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Deontic and Epistemic Modality in Korean Sign Language*

Ahmed, Mai · Kwon, Soon-Bok
(Pusan National University)

Ahmed, Mai & Kwon, Soon-Bok. 2024. Deontic and Epistemic Modality in Korean Sign Language. ***Sign Languages and Linguistics Convergence Research,*** *1*(2), 261-286. Research on both Korean Sign Language (KSL) and modality realization in the Korean language is relatively new in the field of linguistics. This study aims to investigate modality expressions in KSL. The analysis began by organizing modality expressions in spoken Korean and then searching for their equivalents in Korean Sign Language dictionaries. The results show that a single sign or expression in KSL can convey multiple meanings equivalent to those in spoken Korean. Furthermore, signs conveying modality meanings in KSL have undergone a process of grammaticalization, evolving from lexical signs with similar meanings. For example, we propose that the sign for MAYBE has evolved from the sign for FUTURE, and the sign for MUST has evolved from the sign for PROMISE. Another finding is that the sign for MAYBE plays a significant role in forming signs that convey assumptions and possibilities. Additionally, modality markers in KSL are represented after the verb, reflecting a consistent syntactic structure. In conclusion, while modality markers in KSL are more limited compared to those in spoken Korean, they are still sufficient for sign users to express degrees of certainty, possibility, and meanings of obligation.

Key Words: Korean Sign Language, Epistemic Modality, Deontic Modality, Sign Grammaticization, Modality Expression

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1. Introduction

The Korean Sign Language (hereafter, KSL) is the language used by the deaf community within Korea. KSL is not a translation of the spoken Korean language or even considered to be a part of it. It is rather regarded as its own language form with its own grammatical rules. It has been recognized as an official language by the government in 2016 (Korean Sign Language Act, 2016.2.3). But even before its official recognition, some linguists have shown interest in the language and advocated its right to be acknowledged as a language (Won, 2013; Yeun, 2004; Lim & Song, 2015; Jeong, 2020). Research of KSL materialized through comparing between rules and functions in KSL and spoken Korean (hereafter, SK) (Choi, 2019), or simply analyzing the specific rules of the language (Jeong, 2020; Nam, 2022a; Nam, 2022b etc.).

Stokoe (1960) has advocated the right of sign languages to be recognized as actual languages, supported by others such as Jeong (2020) and Yeun (2021) etc., for it shows difference between sign form and the signified reference especially across different sign languages which shows arbitrariness. Sign languages also show the ability to form new signage to express new concepts and indicate creativity, duality, convey culture, and systematic grammaticalization among other things. These are all characteristics that prove the similarity between sign languages and spoken languages, and are prove that sign language checks the qualifications to be recognized as an independent language form. And about the characteristics of sign languages, Jeong (2020) adds that sign languages, such as KSL, can be characterized by conciseness where it discards functional words that don't convey meaning (particles, conjunctions, endings). It is a visual language which makes use of paralinguistics, and it is an isolating language in the characteristics of word forming (Jeong, 2020).

Wilcox and Shaffer (2006) also talked about how sign language is a natural language that should be considered as the deaf person's native language. They argued that sign languages are not to be mistaken to be mere representations of the spoken language in the same region, that sign languages can differ in grammar and even lexicons and can be traced in relations to other sign languages of different region. For example, American Sign Language is related

to French Sign Language. Wilcox and Shaffer (2006) pointed out that signed languages can be analyzed the same way spoken languages are, phonologically, morphologically and even syntax wise. For a sign is composed of different elements that can change the meaning if changed, and signs can also combine to convey different meanings as if composing a new word.

As for grammar, even though sign languages do not depend on grammar or grammatical particles the same way spoken languages do, especially in the case of KSL where grammatical units are not as widely used as in SK, it cannot be said that sign languages lack grammar and grammar meaning conveying units. Regarding grammaticization of language, Wilcox and Shaffer (2006) noted how a part of grammar develops over time from a lexical, a suggestion that was discussed also in Xavier and Wilcox (2014). To give example for that, they explained how in the American Sign Language the modal auxiliary verb 'can' has developed from the sign for 'strong' which reflects ability. Wilcox and Shaffer (2006) also pointed out how facials or nonmanual articulators play a big part of modality expression. They attributed this to the fact that facial articulations subjectify the meaning as they convey the speakers' attitude towards the meaning articulated by the hands. The face then showcases the stance of the speaker, or signer, towards the proposition, and helps modify the meaning conveyed in the manual sign.

Subjective personal attitude expression towards an utterance is essentially what modality is (Palmer, 1986). And whilst modality and modality markers have been a subject of interest in the study of English linguistics and the American Sign Language, study of modality expression has not had the same amount of attention in Korean linguistics or KSL research. This study could not find any attempts of researching modality expression in KSL. And in this lies the novelty of this paper. As this paper aims to identify the realization of modality expression in KSL and analyze these expressions and characteristics. And as this study relies on KSL dictionaries to identify the modal markers, where these dictionaries relate SK to KSL definitions, the comparison of modality in KSL and SK is a sub discussion of the main idea. This study also attempts to discover the grammaticization process that modality markers in KSL has gone through to become and convey the meaning of a modal marker.

This paper is attempting to answer the following questions:

1. How is epistemic and deontic modality realized in KSL?
2. What are the characteristics of modality expression in KSL?
3. What is the grammaticization process of different modality expressions in KSL?

1.1. Modality

Before starting the analysis, a brief explanation of modality is in order to clarify the analysis objectives of this paper. As mentioned above modality is a subjective expression of the speaker or signer's attitude about their proposition. It is one of the metadiscource techniques; since expressing one's attitude in the discourse conveys the speaker/writer's cognition in that discourse, which is part of what metadiscourse is about (Hyland & Tse, 2004). Alghazo et al. (2021) define metadiscourse as some interpersonal techniques used by the speaker to reflect their position in relation to the discourse or the discourse receiver. With the function of helping the receiver evaluate and organize the utterance information but without adding any semantic value to that information (Alghazo et al., 2021; Hyland, 2019).

Palmer (1981) made the connection between modality expressions and logic of semantics. He explained that the world of possibility or belief is realized by epistemic and deontic modality expressions or what might be called "modal logic", as he points out as a term used by logicians in analyzing possible worlds. Modality then is concerned with possibility and obligation from the point of view or the logic of the speaker. Most linguists agree with this view of modality but with slight difference in definition.

For example, Lyons (1977) sees modality as modification to a statement. He explains that modality is used to modify the degree of commitment of the speaker about the truth of their expressed proposition. Halliday & Matthiessen (2004) also has a similar view to Lyons where they see modality as an interpersonal metafunction of language and defines it as "the intermediate degrees between the positive and negative" (Halliday & Matthiessen, 2004:147), and for them these degrees are varied. Modality in Halliday & Matthiessen (2004) has two main types, modalization (which includes degrees of probability and

usuality), and modulation (which includes degrees of obligation and inclination). van Hoang (2018) explains how Halliday's modalization and modulation relate to traditional semantics modality, by relating modalization to epistemic modality and modulation to deontic modality.

On the other hand, Cornillie & Pietrandrea (2012) have defined modality as discourse functions that have attitudinal qualifications. These attitudinal qualifications can mainly be categorized into epistemic, evidential, and deontic. Deontic modality is concerned with the speaker's point of view about obligation, evidentiality is related to the speaker's grounds when making a statement, and epistemic modality is more concerned with the speaker's certainty about the chances of the affairs they are stating (Cornillie & Pietrandrea, 2012). Which combines the view of Palmer, Lyons, and Halliday of modality as an expression of obligation, truth, and possibility.

And while modality provides a marker of the speakers' attitude and stance, it is not, however, a contributor in the semantic meaning of the utterance per se. It is only a modification of an opinion. Nevertheless, these modifications or interpersonal metafunction markers play a big part in understanding the speaker's interactions and commitment to the proposition.

1.2. Modality in Korean

Pyykonen (2023) explains that modality is a varied lexical stance that includes a wide range of types such as adverbs, adjectives, nouns, verbs, and auxiliaries. Modality in Korean is also expressed through lexical and grammatical markers, according to Park (2010), Korean modality is conveyed using auxiliaries, pre-final and final ending suffixes, adverbs, and verbs.

Modality studies in SK started with Jang (1985) as she cleared the confusion between mood and modality which were always regarded as the same concept in previous studies. Jang (1985) defined modality as the speaker's mental/psychological attitude towards the incident or event. This was followed by the definition of modality in Ko (1986) that stated that modality is the semantic domain that is related to the psychological attitude of the speaker. Studies of modality in SK thereafter adapted these definitions to coordinate with the views mentioned above

about how modality is the attitude of the speaker about their proposition (Eom, 2010; An, 2012). And in any case, all these definitions are dealing with modality as a semantic unit that is not part of the actual accident or event mentioned by the speaker, but only a modification on the utterance that shows the point of view of the speaker.

As for classification of modality markers in SK studies, some research has deviated from the traditional two classifications of epistemic and deontic. Park (2000), for example, has organized Korean modality markers into epistemic, deontic, emotional, and evidential. An (2012) generally explained modality markers in relation to whether the marker was conveying possibility or assurance as in epistemic marker, or whether it was conveying obligation or order as in deontic markers. But in classification, An (2012) largely focused on the classification of markers regarding their construction, meaning if the marker was a phrase construction with a noun or a phrase construction with an auxiliary.

Eom (2010) on the other hand has classified markers into two classes epistemic and non-epistemic, and then categorized markers into further sub-classes as assumption, certainty, and proximity conveying markers for epistemic markers; and hope, capability, intention, volition, obligation, permission, and prohibition conveying markers for non-epistemic markers. These classifications are demonstrated in the following Table 1 which is adapted from Eom (2010). This table does not include the marker '-keyss-', but in Jeon (1999) the comparison of modality marker's degree of probability included '-keyss-' as a modality marker that conveys a stronger degree of probability than '-(u)l kes kathta' for example.

[Table 1] Epistemic and non-epistemic modality markers

Modality	Markers
Epistemic	Assumption: -(u)l kesita, -(u)n/nun/(u)l kes kathta, -(u)l moyangita , -(u)n/nun/(u)l tushata, -(u)n/nun/(u)l tussiphta, -(u)nka/nunka/na pota, -(u)nka/nunka/na siphta, -(u)nka/nunka/na hata, -(u)l ci molunta, -(u)l swu issta Certainty: -(u)n/nun pepita, -ki malyenita
Non-Epistemic	Obligation: -a/eya hata , -a/eya toyta Prohibition: -(u)myen an toyta, -a/esenun an toyta

(Adapted from Eom 2010: 35)

Subcategorization of modality is also connected with the degree of commitment the speaker is demonstrating towards the proposition. Some studies examined modality markers of guessing and assumptions in terms of conveying the meaning of certainty or uncertainty such as Lee (2019), and other studies have sought to determine the degree with which markers convey probability (see Jeon, 1999). And in subcategorizing modality markers into possibility, probability and certainty, studies have tried to determine the degree of a speaker's conviction about the truth or likability of their proposition (Lee, 2019; Park, 2006).

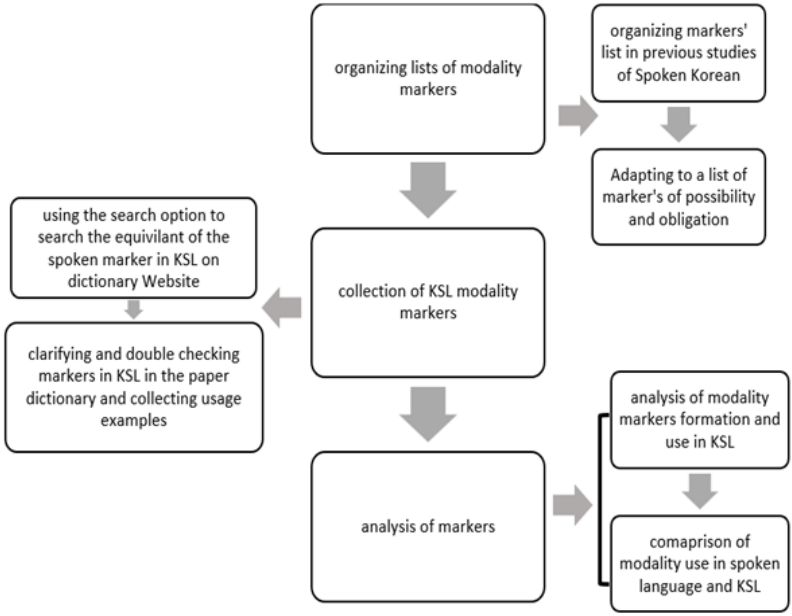
(1) Degree of propositional certainty
  a) Certainty: a Judgement of certainty about the proposition.
  b) Probability: a more than 50% judgement of certainty about the proposition.
  c) Possibility: a less than 50% judgement of certainty about the proposition.
(Park, 2006:81)

Although there is different subcategorization for modality markers, for the sake of simplification the study is following the main categorization of markers into epistemic and deontic markers. This is because the degree of modality marker probability meaning is not a concern of this study but the identification of modality markers in KSL.

2. Method

Figure 1 showcases the process of the analysis. As mentioned above, the aim of this study is to identify modality expressions in KSL. We started with organizing modality markers in spoken language that were analyzed in previous studies. The study then used these SK markers to search for KSL modality markers in dictionaries by using 2 different dictionaries. The study then filtered the expressions that were found as a result of searching for the equivalent expressions of SK markers in dictionaries. The final set of modality expressions identified for KSL are then analyzed to recognize their characteristics and use. And the expressions are also analyzed to try to recognize the grammaticization

process and the origin of the sign marker.



[Figure 1] Analysis process

In Table 1 above Eom (2010) focused on grammatical phrases of modality meaning. The same was in other SK modality markers research, such as Jeong (2018), Shin (2024), Park (2010), Wymann (1996), lee (2004), Hao (2022), and An (2012). This paper has referenced these studies for making a list of modality markers used to convey possibility and obligation. It is very clear that expression of modality in SK relies heavily in grammatical compositions and auxiliaries rather than lexical choices. That is not to say that SK modality expression is only done using auxiliaries and nominal phrases as there are some particles and lexical markers that also convey modal meaning. Reviewing An (2012) confirms that SK modality markers are realized in the forms of verbs, adverbs, grammatical particles, nominal phrases and auxiliaries. After reviewing all the studies mentioned above, we adapted the list in Table 2 for analysis.

[Table 2] List of Epistemic and deontic modality markers in SK

Modality	Markers
Epistemic	-(u)l kesita, -(u)n/nun/(u)l kes kathta, -(u)n/nun/(u)l moyangita , -(u)n/nun/(u)l tushata, -(u)n/nun/(u)l tussiphta, -(u)nka/nunka/na pota, -(u)nka/nunka/na siphta, -(u)nka/nunka/na hata, -(u)l ci molunta, -(u)l swu issta , -(u)n/nun pepita, -ki malyenita, -neun seymita, -(u)l cwul alta , -(u)l ppenhata, -(u)l ttalumita, -keyss-, -li-, chwuchwukhata, sayngkakhata, mitta, thullimepsta, hwaksilhata, kacenghata, kanunghata, kanungsengi issta/epsta, cengmal, pantusi, hwaksilhi, ama, cimcakkhentey, mwullon, pwunmyenghata, tangyenhata, talumepsta
Deontic	-a/eya hata , -a/eya toyta, -(u)myen an toyta, -a/esenun an toyta, -(u)l theita, -nun pephata, kkok, -yakeyssta, pantusi

In a preliminary analysis we confirmed that in comparison to SK, KSL was not as enriched in grammar particle use. As shown in Table 3,4 the grammatical particles and phrases of modality markers in KSL are not as developed in use as in SK. So, by adding more lexical expression of modality we aimed to cover as much of the domain as possible.

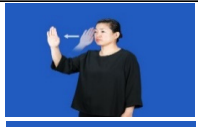
After organizing the markers in spoken language, we searched for the equivalents in KSL using two KSL dictionaries, the Korean Sign Language Dictionary by the National Institute for Korean Language (hereafter, NIKL), and the Korean Sign Language Dictionary by Kim et al. (2005).

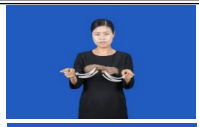
In the online dictionary the terms and expressions were searched for using the search bar and then we looked for the exact meaning of the modality equivalent in the search results. The search of terms in the paper dictionary was done using traditional dictionary search methods by looking for the word or even the grammatical particle in the section of words starting with the same letters. However, using two dictionaries for research has posed a problem. That is because the definitions and signage findings in the two dictionaries were not identical. We could find more data for analysis in the paper Kim et al. (2005) dictionary but some of these data were not reflected in the National Institute for Korean Language online search. Some of the signs were even conveyed differently in both dictionaries. Table 3 showcases these differences between the two dictionaries. Still this paper is considering the findings of the two dictionaries in the analysis.

3. Results

Table 3 presents the result of modality marker search in the KSL dictionaries. The presented data in the table offers a comparison of modality expressions between SK and KSL. This comparison clearly shows how modality expressions are more diverse and defined in SK compared to KSL. KSL modality expressions are more limited especially considering many of the compound expressions which are essentially a main part modifying different lexical units as discussed in the following analysis.

[Table 3] Expression of modality in KSL

Epistemic Marker	Sign	Epistemic Marker	Sign
-l (-(u)l kesita)**		ama***,-(u)l kesita*, -keyss-(chwuchwuk)*	
'aphulo' + 'ama'			
+			
deutada*, tussiphta*		?-keyss-**	
+			
chwuchwuk** cimcak**		-(u)l swu issta*, kanunghata* swu**	
sayngkak+ ama			
+			

Epistemic Marker	Sign	Epistemic Marker	Sign
kaceng[**] phyengka+ama	 + 	alta[*,**]	
thullimepsta[**]	 + 	mitta[*,**]	
pwunmyenghata[*,**], hwaksilhata[*,**], tangyen[*],thullimepsi[*]		sayngkak[*,**]	
tangyenhata[**],mwullon[**] (tangyenhata2[**])	 , ()	bbonhada[*]	

Deontic Marker	Sign	Deontic Marker	Sign
-a/eya (kkok)[*,**]		toyta[*,**]	
pantusi[**] ‘matta’ + ‘yaksok’	 + 	antoyta[*,**]	

Note: [*]The National Institute for Korean Language dictionary, [**]Kim et al. (2005) dictionary (signs’ illustrations are collected from the National Institute for Korean Language dictionary)

3.1. Epistemic and deontic modality expression realization in KSL

Table 3 showcases modality expressions in KSL. A comparison of Table 2 and Table 3 proves that modality expression in SK utilizes grammar particles more than KSL. In KSL the expression of modality is relying more on lexicals and their placement in the sentence to convey the meaning of attitude towards the statement. That is not to say that grammatical particles are not used in KSL, but in comparison to spoken language the latter uses more combinations of ending particles together with auxiliaries and action nouns to make the modal expression. Especially for deontic modality expressions, except for '-a/eya hata' MUST the reliance is only on two verbs to convey the meaning of obligation or allowance 'toyta' CAN/MAY and 'antoyta' MUST NOT and the adverbs 'pantusi' SURELY and 'kkok' MUST.

Modality markers are also more varied in spoken language than it is in KSL. This may be due to the fact that it takes more time to convey an expression using a sign which makes sign language more oriented towards reduction and time saving. Expressions using sound takes less time to convey and the population that uses the spoken language is more than it is in KSL's case which gives room for innovation and diversity of expression use for spoken language. Expressions of guessing the possibility of a statement for example can be done using 'chwuchwukhata, -(u)l kes kathta, ama, -keyss-, -(u)l ci molunta, kacenghata, -(u)l kesita, cimcakkhentey, kanunghata, -(u)n/nun/(u)l moyangita , -(u)nka/nunka/na pota, -l li epsta etc.', but the equivalent in KSL only uses 'ama, -keyss-, kaceng, -(u)l kesita, cimcak, kanung, pota, li', but most of these meanings are expressed by combining the sign for 'ama' with other noun signs to convey the meaning in KSL. Combining signs to convey one meaning is more time consuming, requires memory space to produce the expression through the different signs, and more time to convey one meaning through two or more signs.

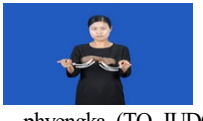
3.2. Characteristics of modality expressions in KSL

3.2.1. Epistemic modality markers

Table 4 points out an important characteristic in the epistemic modal

markers' composition. That is, the sign for 'ama' MAYBE plays a big part in conveying epistemic modality. For example, conveying the 'tushata/tussiphta' SEEM meaning (as demonstrated in the NIKL dictionary) is done combining the sign for 'sayngkakhata' TO THINK and 'ama' MAYBE. In the NIKL dictionary the meanings '-keyss-, -(u)l kesita, and ama' MAYBE are all demonstrated by one sign which is the sign for 'ama' MAYBE. Also, in Kim et al. (2005)'s dictionary the sign for 'kaceng' SUPPOSITION ('phyengka' JUDGE + 'ama' MAYBE), 'chwuchwuk' ASSUME and 'cimcak' GUESS ('sayngkak' THINK + 'ama' MAYBE), and the sign for 'l' as part of '-(u)l kesita' ('aphulo' TO THE FRONT /FUTURE + 'ama' MAYBE) all have 'ama' as part of the combination. Table 4 organizes illustrates the placement of 'ama' MAYBE in these construction where 'ama' MAYBE is always the last part of the sign.

[Table 4] Compound epistemic modality sign composition

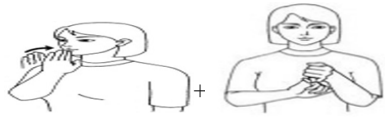
Marker	Sign
-l (-(u)l kesita) ** (MAYBE)	 +  aphulo (FUTURE) + ama (MAYBE)
tushata*, tussiphta* (SEEM)	 +  sayngkak (TO THINK) + ama (MAYBE)
chwuchwuk** cimcak** (GUESS)	 +  sayngkak (TO THINK) + ama (MAYBE)
kaceng** (ASSUME)	 +  phyengka (TO JUDGE) + ama (MAYBE)

Note: *The National Institute for Korean Language dictionary, **Kim et al. (2005) dictionary (signs' illustrations are collected from the National Institute for Korean Language dictionary)

3.2.2. Deontic modality sign characteristics

As for deontic modality expressions, as shown in table 3 again, SK has a variety of expressions to convey different degrees of obligation and prohibition or permission whereas KSL is somewhat limited in Deontic modality expressions. Also, SK deontic expressions rely on grammatical particles such as endings to convey the meaning, but this could not be seen in KSL case. For permission KSL uses two expressions 'toyta' MAY/ CAN and for prohibition 'antoyta' MUST NOT/ MAY NOT. Table 5 also demonstrates the sign composition characteristic discussed above. The sign for 'pantusi' SURELY is conveyed using the two signs of 'dangyeon' UNDOUBTEDLY/ 'sasil' TRUTH/ 'matta' CORRECT and '-a/eya', 'kkok' MUST/ 'yaksok' PROMISE. This indicates that the sign for PROMISE or MUST plays part in conveying the deontic modality meaning of obligation just as 'ama' MAYBE does the same for the epistemic modality meaning of possibility.

[Table 5] Deontic modality sign

Marker	Sign
a/eya*,** kkok*,**	
pantusi**	 'sasil' TRUTH + 'yaksok' PROMISE
toyta*,**	
antoyta*,**	

Note: *The National Institute for Korean Language dictionary, **Kim et al. (2005) dictionary (signs' illustrations are collected from the National Institute for Korean Language dictionary)

3.3. Modality markers' syntactic characteristics

Sign combination here is not arbitrary it seems, meaning that each feature in the combination leads to the eventual meaning to be conveyed through the combination. It seems also that in KSL the factor of modality (the factor that expresses commitment or possibility) is usually expressed later in the combination form. As in 'ama' being expressed in the second half of the combinations, and the expression of necessity in 'pantusi' SURELY is in the latter part of the sign. But perhaps this might be explained through the grammatical rules of KSL.

(2) a. INDEX1 APPLE EAT POSSIBLE
'I can eat the apple.'
b. * INDEX1 APPLE POSSIBLE EAT
c. * INDEX1 POSSIBLE APPLE EAT
(Jo et al., 2022:104)

(3) [나][자동차][새롭다][자동차오다][친구][빌려주다][안되다][아깝다]
[na][catongcha][saylopta][catongchaota][chinkwu][pillyecwuta][antoyta][akkapta]
(As adapted from Nam, 2022b:16)

Indeed Jo et al. (2022) discussed how modals are always to follow the verb in KSL. As shown in the example above adapted from the same paper the auxiliary POSSIBLE can only follow the main verb, here TO EAT, in the sentence. If the modal auxiliary placement is changed, even to a placement before the verb, the sentence is incorrect. In the example from Nam (2022b) the modal 'antoyta' MUST NOT / SHOULD NOT is also following the verb to modify the meaning of the proposition. This is reflected in sign combination as well, for 'ama' MAYBE and 'kkok' MUST/ '-a/eya' MUST are markers of modal meanings and therefore they modify the meaning of the verb after expressing it. For example, 'chwuchwukhata' To ASSUME/GUESS (to put something off and think about it)[1]. TO ASSUME 's meaning is a modification

1) Think about something and put it into consideration (Standard Korean Dictionary (stdict.korean.go.kr))

of modality by the expression of uncertainty on the verb ‘to think’, and therefore the sign for ‘chwuchwuk’ ASSUME is expressed by the sign of ‘sayngkak’ THINK followed by ‘ama’ MAYBE to convey the uncertainty factor to be attached to the meaning of To Think.

Özkul (2019) has also discussed epistemic and deontic marker placement in Turkish Sign Language. While studying the modal marker NECESSITY and its ability to convey both epistemic and deontic meaning in different contexts, the study has also demonstrated the syntactic characteristics of modality markers. According to Özkul (2019), in Turkish Sign Language modal markers follow the verb to modify it’s meaning, just as the case in KSL. For example, in the sentence “MOTHER FATHER NOTIFICATION GIVE NECESSARY” (It is necessary to notify mother and father) (Özkul, 2019:557) the modal NECESSARY follows the verb GIVE to convey the deontic meaning of obligation.

In Shaffer (2004) however the discussion for modality markers in ASL showed different syntactic characteristics compared to KSL and Turkish Sign Language. In Shaffer (2004) the examples for deontic modality markers showed that the markers precede the verb, as in “[1st GRADE]-top DECIDE MUST PUT PUBLIC SCHOOL” (When he got to first grade I decided I had to put him in public school) (Shaffer, 2004:183) where MUST precedes the verb PUT. In the case of epistemic modality, the modal markers followed the proposition to modify it as a whole not just the verb. In example “[LIBRARY HAVE DEAF LIFE]-top [SHOULD]-BF/HN (The library should have Deaf Life/ I’m sure the Library has Deaf Life)” (Shaffer, 2004: 190), the modal SHOULD modifies the sentence “LIBRARY HAVE DEAF LIFE” not just the verb HAVE.

Salazar-García (2018) also discussed modality marker placement in Spanish Sign Language (LSE). Salazar-García (2018) pointed out that epistemic modality markers’ placement in a sentence depends on the marker. For example, subjective markers such as I SURE and I THINK are placed before the proposition they modify (I SURE, HERE SMOKE FREE -> ‘I am sure smoking is allowed here’ (Salazar-García, 2018:396)). Other modality markers follow the verb at the end of the sentence (TOMORROW RAIN CAN -> ‘ it is probable/ possible it will rain tomorrow’ (Salazar-García, 2018:400)), TOMORROW

BROTHER MINE SKI IMPOSSIBLE. HE WORK MUST -> 'It is impossible that my brother will ski tomorrow. He must work.' (Salazar-García, 2018:404)). This is however a very general explanation of the placement of modality markers in LSE. The placement of modality expressions depends on the orientation of the marker to the event and participants, and its objectivity or lack of in its meaning.

In SK, the placement of modal markers depends on the marker's function in a sentence. A marker such as 'ama' is an adverb that modifies the whole sentence and therefore it is placed in reference to the whole proposition rather than the main verb. To answer the question "kiltongi eti kasseyo? (where did Kildong go to?)" we can use "ama cipey kasseyo (maybe he went home)" or "cipey kasseyo ama (went home maybe.)" and both answers are correct. That is not to say that all modality markers in the spoken language follow this rule, but the grammatical markers such as endings and auxiliary verbs' placement are specially connected to the main verb in the sentence. Much like KSL combinations with auxiliary verbs (such as −(u)nka pota, -(u)lkka siphta etc.) and bound nouns (as in-(u)l kesita, -(u)l moyangita) are placed after the main verb of the sentence, and for pre-final endings (-a/eya, -keyss-) they have to be attached to the main verb. As the following example demonstrates the modality expression is conveyed by the grammatical unit following the verb and modifying its meaning:

(4) a. kwuki kkulhkeysse [Soup(subject) boil(verb) +-keyss- (modal)]
b. kwuki kkulhul kesiya [Soup(subject) boil(verb) + -(u)l kesita (modal)]
c. kwuki kkulhul kes katha [Soup(subject) boil(verb) + -(u)l kes kathta (modal)]
d. kwuki kkulhul moyangiya [Soup(subject) boil(verb) + (u)l moyangita (modal)]
e. kwuki kkulhul tushay/tussiphe [Soup(subject) boil(verb) + -(u)l tushata/teutsibda (modal)]
f. kwuki kkulhul pephay [Soup(subject) boil(verb) + -(u)l pephata (modal)]
g. kwuki kkulhulci molla [Soup(subject) boil(verb) + -(u)l cito molunta (modal)]

h. kwuki kkulhnunka pwa [Soup(subject) boil(verb) + -nunka pota (modal)]
(Adapted from An, 2012:221)

In this manner KSL shows similarity to SK in that the modification of the auxiliary comes after the action to modify the meaning.

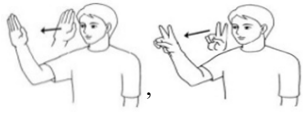
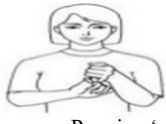
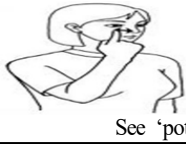
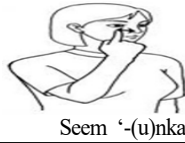
3.4. Grammaticization of modal markers in KSL

In KSL, signs can convey more than one meaning of SK, which may seem like SK has more diversity of modality expression than KSL. For example, as mentioned above, the meaning '-keyss-', '-(u)l kesita', and 'ama' are all expressed using one sign (ama) following the demonstration of the NIKL dictionary. And in both dictionaries the sign for 'hwaksil' CERTAIN and 'pwunmyeng' CLEAR is the same for both meaning, so is the sign that conveys the meanings for 'kkok' MUST, and '-a/eya' (which is the same sign for 'yaksok' PROMISE). This part is different in the two dictionaries though, but the sign for conveying the meaning of 'tangyen' UNDOUBTEDLY and 'sasil' TRUTH is the same in Kim et al. (2005), whereas both meanings are conveyed using different signs in the NIKL. The sign of 'tangyen' UNDOUBTEDLY is the same as the sign for 'mwullon' SURELY in NIKL.

This again can be explained by the grammaticization process that happens to lexical signs before they are used to convey grammatical meaning as discussed in Wilcox and Shaffer (2006). A sign starts as a signal for a lexical meaning and then it may acquire some modification to add a grammatical feature, such as modality, to the proposition. Wilcox and Shaffer (2006) explained that the sign for STRONG has developed to the sign conveying the auxiliary verb CAN. This grammaticization process could be used to explain how one sign conveys different meanings, as in the lexical sign is seen to be under the process of developing grammatical meaning. The sign for 'yaksok' PROMISE developed to be used for adverb 'kkok' MUST and grammatical ending particle '-a/eya'. The sign for 'kanung' POSSIBLE as well developed to convey 'swu', and the one for 'pota' To SEE developed to convey the auxiliary 'pota' SEEMS/ PERHAPS. The origin of the sign 'ama' MAYBE is likely a modification to the sign

'milay' FUTURE  or the sign  by slightly bending the forefinger and the middle one . This modification developed to convey meanings of probability or uncertainty about a proposition or an event that may happen in the future. This is conveyed in modality markers such as '-keyss-' and '-(u)l kesita'.

[Table 6] The development of lexical sign to convey grammatical modality

Meaning	Lexical sign	Modal sign
Perhaps	 Future, the day after tomorrow	 Maybe, perhaps, will, might
Can	 Capable/Possible 'kanung'	 Can, could 'swu'
Must	 Promise 'yaksok'	 '-a/eya', 'kkok' MUST
Should	 Doable 'toyta'	 should '-a/eyaci'
Likely	 See 'pota'	 Seem '-(u)nka/na pota'

4. Discussion

This paper aimed to investigate expressions of modality in KSL. This was attempted by first organizing modality markers in SK and then searching for their equivalents in KSL using KSL dictionaries. A comparison of modality expression in SK and KSL was done to further investigate the characteristics of KSL.

The main difference between SK and KSL in modality is that modality in SK relies heavily on grammatical phrasing and grammatical particles, whereas this particular domain of language is not as well developed in KSL. As Jeong, 2020 has discussed, KSL doesn't use particles or endings to clarify the sentence but rather relies on the lexical content and the order of the sentence. The conciseness of KSL that Jeong (2020) has suggested is indicated also in the lack of variety of modality expressions in KSL.

KSL signs can also convey more than one meaning equivalent in SK, with some of them, such as  that can convey 13 different meanings equivalent in the spoken language. This fact has been discussed in Nam (2018) where he analyzed the polysemy of signs and the formation of idiomatic expressions in KSL. Although Nam (2018) discussed the polysemy of a sign in regard to modifications done on the sign whether it being manual or nonmanual modification, the data we have gathered from the NIKL dictionary suggests that one sign can signal different meanings without any modification done on it, on the condition however that these different expressions are similar in meaning (such as myenghwakhata, cenghwakhata, ttokttokhata, ttwulyeshata, myenglyohata, myengpaykhata, pwunmyenghata, senmyenghata, hwaksilhata etc. which are all different expressions that convey the meaning "clear" or "accurate").

As for sentence order, Jo et al. (2022) have discussed how in KSL modality auxiliaries are placed behind the main verb in the sentence, this is not however clear if it is a rule for all modal expressions in KSL. In SK the modal expression is added to the sentence in the order of its grammatical

characteristics, meaning if the modal is an auxiliary verb or an ending particle it is added after the verb, but if it is an adverb it is added before the verb or even in the beginning of the sentence according to SK sentence order rules.

The process of grammaticization that a sign may go through to develop a grammatical meaning is another explanation for a sign conveying different meanings. This process however is not limited to sign language, in SK for example the particle '-keyss-' is used to convey different meanings that include volition, possibility, and assumption in addition to marking for a future tense (Min et al., 2019; Bang et al., 2019; Yang, 2020). Yang (2020) explained that '-keyss-' has been discussed in research as a grammatical particle that realizes future tense before studies of '-keyss-' has started to realize it as a modal marker. This suggests that '-keyss-' has undergone a process of developing into a modal marker (albeit '-keyss-' being already a grammatical particle) until it has reached the stage of being acknowledged as a marker conveying the meaning of assumption or guessing as Yang (2020) has found out through a survey about the archetypal semantic meaning of '-keyss-'. This process of modal grammaticization can be seen in the similarity of the sign for 'milay' FUTURE or 'more' THE DAY AFTER TOMORROW/FUTURE and the sign of 'ama' MAYBE/PERHAPS, or the similarity between the sign 'kanung' POSSIBLE and the sign for 'swu' CAN etc.

In the case of grammaticization, Wilcox and Shaffer (2006) have discussed that facial expressions play a part in conveying modality meanings. How a raising of an eyebrow or a movement of eye direction help express the signer's point of view towards the event they are conveying. In searching for modality signs in KSL dictionaries though, this study has not encountered any explanation of special facial expression accompanying the signs shown in the tables. The description of the sign in the dictionaries that were referenced in this study focused mainly on the manual components not the non-manual ones such as facial expressions. This, however, was one of the limitations of this study, depending on the description of signs made by the dictionary and not analyzing the sign in actual use by a signer. Therefore, in future study an analysis on a corpus of actual sign language use is needed in order to recognize the non-manual articulators that may add to the composition of the modal signs.

In conclusion, modality marker expression in KSL is somewhat limited in the variety of markers but it is sufficient to convey the modification of possibility and obligation on a proposition. A KSL native can express different degrees of commitment to modify their meaning. These modifications of modal markers however need to be analyzed more in terms of sentence order realization and frequency of use. It is important to approach modality as a part of pragmatics and therefore analysis of modal markers must be covered also in actual use through corpus analysis of KSL. Although this study was to investigate modal expressions in KSL, an analysis of a KSL corpus could have added significantly to the findings of this paper and the analysis of modal marker realization rules, and the determination of whether or not non-manual factors play part in modality expression in KSL. Henceforth, future research on modality expression in context within KSL is essential to deepen understanding of this topic.

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Ahmed, Mai Abubakr Elsedik Mohamed
2, Busandaehak-no 63beon-gil, Geumjeong-gu, Busan, 46241, South Korea
PhD student, Dept. of Linguistics College of Humanities,
Pusan National University
Phone: +82-051-518-1518
E-mail: ahmed.mai@pusan.ac.kr

Kwon, Soon-Bok
2, Busandaehak-no 63beon-gil, Geumjeong-gu, Busan, 46241, South Korea
Professor, Dept. of Language & Information College of Humanities,
Pusan National University
Phone: +82-51-510-2003
E-mail: sbkwon@pusan.ac.kr

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