

From inquisitive disjunction to nonveridical equilibrium: modalized questions in Korean

Abstract. The goal of the present study is to identify a novel paradigm of epistemic modal operator derived from *disjunction*. Our main data involves an inquisitive disjunction marker *nka* in Korean, the presence of which enhances a speaker’s epistemic uncertainty and forms a *modalized question*. We show how *nka* contributes the modal effects in question within a theory of nonveridicality. In particular, we propose that the prerequisite of *nka* are non-homogenous nonveridical states that are partitioned in equiposed epistemic spaces because of the absence in ranking between them. The distinct notions of disjunction, question, and possibility modals can thus be systematically captured under a framework of *nonveridical equilibrium*. The current analysis offers important insights into the relationship between the classes of nonveridical and modal ingredients involved in inquisitive disjunction: First, Korean facts importantly reveal that modalized questions do not form a uniform class with regular questions, since interrogative semantics alone cannot predict the epistemic uncertainty. Second, languages parameterize as to how they lexicalize the function of manipulating modal base. The implication of our findings is that disjunction needs to be recognized as a novel device for encoding *speaker’s weakest perspective* on epistemic modality.

Keywords. modalized question, disjunction, inquisitiveness, nonveridical equilibrium, Korean

1. Introduction

The general purpose of information-seeking questions is to receive a true answer from the addressee by posing a set of alternatives for consideration. In the standard theories of question (Hamblin 1973; Karttunen 1977; Groenendijk and Stokhof 1984), its meaning thus denotes a set of propositions (i.e. alternative possible answers to the question). In this vein, in order for an interrogative to be felicitous, the questioner must believe that the addressed is more knowledgeable and capable of answering.

In recent years, however, a new type of questions has arisen as the subject of interest. Unlike regular questions, it is used for different purposes—instead of requesting information from the addressee, it expresses speaker’s epistemic uncertainty or conjecture on the propositional content. This is achieved by the interaction of modal ingredients therein. This type of question is pervasive across languages that are not genetically or geographically connected, and some light is shed on the topic from previous studies examining them (under various labels). To name a few, there are *darou-ka* ‘MOD+Q’ in Japanese ((1c); *self-addressing* question; Hara and Davis 2013), *as=há=k’a* ‘SBJN+YNQ+INFER’ in St’át’imcets ((2c); *conjectural* question; Littell et al. 2009, Matthewson 2010), and *na* ‘SBJN’ occurring in interrogatives in Greek ((3c); *epistemic subjunctive* question; Giannakidou 2015):

- | | | | | |
|-----|--|---------------|---------------|------------------|
| (1) | a. <i>John-ga</i> | <i>kuru</i> | <i>darou.</i> | [Japanese] |
| | John-NOM | come | DAROU | |
| | ‘John is coming, I bet. ≈ Probably, John is coming.’ | | | |
| | b. <i>John-ga</i> | <i>kuru</i> | <i>ka.</i> | |
| | John-NOM | come | Q | |
| | ‘Is John coming?’ | | | |
| | c. <i>Yurie-wa</i> | <i>wain-o</i> | <i>nomu</i> | <i>darou-ka.</i> |

- Yurie-TOP wine-ACC drink DAROU-Q
 ‘I wonder if Yurie drinks wine.’ (Hara and Davis 2013; (2),(1),(7))
- (2) a. *lán=k’a kwán-ens-as ni=n-s-mets-cál=a.* [St’át’imcets]
 already=INFER take.DIR-3.ERG DET.ABS=1sg.POSS-NOM=write-ACT=EXIS
 ‘She must have already got my letter.’
- b. *lán=ha kwán-ens-as ni=n-s-mets-cál=a.*
 already=YNQ take.DIR-3.ERG DET.ABS=1sg.POSS-NOM=write-ACT=EXIS
 ‘Has she already got my letter?’
- c. *lan=as=há=k’a kwán-ens-as ni=n-s-mets-cál=a.*
 already=3.SUBJ=YNQ=INFER take.DIR-3.ERG DET.ABS=1sg.POSS-NOM=write-ACT=EXIS
 ‘I wonder if she’s already got my letter.’
 ‘I don’t know if she got my letter or not.’ (Littell et al. 2009: (1))
- (3) a. *isos Na kimate o Nicholas.* [Greek]
 maybe SUBJ sleep-3sg the Nicholas
 ‘Maybe Nicholas is asleep.’
- b. *tou milise (arage)?*
 him talked-3sg Q
 ‘Did she talk to him?’
- c. *na tou milise (arage)?*
 SUBJ him talked-3sg Q
 ‘Might she have talked to him?’ (Giannakidou, 2015: (55), (61), (60))

The wide distribution of modal ingredients in questions has stimulated previous analyses in connection with the *speaker’s consideration* of a set of alternatives. Focusing on the type of questions as in (1)–(3) that encode a certain subtype of epistemic modality, the goal of the current paper is to add to the discussion by considering novel empirical issues in Korean, that have not previously been reported in the literature.

One crucial difference in Korean is the fact that the relevant link between modality and the question is realized without overt modal markers. The following examples show that there is a notable meaning difference between modal questions with *nka* and regular questions with *ni*. In (4a), the question marked by *nka* concerns speaker’s own knowledge and issues, reporting on the *speaker’s* consideration of a set of *possibilities* of the given propositional content. Based on the fact that John had a very subtle smile in the context, the speaker infers that ‘John is the winner’ has a good possibility of being true, while also acknowledging the equal likelihood of a negative scenario given the background that Bill is the strong front-runner. It contrasts with the regular factual question marker *ni* in (4b) which does not have the same presumption by the speaker:

(4) *Context: Mary, a reporter, was waiting for John and Bill, who were competing with each other for the win in the finals of the chess competition. She was ready to interview Bill, because Mary was told from her boss that Bill was the strong front-runner of the competition. After the match, John and Bill came out of the room. John had a very subtle smile and Bill had a poker face. Given their facial expressions, she infers that John might have won. But at the same time, John is unlikely to be the winner given her boss’s comment. In complete uncertainty about her inference, Mary says:*

- a. *Con-i wusungca-i-nka?* [Korean]
 John-NOM winner-be-NKA

- ‘Maybe John is the winner, maybe not?’
- b. *Con-i wusungca-i-ni?*
 John-NOM winner-be-Q
 ‘Is John the winner?’

This suggests that the meaning carried by *nka* is not simply an extension of the general use of questions. Rather, we treat the *nka*-question in (4a) as a non-factual question (Jang 1999; C. Kim 2010, a.o.): It is a question about the possibility of the propositional content. By using *nka*, the speaker questions her own knowledge on whether John might have won the game or not, rather than requests information from the addressee. The infelicity in (5a) further confirms the modality in *nka*-questions; when the content of question concerns the addressee, using *nka* becomes infelicitous because it is too weak. Note the contrast with the factual question marker *ni* in (5b) which forms a hearer-addressed question.

(5) Context: same as in (4). Mary asks John:

- | | |
|--|--------------------|
| a. <i>#ney-ka wusungca-i-nka?</i> | Modalized question |
| you-NOM winner-be-NKA | |
| ‘#(I am asking you:) Maybe you are the winner, maybe not?’ | |
| b. <i>ney-ka wusungca-i-ni?</i> | Ordinary question |
| you-NOM winner-be-Q | |
| ‘Are you the winner?’ | |

(5a) thus reveals that the *nka*-question does not require a hearer’s response but only conveys the speaker’s uncertainty, and the oddity arises because the second person subject *ney* ‘you’ (i.e. the hearer, John) would know if he is the winner or not.

Regarding the non-requirement of answer from the hearer, Koo and Rhee (2013b) provide a descriptive explanation on the wide range of usages of *nka*-question from monologue to question-answerhood, portraying it as a “feigned monologue”:

- (6) Characteristics of *nka*-question as a “feigned monologue” (Koo and Rhee 2013b: (14)):
- a. The speaker says something as if it were a monologue.
 - b. It may take the form of a question, as if it were a self-addressed question.
 - c. Because of the monologic nature of the utterance, it does not necessarily obligate the hearer to respond.
 - d. From the viewpoint of discursive strategies, the speaker shows gentleness by not imposing a direct burden of response on the intended addressee, and the implicit addressee now shows courtesy by being responsive to “what the other seems to have had in mind.”

Given this, our main claim is that the Korean *nka*-question has distinct semantics properties from the ordinary question so it cannot be fully accounted for by any existing analysis of the interpretation of questions. The use of *nka* indicates the speaker’s presumed awareness of asking a weaker question, and specifies the degree of certainty about the proposition in question, just like an epistemic modal. In this sense, we term the *nka*-question a *Modalized Question* (MQ, henceforth). A MQ questions the speaker’s belief and knowledge, thus it raises a weaker inquiry than a regular unmodalized question. Reporting on the consideration of a set of alternatives, the speaker expresses her weakest commitment to the possibility of propositional content by using *nka*. The following archetypal example exhibits the weakest commitment of *nka*:

- (7) *kkwum-i-nci* *sayngsi-i-nci* *kukes-i* *ki-nka* *mi-nka-ha-ta*.
dream-be-Comp reality-be-Comp that-be so-NKA not.so-NKA-do-Decl
‘Maybe it is a dream, maybe not; it may be real.’

By attaching to *ki* ‘so’ and *mi* ‘not so’, *nka* forms an idiomatic phrase *ki-nka mi-nka* ‘maybe so or maybe not so’.

We thus suggest that the *nka*-MQ can be characterized as follows: First, unlike ordinary questions, the MQ marker *nka* expresses the speaker’s weakest commitment, i.e. reluctance to commit to the truth of the proposition, almost akin to non-commitment. Given that the *nka*-MQ gives rise to a distinct morpho-semantic effect, it is plausible to treat this MQ as a separate creature from ordinary questions, assuming that Korean is a language that employs distinct question markers for a factual question and a modalized non-factual question. Second, another crucial difference of *nka* from MQs in other languages in (1)-(3) comes from the fact that the modal and question effects are achieved by a single morpheme *nka* in Korean. Accordingly, our discussion on *nka* hinges on the question of (i) how the semantic categories of MQs can be distinguished within the traditional domain of modality, and how they can be defined, and (ii) how the seemingly distinct notions of disjunction, modal effect, and question structure are amalgamated in a single element. For this purpose, we suggest three core criteria of *nka*-MQ, as follows:

Interrogative-disjunctive affinity. The crosslinguistic tendency of interrogative-disjunctive affinity is a reflex of an inherent semantic connection between disjunctive coordinators and interrogative markers. The most crucial property for the *nka*-MQ comes from the fact that the epistemic modality stems from its original function of *disjunction*. As illustrated below, *inka* in (8a) and *nka* in (8b) both function as a join operation of two alternatives.¹

- (8) a. *Context: I know that either John or Bill won the competition, but I don’t know which:*
wusungca-nun *Con-inka* *Pil(-inka)* *i-ta*.
winner-TOP John-INKA Bill-INKA be-DECL
‘The winner is maybe John or maybe Bill (I don’t know which).’
- b. *Context: I know there is a possibility that John won the competition, but I have full uncertainty about my inference:*
Con-i *wusungca-i-nka?* *(ani-nka?)*²
John-NOM winner-be-NKA not-NKA
‘Maybe John is the winner, maybe not? (maybe not?)’

In this sense, we term the *nka*-MQ “*nka*-disjunction” and (*i*)*nka* “a disjunction marker”, which is equivalent to the disjunction without overt modals in the sense of Zimmermann (2001) and Geurts (2005), interpreted as a list of epistemic possibilities. It asserts that the winner might be John or the winner might be Bill in a world *w* if and only if the proposition contains at least one

¹The disjunctive particle *inka* has been argued to be a morphologically contracted form of the combination of the copular *i* ‘be’ and the question marker *nka* ‘Q’. It went through grammaticalization and was reanalyzed as a single nominal particle (Yoon 2005, Sohn 2013, a.o.).

²As indicated in the translation, *nka* itself entails ‘maybe not.’ In this vein, the second disjunct *ani-nka* ‘maybe not’ part can be regarded as redundant, thus optionally omitted.

world that is permitted in *w*. Observe that, unlike *nka*, the factual question marker *ni* does not exhibit such a distribution of disjunction:

- (9) **wusungca-nun* *Con-ini* *Pil-(ini)-i-ta*.
 winner-TOP John-Q Bill-Q-be-DECL
 ‘Intended: The winner is maybe John or maybe Bill (I don’t know which).’

Close parallels between disjunction markers and question markers are repeatedly observed in unrelated languages such as *oo* in Malayalam (Jayaseelan 2004, 2008), *ka* in Japanese (Kuroda 1965; Hagstrom 1998; Uegaki, to appear), *wáa* in Yucatec Maya (Anderbois 2011, 2012), and *də* in Sinhara (Slade 2011). Since all these constructions are taken as sources of inquisitiveness (à la Inquisitive Semantics in section 2), the notion of inquisitiveness is suggested to provide a fundamental explanation of the interrogative-disjunctive affinity in natural languages (see AnderBois 2009, 2011, Slade 2011, Szabolcsi 2015, a.o.). For reasons to be made clear in section 2, this is in line with the recent trend to analyze MQs as “inquisitive disjunction”, which predicts the common semantic denominator of disjunction and question. Besides the traditional interrogative-disjunctive affinity discussed in the above languages, however, our account offers a proper explanation on how the modal effect is incorporated in the inquisitive *nka*-disjunction.

Nonveridicality. The conceptual link between inquisitive disjunction and epistemic modality can be captured under a framework of nonveridicality (via the notion of *homogeneity and non-inquisitiveness*; Giannakidou 2013). The nonveridicality is revealed in that a *nka*-MQ indicates an equal possibility of *p* and $\neg p$ worlds given what the speaker’s doxastic world is. The following facts lend further support to the nonveridicality property. The *nka*-MQ occurring in embedded contexts does not entail the truth of propositions in subordinate clauses. As illustrated below, when *nka* in (10) combines with morphologically negative verbs like *mol* ‘not.know’, it yields a dubitative reading, unlike the ordinary interrogative complementizer (*n*)*ci* in (11):

- (10) *B-ka* *mac-nun* *tap-i-nka* *mol-la*.
 B-Nom correct-Rel answer-be-NKA not.know-Decl
 ‘I **doubt if** B is a correct answer.’
- (11) *B-ka* *mac-nun* *tap-i-nci* *mol-la*.
 B-Nom correct-Rel answer-be-Comp not.know-Decl
 ‘I **don’t know whether** B is a correct answer.’

We thus assume that the addition of *nka* induces nonveridicality effect, which intrinsically involves the subjunctive mood. In section 4.3, we will show how the incorporation of the subjunctive mood can be understood as the existence of irrealis value in *inka*-disjunctions.

Modal spread. The third property of *nka* combines with modal verbs regardless of their modal force. As shown below, *nka* and modal verbs with apparently opposing forces—*l swu iss* ‘might (be possible)’ in (12) and *keyss* ‘must’ in (13), can co-occur, giving rise to a non-biased modality reading:

- (12) *Con-i* *wusungca-i-l.swu.iss-nu.nka*?³
 John-Nom winner-be-can-NKA

³ The allomorphs of the *nka*, *unka* and *nunka* are phono-morphologically conditioned: *nunka* after a verb, *unka* after a consonant-final adjective, and *nka* after a vowel-final adjective and a copula (Sohn 2013).

- ‘Maybe John might be the winner, maybe not?’
 (13) *Con-i* *wusungca-i-keyyss-nu.nka?*
 John-Nom winner-be-must-NKA
 ‘#Maybe John must be the winner, maybe not?’

This is unexpected from the perspective of modal concord, in which the double use of modal ingredients such as modal adverbs and modal verbs should be harmonic and of compatible force (Halliday 1970; Lyons 1977; Geurts and Huitink 2006; Zeijlstra 2008; Anand and Brasoveanu 2010; Huitink 2012, a.o.). Instead, we assume that their co-occurrences in (12) and (13) follow the pattern of *modal spread* in the sense of Giannakidou and Mari (2017; GM, henceforth). Based on the empirical data in Greek and Italian, Giannakidou and Mari show that the semantic contribution of modal verbs and modal adverbs are equivalent in the sense that they both play a role as a modal operator. In the current analysis of MQs, utilizing modal spread as a diagnostic, we argue that the function of disjunction marker *nka* is akin to that of modal adverbs in constraining the modal force, establishing an unbiased, equally split set of p and $\neg p$ worlds. Note, however, that English allows only matching spread, thus it is marked as infelicitous in the translation of (13).

Given this background, our goal is to show how three distinct notions of disjunction, questions, and possibility modality can be unified under the framework of *nonveridical equilibrium* (Giannakidou 2013; GM 2017). The maximal epistemic weakening in *nka*-MQs is obtained by the creation of non-homogenous nonveridical states partitioned in equiposed epistemic spaces. We suggest the following semantic properties of MQs:

- (14) *Nka*-disjunction as *nonveridical equilibrium*
 a. *Nka* is an indicator of the presence of non-homogenous modal spaces.
 b. *Nka* restricts the modal spaces to nullify the bias.

In the previous literature, nonveridical equilibrium has been mainly discussed within the realm of polar questions (Giannakidou 2013) or possibility modality (GM 2017). The notion of question and modal, however, remained quite distinct from each other, and there was no account of how they are related. The contribution of the present study is to show that the inquisitive *nka*-disjunction plays a crucial role in elucidating *the conceptual link of questions and modals*. Further, regarding the function of nonveridical equilibrium, Korean facts importantly reveal that languages parameterize as to whether they assign the function to adverbs (Greek, Italian, English) or to other categories such as disjunction (Korean).

The paper proceeds as follows: In section 2, we provide a brief recapitulation of Inquisitive Semantics and nonveridical equilibrium. Exploring the basic properties of *nka* in Korean in section 3, we provide three core characteristics of *nka*-disjunction and show how MQs are distinct from ordinary questions: First, *nka* expresses the speaker’s weakest perspective on the modal base, forming an unbiased partition in modal spread; Second, prosody in *nka*-disjunction plays a pragmatic role in strengthening the unbiased partition; Third, an added layer of the speaker’s perspective is incorporated as part of the syntactic structure. In section 4, we offer a semantic analysis of MQs, showing how the more comprehensive picture of MQs that we provide fits into the framework of nonveridical equilibrium. We provide further evidence to support that the MQ is sensitive to nonveridicality and the subjunctive mood in embedded structures. The incorporation of the subjunctive mood is further revealed by the irrealis value

marked in *inka*-disjunction. In section 5, we conclude with theoretical implications and remaining questions.

2. Theoretical backgrounds

In this section, we briefly introduce the main idea of Inquisitive Semantics and nonveridical equilibrium upon which our analysis is built, and discuss how the distinct disjunction, question and possibility modal features can be integrated into a single theory of nonveridical equilibrium.

2.1 Inquisitive Semantics: inquisitiveness, informativeness and disjunction

Inquisitive semantics (IS, henceforth) (Ciardelli 2009; Groenendijk and Roelofsen 2009; Roelofsen 2016; Farkas and Roelofsen 2017) has been suggested as a framework for the semantics of natural language questions and disjunction. Reconciling two previous views on disjunction, i.e. join operation of booelean algebra and propositional alternative semantics (generating alternatives), IS unifies the core meaning of questions and disjunctions based on the common denominator that they both contribute issues to discourse.

Formally, IS is based on two fundamental definitions. First, the propositions expressed in a sentence are defined as non-empty, downward closed sets of possibilities modeled as *sets* of possible worlds. It is crucially distinct from traditional assumption that proposition is construed as a set of possible worlds. In IS, however, proposition captures not only the informative content of the sentence, but also its inquisitive content. Under the framework of IS, declarative sentences and interrogative sentences both denote sets of sets of possible worlds (i.e. sets of possibilities), rather than just sets of worlds. Each possibility is defined as a set of possible worlds embodying a possible way to update the common ground. Information states are sets of possible worlds where a state s supports an atomic formula p , as in the following definition:⁴

(15) Definition of Truth sets, possibilities, propositions (Ciardelli and Roelofsen 2011: Definition 2.9):

Let φ be a formula.

- a. *Possibility*: A possibility for φ is a maximal state supporting φ , that is, a state that supports φ and is not properly included in any other state supporting φ .
- b. *Proposition*: The proposition expressed by φ , denoted by $[\varphi]$, is the set of possibilities for φ .

⁴ Note that a state is a set of indices. The term state is used to define the proposition via the notion of support. Full definitions of supports are given below:

(i) Definition of support (Ciardelli and Roelofsen 2011: Definition 2.3):

(a) $s \models p$ iff $\forall w \in s: p \in w$

(b) $s \models \perp$ iff $s = \emptyset$

(c) $s \models \varphi \wedge \psi$ iff $s \models \varphi$ and $s \models \psi$

(d) $s \models \varphi \vee \psi$ iff $s \models \varphi$ or $s \models \psi$

(e) $s \models \varphi \rightarrow \psi$ iff $\forall t \subseteq s: \text{if } t \models \varphi \text{ then } t \models \psi$

a. A state s supports an atomic sentence p iff every index in s makes p true;

b. A state s supports a negation $\neg\varphi$ iff no substate of s supports φ ;

c. A state s supports a disjunction iff it supports at least one of the disjuncts;

d. A state s supports a conjunction iff it supports both conjuncts;

e. A state s supports an implication $\varphi \rightarrow \psi$ iff every substate of that supports φ also supports ψ .

c. *Truth sets*: The truth-set of φ , denoted by $|\varphi|$, is the set of indices where φ is classically true.

Second, IS comes with a notion of entailment, which preserves the algebraic treatment of the connectives. Among the connectives, the join operator and entailment are defined below:

(16) Definition of join (Roelofsen 2016):

Any two propositions φ and ψ in IS have a join, i.e., a least upper bound w.r.t. entailment, and this join amounts to $\varphi \cup \psi$:

$$\llbracket \varphi \vee \psi \rrbracket = \llbracket \varphi \rrbracket \cup \llbracket \psi \rrbracket \quad \text{join}$$

Under the framework of IS, speaker and addressee are engaged in proposing and resolving issues. When the speaker utters a sentence expressing a proposition p , it brings two effects to the conversation in terms of informativeness and inquisitiveness. When a sentence is *informative*, the speaker steers the common ground of the conversation towards one of the states in p , and she provides the information that at least one of the states in p must be compatible with the actual state of affairs. When a sentence is *inquisitive*, the proposition embodies a proposal to update the common ground in one or more ways. The common ground should be enhanced in that one of these states is reached. The definition of informativeness and inquisitiveness is given as follows:

(17) Inquisitiveness in terms of possibilities (Groenendijk and Roelofsen 2009: Definition 9):

- a. φ is inquisitive in σ iff there are at least two possibilities of φ in σ ;
- b. φ is informative in σ iff there is a possibility for φ in σ and a possibility is excluded by φ in σ .

It has been argued that disjunction also shares this basic feature of inquisitiveness with questions and *main* disjunctions in that the sentence involving disjunction is dedicated to raising an issue by presenting a set of alternatives and demanding that one of them be chosen.

Under the theory of IS, a *nka*-MQ can be considered as an inquisitive disjunction in the sense that it raises an issue by presenting a set of alternatives (i.e. two possibilities of p and $\neg p$ worlds). However, it differs from typical disjunctions within the view of IS in the sense that the purpose of asking a MQ is not to encode a speaker's wish to have a common ground between interlocutors with regard to a true answer, but to express her non-commitment to the possibility of the given proposition: Given the alternatives which come from the speaker's belief and knowledge, the speaker is unable to choose which state is compatible with the actual state. To capture the relationship among disjunction, questions and modality, we appeal to the notion of nonveridical equilibrium. It will be shown that the central connection between questions and modality under the property of inquisitive disjunction is unsurprising considering the previous insight that links the two nonveridicality.

2.2 Nonveridicality is inquisitive

We begin with the definition of nonveridicality and then discuss the interrelationship between inquisitiveness and nonveridicality. Giannakidou (2013) incorporates inquisitiveness into the realm of nonveridicality, assuming that homogenous information states are non-inquisitive while non-homogenous information states are inquisitive. Regarding the veridicality assessment, Giannakidou (1995 et seq.) argues that it relies on the belief and knowledge of the epistemic

agent, i.e. the person assessing a proposition. Every sentence is evaluated with respect to an agent's epistemic state, which is called *information state*. Information state is understood as a set of worlds, representing what the epistemic agent i knows or believes. She notes that truth in a model is relativized with respect to an epistemic model, in which a proposition p is always true or false with respect to an individual x . Accordingly, this information state is termed a *model* of the individual. The proposition p of a main assertion is evaluated in the epistemic subject's model:

- (18) *Epistemic model of an individual i* (Giannakidou 1999: (45))
 An epistemic model $M(i) \in M$ is a set of worlds associated with an individual i representing worlds compatible with what i believes or knows.
- (19) *Truth in an epistemic model (=full commitment)* (Giannakidou 2013: (8)(9))
 A proposition p is true in an epistemic model $M(i)$ iff $M(i) \subseteq p$: $\forall w[w \in M(i) \rightarrow w \in \{w' \mid p(w')\}]$
- a. John won the race.
 - b. $\llbracket \text{John won the race} \rrbracket^M = 1$ iff
 $\forall w[w \in M(\text{speaker}) \rightarrow w \in \{w' \mid \text{John won the race in } w'\}]$

According to the definition, an unembedded positive assertion in the simple past like (19a) is veridical because the indicative assumes the speaker's commitment by default. Nonveridicality, on the other hand, is a function indicating the non-commitment to the truth of a proposition, and nonveridical operators include *disjunctions* and *questions*.

In terms of the relation between the information state and agent commitment, a veridical information state is positively homogenous—all worlds are p worlds—and therefore positively commits the speaker to p . The actual world is in the p space. Pragmatically, a homogenous state corresponds to adding the proposition to the common ground. Accordingly, veridical spaces are non-inquisitive by being homogenous:

- (20) *Fact: Homogeneity and non-inquisitiveness* (Giannakidou 2013: (12))
 Homogenous information states are non-inquisitive.

The following is the definition incorporating (non)homogeneity and (non)veridicality:

- (21) (Non)veridicality and (non)homogeneity (Giannakidou 2013: (13))
- a. An information state (a set of worlds) $W(i)$ relative to an epistemic agent i is *veridical* with respect to a proposition p iff all worlds in $W(i)$ are p -worlds. (Positively homogenous state).
 - b. An information state $W(i)$ relative to an epistemic agent i is *nonveridical* with respect to a proposition p iff $W(i)$ is partitioned into p and $\neg p$ worlds. (Non-homogenous state)

Nonveridicality creates polar (p and $\neg p$) partitioning in the information space, and the speaker is undecided as to where the actual world is (i.e. inquisitivity). Thus being inquisitive and being nonveridical are assumed to describe the same set of states.

Recall that Giannakidou's account on nonveridical equilibrium mainly focuses on the function of polar question. The present study, however, proposes that another crucial component, disjunction, also can be captured under the framework of nonveridical equilibrium, alongside

polar questions (or epistemic modality in GM 2017). Given that the information state of *nka* contains positive states p and negative states $\neg p$, *nka*-disjunction is strictly the nonveridical equilibrium.

2.3 Nonveridicality is modal

In addition to its connection to inquisitiveness, nonveridicality is at the heart of mood and modality (Giannakidou 1994 et seq.). Giannakidou proposes that the modal structure under the framework of nonveridicality involves three main ingredients: (i) a nonveridical modal base $M(i)$, (ii) a secondary modal base \mathcal{S} , and (iii) a meta-evaluation \mathcal{O} . First, Giannakidou assumes Kratzerian semantics for modals (Kratzer 1981, 1991) where modals take modal bases and ordering sources, and add one ingredient, the *Nonveridicality Axiom* that all modal bases are nonveridical. From the epistemic domain, we can move to generalize veridicality and nonveridicality to all kinds of modal spaces (sets of worlds), involving various kinds of modal bases. All modal bases are nonveridical spaces in that they do not entail the truth of the prejacent proposition. The notion of (non)veridicality can be defined in terms of the properties of modal spaces:

(22) Veridical, nonveridical modal spaces (sets of worlds) (Giannakidou 2014: (31))

- (i) A set of worlds M is veridical with respect to a proposition p iff
all worlds in M are p -worlds (Homogeneity): $\forall w'(w' \in M \rightarrow p(w'))$
- (ii) A set of worlds M is nonveridical with respect to a proposition p iff
there is at least one world in M that is a non- p world. (Non-homogeneity):
 $\exists w', w'' \in M (w' \neq w'' \wedge (p(w') \wedge \neg p(w'')))$
- (iii) A set of worlds M is antiveridical with respect to a proposition p iff M and p are
disjoint: $M \cap p = \emptyset$

Nonveridicality is a precondition on modalities, as given below:

(23) Nonveridicality Axiom of modals (GM 2017: (49))

MODAL(M)(p) can be defined only if the modal base M is nonveridical, i.e. only if M contains p and non- p worlds.

This axiom guarantees that MODAL p will not entail p , since there are also $\neg p$ worlds in M , and the actual world may be one of them. The modal base M intersects with p , but also contains non- p worlds.

Second, nonveridicality is postulated by the interaction of stereotypical and non-stereotypical worlds. In Kratzerian view of modality (1991), given that \mathcal{S} is a normative ordering source, GM (2017) postulate $\text{Ideal}_{\mathcal{S}}$ as a function over $M(i)$. The output $\text{Ideal}_{\mathcal{S}}$ is a subset of $M(i)$, as shown below (GM2017: (52)): ⁵

⁵ Following Portner (2009), they define $\text{Ideal}_{\mathcal{S}}$ in the sense of the ordering sources and Best worlds (GM 2017 (28)(29)), as follows:

(23) a. *Ordering of worlds* (Portner 2009: 65)

For any set of propositions X and any worlds w, v : $w \leq_X v$ iff

- (i) for all $p \in X$, if $v \in p$, then $w \in p$

b. For any set of propositions X , Best worlds as per X .

(24) $\text{Ideal}_S(M(i)) = \{w' \in M(i) : \forall q \in \mathcal{S}(w' \in q)\}$

The ordering source \mathcal{S} partitions $M(i)$ into Ideal_S and $\neg\text{Ideal}_S$ subsets, in which Ideal_S delivers the worlds in $M(i)$ in which all the propositions in \mathcal{S} are true.

Third, GM additionally postulate the secondary ordering source \mathcal{O} . As a ‘meta-evaluation’ that compares Ideal_S to its complement in $M(i)$, \mathcal{O} contains those propositions that allow i to evaluate the relative ranking of Ideal_S and $\neg\text{Ideal}_S$. When \mathcal{O} determines that Ideal_S is a better possibility than $\neg\text{Ideal}_S$, it creates a *positive bias*:

(25) Positive bias of epistemic necessity modals (GM 2017: (69)):

Ideal_S is a weak necessity relative to $M(i)$ and \mathcal{O} .

Given this, the general concept of bias is defined as follows:

(26) *Biased modals* (GM 2017: (70)):

A modal verb is biased iff it has a non-empty \mathcal{O} .

They take the positively biased epistemic modal as the one with ordering sources. The ordering source \mathcal{O} ranks Ideal_S as a better possibility than $\neg\text{Ideal}_S$.

Then, if the modal presupposes an “absence of ordering \mathcal{O} ,” it dissolves a bias or ranking between the two sets Ideal_S and $\neg\text{Ideal}_S$. Building upon the standard theory of possibility modals (Kratzer 1991), the absence of ordering sources results p and $\neg p$ as equal possibilities, which reveals a state of “nonveridical equilibrium.” The definition of nonveridical equilibrium is as follows:

(27) Nonveridical equilibrium (GM 2017: (92)):

A partitioned space $M(i)$ is in nonveridical equilibrium if the ordering \mathcal{O} is empty.

Thus far, we have overviewed relevant theoretical ingredients, introducing the theories of Inquisitive Semantics and nonveridicality. In what follows, we investigate the core properties of *nka* and show how nonveridical equilibrium offers an elegant analysis to capture the meaning of *nka*-marked MQs, incorporating the concepts of question, epistemic modal, and disjunction.

3. Nature of (i)nka-disjunction

To account for the meaning of *nka*-disjunction, we show the main characteristics of MQs with regard to modal spread, prosody, and syntactic structure, and how they characterize MQs distinct from regular questions.

3.1 Modal spread: manipulating the modal base into non-biased epistemic states

Korean employs proliferating modal ingredients whose delimitation is still a matter of debate. We define epistemic modality in terms of a speaker’s judgment on the likelihood of propositional content to be realized, and restrict our attention to the following cases, which are generally

$\text{Best}_X = \{w' : \forall q \in X(w' \in q)\}$

assumed to be central epistemic modal constructions of Korean (Lee et al. 2015: 226; Wymann 1996):

epistemic	modal verbs	meaning
possibility	-(u)l swu iss-ta	‘might/be possible that’
	-(ul) kes kath-ta	‘may’
necessity	-(ul) kes i-ta	‘must’
	-keyss-ta	‘must’

Table 1. Central epistemic modal constructions of Korean

As briefly mentioned in section 1, the phenomenon of modal concord—i.e. quantificational modal forces are harmonious between two modal exponents—seems to exist in the Korean modal system. As shown below, the low degree of commitment expressed by probability adverbs such as *eccemyen* ‘maybe’ or *hoksi* ‘by any chance’ renders them agreeable with possibility epistemic modals. In order to blend the iterated modalities into a single modality, the modal adverb and the modal verb are of compatible force. Thus these modal adverbs are attuned with epistemic possibility modal verbs such as *-l swu iss* ‘might/be possible that’ and *-(ul) kes kath-ta* ‘may’ in (28-29) and fortifies the meaning of the modal verbs. On the other hand, they reveal incompatibility with necessity epistemic modals like *kes i* and *keyss* ‘must’ in (30-31):

- (28) *Con-i* (*eccemyen/hoksi*) *wusungca-i-l.swu.iss-ta.*
 John-Nom maybe/by.any.chance winner-be-can-Decl
 ‘John can maybe be the winner.’
- (29) *Con-i* (*eccemyen/?hoksi*) *wusungca-i-l.kes.kath-ta.*
 John-Nom maybe/by.any.chance winner-be-may-Decl
 ‘John may (maybe) be the winner.’
- (30) *Con-i* (**eccemyen/*hoksi*) *wusungca-i-l.kes.i-ta.*
 John-Nom maybe/by.any.chance winner-be-must-Decl
 ‘John must (#maybe) be the winner.’
- (31) *Con-i* (**eccemyen/*hoksi*) *wusungca-i-keyss-ta.*
 John-Nom maybe/by.any.chance winner-be-must-Decl
 ‘John must (#maybe) be the winner.’

Modal concord between modal adverbs and modal verbs remains intact when the ordinary question marker *ni* is used to form a question, as shown below:

- (32) *Con-i* (*eccemyen/hoksi*) *wusungca-i-l.swu.iss-ni?*
 John-Nom maybe/by.any.chance winner-be-can-Q
 ‘Can John maybe be the winner?’
- (33) *Con-i* (*eccemyen/hoksi*) *wusungca-i-l.kes.kath-ni?*
 John-Nom maybe/by.any.chance winner-be-may-Q
 ‘May John maybe be the winner?’
- (34) *Con-i* (**eccemyen/*hoksi*) *wusungca-i-l.kes.i-ni?*
 John-Nom maybe/by.any.chance winner-be-must-Q
 ‘Must John (#maybe) be the winner?’
- (35) *Con-i* (**eccemyen/*hoksi*) *wusungca-i-keyss-ni?*

John-Nom maybe/by.any.chance winner-be-must-Q
 ‘Must John (#maybe) be the winner?’

Given that *nka* is a possibility modal ingredient, one would expect that *nka* also exhibits (in)compatibility with necessity modal verbs, just as possibility modal adverbs do. Surprisingly, however, *nka* actually combines with all modal verbs regardless of their force and no bias is detected:

- (36) *Con-i* (*eccemyen/hoksi*) *wusungca-i-l.swu.iss-nu.nka?*
 John-Nom maybe/by.any.chance winner-be-can-NKA
 ‘Maybe John can be the winner, maybe not?’
- (37) *Con-i* (*eccemyen/hoksi*) *wusungca-i-l.kes.kath-un.nka?*
 John-Nom maybe/by.any.chance winner-be-may-NKA
 ‘Maybe John might be the winner, maybe not?’
- (38) *Con-i* (*eccemyen/hoksi*) *wusungca-i-l.kes.i-nka?*
 John-Nom maybe/by.any.chance winner-be-must-NKA
 ‘Maybe John might be the winner, maybe not?’
- (39) *Con-i* (*eccemyen/hoksi*) *wusungca-i-keyss-nu.nka?*
 John-Nom maybe/by.any.chance winner-be-must-NKA
 ‘Maybe John might be the winner, maybe not?’

This asymmetric pattern between *ni* and *nka* suggests that *nka* requires absence of bias toward the preadjacent proposition, which triggers no conflict with the low degree of commitment expressed by the low probability adverbs. This would be unexpected if the structures in (36-39) involve modal concord in which modal verbs and modal auxiliaries match in modal type and quantificational force and one of them is semantically vacuous. Rather, the multiple exponents of modality in *nka*-MQ are not harmonious and seem to have their own distinct modal force. In fact this is not so puzzling since there is another mode of interpretation for iterating modal operators: modal spread. As GM (2017: 3) claim, modal spread refers to the phenomena in which “the modal verb and adverb belong to the same syntactic domain ...with apparently opposing force”. The idea is that multiple exponents of modality have a single semantic role since the adverb is the one that ultimately determines the contentful perspective. This explains why modal verbs and adverbs with opposing forces can co-occur with the interpretation of a single modality. Modal verbs and modal adverbs are thus not necessarily of compatible force because modal adverbs can manipulate the information on the modal base.

Modal spread is observed in various languages. In Italian, for example, the weak modal *può* can combine with strong adverbs such as *probabilmente* ‘probably’ or *sicuramente* ‘certainly’ in (40a), and the strong modal *dovere* ‘must’ can combine with weak adverbs like *forse* ‘maybe’ in (40b):

- (40) a. *Può* *probabilmente/sicuramente* *essere partito presto.* [Italian]
 can.3sg.pres probably/certainly be left early
 ‘#He may have probably/definitely left early.’
- b. *Le luci sono accese. Gianni deve forse essere a casa.*
 the lights are switch-on Gianni must maybe be at home
 ‘The lights are on. John must (#maybe) be at home.’

(GM 2017: (12)(9))

GM claims that the overt marking of modal adverbs in modal spread structures involves the manipulation of modal bias: *pronanilmente/siguramente* ‘probably/certainly’ introduces a bias and represents a positively biased modal base, whereas *force* ‘maybe’ maintains the lack of bias in the modal base. Depending on their manipulating force, GM categorizes three nuances of strength for the adverbs into *strengthening*, *weakening*, *maintaining the default*, to capture the combinations of modals and adverbs. Table 2 summarizes the pattern of *modal spread* (adapted from GM 2017: (72), (73)):

	DEFINITELY (e.g. It. <i>assolutamente</i> ; Gk. <i>oposdhipote</i> ; Eng. <i>definitely</i>)	MAYBE (e.g. It. <i>force</i> ; Gk. <i>isos</i> ; Eng. <i>maybe</i>)	PROBABLY (e.g. It. <i>probabilmente</i> ; Gk. <i>mallon</i> ; Eng. <i>probably</i>)
<i>must</i>	Strengthening	Weakening	Maintaining the default
<i>may</i>	Introducing the bias	Maintaining the default	Introducing the bias

Table 2. Modal spread with universal and existential modals

As already mentioned in section 2.3, an epistemic modal base $M(i)$ is nonveridical and non-homogeneous as it contains both p and $\neg p$ worlds. In this modal base, the role of DEFINITELY and PROBABLY types of modal adverbs is to strengthen bias in a positive direction. On the other hand, in (40b), MAYBE type adverbs annul any bias in the modal base and do not use ordering sources.

Likewise, in MQs, *nka* bears information about modal force and manipulates the modal base. Given that the set of p -worlds is the size of worlds in the modal base in which the proposition is true, *nka* expresses the speaker’s weakest perspective towards p by manipulating it to be equal to the size of the set containing $\neg p$ worlds. Accordingly, *the weakening effect* of *nka* can arise in a relation of equivalent propositionality between the set of p and $\neg p$ worlds in a given epistemic modal base $M(i)$. We thus suggest the following pattern of Korean modal spread with epistemic modals and *nka* in table 3:

epistemic	modal verbs	meaning	information of <i>nka</i> on modal force
possibility	-(ul) <i>swu iss-ta</i>	‘might/be possible that’	default
	-(ul) <i>kes kath-ta</i>	‘may’	
necessity	-(ul) <i>kes i-ta</i>	‘must’	weakening
	- <i>keyss-ta</i>	‘must’	

Table 3. Modal spread with epistemic modal verbs and *nka*:

Although Italian *forse* and Korean *nka* share the semantic function of being modal operators that create a nonveridical equilibrium in the modal spread structure, they exhibit different morpho-syntactic forms—*forse* is an adverb, whereas *nka* is a sentence final particle. We take this to assume that there is a crosslinguistic parameterization for morpho-syntactic formation in the modal spread structures.

Before concluding this section, some comments on the interaction between *nka* and evidential marker *-te* are in order. Traditionally, Korean *-te* has been treated as an epistemic modal subspecies, i.e. a direct evidential marker that refers to a specific past moment at which

the speaker witnessed or experienced the situation described. In (41), for example, *-te* indicates that the speaker has direct perceptive evidence regarding the eventuality. The distinct feature is that, when used in a question, as in (42), *-te* marks that the addressee, rather than the speaker, is expected to have direct perceptive evidence. This phenomenon is termed as a perspective shift of *-te*, as noted by Lim (2010; J. Lee 2011, among others):

- (41) *Con-i* (***hoksi**) *wusungca-i-te-la*.
 John-Nom by.any.chance winner-be-Past-INFER-Decl
 ‘John was the winner.’
 Implication: The speaker directly perceived that John was the winner.
- (42) *Con-i* (**hoksi**) *wusungca-i-te-nya?*
 John-Nom by.any.chance winner-be-Past-INFER-Q
 ‘Was John the winner?’
 Implication: The speaker requests directly perceived evidence from the addressee about whether John was the winner.

As a reviewer pointed out, what is interesting is that when *nka* co-occurs with *-te* as shown below, it gives rise to ambiguous interpretations: the first reading involves a non-factual modalized question, in (43a), in which the speaker expresses her non-commitment on whether she has directly perceived evidence that John was the winner. The sentence also yields a factual question reading as in (43b). In this case, *nka* seems to have a perspective shift, just like (42), which makes a request for an answer on the hearer’s direct evidence and there is no monologue feature:

- (43) *Con-i* (**hoksi**) *wusungca-i-te-nka?*
 John-Nom by.any.chance winner-be-Past-INFER-NKA
 a. ‘Maybe John was the winner, maybe not?’
 Implication: The speaker expresses her non-commitment on whether she has directly perceived evidence that John was the winner.
 b. ‘(I am asking you:) Maybe John was the winner, maybe not?’
 Implication: the speaker expects the addressee to have direct evidence on whether John was the winner.

We assume that the puzzle of dual readings in (43) can be solved by looking at previous literature on the analyses of evidential *-te* which can be divided into two camps: First, *-te* is treated as a typical epistemic modal operator that introduces an epistemic modal base (C. Lee 2011). Second, *-te* is analyzed as a function that takes a proposition as its argument and returns a character (Kaplan 1989), and a question with *-te* is a set of characters rather than a set of propositions (D. Lim 2010). Each interpretation is the result of each function. The first interpretation comes from the function of *-te* in C. Lee’s (2011) proposal. As an epistemic modal, *-te* introduces a biased modal base and the addition of *nka* nullifies such a bias. It is thus compatible with the low likelihood adverb *hoksi*.

The interpretation in (43b) is accounted for if we treat the evidential marker *-te* as Lim’s perspective shifter. As a perspective shifter, *-te* turns the question to the hearer, hence it obligates the hearer to respond. Note, however, that although the question marker *nya* in (42) and *-te-nka* in (43b) both forms a factual question, there is a subtle nuance difference between them: the

canonical question marker *nya* in (42) imposes a more direct burden of response on the addressee than *te-nka*. This difference, we assume, comes from the unique property of “feigned monologue” in *nka* (refer back to (6)). This is merely a sketch that needs to be spelled out in more technical detail, but since the analysis of *-te* is not the purpose of the current study, we will put it aside from our modal list.

3.2 Prosody

Further evidence for the unique property of *nka* comes from the distinct use of prosody. Languages employ diverse tools of expressing questions which come with various sources. Crosslinguistically, it is well known that interrogatives and declaratives have different syntactic structures and semantic interpretations, and prosodic realizations play a crucial role in disambiguation (Roelofsen and van Gool 2010; Pruitt and Roelofsen 2011, 2013, a.o.). They are reflected in the contour of the final pitch accent, i.e., declaratives end with falling intonation whereas interrogatives end with a rising one.

Korean is a language which employs both an overt question marker and final rising pitch accent. For example, yes-no questions are formed by attaching a sentence-final question particle *ni*, with a rising intonation contour, as in (44a):

(44) *Context: John is boiling noodles in the kitchen. He already took out the main ingredients, e.g. noodles, green onions, garlic, and carrots, from the refrigerator. But there is no egg, which is an optional ingredient. Seeing this, Bill asks John:*

- a. Bill: *lamyen-ey kyeylan-ul neh-ul.kes.i-ni? ↑*
 noodles-Loc egg-Acc put-will-Q
 ‘Will you put an egg in the noodles?’
- b. John: *ung, lamyen-ey kyeylan-ul neh-ul.kes.i-ta. ↓*
 yes noodle-Loc egg-Acc put-will-Decl
 ‘Yes, I will put an egg in the noodles.’

Although the above example is the case where the question employs both question markers and final rising contour, some questions such as one in an intimate speech style do not employ overt question markers, and the interrogative and declarative markers share the same morphological form. Only distinct realization of pitch accent determines their interpretations (Sohn 2013, Lee at al. 2015, a.o.).⁶ As shown below, a rising intonation at the end of sentence forms an interrogative in (45), while a falling intonation a declarative in (46):

(45) *Context: same as in (44):*

- Bill: *lamyen-ey kyeylan-ul neh-ul.kes.i-a? ↑*
 noodles-Loc egg-Acc put-will-Q
 ‘Will you put an egg in the noodles?’
- (46) John: *ung, lamyen-ey kyeylan-ul neh-ul.kes.i-a. ↓*
 yes noodle-Loc egg-Acc put-will-Decl
 ‘Yes, I will put an egg in the noodles.’

⁶ In modern Korean, question markers consist of six different types of inflectional suffixes based on their speech levels—plain, intimate, familiar, blunt, polite, and deferential. Note that the six inflectional suffixes of question markers in Korean do not have a truth conditional meaning other than being a question operator.

What is notable about *nka*, however, is that its behavior is never equivalent to the above typical questions: as a sentence final particle, *nka* occurs both in the declarative and the question, but rising or falling intonation does not reflect such distinction. In the following examples, there is no immediately noticeable meaning difference between the sentence with final falling contour (47a) and with final rising contour (47b):

(47) *Context: John is boiling noodles in the kitchen. He already took out the main ingredients, e.g. noodles, green onions, garlic, and carrots, from the refrigerator. But there is no egg, which is an optional ingredient. Seeing this, Bill raises the possibility that John will put an egg in the noodles by taking it out from the refrigerator later; at the same time, he raises the other possibility that John will not put an egg because he didn't already take it out. With full of uncertainty about his inference, Bill says:*

- a. (Con-i) *lamyen-ey* *kyeylan-ul* *neh-ul.kes.i-nka?* ↑
 John-Nom noodles-Loc egg-Acc put-will-NKA
- b. (Con-i) *lamyen-ey* *kyeylan-ul* *neh-ul.kes.i-nka.* ↓
 John-Nom noodle-Loc egg-Acc put-will-NKA
 ‘Maybe John is going to put an egg in the noodles, maybe not?’

We take this fact to argue that the structure a MQ is mapped onto is relevant to neither traditional interrogatives nor declaratives. Regardless of accentual contours, the semantic effect of MQs involves an equiposed modal space thus the intonation pattern is not a disambiguating factor between interrogatives and declaratives. Rather, we assume that the final rising tone in MQs is associated with speaker-oriented pragmatics, and its function is to put *an emphasis on the disjunction*. A final rising contour comes with additional information about the manipulation of the modal base, i.e. *strengthening* an unbiased partition. In this vein, we assume that the contribution of final rising tone in MQs is at the *pragmatic* level. Once the semantic meaning is completely generated, the prosody specifies the condition on how to associate phonology with meaning. In the interpretation of MQs, the final rising tone further highlights, hence reconfirms, the state of nonveridical equilibrium. In fact the idea of interaction between rising intonation and a possibility modal is not new. It has been suggested that the final rise marks speaker's uncertainty in terms of pragmatics and semantics (Gunlogson 2008; Constant 2012; Zaroukian 2013, a.o). Zaroukian (2013) even takes the prosody of final rising tone as a semantic tool for inducing the modal content, arguing that the co-occurrence of rising intonation and the possibility modal adverb *maybe* in English yields a modal concord reading.⁷

The close connection between final rising prosody and emphasis on disjunction is further confirmed by the following empirical evidence, which a reviewer pointed out. In a rhetorical question with falling intonation, a MQ construction is interpreted as negative:

⁷ Unlike Korean MQs, Japanese MQs do not allow final rising intonation (Hara and Davis 2013). Following Bartels (1999), Hara puts (2013: 9): “the boundary rising tone ↑ (L%H%) is an intonational morpheme which indicates that the utterance is directed at an addressee and if an utterance contains a deictic expression, it shifts the deictic center to the addressee. In case of the falling interrogative with *darou*, the utterance lacks the intonational morpheme, hence no shifting occurs. Therefore, the utterance simply performs an inquisitive update on the speaker's belief”. Contrary to this, we see that rising intonation on the declarative marks the *contingent commitment* where the utterance is interpreted as a question (Gunlogson 2008).

(48) *Context: John is boiling noodles in the kitchen. He already took out the main ingredients, e.g. noodles, green onions, garlic, and carrots, from the refrigerator. But there is no egg, which is an optional ingredient. Seeing this, Bill is certain that John will not put the egg, since he is allergic to eggs. Bill says:*

(Con-i)	<i>lamyen-ey</i>	<i>kyeylan-ul</i>	<i>neh-keyss-nun-nka.</i> ↓	
John-Nom	noodle-Loc	egg-Acc	put-will-II-NKA	
a.	‘Maybe John is going to put an egg in the noodles, maybe not?’			[MQ reading]
b.	‘Should John put an egg in the noodles?! (I don’t think so!)’			[rhetorical question reading]

The rhetorical question in (48b) has the illocutionary force of assertion of the opposite polarity from what is asked, in which the falling intonational contour has been characterized as an important cue (Han 2002, a.o.). Indeed, the meaning of rhetorical question is not associated with the core property of nonveridical equilibrium, but with high possibilities of the opposite polarity of the propositional content. The rhetorical question reading of (48), for instance, is ‘Should John put an egg in the noodles?’, implying ‘Of course not, everybody knows that he is allergic to eggs!’

We do not assume that MQs and rhetorical questions pattern alike. The key difference between them concerns the informativeness of the proposition in a given context (Han 2002): As Han puts, “rhetorical *yes-no* questions implicate the speaker’s expectation towards the answer in the strongest possible form (Han 2002: 216)” and the use of a rhetorical question would be felicitous only in a context where “the speaker’s assessment of the probability of $\neg p$ is 1, and so the speaker’s expectation towards the negative answer is asserted as the speaker’s belief (*ibid*: 216).” In other words, in a given situation where the speaker believes that it is highly likely that $\neg p$ (= It is not the case that John will put an egg in the noodles) holds in *c*, the likelihood that a speaker will use a question *p?* (= Is it the case that John will put an egg in the noodles?) is equal to the speaker’s assessment of the probability of $\neg p$ (= I don’t think that John will put an egg in the noodles). Such expectation toward the possible (either positive or negative) answers does not exist in the speaker’s belief model of *nka*-MQ. That is the reason why the context in (48) does not allow MQ interpretation and, we claim, why final rising intonational contouring is allowed only for MQs, i.e., in order to fortify the nonveridical equilibrium.

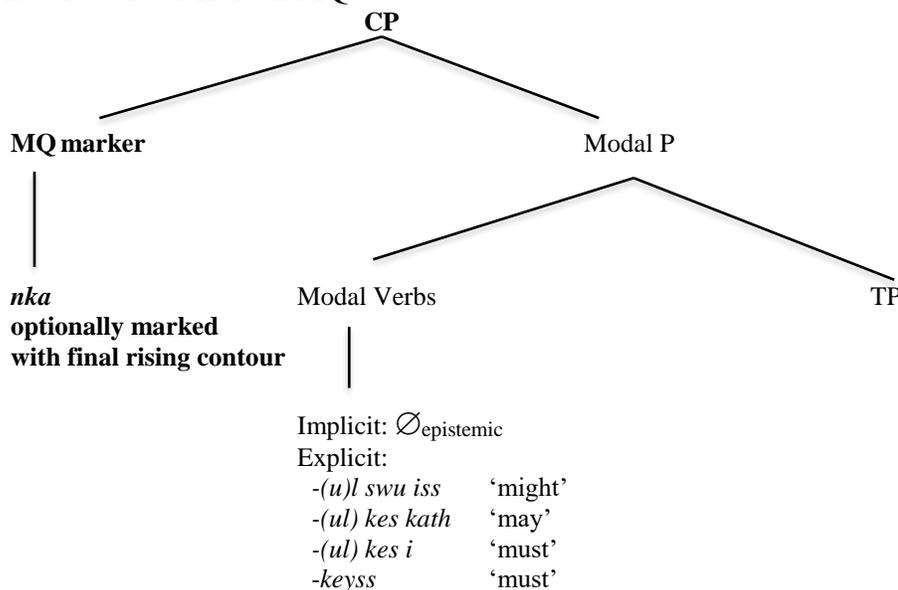
The conceptual link between the MQ marker *nka* and the rhetorical question marker *nka* can be captured in terms of grammaticalization. Since stance-marking is highly developed as an integral part of Korean grammar, various versions of historical reanalysis on the epistemic stance markers have been suggested in the literature, including one in which these markers evolve from epistemic ignorance markers to mitigators, and from mitigators to rhetorical question markers again (Rhee 2004, 2011, a.o.). While the discussion on grammaticalization process is worth pursuing in detail, we skip the relevant discussion as it is beyond the scope of this paper.

3.3 Syntactic structure of MQ

Given the full range of phenomena that correlate with the occurrence of *nka*, we propose the syntactic structure of *nka*-disjunction and show how it forms a MQ in this section. In the previous section, we observed that the speaker decides to use the nonveridical equilibrium operator *nka* in order to represent the equiposed epistemic space, a state where the speaker has uncertainty about her belief and knowledge on where the actual world is. To capture the semantic properties, we suggest a semantico-syntactic representation in which the epistemic uncertainty

meaning of *nka* is conveyed, pursuing a semantico-pragmatically non-null analysis: For the *nka*-MQ, we propose that without an overt verb, there is a silent verb akin to ‘might’, i.e. an implicit weak epistemic modal component in the structure below. Building on GM (2017: (76)), we thus suggest the following structure which maps the semantics onto the syntax with an added layer of structure for the modal, with the speaker’s perspective as an integral part of the modal structure. Crucially, we posit an underlying argument structure for modal spreads, where *nka* is an essential component of modality and denotes a function which is an argument of the verb, i.e. it is a function that reflects the speaker’s perspective, namely *a layer of perspective* in addition to the modal base and ordering source:

(49) The structure of Korean MQ



The function of *nka* is to express the speaker’s weakened perspective on the ranking of the positive set p by determining the ranking of the worlds in the modal base in which the proposition is true, while also comparing the set of p -worlds to the ranking of the set containing $\neg p$ worlds. *Nka* offsets the relativization of ranking between the two worlds, and returns a modal base equally partitioned between p worlds and $\neg p$ worlds. It works for either case, whether we have an overt or covert modal marking. When the modal base is overtly marked and already equally partitioned (possibility modal; see (36), (37)), *nka* maintains the default. When the modal base is overtly marked and it is not equally partitioned (necessity modal; see (38), (39)), *nka* annuls the bias. When *nka* is used without overt modals (see (4a)), it is applied to an implicit modal $\emptyset_{\text{epistemic}}$ and obtains the state of nonveridical equilibrium.

4. Semantics of MQs

In what follows, we propose how the semantics of *nka*-MQ can be captured under the framework of IS and nonveridical equilibrium.

4.1 Nonveridical equilibrium

The nonveridical equilibrium operator *nka* presupposes a non-homogeneous modal base (following nonveridical axiom) partitioned into p and $\neg p$ worlds. The medium possibility thus

can be naturally explained if we assume that *nka* modulates the force of modal verbs. In table 4 below, *nka*-MQs (a bare MQ in (50a) and a MQ with a necessity modal in (50b)) are infelicitous in contexts with high possibility (51a) and low possibility (51c), while felicitous in contexts with medium possibility (51b):

- (50) a. *imsin-i-nka?*
 pregnancy-be-NKA
 ‘Maybe she is pregnant, maybe not?’
 b. *imsin-i-keyss-nu.nka?*
 pregnancy-be-must-NKA
 ‘Maybe she is pregnant, maybe not?’
- (51) Degree of possibility
 a. High-possibility context (80-100%): It had been 1 year since my sister got married. One day, I visited her. She wanted to tell me about the surprise news. She showed me her pregnancy test kit. There were two lines on it. It suggested explicit medical evidence that she was pregnant and there should be no doubt on my inference. I said:
 b. Medium-possibility context (50%): It had been 1 year since my sister got married. One day, I visited her. She showed some symptoms such that she was suffering from nausea and feeling tired. These symptoms led me to infer that she might be pregnant; but at the same time, there was a possibility that she just had an upset stomach. With some uncertainty about my inference, I said:
 c. Low-possibility context (0-20%): It had been 1 year since my sister got married. One day, I visited her. She told me that she wanted a baby. There was nothing to make me infer about her pregnancy. I said:

	Continuation of (50a)	Continuation of (50b)
High possibility context (51a)	#	#
Medium possibility context (51b)	√	√
Low possibility context (51c)	#	#

Table 4. MQ and degree of possibility

The above examples suggest that for *nka* to be felicitous, the speaker must believe that the realization of the propositional content has a medium possibility given what she knows. The context is set up such that the speaker is uncertain about her inference and the truth of the proposition: the speaker does not know whether p (the possibility that she is pregnant) or $\neg p$ (the possibility that she is not pregnant) is true. However, if the evidence points too strongly, as in (51a), or too weakly, as in (51c), in favor of the proposition being either true or false, *nka* becomes infelicitous. The contribution of *nka*, we argue, thus involves the speaker’s presupposition of an approximately medium possibility in her belief system, which means that the speaker has zero certainty about the possibility since the speaker considers both p and $\neg p$ equally possible. Furthermore, given that we have the same effect regardless of the presence or absence of overt epistemic modal verbs, it supports our claim that there is an implicit modal base in MQ structure for the unified function of *nka*.

Given the properties of *nka*-disjunction thus far, it is plausible to assume that the meaning of *nka*-MQ is best represented as two partitioned possibilities of p and $\neg p$, containing epistemic modals:

$$(52) \quad \llbracket \text{NKA}(p) \rrbracket^{O, M, i, S} = \llbracket \text{that it is possible that } p \rrbracket \cup \llbracket \text{that it is not possible that } p \rrbracket$$

Disjunction in (52) creates polar partitioning, dividing the epistemic space into p and $\neg p$. Thus the analysis of *nka*-question naturally fits into the general picture of inquisitiveness, and it can still be considered as a question. Although it does not request information from the hearer, it raises the issue of whether p or $\neg p$ in the speaker's epistemic states holds true.

Before turning to the semantics of *nka*-based MQs, we first define epistemic possibility and necessity modal verbs in Korean under the framework of nonveridical equilibrium. The truth condition of possibility will come out as follows:

- (53) Bare existential modal (non-biased): *-(u)l swu iss*, *-(ul) kes kath* 'might':
 $\llbracket \text{MIGHT}(p) \rrbracket^{O, M, i, S}$ will be defined iff
 (i) the modal base $M(i)$ is nonveridical;
 (ii) $\llbracket \phi \text{ MIGHT}(p) \rrbracket^{O, M, i, S} = 1$ iff \mathcal{O} is empty; and
 (iii) $\exists w' \in M(i) p(w')$

Here the modal base of existential modal already forms a state of nonveridical equilibrium without ordering sources. On the other hand, the truth condition of necessity will come out as follows:

- (54) Bare universal epistemic modality (biased): *-(ul) kes i*, *-keyss* 'must':
 $\llbracket \text{MUST}(p) \rrbracket^{O, M, i, S}$ will be defined iff
 (i) the modal base $M(i)$ is nonveridical;
 (ii) $\llbracket \phi \text{ MUST}(p) \rrbracket^{O, M, i, S} = 1$ iff Ideal_s is a weak necessity relative to \mathcal{O} ; and
 (iii) $\forall w' \in \text{Ideal}_s: p(w')$

We thus suggest that an appropriate interpretation of *nka* obtains by considering the epistemic status of the speaker. The nonveridical modal base of *nka*-MQ holds the nonveridical modal space, p and $\neg p$, which is compatible with the speaker's belief, and indicates an equal possibility of its spaces given what the speaker's doxastic (or belief) world is. We therefore assume that the function of *nka* can be understood along the lines of the modal adverbs like Italian *forse* 'maybe' in modal spread, which weakens the biased modal base, or maintains the default of the existential modal base. When *nka* combines with existential possibility modal, it maintains the default, having no effect on the positive set, as in (55a). On the other hand, when *nka* combines with a biased necessity modal, the ranking and ordering source is annulled, and nonveridical equilibrium is delivered, as in (55b):

- (55) $\llbracket \text{NKA}(p) \rrbracket^{O, M, i, S} = \lambda q. \mathcal{O}$ is empty & q
 a. $\llbracket \text{NKA MIGHT}(p) \rrbracket^{O, M, i, S}$: Maintain the default of the existential modal
 b. $\llbracket \text{NKA MUST}(p) \rrbracket^{O, M, i, S}$: Weaken the default of the necessity modal

The table 5 summarizes the function of *nka* with epistemic modal verbs in modal spread:

$\phi_{\text{epistemic}} + nka$	Maintaining default: (4a)
<i>-(u)l swu iss</i> 'might/be possible that' + <i>nka</i>	Maintaining default: (36)

<i>-(ul) kes kath</i> ‘may’ + <i>nka</i>	Maintaining default: (37)
<i>-(ul) kes i</i> ‘must’ + <i>nka</i>	Weakening default: (38)
<i>-keyss</i> ‘must’+ <i>nka</i>	Weakening default: (39)

Table 5. Korean modal spread in nonveridical equilibrium

With these semantic assumptions in hand, we propose the nonveridical equilibrium of *nka*-MQ as follows:

- (56) Nonveridical equilibrium of MQ:
 $\llbracket \text{NKA MODAL}(p) \rrbracket^{O,M,i,S}$ will be defined iff
 (i) the modal base $M(i)$ is nonveridical;
 (ii) $\llbracket \text{NKA MODAL}(p) \rrbracket^{O,M,i,S} = 1$ iff \mathcal{O} is empty; and
 (iii) $\exists w' \in M(i) p(w')$

In sum, the proposed semantics shows how *nka* expresses the speaker’s perspective towards p by achieving equilibrium in the modal base, characterized as an equiposed epistemic space. Since the interrogative-based theory turns out to be untenable in the analysis of MQs, we have proposed a novel analysis of *nka*-MQs, subsuming the distinct types of MQs under the general theory of possibility modality. We have shown that the property of interrogativeness alone is not a sufficient condition for MQs, but the semantics of nonveridical equilibrium is a prerequisite for MQs.

4.2 MQ in embedded clauses: non-entailment of truth

In this section, we discuss the behavior of *nka* in embedded contexts. Based on new empirical data, we show that MQs in embedded clauses are interpreted as possibility modals rather than questions.⁸ The nonveridical equilibrium of MQs is further supported by complementizer choice. Typically, Korean employs a non-factive, interrogative complementizer (*n*)*ci*. Given that the semantics of questions comprises all potential answers irrespective of p or $\neg p$, the employment of an interrogative complementizer introduces both positive and negative cases as equal possibilities:

- (57) *B-ka* *mac-nun* *tap-i-nci* *mol-la*.
 B-Nom correct-Rel answer-be-Comp not.know-Decl
 ‘I don’t know whether B is a correct answer.’

In sharp contrast, MQs do not entail the truth of proposition in subordinate clauses, which means that the addition of *nka* produces a weakening, nonveridicality effect, which implies that it inevitably involves the subjunctive mood.⁹ When *nka* combines with morphologically negative

⁸ We thank an anonymous reviewer for suggesting that an MQ in an embedded clause can certainly be a question if the matrix clause carries a question marker as follows:

- (i) Con-i (ama) wusungca-i-nka po-ci?
 John-Nom maybe winner-be-NKA look-Q
 ‘It seems that John is the winner, isn’t he?’

⁹ We thank Jong-Bok Kim (personal communication) for bringing this important point to our attention.

verbs like *mol* ‘not.know’, it yields a dubitative reading interpreted as ‘doubt’ rather than ‘not.know’:

- (58) *B-ka mac-nun tap-i-nka mol-la.*
 B-Nom correct-Rel answer-be-NKA not.know-Decl
(ama) tap-un A-i-l.kes.kath-ta.
 maybe answer-Top A-be-may-Decl
 ‘I **doubt** if B is a correct answer. Maybe the answer might be A.’

It is further supported by the fact that *nka* sentences can be continued by probability adverbs like *ama* ‘maybe’ above. Observe that *nka* is incompatible with necessity adverbs such as *pwunmyenghi* ‘certainly’:

- (59) *B-ka mac-nun tap-i-nka mol-la.*
 B-Nom correct-Rel answer-be-NKA not.know-Decl
#pwunmyenghi tap-un A-i-l.kes.kath-ta.
 certainly answer-Top A-be-may-Decl
 ‘I **doubt** if B is a correct answer. #Certainly the answer might be A.’

Furthermore, in the following sentence, the addition of *nka* to the verb *po* ‘look’ gives rise to ‘it seems that’ reading:

- (60) *Con-i (ama) wusungca-i-nka po-ta.*
 John-Nom maybe winner-be-NKA look-Decl
 ‘**It seems that** John is the winner.’

These facts collectively support our claim that *nka* does not entail the truth of proposition in subordinate clauses and reduces speaker’s commitment to the truth of the sentence. In this sense, the semantics of MQ is strongly reminiscent of that of possibility modals, which is further confirmed by its compatibility with other nonveridical components that we see below. The choices of non-factive predicates such as *kitayha* ‘hope’ and *kekcengha* ‘worry’ are illustrated here:

- (61) *Con-un Mari-ka onulpam noray-lul halye-nu-nka*
 John-Top Mari-Nom tonight sing-Acc plan.to.do-NU-NKA
kitayha-koiss-ta.
 hope-Asp-Decl
 ‘John hopes if Mary will sing tonight.’
- (62) *Con-un Mari-ka eceyspam cip-ey cal tulekass-nu-nka*
 John-Top Mari-Nom last.night home-Loc well went.back-NU-NKA
kekcengha-ess-ta.
 worry-Past-Decl
 ‘John worried if Mari had returned home safely last night.’

We take this to argue that a strong connection exists between the nonveridical reading and the *subjunctive mood* since both are related to speaker's *non-commitment* to the truth of proposition. One of the standard assumptions of the subjunctive is that it is the mood of irrealis contexts and the indicative is the mood of realis contexts. As Curme (1931) notes, the subjunctive is the mood of a mere conception of the mind while the indicative is the mood of fact. The general properties of the subjunctive are related with this non-factive property. Note further that the conceptual connection between *nka* and the subjunctive mood via nonveridicality is made in terms of the *notional mood* (Portner 1992, 1997, 1999; Giorgi and Pianesi 1997) rather than the grammatical mood. The notional mood affords a classification of clauses or utterances by a semantic principle concerning the epistemic/buletic subject's commitment to the truth. Unlike the grammatical mood, which is a syntactic distinction and cannot be reduced to a simplified semantic classification, the notional mood allows for simplification into a binary semantic distinction, formalizing the conception of speaker's commitment as the properties of the semantic environment in which the truth of the sentence is to be evaluated.

Furthermore, the nonveridical nature of the Korean MQ is supported by the kinds of predicates that typically subcategorize it (Yoon 2011, 2013). Indicative predicates such as assertive, epistemic, factive, and semi-factive verbs (Yoon 2013: (48a-d)) are incompatible with MQs, just as they are incompatible with *expletive negation* which, according to Yoon, is a subcase of subjunctive mood markers:

- (63) Verbs that do not combine with MQs: indicatives in Korean
- a. assertive: *malha* 'say', *ilk* 'read', *cwucangha* 'claim'
 - b. epistemics: *mit* 'believe'
 - c. factive verbs: *kippu* 'glad', *al* 'know', *hwuhyoha* 'regret'
 - d. semi-factives: *kkayat* 'discover', *kiekha* 'remember'
- (*fiction verbs: *kkwumkkwu* 'dream', *sangsangha* 'imagine')

On the other hand, verbs that combine with *nka* are characterized as verbs of uncertainty, i.e. subjunctive verbs. This patterns with the distribution of expletive negation, which further confirms the commonality with *nka* under the notion of nonveridicality (Yoon 2013: (49a-d)):

- (64) Verbs that combine with MQs: subjunctives in Korean
- a. volitional: *hyimangha* 'hope', *kitayha* 'hope'
 - b. verbs of fear: *twuryeweha* 'fear', *kekchengha* 'worry'
 - c. directives: *chwungkoha* 'advise', *ceyanha* 'suggest'
 - d. verbs of uncertainty: *moru* 'not;know', *kwungkumha* 'wonder'

The observation so far is revealing about the nature of the interdependence of MQs and the subjunctive, which lends further support to their common non-veridicality, and explains why the occurrence of *nka*-disjunction is available in the irrealis context.

4.3 Irrealis value in *inka* disjunction

Given the connection between the subjunctive and the MQ discussed in the previous section, we close our discussion by showing how the subjunctive mood is expressed in the *inka* disjunction of two DPs. Mauri (2008) notes that there is a close connection between the alternative relation

and irrealis value of the involved propositions. Irrealis value is specified by an irrealis marker, defined as follows:

(65) Irrealis marker (Mauri 2008: 173-174)

Irrealis marker is meant here any marker which directly encodes the notion of irrealis or encodes a notion which implies that of irrealis (cf. interrogative, dubitative and hypothetical markers).

Irrealis markers encode notions that imply non-realization of the disjunct, such as imagination, possibility, wish, interrogation, necessity, obligation, and so on, in which there is no certainty about its occurrence. Crosslinguistically, irrealis markers in disjunction are usually realized as a verbal suffix (e.g. verbal dubitative suffix *-rafu* in Tauya (Mac Donald 1990), verbal suffix *šaa* in Maricopa (Gil 1991)). In these languages, the overt irrealis markers encode irrealis value on their alternatives to express speaker's uncertainty.

Assuming that a speaker's (lack of) knowledge is one of the possible dimensions of variation within the class of disjunction, we identify *inka* as an irrealis marker which specifies alternatives with irrealis value. In the previous literature, *i(ke)na* 'or' is treated as a standard disjunctive particle in Korean (Mauri 2008, a.o.), and the discussion of disjunctive particle *inka* only recently started (G.-H. Lee 2006; Y.-J. Choi 2011, Kang 2017, a.o.). The commonality between *inka* and *i(ke)na* is that they form a list of epistemic possibilities. The crucial difference, however, lies in that *inka* never induces epistemically specific interpretations. This is evidenced by a "guess who" test (Haspelmath 1997, Aloni 2011) which requires a fixed value, as shown below. Its incompatibility with *inka* disjunction in (66) reveals the speaker's uncertainty:

- | | | | | | |
|------|--|-------------------------------|--------------------------------|-------------------------|---------------------------|
| (66) | <i>wusungca-nun</i>
winner-Top | <i>Con-inka</i>
John-INKA | <i>Pil(-inka)</i>
Bill-INKA | <i>i-ta.</i>
be-Decl | #nwukwu-key?
guess who |
| | 'The winner is possibly John or possibly Bill (I don't know which). #Guess who?' | | | | |
| (67) | <i>wusungca-nun</i>
winner-Top | <i>Con-i(ke)na</i>
John-or | <i>Pil</i>
Bill-or | <i>i-ta.</i>
be-Decl | nwukwu-key?
guess who |
| | '(I know that) The winner is "John or Bill". Guess who?' | | | | |

Inka thus forms a list of epistemic possibilities in an alternative relation established between functionally parallel disjuncts that stand in a paradigmatic contrast with each other. It conveys information about the speaker's epistemic indeterminacy on the value of alternatives. In other words, *inka* is sensitive to the speaker's knowledge, requiring the speaker to be in a state of uncertainty about the value of alternative. That is, an epistemic subject employs a subjunctive-like marker *inka* as a means to not commit to the truth of what she says because she is not sure. The use of *inka* imposes the speaker's epistemic uncertainty on the two possibilities. This leads us to conclude that the disjunctive particle *inka* can be thought of as an irrealis marker whose function is to specify the irrealis value, encoding alternative possibilities. On the other hand, there is no specified irrealis value in *i(ke)na*.

Unlike some languages in which a speaker's ignorance in disjunction is reflected on a pragmatic level (e.g. *or* in English), the irrealis value on alternatives is lexicalized in the disjunctive particle *inka* in Korean. The irrealis value of *inka* is further supported by the general pattern of irrealis grammaticalization as claimed by Mauri (2008: 181): "A quick diachronic glance seems to confirm the close connection between irrealis and the alternative relation. Many

connectives coding alternative indeed originate from or evolve into irrealis markers, such as interrogative particles.”¹⁰

5. Conclusions

In this paper, we identified a novel case of epistemic uncertainty on propositions, i.e. MQs, and showed that the composite morpheme *nka* conveys more meaning than simple possibility modals or factual question markers: it is a modal-verb restrictor that maintains the default of the existential modal. We proposed that: (i) the epistemic constraints of MQs can be achieved by the presence of nonveridical modal space; and (ii) this modal space is partitioned in *equipoised epistemic space*. We further showed how the challenge of capturing the precise semantics of such an epistemic uncertainty can be met by capitalizing on the notion of nonveridical equilibrium. Specifically, *nka* expresses the speaker’s weakest perspective towards p , manipulating it equal to the size of the set containing p and $\neg p$ worlds. In other words, the weakening effect of *nka* eliminates the ranking between the set of p and $\neg p$ worlds in the epistemic modal base, thus bias is annulled. Furthermore, we showed that if the *nka*-based MQ accompanies a (optional) final rising contour, it brings about additional information on the intensity of restriction, i.e. *strengthening* the unbiased partition (hence emphasis on uncertainty) at the pragmatic level. This exhibits another interesting contrast with regular questions in which prosody typically impacts on semantics. We also pointed out that the meaning of MQs in nonveridical equilibrium inevitably involves the subjunctive mood and irrealis value.

The implications of the current study are the following: First, Korean facts importantly reveal that modalized questions do not form a uniform class with ordinary questions. Second, interrogative semantics alone cannot predict this epistemic uncertainty. Finally, languages parameterize as to whether they lexicalize the function of epistemic uncertainty as an adverb (Greek, Italian, English) or other categories; we show that the job is done by a disjunction marker in Korean. Further work on the interactions between MQs in embedded clauses and the subjunctive mood remains in our future agenda.

Acknowledgement (To follow)

¹⁰ It has been argued that *inka* combining with *wh*-words went through grammaticalization and was reanalyzed as a single nominal particle (i.e. determiner) from the MQ marker *nka* (Yoon 2005). Until the end of the 19th century, *wh*-phrases such as *nwukwu* ‘who’ in Korean were used exclusively as interrogative pronouns and only in questions. What the data in Modern Korean suggest is that the distribution of *nwukwu* has been extended to non-interrogative contexts, which means that the properties of *wh*-words in Korean have changed over time from the exclusively interrogative pronouns to quantificational indefinite pronouns (Kim 2000, a.o.). To explain the extension, it has been claimed that Q-morphemes lost their syntactic status as an interrogative C and underwent reanalysis to non-C elements with varying quantificational forces such as an existential quantifier (Kim 1992). This change, in turn, had the consequence of allowing *wh*-phrases to appear in genuinely non-interrogative contexts. Now they can be used in both interrogative and non-interrogative contexts: when they are associated with an interrogative C, they are interpreted as interrogative pronouns; when they are associated with an existential quantificational *inka*, they read as an existential pronoun. In the historical reanalysis process, the original properties of a construction before the reanalysis may continue to constrain the use of the reanalyzed forms (Hopper and Traugott 1993, a.o.). This can account for why the indefinite *wh-inka* conveys the speaker’s ignorance: the speaker’s ignorance induced by *wh-inka* came from the MQ, which is based on the original properties of a construction prior to the reanalysis. Therefore, the reanalyzed *referentially vague item* (RVI; Giannakidou & Quer 2013; Giannakidou & Yoon 2016) headed by the particle *inka*, which was originally a MQ, is unnatural in a situation where the speaker knows the identity of the referent.

References

- Aloni, Maria. 2011. Modal inferences with marked indefinites. Handout of a talk presented at the Dept. of Linguistics, University of Chicago.
- Anand, Pranav & Adrian Brasoveanu. 2010. Modal concord as modal modification. In Martin Prinzhorn, Viola Schmitt, & Sarah Zobel (eds.), *Proceedings of Sinn und Bedeutung* 14. 19-36.
- AnderBois, Scott. 2009. Non-interrogative questions in Yukatek Maya. In *Proceedings of SULA 5* (UMOP 41), ed. S. Lima, 1–16. Amherst, MA: GLSA.
- AnderBois, Scott. 2011. Issues and alternatives. University of California Santa Cruz Ph.D. dissertation.
- AnderBois, Scott. 2012. Focus and unformativity in Yucatec Maya questions. *Natural Language Semantics* 20. 349-390.
- Bartels, Christine. 1999. *The intonation of English statements and questions: a compositional interpretation*. Psychology Press.
- Choi, Yoon-Ji. 2011. Correlation between disjunction and modality: focused on *inka* (written in Korean). *Journal of Korean linguistics* 60. 146-181.
- Ciardelli, Ivano. 2009. *Inquisitive semantics and intermediate logics*. University of Amsterdam MA thesis.
- Ciardelli, Ivano & Floris Roelofsen. 2011. Inquisitive logic. *Journal of Philosophical Logic* 40. 55-94.
- Constant, Noah. 2012. English rise-fall-rise: A study in the semantics and pragmatics of intonation. *Linguistics and Philosophy* 35(5). 407-442.
- Curme, George O. 1931. *A grammar of the English language in three volumes, vol. III: Syntax*. Boston: D. C. Heath and Company.
- Farkas, Donka & Floris Roelofsen. 2017. Division of labor in the interpretation of declaratives and interrogatives. *Journal of Semantics*. Doi: 10.1093/jos/ffw012.
- Geurts, Bart. 2005. Entertaining Alternatives: Disjunctions as Modals. *Natural Language Semantics* 13(4). 383-410.
- Gannakidou, Anastasia. 1994. The Semantic licensing of NPIs and the Modern Greek subjunctive. In Ale de Boer, Helen de Hoop & Henriette de Swart (eds.), *Language and Cognition 4, Yearbook of the Research Group for Theoretical and Experimental Linguistics*. 55-68. University of Groningen.
- Giannakidou, Anastasia. 1995. Subjunctive, habituality and negative polarity items. *Semantics and Linguistic Theory* 5. 94-111.
- Giannakidou, Anastasia. 1999. Affective dependencies. *Linguistics and Philosophy* 22. 367-421.
- Giannakidou, Anastasia. 2013. Inquisitive assertions and nonveridicality. In Maria Aloni, Michael Franke, & Floris Roelofsen (eds.), *The dynamic, inquisitive, and visionary life of ϕ , $?\phi$ and possibly ϕ* , *A festschrift for Jeroen Groenendijk, Martin Stokhof and Frank Veltman*, 115-126.
- Giannakidou, Anastasia. 2014. The modality of the present and the future: Greek, Dutch, and beyond. *Natural Language and Linguistic Theory* 32(3). 1011-1032.
- Giannakidou, Anastasia. 2015. The subjunctive as evaluation and nonveridicality, epistemic subjunctive, and factive-as-emotive. In Blaszcak et al. (eds.), *For: Mood, Aspect and Modality: What is a linguistic Category?* University of Chicago Press.
- Giannakidou, Anastasia & Alda Mari. 2017. *The semantic roots of positive polarity: epistemic modal verbs and adverbs in Greek and Italian*. ms., University of Chicago.

- Giannakidou, Anastasia & Josep Quer. 2013. Exhaustive and non-exhaustive variation with free choice and referential vagueness: Evidence from Greek, Catalan, and Spanish. *Lingua*, (126): 120-149.
- Giannakidou, Anastasia & Suwon Yoon. 2016. Scalar marking without scalar meaning: non-scalar, non-emphatic EVEN-marked NPIs in Greek and Korean. *Language*. 522-556.
- Gil, David. 1991. Aristotle goes to Arizona, and finds a language without *and*, In D. Zaefferer (ed), *Semantic Universals and Universal Semantics*. 96-130. Berlin, New York: Foris.
- Giorgi, Alessandra, & Fabio Pianesi. 1997. *Tense and aspect, from semantics to morphosyntax*. Oxford: Oxford University Press.
- Groenendijk, Jerson & Martin Stokhof. 1984. *Studies in the Semantics of Questions and the Pragmatics of Answers*. University of Amsterdam Ph.D. dissertation.
- Groenendijk, Jeroen. & Floris Roelofsen. 2009. *Inquisitive semantics and pragmatics*. Presented at the Workshop on Language, Communication, and Rational Agency at Stanford, available via www.illc.uva.nl/inquisitive-semantics.
- Geurts, Bart. 2005. Entertaining alternatives: Disjunctions as modals. *Natural Language Semantics* 13(4). 383-410.
- Geurts, Bart, & Janneke Huitink. 2006. Modal concord. In Paul Dekker & Hedde Zeijlstra (eds.), *Concord and the syntax-semantics interface*, 15-20. Malaga: ESSLLI 06.
- Gunlogson, Christine. 2008. A question of commitment. *Belgian Journal of Linguistics* 22. 101-136.
- Hagstrom, Paul Aalan. 1998. Decomposing questions. Massachusetts Institute of Technology Ph.D. Dissertation.
- Halliday, Michael Alexander Kirkwood. 1970. Functional diversity in language as seen from a consideration of modality and mood in English. *Foundations of Language* 6. 322-361.
- Hamblin, Charles Leonanrd. 1973. Questions in Montague grammar. *Foundations of Language* 10. 41-53.
- Han, Chung-Hye. 2002. Interpreting interrogatives as rhetorical questions. *Lingua* 112. 201-229.
- Hara, Yurie & Christopher Davis. 2013. *Darou* as a deictic context shifter. In Kazuko Yatsushiro and Uli Sauerland (eds.), *Proceedings of Formal Approaches to Japanese Linguistics 6* (FAJL 6), 41-56. Cambridge, MA: MITWPL.
- Hara, Yurie. 2013. On the interaction among sentence types, bias, and intonation: a rating study. In *Proceedings of Glow in Asia IX*.
- Haspelmath, Martin. 1997. *Indefinite pronouns*. Oxford University Press.
- Hopper, Paul & Elizabeth C. Traugott. 1993. *Grammaticalization*. Cambridge: Cambridge University Press.
- Huitink, Janneke. 2012. Modal concord: a case study of Dutch. *Journal of Semantics* 29. 403-437.
- Jang, Youngjun. 1999. Two types of question and existential quantification. *Linguistics* 37. 847-869.
- Jayaseelan, K. A. 2004. Question movement in some SOV languages and the theory of feature checking. *Language and linguistics* 5. 5-27.
- Jayaseelan, K. A. 2008. Question particles and disjunction. Ms., The English and Foreign Languages University.
- Kang, Arum. 2015. *(In)definiteness, disjunction and anti-specificity in Korean: a study in the semantics-pragmatics interface*. University of Chicago Ph.D. dissertation.

- Kang, Arum. 2017. Epistemic constraint on the modal disjunctive particle in Korean: the condition of minimal variation and irrealis value on the anti-specific disjunction. *Korean Semantics* 57: 49-72.
- Kang, Arum & Suwon Yoon. 2016. Two types of epistemic ignorance in Korean. In Patrick Farrell (ed.), *The proceedings of the Linguistic Society of America* Vol. 1 (2016), 21. 1-15 (DOI: <http://dx.doi.org/10.3765/plsa.v1i0.3723>), Linguistic Society of America.
- Karttunen, Lauri. 1977. Syntax and semantics of questions. *Linguistics and Philosophy* 1. 3-44.
- Kim, Chonghyuck. 2010. *Korean Question Particles Are Pronominals: A transparent Case of Representing Discourse Participants in the Syntax*. <http://ling.auf.net/lingBuzz/001157/>
- Kim, Ae-Ryung. 2000. *A Derivational Quantification of "WH-Phrase"*. Indiana University Ph.D. dissertation.
- Kim, C.-H. 1992. A study on interrogative and indefinite pronouns in Korean (written in Korean). Hanyang University Ph.D. dissertation.
- Koo, Hyun Jung & Seongha Rhee. 2013b. On an emerging paradigm of sentence-final particles of discontent: a grammaticalization perspective. *Language Sciences* 37. 70-89.
- Kratzer, Angelika. 1981. The notional category of modality. In Hans-Jürgen Eikmeyer & Hannes Rieser (eds.), *Words, worlds, and Context*, 38-74. Berlin: de Gruyter.
- Kratzer, Angelika. 1991. Modality. In von Stechow & Wunderlich (eds.), *Semantics: an International Handbook of Contemporary Research*, 739-650. Berlin: de Gruyter.
- Kuroda, Sige-Yuki. 1965. *Generative grammatical studies in the Japanese language*. Massachusetts Institute of Technology PhD dissertation.
- Lee, EunHee, Sean Madigan & Mee-Jeong Park. 2015. *Introduction to Korean Linguistics*. London: Routledge.
- Lee, Gyu-ho. 2006. Classification and list of conjunctive particles. *Urimalgeul: The Korean Language and Literature* 37. 171-195.
- Lee, Jungmee. 2011. The Korean evidential *-te*: a modal analysis. In *Empirical Issues in Syntax and Semantics* 8. 287-311.
- Lim, Dongsik. 2010. *Evidentials and Interrogatives: A Case Study from Korean*. University of Southern California PhD dissertation.
- Littell, Patrick, Lisa Matthewson & Tyler Peterson. 2009. *On the semantics of conjectural questions*. Paper presented at the MOSAIC Workshop (Meeting of Semanticists Active in Canada), Ottawa.
- Lyons, John. 1977. *Semantics*. Cambridge: Cambridge University Press.
- Mauri, Caterina. 2008. *Coordination relations in the languages of Europe and beyond*. Vol. 42. Walter de Gruyter.
- Matthewson, Lisa. 2010. Cross-linguistic Variation in Modality Systems: The Role of Mood. *Semantics and Pragmatics* 3. 1-74.
- Portner, Paul. 1992. *Situation theory and the semantics of propositional expressions*. University of Massachusetts, Amherst Ph.D. dissertation.^[SEP]
- Portner, Paul. 1997. The semantics of mood, complementation, and conversational force. *Natural Language Semantics* 5. 167-212.
- Portner, Paul. 1999. The semantics of mood. *Glott International* 4(1). 3-8.
- Portner, Paul. 2009. *Modality*. Oxford University Press.
- Pruitt, Kathryn & Floris Roelofsen. 2011. *Disjunctive questions: Prosody, syntax, and semantics*. Presented at a seminar at the Georg August Universität Göttingen, April 2011. available via www.illc.uva.nl/inquisitive-semantics.

- Pruitt, Kathryn & Floris Roelofsen. 2013. Interpretation of prosody in disjunctive questions. *Linguistic Inquiry* 44. 362-350.
- Roelofsen, Floris. 2016. Two alternatives for disjunction: an inquisitive reconciliation. To appear in Edgar Onea, Klaus von Heusinger, and Malte Zimmermann (eds.), *Questions in discourse*.
- Roelofsen, Floris & Sam van Gool. 2010. Disjunctive questions, intonation, and highlighting. In M. Aloni, H. Bastiaanse, T. de Jager, and K. Schulz (eds.), *Logic, Language, and Meaning: Selected Papers from the Seventeenth Amsterdam Colloquium*: 384-394. Springer.
- Slade, Benjamin M. 2011. *Formal and philological inquiries into the nature of interrogatives, indefinites, disjunction, and focus in Sinhala and other languages*. University of Illinois Ph.D. dissertation.
- Sohn, Ho-min. 2013. *Korean*. Korea University Press.
- Szabolcsi, Anna. 2015. What do quantifier particles do? *Linguistics and Philosophy* 38(2). 159–204.^[SEP]
- Uegaki, Wataru. To appear. A unified semantics for the Japanese Q-particle *ka* in indefinites, questions and disjunctions. *Glossa*.
- Wymann, Adrian Thomas. 1996. *The expression of modality in Korean*. University of Bern Ph.D. dissertation.
- Yoon, Jeong-Me. 2005. Two historical changes in wh-constructions in Korean and their implications. *Studies in Generative Grammar* 15. 457-487.
- Yoon, Suwon. 2011. *'Not' in the Mood: the Syntax, Semantics, and Pragmatics of Evaluative Negation*. University of Chicago Ph.D. dissertation.
- Yoon, Suwon. 2013. Parametric variation in subordinate evaluative negation: Korean/Japanese versus others. *Journal of East Asian Linguistics* 22. 133-166.
- Zimmerman, Thomas Ede. 2001. Free choice disjunction and epistemic possibility. *Natural Language Semantics* 8. 255-290.
- Zaroukian, Erin. 2013. *Quantification and (un)certainty*. Johns Hopkins University Ph.D. dissertation.
- Zeijlstra, Hedde. 2008. Modal Concord. In M. Gibson & T. Friedman (eds.), *Proceedings of SALT 17*, 317-332. Ithaca: CLS Publications.