Suppose that a person is hanging from a bridge by a rope. We want to pull him onto the bridge, but the person wants to fall into the water and swim to the side of the river. In this situation, I might say the following sentence.

(i) ney-ka kuli wenha-n-tamyen, ku-uy cwul-ul noh-ala!
    you-nom so want-pres-if he-poss rope-acc release-imp
(52) \text{COMM}(\text{the room is dark})_i \land \text{PRESUP(DEKNOW}(a, p)) \rightarrow \delta(a \text{ turn on the light})

In a -ketun-conditional, in particular, the agent of (DE)KNOW in the antecedent clause and the agent of the action in the consequent clause are always the same. This indicates the antecedent clause is a condition for the agent's action, not a condition for the speaker's command. I regard -ketun-conditionals as typical examples of conditional imperatives. Now that -ketun-conditionals are commands of conditional actions, it is plausible to claim that conditional imperatives are commands of conditional actions.

One piece of evidence for the idea of command of conditional action is that commands show some difference in quantification. Krifka (2000) claims that only conjunctive quantifiers can quantify into speech acts. He claimed this with respect to questions. Quantificational expressions like motun 'every' are examples. He also claims that a quantifier which quantifies into a speech act is a topic. In imperatives, however, disjunctive quantifiers like myech 'several' can quantify into actions.

(53) a. ??taypwupwunuy haksayng-{i/un} ttena-la!
    most students-{nom/top} leave-imp
    Most students leave! (\neq A \text{ leave!} \land B \text{ leave!})

b. myech haksayng-{i/un} ttena-la!
    several student-{nom/top} leave
    A few students leave!

c. motun haksayng-{i/un} ttena-la!
    every student-{nom/top} leave
    Every student leave! (\neq A \text{ leave!} \land B \text{ leave!} \land C \text{ leave!})

There seem to be some restrictions on quantifications into actions, which I do not know yet: for some reason, taypwupwun 'most' is not allowed in imperatives. However, other quantifiers can be used in

If you_1 want it so much, let go of his_2 rope.

Note that you in the antecedent clause and his in the consequent clause refer to the same individual. This shows that the addressee for the antecedent clause and that for the consequent clause are different. For this reason the sentence can be considered as two utterances.
imperatives. Even a non-conjunctive quantifier like *myech haksayng* 'a few students' can be used in an imperative sentence. In this case the only interpretation is the one in which the quantifier has the scope within the imperative mood. Even the conjunctive quantifier with *motun* combines with a nominative case marker. This shows that the universal quantifier is not a topic, and can be regarded as having narrower scope than the operator COMM. If there are three students, A, B and C, in the room, the imperative with a universal quantifier is one command in which each student is required to leave. So the addressee is the three students, not each of them.

The same pattern is observed in adverbial quantificational expressions too. Consider the following examples.

(54) chinkwu-ka o-ketun {hangsang/cacwu/kakkum/??pothong} ku
kos-ey ka-la.
friend-nom come-if {always/often/sometimes/usually} the place-to
do-imp

If you DEKNOW that a friend has come, {always/often/sometimes/usually} visit the place!

For some reason we do not know yet, adverbial quantificational expressions like *pothong* and *taykay*, which correspond to a nominal quantifier with *taypwupwun* 'most,' are not allowed in imperatives. However, other quantificational expressions like *hangsang* 'always,' *myech* 'several,' *kakkum/ttaytaylo* 'sometimes' can be used in imperatives, whether conjunctive or non-conjunctive. This shows that the quantificational expressions have the scope within the command mood. Then the *if*-clauses, which are the restrictors of the quantifications, can be taken to be within the scope of imperative mood. We have not seen evidence for making a weaker claim that a quantifier can quantify into commands, but at the moment I cannot find evidence for such a claim. Considering these facts, the meaning of a conditional imperative can be represented as (51b). This roughly means that it is commanded that 'if (you comes to know) φ is true, then you make φ true.'

I have only discussed imperatives, but the same structure of meaning can apply to other moods and modality which come in *ketun*-conditionals. That is, the operator which takes a proposition into an action has the scope of the consequent clause and the mood or modality
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marker has the scope of the whole conditional. The only difference between various -ketun-conditionals lies in who adds the action to his/her plan.

4.2. Semantics of -ketun-Conditionals

To give the semantics of a -ketun-conditional, we need to assume more notions, and give their semantics. We assume that an action is derived from a proposition. An action is a change from a state of affairs in which the action is not done yet to a state of affairs in which the action has been done. To express such a change, Segerberg (1990) expresses an action as a set of pairs of possible worlds \(<w,w'>\), where the first world is a state of affairs in which the action can be performed, and the second world is an outcome of performing the action in the first world. Then we can get an action from a proposition via a function \([\delta]\) (= D).

\[
(55) \text{For a given proposition } p, \text{ the corresponding action } [[\delta p]] = D[[p]] = \{<w,w'> : w \text{ is compatible with } p \& w' \in [[p]]\}.
\]

For a conditional imperative, we need a conditional action. One difficulty with giving the meaning of a conditional action is that the denotation of the antecedent clause is different in types from that of the consequent clause: the former is a proposition while the latter is a relation between possible worlds. A similar situation occurs in conditional interrogatives. Considering non-declarative conditionals, the best way of interpretation is to take the antecedent clause to be the restrictor of the domain of quantification,\(^{21}\)

\[
(56) [[\phi \rightarrow \delta \psi]] = \{<w,w'> \in [[\delta \psi]] : w \in [[\phi]]\}
\]

A plan is a sequence of actions, so it is also represented as a set of pairs of possible worlds.

\(^{21}\) This formulation does not stick to the idea of compositionality, but it might be required that conditionals with different speech acts need different interpretations. To maintain compositionality, we may need to make all speech acts have the same type of denotation. I will leave this problem open.
An action is carried out to achieve a goal under a plan which consists of a series of actions, and the action is only part of the plan. So first we need to discuss how a goal is set. A goal is a situation which the agent takes to be desirable and possible, and which he/she has decided to realize. A goal can be taken to be a proposition, which is represented as a set of possible worlds which are compatible with the goal situation. In order to set a goal, the agent first has to appreciate the current situation and decide whether a goal is possible at the current context. So at the bottom of the meaning of an imperative lie an agent's beliefs about the current situation and his/her goal. Based on these two, the agent makes a plan to achieve the goal. So a plan can be defined as follows:

(58) $P$ is a plan for a goal $g$ for an agent $A$ in a possible world $w$ iff

$$\{w' : w' \in Bel(A,w) \& <w',w'> \in [[P]] \} \subseteq g$$

That is, a plan is a series of actions by which an agent thinks that he can reach the goal from what the agent thinks is the current situation.

Piwek (2000) only assumes a set of goals to give the semantics of an imperative. However, this does not guarantee the correct semantics of a conditional imperative. Consider the following examples.

(59) If John comes to the party, invite Mary. But if Bill comes too, don't invite her.

(60) If John comes to the party, invite Mary. But if Mary doesn't want to come, invite Sue instead.

These examples show that the goal may change as the situation changes. Suppose that in (59) the speaker wants to make John and Mary closer to each other. But when the speaker considers the case where John and Bill come to the party, his/her goal may become avoiding a disaster since Mary is double dating with John and Bill. In (60), the command in the first sentence is canceled by the second sentence. We can easily think of a case where the goal changes as we move from the first
command to the second. To John, Mary is a girlfriend and Sue a business partner. The party can be a chance for John's reconciling with Mary, but also can be a chance for a better business. These show that conditional imperatives are non-monotonic, just like conditional declaratives. To deal with non-monotonicity, we need an ordered set of goals. If a condition for an action changes, the agent in question can change the goal into the most preferable one at the given situation.

Now we are ready to give the semantics of a -ketun-conditional on the basis of the notions goal, plan and an agent's beliefs. Before I give the formal semantics of a -ketun-conditional, I will give an informal description of the semantics of the conditional.

(61) a. For a set of beliefs B and an ordered set of goals G, a conditional \( \phi \text{-ketun } \psi \text{-la!} \) is \( (\phi \rightarrow \delta \psi) \subseteq P \) such that \( B \cup \{ \phi \} \cup P \vdash \gamma \left(G, B \cup \{ \phi \}\right)\).

b. \( \gamma \) is a function such that \( \gamma(G,B) \) is the most preferable goal in \( G \) which is compatible with \( B \).

Here \( G \) is an ordered set of goals given in the context, \( \gamma \) is a function which selects the most preferable goal from an ordered set of goals and a set of beliefs. A speaker utters a conditional imperative to make an agent put a conditional action \( (\phi \rightarrow \delta \psi) \) in his/her plan. The conditional action is based on a supposition \( \phi \) which does not hold yet but which will lead to a goal, together with the agent's beliefs \( B \) and a plan \( P \) which includes the action in the consequent clause. Here the goal changes as the supposition changes. The change of a goal will also change the plan, as given in (58). Hence an action in the plan changes. The antecedent clauses of -ketun-conditionals have the operator (DE)KNOW. So it is quite natural that the content in the antecedent clause plays a role in determining a goal together with the agent's other beliefs.

In implementing this idea in the formal semantics, we need to specify how an agent's set of beliefs increases. An agent's belief state in a possible world is \( \text{Bel}(A,w) \), which is a set of possible worlds that are compatible with what \( A \) believes in \( w \). A change in one's belief state can be captured by a change of a possible world. For a possible world \( w \) and an agent \( A \), \( A \)'s belief state is \( \text{Bel}(A,w) \). When \( A \) comes to add the information \( \phi \), \( A \)'s belief state changes into \( \text{Bel}(A,w) \cap [\llbracket \phi \rrbracket] \). This means that \( A \) is in a different world \( w' \) such that \( \text{Bel}(A,w') \subseteq \text{Bel}(A,w) \cap [\llbracket \phi \rrbracket] \).
In some possible world like that, however, the agent gets more than the information $[[\phi]]$. What we want is the minimal change of information. For this purpose, we need the function $\text{Sim}_{w}$, which is required in the interpretation of a conditional in general.\(^{22}\)

\begin{enumerate}
\item For an agent $A$ in a possible world $w$, if (s)he gets new information $[[\phi]]$, (s)he gets in a possible world in $\text{Sim}_{w}(w' \in W: \text{Bel}(A,w') \subseteq \text{Bel}(A,w) \cap [[\phi]])$.
\item $\text{Sim}_{w}(\phi) = \{w' \in W : w' \in \phi \land w' \text{ resembles } w \text{ no less than any other } w'' \in \phi\}$
\end{enumerate}

The interpretation of a *-ketun*-conditional is defined with respect to those possible worlds in which the agent's belief state has changed minimally.

For a given ordered set of goals $G$ and the agent's new belief state $\text{Bel}(A,w')$, a function $\gamma$ is defined in such a way that it takes $G$ and $\text{Bel}(A,w')$ and yields the most preferable goal that is possible in $\text{Bel}(A,w')$. Given a belief state $\text{Bel}(A,w')$ and an ordered set of goals $G$, $\gamma(G,\text{Bel}(A,w'))$ is the most preferable goal. The most preferable goal can be reached if the agent carries out the plan $P$ for the goal. The resulting state after carrying out a plan $P$ is defined as follows:

\begin{enumerate}
\item In a belief state $\phi$, if a plan $P$ is carried out, the resulting state $[[\phi]] \circ [[P]]$ is defined as $\{w' \in W : w \in [[\phi]] \land <w,w'> \in [[P]]\}$
\end{enumerate}

When the resulting state satisfies a goal $g$, it becomes a subset of $g$. The conditional imperative is satisfied by putting the conditional action $\phi \rightarrow \delta \psi$ in the plan $P$. This can be represented by a subset relation. So the following becomes the interpretation of a *-ketun*-conditional.

\begin{enumerate}
\item For an agent $A$ and an ordered set of goals $G$ in a possible world $w$, $\text{COMM} [[\phi_i \& \text{PRESUP}(\text{DEKNOW}(A, p_i)) \rightarrow \delta \psi]] = \text{def}$ for every
\end{enumerate}

\(^{22}\) A conditional 'if $\phi$, then $\psi$' is interpreted as follows:

\begin{enumerate}
\item a. $[[\text{if } \phi, \psi]] = \{w \in W : \text{Sim}_{w}(\phi) \subseteq \psi\}$
\item $\text{Sim}_{w}(\phi) = \{w' \in W : wRw \land w' \text{ resembles } w \text{ no less than any other } w'' \in \phi\}$, where $R$ is an accessible relationship.
\end{enumerate}

For the interpretation of a conditional imperative, we need the same idea.
possible world $w''$ in $\text{Sim}_w\{w': \text{Bel}(A, w') \subseteq \text{Bel}(A, w) \cap \llbracket \phi \rrbracket\}$,
$\text{Bel}(A, w') \circ \llbracket P \rrbracket \subseteq \gamma(G, \text{Bel}(A, w'))$ and $\llbracket P \rrbracket \subseteq \llbracket (\phi \rightarrow \delta \psi) \rrbracket$

Roughly, the meaning of a $-ketun$-conditional is like this. In an agent's belief state $\text{Bel}(A, w)$, the agent supposes a case where $\phi$ holds. Since $\phi$ becomes part of the agent's belief, that supposition means that the agent supposes that (s)he is in a possible world $w''$ such that $w'' \in \text{Sim}_w\{w': \text{Bel}(A, w') \subseteq \text{Bel}(A, w) \cap \llbracket w\phi \rrbracket\}).$ For the supposed case, the agent sets a goal $\gamma(G, \text{Bel}(A, w'))$ and a plan $P$. Then the conditional action $(\phi \rightarrow \delta \psi)$ must be part of the plan. In this formulation, I assume that for a single goal, there is a unique plan. This assumption can be loosened, but I will not go into this possibility.

5. Conclusion

In this paper, I have shown that $-ketun$ selects particular moods and modalities in the consequent clause, and this is closely related to the semantics of $-ketun$ itself. More specifically, change of future actions is the result of cognitive change which comes from the operator of (DE)KNOW. The restriction on the mood or modality in a $-ketun$-conditional is not exceptional. In Korean, it is general that a conditional connective has an implicit operator which selects or deselects a particular mood or modality. A conditional connective $-\{ta/la\}-myen$ is similar to $-myen$ as the form shows. But one difference is that $-ta-myen$ always allows epistemic modality, while $-(u)myen$ does not. As discussed in Yeom (2004), this is due to the additional implicit operator settledness which is carried by the connective $-ta/la-myen$. We can find more examples in which there are restrictions on the moods of the consequent clauses. A conditional connective $-\{a/e\}ya$ 'only if' does not combine with epistemic modality. Another conditional connective $-tentul$ only allows a counterfactual reading. Even though it has not been found what operators are in the antecedant clause of these two conditionals, the restrictions on the moods of the latter two conditionals are likely to be due to some (implicit) operators in addition to the normal conditional operator. In this respect, the analysis of a $-ketun$-condition in this paper is on the right track.

I have also raised some issues in relation to the interpretation of non-de-
clarative conditionals. A conditional imperative is generally considered to be a conditional command. However, I have claimed that a conditional imperative can be a command of a conditional action. I think this study sheds light on the study of other conditionals in non-declarative mood.

References


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