Expressing prediction and epistemicity with Korean *-(u)l kes-i* and Mandarin Chinese *hui*

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Abstract

Due to the non-factual nature of futurity, there is an ongoing ambiguity between modality and futurity. The same ambiguity persists in Korean *-(u)l kes-i* and Mandarin Chinese *hui* that both express an estimation of the likelihood that the state of affairs will be realized in the world, involving the speaker's conjecture. A conjecture can be a statement expressing a prediction about what might happen or an epistemic assumption that draws a conclusion about the past course of events. This paper aims to show that *-(u)l kes-i* can express both prediction and epistemicity whereas the use of *hui* is limited to prediction. The present paper argues that *-(u)l kes-i* encodes the reasoning process which can be reversible from cause to consequence and consequence to cause, whereas *hui* encodes linkage between events in a forward direction whereby cause precedes consequence.

Keywords: *-(u)l kes-i, hui,* conjecture, prediction, epistemicity, cause, consequence

1 Introduction

Commonly, *-(u)l kes-i* and *hui* both encode prediction based on the speaker's observation. In Korea, *-(u)l kes-i*, which is based on a periphrastic construction, [1] is explained by Kim (1987) as expressing the speaker's volition or supposition and is used for both a definite future and a probable present or past. In addition, the adnominal ending *-(u)l* adds uncertainty as it indicates that an event has not yet occurred. [2]

(1) kkamakwi-ka wul-ko iss-ta
    crow-Nom cry-Con exist-Dec
    mwen-ka pwulkilha-n il-i
    something-Nom be:ominous-Adn thing-Nom
    ilena-l kes-i-ta
    happen-Adn thing-Cop-Dec
    'A crowd is crying. Something bad will happen'. [3] (Kim 2012:39)

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[1] *-(u)l kes-i* is a combination of an adnominal form *-(u)l* and the pronominal kes 'thing' and the copula i 'be'.

[2] A reviewer made a comment that instead of *-(u)l kes-i* as a modal auxiliary, the meanings of prediction and epistemicity can better be attributed to the adnominal ending *-(u)l* as opposed to *-(nu)n*. There has been an approach to dividing *-(u)l* and *-(nu)n* as irrealis and realis markers, which involves the concept of modality and defines them as modal markers. However, there is an ongoing debate over the usage of *-(u)l*. Pak (2009) argues that *-(u)l* still requires a periphrastic construction such as *-(u)l kes kath* to fully express the speaker's

conjecture. Lim (2008) defines *-(u)l kes-i* as an epistemic modal that draws a conclusion based on common knowledge. Given this, this paper defines *-(u)l kes-i* as a modal marker instead of a modal auxiliary.

[3] Abbreviations used in this paper: Acc (accusative), Adn (adnominal), Cl (classifier), Cop (coupla), Comp (complementizer), Con (Connective), Dec (declarative), Ind (indicative morpheme), Nom (nominative), Nmlz (nominalization), Prs (present), Pst (past), Part (particle), Top (topic)

In Mandarin Chinese, with no morphological tenses, it is commonly believed that other factors such as tense and aspect particles contribute to expressing futurity. The modal auxiliary verb *hui* 'may, will' presents the speaker's judgment of the possibility of a situation.[4] Fei Ren (2008) argues that when using *hui*, the speaker makes a predication based on what is observed and evaluates the possibility of a situation at the moment of speaking, based on information not explicitly stated in the sentence.

(2) Kan yangzi,   hui xiayu
    Look-appearance, Mod-rain
    'It looks like it will rain.'   (Zhu 1982: 63)

As seen above, *-(u)l kes-i* and *hui* express a prediction which is derived from the construction that q is contingent upon p. Lim (2008: 222, 237-238) claims that *-(u)l kes-i* is an epistemic modal marker that draws a conclusion based on common knowledge and denotes a conjecture based on internally-processed information. As a result, *-(u)l kes-i* expresses the speaker's conjecture based on the knowledge or beliefs of the speaker or others, as opposed to *-keyss* that expresses the speaker's conjecture based on the speaker's perception on the spot or his/her perceptivity, as illustrated below by Lim:

(3) a. ya, masiss-keyss-ta
     oh, be:delicious-Mod-Dec
     'Oh, it must be delicious.'
   b. ne-to masiss-ul ke-ya
     you-too be:delicious-Adn-thing-be-INT
     'you will like it too.'

Lim explains that (3a) denotes the speaker's conjecture about the food that is just ordered on the spot, whereas (3b) implies a conjecture based on past knowledge about the food that the speaker is already acquainted with.

In his analysis of Mandarin Chinese modal verbs, *neng* and *hui*, Min (2007: 77) argues that *neng* and *hui* are often found in complex sentences, in which *hui* establishes the presence of a logical and causal relation between the main and subordinate clauses, in contrast to *neng* that does not imply causation.

Puente, et al. (2009) explain that causation is a useful way of generating knowledge and providing explanations and is a type of relationship between two entities, cause and effect, and at the same time, causality not only concerns causal statements but also conditional sentences. In conditional statements, causality generally emerges from the entailment relationship between the antecedent and the consequence.

Despite this common feature of *-(u)l kes-i* and *hui*, the process of predicting an effect from a cause can also be reversed, and reasoning backward requires the process of inferring a cause from an effect. In terms of two reasoning processes, this paper aims to examine how *-(u)l kes-i* and *hui* are realized: 1) in predictive statements, constructed in the cause to consequence order, including generics and habituals in which general information is used to predict future consequences; 2) in epistemic statements[5] which provide an account of the state of the conjecture from the known effect; and 3) in the causal and conditional constructions through a corpus investigation. It will be argued that in the cause to consequence (p→q) order, *-(u)l kes-i* and *hui* are both used to denote prediction, while in the consequence to cause (q→p) order, only *-(u)l kes-i* can be applied to express an epistemic assumption.

2 Predictions and Generics/Habituals

Prediction entails a causal relationship in which the cause under a certain condition gives rise to the effect. According to Dancygier (1998), in the construction of predictive conditionals, a causal relation between the two events exist and then creates an environment that entails a sequential relation, as illustrated by Dancygier (1998:86) in the following example:

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(4) a. If Mary goes to the dentist, she'll be late.

Like the English *will*, in Korean and Mandarin Chinese, *-(u)l kes-i* and *hui* are used to express prediction.

(4) b. Mali-nun chikwa-ey   ka-myen nuc-ul
      Mary-Top dentist-at   go-if   be:late-Adn
      kes-i-ta
      thing-Cop-Dec
   c. Mali rugu qu yake   jiu   hui   chidao
      Mary-if -go-dentist-then-Mod-be:late

Not only in a typical conditional which predicts a likely result in the future if the condition is fulfilled, but also in past hypothetical and counterfactual situations whereby a prediction about the occurrence of a hypothetical or counterfactual [6]event is still contingent on the given circumstance, *-(u)l kes-i* and *hui* are equally used to denote a hypothetical predictive meaning as illustrated in (5):

(5) a. ku-ka   sala-iss-ta-myen   nay phyen
      he-Nom be:alive-exist-Dec-if my side
      tul-ess-ul   kes-i-ta
      take-Pst-Adn thing-Cop-Dec   (from Internet)
      'If he were alive, he would have taken my side.'
   b. youqi ruguo xianzai hai huo zhe yiding
      youqi-if   - now-still-alive-Part-certainly
      hui   hen gaoxing ba
      Mod- very-happy-Part
      'If Youqi were alive, he would be very happy'.   (Mi(迷)：175)

The cause-consequence order is argued to be found in generic truths and habitual actions which are often expressed by *will* in English. Ziegeler (2006) claims that *will* can indicate generics due to the operation of inductive inferences by generalizing from the truth of p (at all times, including the future) to p as a future event. In the similar manner, in Mandarin Chinese, *hui* can indicate genericity. With regard to *hui*, Iljic (1985) argues that the predictive meaning of *hui* comes from the generalization of a potential property as in "When the fruit on the tree

is ripe, it will naturally fall down" (shushang de guozi shu le ziran hui diao xia).

As seen in the following examples, *will* and *hui* are both used to indicate generic truths.

(6) a. Oil will float on water.   (Huddleston 1995)
   b. you yudao shui hui piao zai shui mianshang
      oil-meet-water-Mod-float-in-water-above
   c. kilum-un mwul-ey ttu-ki
      oil-Top water-at   float-Comp
      malyen-i-ta
      provision-Cop-Dec

Unlike (6a) and (6b), *-(u)l kes-i* cannot be used to express generality as seen in (6c). In Korean, law-like events are expressed by other modals such as *-ki maryeonida* or *nun pep ita*, or a generic truth is realized using an if-statement constructed with a regular declarative sentence in the main clause. Park (2013) claims that in Korean, generic truths are constructed by an if-clause with the Korean conditional marker that encodes a strong belief of the speaker towards the proposition of the apodosis, as illustrated by Park (2013:295):

(7) pi-ka   manhi o-myen kang-mwul-i
    Rain-Nom a lot   come-if river-water-Nom
    pwut-nun-ta.
    flood-Ind-Dec
    'When it rains a lot, the river floods'.

Generality that describes generic characteristics exists as repeatable events, and this repetitive propensity of *will* and *hui* can also express habituality as in (8a) and (8b), in contrast to (8c) in Korean which describes a habitual behavior as a fact in the unmarked indicative form.

(8) a. They'll go on for hours without speaking to each other using a specific subject. (Huddleston 1995)
   b. ta meitian   dou hui   wushui
      he-everyday-also-Mod-take:a:nap
      'He takes a nap everyday'
   c. ku-nun mayil   naccam-ul ca-n-ta
      he-Nom everyday nap-Acc sleep-Ind-Dec

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[6] According to Ziegeler (2006:140), the difference between hypothetical and counterfactual concepts is the absence and presence of contextual knowledge.

In Korean, not only generality but also habituality is expressed by a specific modal that describes a habitual event or an if-statement accompanied by the indicative form in the main clause as in (9a) and (9b).

(9) a. kutul-un   yennyensayng i-la
       they-Top siblings:born:within:a:year be-as
       kotcal tathwu-kon ha-n-ta
       often argue-Comp do-Ind-Dec
       'Since they are born within a year of each
       other, they tend to argue often.'   (Internet)
    b. kutul-un manna-ki-man   ha-myen
       they-Top meet-Nmlz-only do-if
       tathwu-n-ta
       argue-Ind-Dec
       'Whenever they meet, they argue.'   (Internet)

In the cause-to-effect reasoning which is a typical process of predicting an event from a piece of knowledge, *-(u)l kes-i* and *hui* can both be used to express a conjecture in hypothetical and counterfactual situations as well. In the same vein, generics and habituals are constructed on the cause-consequence structure to predict an event which is not yet actualized. Ziegeler (2013) claims that in generics, the English modal *will* allows for a possible future prediction to be made. In Mandarin Chinese, like the English *will*, *hui* is often used to indicate generic and habitual events, whereas Korean denotes generality and habituality through specific modals or an if-statement constructed with the unmarked declarative main clause to indicate a factual statement. [7]

As will be presented later in epistemicity, not only in a causal conjunction but also in a conditional conjunction, when there is a strong causal relation with an apparent sequentiality, Korean uses the indicative form to describe factual knowledge or belief, in contrast to Mandarin Chinese that employs *hui*. Let us consider (10):

(10) a. ku-key   ppalli meku-myen cheyha-n-ta
        That-thing fast eat-if   indigest-Ind-Dec
                                      Park (2013: 291)
     b. ruguo ni chi de tai kuai, jiu hui shanghai

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[7] Chung (2012:221) argues that in Korean, an inference mechanism is utilized to indicate indirect evidence but when evidence is direct, things that are generally known, such as

if-you-eat-Part-too-fast, then-Mod-damage
ni de wei
you-Gen-stomach   (吃对了，病就少)

3   Epistemicity and assumptions

A process of prediction can be reversed. With backward reasoning, an inference can be derived in the consequence to cause order. Dancygier (1998:86) claims that causal and predictive sentences can be seen as reversed, expressing inferences, not predictions, and the relation is based on assumptions as in:

(11) "If Mary is late, she went to the dentist".

According to Dancygier, since epistemic conditionals are non-predictive, they are infelicitous with hypothetical forms, and the epistemic modal 'must' can be used, which is then understood as 'it means that'.

In Mandarin Chinese, *hui* cannot be used to express an epistemic relation. Instead, it is rephrased with epistemic modals such as *yinggai*. However, the Korean modal *-(u)l kes-i* can still be applied to denote this reasoning process in the reverse direction, as illustrated in (12) :

(12) a.manyak kil-i   cec-ess-ta-myen, ecey
       in:case road-Nom wet-Pst-Dec-if, yesterday
       pam-ey pi-ka   w-ass-ul   kes-i-ta
       night-at rain-Nom com-Pst-Adn-thing-Cop-
       Dec   (Yeom 2005:11)
     b. ruguo di shi le，   zuotian yinggai/*hui
        If-ground-wet-Part, yesterday-Mod
        xia guo yu
        come-Part-rain
        'If the road is wet, last night, it must have
         rained'

In fact, in Korean, *-(u)l kes-i* can also be used with the causal connective *-nikka*. Park (2013:155) shows that the reading of the causal connective *-nikka* is determined by the presence of a modal in the main clause. In his analysis about the Korean causal connective *-nikka*, Park presents that if the

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universal truth and generic situations, are expressed by regular declarative non-evidential sentences.

proposition of the main clause includes an epistemic modal such as *thullimepsta* 'must' or *-(u)l kesita* 'will', *-nikka* encodes a reason to justify the outcome of the main clause. On the other hand, if a modal is not realized in the proposition of the main clause, the *nikka* clause just expresses causality.[8]

As observed above in generics and habituals, in Korean, generic and habitual statements with a tight causal relation can also be realized by an if-construction with the unmarked indicative form in the main clause, while a predictive statement that indicates a specific outcome contingent upon a specific piece of information is expressed by *-(u)l kes-i*.

In contrast, in Mandarin Chinese, when expressing a causal conjunction with a causal connective *yinwei*, *hui* cannot have an epistemic meaning that expresses the speaker's epistemic assumption but still encodes a linkage between propositions in which q is contingent on p as in (13):

(13) yinwei you ai，cai　　hui qidai
　　because-exist-love, only:then-Mod-expect
　　'We expect because there is love.' (a novel title)

Then, the question remains why in epistemic relations, *-(u)l kes-i* remains applicable. The reason can be found in the fact that *-kes-i*, which can also be realized in combination with *-(nu)n* to indicate present and past situations, actually offers a reason for an inference made from the known facts. Jung (2016) argues that the most essential function of *-(nu)n kes-i* is to explain a cause or reason derived from the background knowledge as in (14):

(14) ku-nun "Eureka"-lako oychi-mye mwul
　　he-Nom 'Eureka -as　shout-while water
　　pakk-ulo　ttwichyenaw-ass-ta.
　　outside-to　come:out-Pst-Dec
← 　haykyel-pangan-ul palkyenha-n kes-i-ta

solution-Acc discover-Adn thing-Cop-Dec
'He jumped out of the bathtub, shouting, Eureka! He found a solution.'
(Jung 2016:250)

Lycan (2002) argues that explanation and epistemology are closely related, since the notion of explanation is itself exactly an epistemic notion. The function of *kes-i* to provide an account of reason is also supported by Foong *et al.* (2011:485) who claim that *kes-i* entails an epistemic meaning of strong probability*,* since *kes-ita* as in *-(nu)n kes-i* itself encodes the presence of evidence, which is presupposed by the speaker. In addition to the justification of a reason embedded in *kes-i*, due to the meaning of *-(u)l* that indicates non-actuality [9], *-(u)l kes-i* can provide predictive and epistemic readings at the same time depending on the reasoning process.

Unlike *-(u)l kes-i*, *hui* is based on the cause-and-effect reasoning that normally entails sequentiality, which then naturally encodes prediction, but it cannot derive an inference to justify the accepting of a conclusion as seen in (12b).

The fact that *hui* in positive statements especially with a stative verb that describes a state of being cannot have an epistemic reading can be supportive of this claim. It has been observed that the epistemic meaning of *hui* is more natural in negations and interrogatives (Tsang 1981).[10] The meaning of *hui* in positive statements is not epistemic, as illustrated by Tsang (1981:155):

(15) a.　Ta hui bu hui shi ge jingcha?
　　　he-may-not-may-be-Cl-policeman
　　　'May he be a policeman?'
　　b.　Ta bu hui shi yi ge jingcha.
　　　he-not-may-be-one-Cl-policeman
　　　'He may not be a policeman'.
　　c.　Ta hui shi yi ge jingcha.
　　　he-may-be-one-Cl-policeman
　　　'He will become a policeman.' [11]

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[8] Examples proposed by Park (2013:155) are as follows:
a. onul mina-ka　hakkyo-ey an o-ass-unikka
　today Mina-Nom school-to not come-Pst-because
　aphun key thullimeps-ta.
　sick Comp sure-Dec
　'Mina must be sick, because she didn't come to school today.'
b. hay-ka ci-nikka　　pakk-i kkamkkamhata.
　sun-Nom go:down-because outside-Nom dark
　'Because the sun has set, it is dark outside.'

[9] Lim and Chang (1995) explain that the relativizer *-l* denotes an event status that the event has not yet occurred, whereas the relativizer *-n* expresses a past situation and the relativizer *-nun*, progressiveness.
[10] Palmer (1986) explains that this is possibly because negatives and interrogatives are non-assertive, which reinforces uncertainty.
[11] In the original text, 'Ta hui shi yi ge jingcha.'was translated as 'he will be a policeman.'. However, in this paper, it is

Especially in realis contexts, *hui* appears to express an epistemic claim instead of a prediction, as the utterance expresses a realis state at some point in the past. However, it is actually impossible to make an epistemic conjecture about definite things. In fact, in realis contexts, *hui* does not encode an epistemic assumption by reasoning backwards but still a prediction by reasoning forward just from the event time set in the past. Let us consider the examples illustrated by Lu (1999:278) as in (16):

(16) a. mei xiang dao hui zhenme shunli
   Not-think-Part-Mod-this-smoothly
   'It was not expected that things would go so smoothly.'
   b. ta zenme hui zhidao?
   he-how-Mod-know
   'How would he know?'

Lu explains that when expressing probability, *hui* can be used in realis situations. As a matter of fact, (16a) and (16b) indicate surprise at an unexpected realization. In other words, they reflect the speaker's surprise as something goes against what was predicted at some point in the past. The hypothetical sense becomes stronger when the subject in (16b) is replaced by the first person as in the following example (17) which yields a counterfactual conditional reading, 'If X had not happened, I wouldn't have known Y'.

(17) wo zenme hui zhidao ne?
   I-how-Mod-know-Sfp?
   How would I know this?

In fact, in an epistemic statement, the first person subject cannot be allowed, since it does not make sense that the speaker questions his own state of knowledge.[12] As such, in the interrogative form, -*(u)l kes-i* is not allowed. According to Yeom (2005), in Korean, when the speaker states something in a strong and definite way, -*(u)l kes-i* is infelicitous in interrogatives. Instead, -*(u)l kka*, combined with -

kka, an interrogative sentence-type suffix, can be used, however its usage is allowed only with the second and third person subjects as in (18).[13]

(18) *nay-ka/ney-ka/chelswu-ka   sayngkak ha-ki
   *I-Nom/you-Nom/Chelswu-Nom think-Nmlz
   ey ku mwuncey-ka   elyewu-l-kka?
   Top that question-Nom difficult-Adn-Int?
   '*As for me/as for you/as for Chelswu, this question would be difficult?'
                              (Yeom 2005:16)

In addition to the infelicitous use of *hui* in positive statements accompanied by stative verbs, when referred to past events, the use of *hui* in positive statements is not allowed either for epistemicity. Nuyts (2001:196) claims that the chances for an epistemic reading increase when there exists a discrepancy between the time of the state of affairs and that of the qualification. Let us consider the example as illustrated by Iljic (1985):

(19) zuotian wanshang ta yinggai (*hui) zai jia li
   yesterday-night- she-Mod -at-home-inside
   'Last night, she must have been at home.'

Yang (2006) claims that when predicting past events, sometimes with a past time adverbial, *hui* denotes a law-like event that occurred in the past, however, when the verb itself indicates pastness in combination with particles such as *le* and *guo*, *hui* cannot be used. Instead, *keneng* indicates probability as illustrated by Yang (2006) in (20):

(20) yao fuguan keneng jie guo hun
   yao-general-may - marry-Part
   'General Yao may have been married.'

The examples in (19) and (20) do not predict what might happen in the future but derive a conclusion from what is already known. As seen in (19) and (20), *hui* is not allowed in the backward process as in q → p. However, in Korean, the epistemic

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translated as 'he will become a policeman' to make it clear that it has a predictive reading, as opposed to the epistemic *will* which was proposed by Huddleston as in "That will be the postman" which receives an epistemic reading due to the stativity of the complement verb 'be'.
[12] Papafragou (2006) and Dorr & Hawthorne (2010) claim that epistemics are often taken to express possibilities given what the speaker knows.

[13] In Kim (2014)'s analysis on the relativizer -*l*, like -*kes*, -*kka* is also considered as a head noun. Kim claims that the fusion of -*l* and -*kka* expresses suggestion, as illustrated in:
nayil yenghwa   po-le ka-lkka?
tomorrow movie watch-to go-lkka
'Let's go to watch a movie tomorrow.'

readings in (15c), (19), (20) can be expressed by -*(u)l kes-i* with no such restriction.

4. Corpus investigation

In order to further investigate how the features of *hui* and *-(ul) kes-i* are realized in cause-effect relationships in each language, a corpus-based investigation of causative and conditional constructions has been conducted. 149 phrases of *hui* in the conditional construction *ruguo…, hui…* and 136 phrases of *hui* in the causal construction *yinwei..., hui…* have been collected from the CCL (Center for Chinese Linguistics) corpus. As for *-(ul) kes-i*, 228 phrases in the conditional construction *-myen…, -(ul) kes-i* and 51 phrases in the causal construction [14] have been collected from the Sejong Corpus.

One of the findings to emerge from this investigation is that *yinwei..., hui…* entail general conjectures based on general knowledge, generality, and habituality. Out of the 136 phrases, 39 refer to conjectures based on general knowledge and generality, and 10 phrases denote habituality, marked by adverbs expressing frequency such as *wangwang* and *jingchang*. In these cases, in Korean, the main phrases will not be marked by *-(ul) kes-i* but will be realized in the unmarked indicative mood. Let us see some examples from the CCL corpus:

(21) laonianren   yinwei huodongliang buzu,
     elderly:people-because-activities-not:enough,
     sheru de nengliang duoyu, ye hui fapang
     aborb-Gen-ability-excessuve,also-Mod-get:fat
     'Because elderly people lack activities, increased intake of foods will make them fat.'

 (22) yinwei jinchang chi tianpin，guoliang de
      because-often-eat-sweets, excessive-Part-

tang hui zhengjia yidaosu de fenmi
sugar-Mod-increase-insulin-Part-secretion
'Because (if you) often eat sweets, excessive sugar will increase insulin secretion.'

(23) yinwei yidan huan ganbing, baiyanqiu
     Because-once-have-liver:disease, whites
     de bufen jiu hui chuxian huangdan
     Part-area-then-Mod-appear-jaundice
     'Because once (you) get liver disease, the whites of the eyes will become yellow.'

(24) yinwei wo jingchang jibuzhu ci, youdeshihou
     Because-I-often-forget-lyrics, sometimes
     zai tai shang chang zhe jiu hui wang ci
     on-stage-up-sing-Part-then-Mod-forget-lyrics
     'Because I often don't remember lyrics, sometimes on stage, while singing, I will forget lyrics.'

As for *-(ul) kes-i* in the causal construction, out of 51 phrases[15], 34 phrases are based on the structure of deriving a prediction from a given circumstance as seen in (25):

(25) kulemulo milay-uy inkansang-un Atlas
     therefore future-of human:image-Top Atlas
     sin-ul   talmaka-l kes-i-ta
     God-Acc resemble-Adn thing-Cop-Dec
     'Therefore, the image of the future men will resemble God Atlas.'

However, unlike *yinwei..., hui…*, 7 phrases marked by *-(ul) kes-i* entail an epistemic justification of an inference derived from what is known. In this case, *hui* is infelicitous as in the example (26):

(26) ku-to nwunchi-ka ppalun salam-i-ni nauy
     he-too sense-Nom quick person-be-as my
     komin-ul alachaly-ess-ul kes-i-ta

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[14] As for the causal construction in Korean, phrases semantically interpreted as causative including causal markers such as ttalase, kulayse, kulemulo, kunikka, ttaymwun, inhay, -(u)ni, and etc. have been included due to a relatively small sample pool, compared to the Mandarin Chinese causal connective *yinwei*. In fact, not only for Korean but also for Mandarin Chinese phrases, the frequency of occurrence of *hui* and *-(ul) kes-i* is significantly higher in the conditional construction than in the causal construction. Although all the phrases of the CCL corpus have not been sorted manually to verify eligibility, the total number of data matches for

ruguo…,hui… is 20,247, as opposed to 6,160 matches for *yinwei..., hui…*.

[15] 10 phrases are found to have the construction of giving an account first and then a reason. In order to indicate an epistemic reason to support the account, *-(ul) kes-i* is realized, for which *hui* is infelicitous. However, for simplicity and clarity, the scope of the investigation of this paper is limited to conditional and causal complex phrases, since *-(ul) kes-i* is often realized in single phrases as a continuity of causal or conditional statements, as in "Drinking two grams of cyanide causes death", which is approximately the same as saying "If somebody drinks two grams of cyanide, they will die" (Puente, et al. 2009)

worries-Acc sense-Pst-Adn thing-Cop-Dec
'Since he is also a sensitive person, he must have sensed my concern.'

As to *hui* which is realized in the conditional construction, *ruguo…,hui…*, the process of reasoning is forward, indicating that an effect becomes possible when its premises hold, however, 4 phrases marked by *hui* are found to entail habituality as in (27):

(27) ruguo shi wo xiugai, nuer wangwang hui
    if -be- I-correct, daughter-often-Mod
    bufuqi, jinchang hui yu wo zhengbian
    reject,   often-Mod-with-me-argue
    'If I corrected her, my daughter would reject it
    and argue with me.'

With regards to *-(ul) kes-i* which is realized in the conditional construction, the forward reasoning process is still applied to most of the phrases, however, without a strong cause-and-effect relationship between the hypothesis and conclusion of a conditional statement, an epistemic judgement about the current or past state of affairs is identified in 9 phrases as in (28).

(28) nay-key khomphulleyksu-ka hana issta-ko
    I-to   complex-Nom   one exist-Comp
    ha-myen palo khi-i-l kes-i-ta
    do-if   then height-Cop-Adn thing-Cop-Dec
    'If I have one complex about myself, that must
    be my height.'

From the corpus-based investigation, it is noticed that *hui* tends to entail a causal relationship, often indicating generality and habituality abundantly in the causal construction but also in the conditional construction, albeit fewer in number. Causality is derived from the accumulated or realized knowledge so that it is easy to derive a more concrete consequence whereby *hui* appears more in the causal construction than in the conditional construction to mark law-like events. Anscombe (1971) claims that causal relations are instances of exceptionless generalizations and presuppose some kind of law.

As for *-(ul) kes-i*, in addition to predicting an effect from a cause, the feature of expressing an epistemic assumption and judgement is identified in the corpus, which is more frequently realized in the causal construction whereby an inference about the state of affairs is made based on a circumstance that has been known, as opposed to a conditional statement in which a condition is a cause which has not yet been realized at the time of speaking.

5. Conclusion

This paper has examined the Korean and Mandarin Chinese modals, *-(ul) kes-i* and *hui* which are often used to express the speaker's conjecture and thus are sometimes considered to have future reference. Inspired by two thinking processes, one in which the events are linked in a cause-consequence order and the other in which events are realized in a consequence-cause order, this paper has shown how *-(ul) kes-i* and *hui* are used in the two reasoning processes. As for the process of prediction whereby cause leads to consequence, *-(ul) kes-i* and *hui* are both used. However, in generics and habituals which are also based on the cause-consequence framework, unlike *hui*, *-(ul) kes-i* cannot be applied. In generics and habituals that describe general property, *-(ul) kes-i* cannot be used, but it is applicable when specific episodes are expressed based on the construction of a specific condition resulting in a specific consequence. It can be explained by the essential function of *kes-i* that tends to derive a certain explanation from the known facts. In the same vein, in a consequence-cause order, *-(ul) kes-i* is used as giving an epistemic reason. Through a corpus-based investigation of causative and conditional constructions marked by *hui* and *-(ul) kes-i*, it is noted that the feature of *hui* is strongly relevant to generality, while that of *-(ul) kes-i* does not indicate law-like generalizations but can indicate epistemic assumptions about specific episodes based on specific accounts.

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