Uttering evidentials without evidence

Diti Bhadra

Epistemic modals are uncontroversially assumed to have an inherent evidential component of NON-DIRECT evidence (von Fintel and Gillies 2010, a.o.). This assumption entails the following: (i) epistemic modals should be infelicitous in evidence-neutral contexts, (ii) and they should be infelicitous in contexts with DIRECT perceptual evidence (including trustworthy reports). This paper will engage with the first prediction, and provide empirical basis for the claim that epistemic modals *can* and *do* appear in certain neutral contexts cross-linguistically. An analysis is provided centered around the epistemic modal base, where an additional ordering source is shown to yield non-evidential readings of epistemic modals, thus arguing that discourse goals can affect formal representations of modality.

1. Introduction

It is considered to be a robust cross-linguistic generalization that epistemic modals in the world's languages have a restriction of NON-DIRECT evidence (Westmoreland 1995, 1998, Faller 2002, von Fintel & Gillies 2007, 2010, Matthewson et al. 2007). For example, consider the following modalized statement:

(1) John **must** be home right now.

The use of the modal *must* (in its epistemic use - the only reading we are concerned with here) would signify to the hearer that the speaker is somehow *inferring* the proposition 'John is home right now' from certain relevant cues in the context. For example, the speaker could be driving past John's house, sees his lights on, and knowing that John is conscientious about saving energy, could infer quite confidently that John is home at the moment because his lights are on. Let us call this the INFERENTIAL reading (IR) of an epistemic modal. Notice that the same modal becomes infelicitous in the following context:

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(2) *Mary is driving past John's house, and sees him standing in the doorway talking to a friend. Mary says:*
#John **must** be home right now.

The context in (2) is a DIRECT evidence context (see Willett 1988's full taxonomy of evidence types). Willett's taxonomy was one of the first of many comprehensive survey studies in evidentiality (see De Haan 2001, Aikhenvald 2004, Davis et al. 2007, Faller 2002, McCready & Ogata 2007, Rooryck 2001a, 2001b, Matthewson et al. 2007, among others).

The DIRECT evidence in this context is the fact that the speaker is informed by one of her own direct senses of perception (vision) that John is in his house. In contrast, in a scenario of INFERENTIAL evidence as discussed under (1), the modal use is perfectly felicitous. Given this strict restriction of INFERENTIAL evidence, (von Fintel & Gillies 2010:4) place epistemic modals under Indirect evidence in Willett's taxonomy of evidence types - comprising Inference from Results and Reasoning [1].

Another context where epistemic modals are infelicitous is when the speaker *does not have any evidence* regarding a p or $\neg p$. Such contexts will be called 'evidence-neutral' or 'neutral' in this paper. The speaker does not have sufficient grounds to make an inference about either p or its complement. For example, in the context below, the epistemic use of *must* is infelicitous in assertions of either polarity:

(3) *Mary and John are co-workers. John left the office an hour ago without telling anyone where he's headed. Sally is now asking Mary where John is. Mary says:*
#John **must** be home right now.
#John **must not** be home right now.

Note that a non-modalized claim (*John is home right now*) has the exact opposite distribution of its modalized counterpart. It can only be uttered when the speaker *has* DIRECT perceptual evidence that John is home, and cannot be uttered when the available evidence is only inference OR in an evidence-neutral context. These facts surrounding the felicity of epistemic modals [2] as mediated by the inherent evidential component hold cross-linguistically.

This paper presents data from Bangla (also known as Bengali; Indo-Aryan, SOV) to make the claim that *epistemic modals can appear in certain neutral contexts*. In general, Bangla epistemic modals have the same properties discussed so far. Crucially, however, they can also appear in contexts such as the following:

(4) *Raj is a soldier in the army. His whereabouts are completely unknown, and there has been no news from him in a very long time. Mina is trying to reassure his distressed mother by saying:*

a. *Dekhben, Raj shiggiri bari phire ashbe nishchoi*
you-will-see, Raj soon home return.IMPV come.3P.FUT surely/must
'Don't worry, I am sure Raj will come home soon.'

[1] The use of small caps for denoting type of evidentiality throughout this paper is in keeping with the conventions in the evidential literature post-Willett's taxonomy.

[2] Although only examples with *must* have been provided so far, the same facts hold for possibility modals such as *might* as well as other necessity modals such as *should*.

In this case, the speaker Mina has no evidence either way, but still uses the epistemic necessity modal *nishchoi* 'surely/must'. As far as labels go, let us call this the REDUCTIVE reading (RR) of the modal (for reasons that will be clear in the following sections).

Showing the contrast between the properties of *must* and *nishchoi* is the main goal of examples (3) and (4). Crucially, both being epistemic modals, they share one property in common - they both encode INDIRECT evidence, and are infelicitous in the face of DIRECT evidence. Their crucial difference lies in the fact, however, that *nishchoi can appear* in evidence-neutral contexts such as (4). To make the point clearer, let's try to use *must* in the same context. The result is infelicity, as shown below. The RR is unavailable, and at best the addressee might get an INFERENTIAL reading, which would be quite weird in this situation where no one has any evidence:

(5) *Raj is a soldier in the army. His whereabouts are completely unknown, and there has been no news from him in a very long time. Mina is trying to reassure his distressed mother by saying:*
#'Don't worry, Raj must be coming home soon.'

The main aims of this paper are to provide evidence for the claim that the REDUCTIVE is an universal or at least a very common phenomenon cross-linguistically, and to provide an analysis of how to derive the semantics of this alternative reading within a standard framework of modal semantics. The paper is organized as follows: Section 2 discusses some crucial properties of the REDUCTIVE construction, including its reduced meaning and its correlation with tense. Section 3 presents a formal framework of epistemic modality and places *nishchoi* within it. Section 4 presents a semantic analysis of REDUCTIVE *nishchoi* and a pragmatic account of the incompatibility with the past. Section 5 discusses residual issues and Section 6 concludes.

2. *The nature of the* REDUCTIVE *construction*

As we saw above, in an evidence-neutral construction, it appears that the only felicitous use of an epistemic necessity modal is in the RR. Let us examine the construction a bit further.

2.1. *Reduced meaning*

Firstly, one of the main hypotheses that this paper will pursue is that this reading should be available under the right conditions in all languages that have epistemic modals. To this end, we provide examples from English, Hindi and Japanese[3] below where the respective modals have the RR only. In the same context as provided in (4):

(6) a. 'Don't worry, Raj will **definitely/probably** come home soon.' ENGLISH

b. *Chinta mat karo, Raj* ***zaroor*** *ghar wapas aayega*
worry not do, Raj must/surely home return come.MASC.FUT.
'Don't worry, Raj will surely come home soon.' HINDI

[3]Thanks to an anonymous reviewer of one of my abstracts for the example.

c. *Raj-wa* ***kitto*** *kaettekuru yo*
Raj.TOP surely come.back particle
'Don't worry, Raj will surely come home soon.' JAPANESE

In all of these examples, the available interpretation is a somewhat 'bleached' one - 'I have no evidence for *p* but I will use a necessity modal anyway to reassure/comfort you'. It is this *reduced* meaning, in a sense, that led to its label. Crucially, note that the presence of the RR entails the absence of the IR. In other words, the examples above cannot have the interpretation - 'I made an inference about *p* given some contextual clues or from my previous knowledge about related facts'. This points to a complementary distribution between reassurance and inference. Thus, in a context where the speaker has inferential evidence that he wants to use to reassure the hearer - for example, *R sees M looking up flight tickets to Delhi, and wants to reassure M's mother, who lives in Delhi, that her son will visit her soon* - only the IR or the RR would be possible, not both.

Given our observation that a special theme of *reassurance of the hearer* appears to be present in these evidence-neutral epistemic usages, I claim that the RR exists to fulfill a special *conversational goal* of the speaker. This claim will be an important piece in the analysis of *nishchoi* sketched in Section 4.

In the typology of conversational goals (see Halliday 1978, Hobbs & Evans 1980, Cheepen 1988, Todman & Alm 1997, 2003) there are two broad categories of implicit and explicit goals people pursue in conversation - transactional/ideational goals and interactional/interpersonal goals. The former are concerned with "getting things done", i.e. evolving plans, engaging in a task, while the latter predominate when the focus is on the social aspects of the conversation itself. Our conversational goal of reassurance would fall under the interactional/social category, where the utterance content is 'listener-oriented' (Bernsen 2001). Todman & Alm (2003) argue that in social chat, which is guided by interpersonal, listener-oriented goals, the precision of the message itself is often less important than its *delivery* and *timeliness*. Such a characterization seems to accurately describe the contexts in which the RR is felicitous. A distressed hearer is seeking comfort, and therefore the accuracy of the message *Your son will definitely come back home from war* is less important than the timely delivery of it in the conversation. This holds even when the speaker has no real grounds for that utterance.

2.2. Correlation with tense

The availability of the RR has an interesting interaction with tense, in that it is available only in the *non-past tenses*. The example contexts we have seen so far have been in the *future tense*. The RR can also be obtained in the *present tense* but never in the *past tense*. The Bangla examples with present tense (7a) and past tense (8a) below bring out this contrast:

(7) *Mina is complaining to Raj, who has never met her son Shyam before, that her son's exam is today and she's worried that he's out playing hookie somewhere. Raj says to her:*

a. *Porikkhar halle dekhun giye, Shyam* ***nishchoi*** *boshe mon diye porikkha dicche*
exam hall.LOC see.2P.HON.PRES go.IMPV, Shyam surely/must sit mind give.IMPV exam give.3P.PRES
Lit. '(Don't worry), go see in the exam hall, I am sure Shyam is writing his exam seriously.'

(8) *Yesterday, Mina's son Shyam visited the town where his grandmother lives. Mina is worried that he didn't visit his grandmother, who was waiting to see him. Sita is reassuring Mina:*

a. *#Chinta korona, Shyam* ***nishchoi*** *or dida'r sathe dekha koreche giye*
worry do.2P.NEG, Shyam surely/must his grandmother.GEN with meet do.3P.PASTPRF go.IMPV
Intended: 'Don't worry, I am sure Shyam met his grandmother.'

The past tense context in (8a) is a neutral context that locates the time of the event in the past. It yields infelicity because of two reasons: (i) the RR, a usage based on reassuring or comforting the speaker, is somehow not allowed access into events that have already taken place, and (ii) the IR is not available in this neutral context anyway, given its strict evidential restriction common to all epistemic modals - only contexts supporting inference of p allow [modal p]. The incompatibility with the past in (i) will be shown to exist due to a Gricean *generalized implicature* arising out the nature of the ordering source of the modal, in Section 4.2.

Thus, we have narrowed down the exact conditions for the birth of the RR:

- evidence-neutral context for the speaker.
- non-past tense construction.
- conversational goal of the speaker - *reassure the speaker.*

Before moving on to the main aim of providing an analysis that captures all these facts, let us review the system of formalization of the evidential restriction of epistemic modals that we will work with in this paper.

3. The semantics of epistemic modals

3.1. von Fintel and Gillies (2010)

The von Fintel & Gillies (2010) system refines the basic framework proposed in Kratzer (1981, 1991) with a focus on formalizing the evidential restriction of epistemic modals.

This combination makes their account the first in the modality literature to provide a dual characterization of the semantics of epistemic modals, which is the reason it is our preferred system in this paper. The authors argue for a *hard-wiring* of the evidential signal in the meaning of *must*. This hard-wiring approach could take two possible routes: (i) the evidential signal is a *presupposition*, (ii) the evidential signal is a *conventional implicature* (à la Potts 2005). The authors argue for the first route over the second given the fact that epistemic *must* contributes to both the 'at-issue' and 'not-at-issue' dimensions of meaning (as opposed to conventional implicatures which only contribute to the 'not-at-issue' dimension). The epistemic necessity expressed through standard possible world semantics (Kratzer 1981, a.o.) is the at-issue contribution, while the evidential signal is the not-at-issue contribution.

In such a system, the formalization of the evidential component relies on a structured model of information states (that is analogous to certain models in the literature on belief dynamics). There are two kinds of information states:

(9) a. Direct trustworthy evidence, either acquired by direct observation via the senses of perception or via trustworthy reports. The label given to this is the *kernel*.

b. Inferential conclusions that are compatible with, and thus follow from, the kernel.

The evidential restriction is a presupposition stating that the question of *whether p* has not been *settled* by the direct evidence (or the kernel) in the context. Crucially then, the evidential signal of an epistemic modal is a signal of *indirectness*, and not of weakness (contra Karttunen 1972, Groenendijk & Stokhof 1975, Kratzer 1991, among many others). However, the main innovation in the mapping of this indirectness of evidence lies in the authors defining what is DIRECT evidence, instead to trying to define the quagmire of all that could possibly come under INDIRECT evidence. This is where the idea of the kernel comes in.

A *kernel K* is a finite, non-logically closed set of propositions that are known to be true via the speaker's direct perception or trustworthy reports. The propositions contained in this set are considered to be *directly settled* by the kernel.

(10) **Kernels and Bases:** K is a kernel for the modal base B_K; B_K is determined by the kernel K iff:

a. K is a set of propositions (if $\mathrm{P} \in \mathrm{K}$ then $\mathrm{P} \subseteq \mathrm{W}$)

b. $\mathrm{B}_K = \bigcap K$

(von Fintel & Gillies 2010:p. 25)

The idea is that since we cannot have direct information that P unless it is the case that *P*, so for a modal uttered at *w*, with respect to a kernel *K*, we know that $w \in K$. So our modal bases will be reflexive. Given this set-up, and if $\mathrm{K}_0 = \varnothing$ is considered as the minimal kernel, then in a situation when we have no direct information, $\mathrm{B}_{K_0} = \mathrm{W}$, i.e. we have no information at all.

von Fintel and Gillies treat the evidential signal as a presupposition that needs to be satisfied for the purposes of well-definedness. The definition given of epistemic modal (demonstrated with *must*) is the following:

(11) **Definition** (Strong *must* + Evidentiality). Fix a c-relevant kernel K:

a. $[\![must\phi]\!]^{c,w}$ is defined only if K does not directly settle $[\![\phi]\!]^c$

b. $[\![must\phi]\!]^{c,w} = 1$ iff $\mathrm{B}_K \subseteq [\![\phi]\!]^c$ (von Fintel & Gillies 2010:26)

The intuition here is that even if K fails to *settle* whether p, it can still *entail* whether p. As von Fintel and Gillies demonstrate - epistemic modals exploit this gap. I provide the diagrammatic representation below to capture this insightful understanding of epistemic modals, which includes their restriction of indirect evidence:

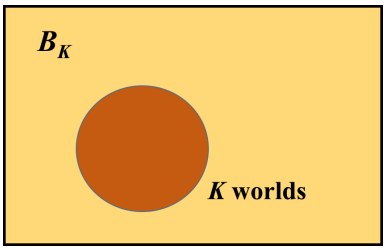

Figure 1: $\mathrm{B}_K = \bigcap K$

3.2. Nishchoi

I adopt the von Fintel and Gillies framework for to provide an analysis of *nishchoi*, as given below:

(12) For a c-relevant kernel K:

a. $[\![nishchoi\ \phi]\!]^{c,w}$ is defined only if K does not directly settle $[\![\phi]\!]^c$

b. $[\![nishchoi\ \phi]\!]^{c,w} = 1$ iff $\mathrm{B}_K \subseteq [\![\phi]\!]^c$

We see, therefore, that the prejacent of *nishchoi* is entailed by the kernel, but not directly settled by it. For explication, let us consider the following piece of Bangla data:

(13) *As John, Mary and Sue were leaving the house, John asked Mary to leave their house keys with the neighbor, and NOT the caretaker. However, on returning home, John and Sue see Mary calling up the caretaker. Sue says to John:*

a. *Cabita nishchoi kyartakerer kache rekhe esheche!*
key.CL surely/must caretaker.GEN near keep.IMPV come.3P.PASTPRF
'(She) must have left the keys with the caretaker!'

In this case, we can imagine Sue's kernel consisting of propositions such as *John asked Mary to leave the keys with the caretaker, John asked Mary not to leave the keys with the neighbor, Mary is dialing the number of the caretaker right now while we are standing waiting to get into*

the apartment, Mary is not dialing the number of the neighbor, etc. Based on these propositions for which Sue has direct perceptual evidence, she makes a valid inference that the keys must be with the caretaker and not the neighbor and thus felicitously uses *nishchoi* in the construction. Note that the kernel does not *directly settle* the question of who the keys were given to, (i.e. Sue does not have direct perceptual evidence that Mary handed the keys over to the caretaker) but *does entail* the prejacent of the modal. Thus, the inference belongs in the epistemic modal base by the principle in (10): $B_K = \bigcap K$.

Why is the IR unavailable in evidence-neutral contexts in the world's languages? To be able to formulate the answer to that question, the context in (13) is tweaked to turn it into a neutral context:

(14) *John and Mary live together, and they are meeting their friend Sue directly at the movies. While leaving, John asked Mary to leave their keys with the neighbor and NOT the caretaker. After the movie, Sue comes back to their apartment with them, and they see Mary dial the caretaker's number. Sue says to John*:

a. *#Cabita nishchoi kyartakerer kache rekhe esheche!*
key.CL surely/must caretaker.GEN near keep.IMPV come.3P.PASTPRF
Intended: '(She) must have left the keys with the caretaker!'

In this case, Sue's kernel can imaginably consist of propositions such as *Mary is dialing the caretaker's number, Neither John nor Mary are taking out keys to open the door*, among other obvious contextual and pragmatic information. Given that her kernel has no direct information about the history of the keys, she cannot make the inference in (14), yielding infelicity. In other words, given her *privileged information* (the kernel), the resultant epistemic modal base does not support the prejacent *Mary left the keys with the caretaker*.

In this system, then, we see that the interpretation of the epistemic modal base is dependent on the mapping of the epistemic modal base which in turn is dependent on the contextually defined kernel. Cross-linguistically, the evidential restriction of inference results from the prejacent of the modal being compatible with (entailed by) the kernel, while crucially being *outside* the kernel (not directly settled by it).

4. Semantics of REDUCTIVE *nishchoi*

4.1. Deriving the reading

In the standard Kratzerian framework (Kratzer 1981, 1991), different flavors of modality (epistemic, goal-oriented, deontic, etc.) are achieved via the interplay and contextual resolution of two conversational backgrounds - a modal base and an ordering source. Ordering sources are typically understood as sets of propositions that help determine the position of a particular world on a scale of *favored* or *best-ranked* worlds (see Kratzer 1981, 1991, von Fintel & Iatridou 2005, 2008 for different applications of the ordering source component).

An ordering source determines a partial order on a modal base such that a world *w'* comes closer to the ideal set up by *g(w)* than a world *w"* iff *w'* makes more ideal propositions true

than *w"* does. This paper will use this understanding of an ordering source to propose that the main mechanism to capture the RR is a simple additional restriction of an ordering source on the epistemic modal base. In this setup, the more of the ideal propositions fulfilling the speakers conversational goal of reassuring the hearer are made true by a world, the closer it is to the ideal. Given that the ordering source function g serves such a goal-oriented purpose, we will use the standard label of BOULETIC[4] (or BOULETIC$_{conversationalgoals}$ to be very specific) for the type of the ordering source. Adding this ordering source to the current semantics of *nishchoi* that we formulated in (12) provides us with the meaning of the REDUCTIVE *nishchoi*, shown in (15) below.

(15) For a c-relevant kernel K and the modal base B_K:

a. $[\![$ *nishchoi* $\phi]\!]^{c,w}$ is defined only if K does not directly settle $[\![\phi]\!]^c$

b. $[\![$ *nishchoi* $\phi]\!]^{c,w} = 1$ iff $\mathrm{B}_K \subseteq [\![\phi]\!]^c$

c. $g(w) = \{p: p$ fulfills the speakers conversational goal of reassuring the hearer$\}$
$\forall w', w'' \in W : w' \leqslant_{g(w)} w''$ iff $\{p \in g(w) : w'' \in p\} \subseteq \{p \in g(w) : w' \in p\}$

These ideal propositions that fulfill the speaker's conversational goal can be of the form - *soldiers come back from war even after long periods of being missing, the division of the army Minas son joined may not be directly at the warfront*, etc. The BOULETIC ordering source (BOS) picks out the worlds ranked highest by how many propositions the worlds make true that fulfill the speaker's conversational goals (as shown in Figure 2). The quantificational part of the modal (that we have kept intact as inherited from the Kratzerian framework) then comes into effect and quantifies over these worlds.

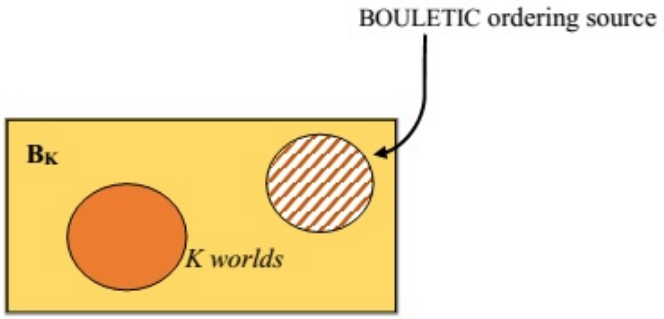

Figure 2: An Ordering Source Restriction introduced by discourse goals

This ordering source crucially **rules out the $\neg\psi$ worlds from the modal base, because those violate the speaker's goals**. Thus, the speaker can get away with a REDUCTIVE *nishchoi* statement because: (i) the worlds picked out by the BOS still satisfy the presupposition of

[4]Kratzer (1981), a.o., subsumes TELEOLOGICAL into BOULETIC, while Portner (2007) a.o., makes a difference between the two. The terminology is not crucial here; we call it BOULETIC here since the *desire* of the speaker is to reassure the addressee.

nishchoi, i.e. these worlds make those propositions true which are not directly settled by the context; and (ii) the world of evaluation does not have to be among these worlds - making the REDUCTIVE statement true in the context. Thus, the speaker does not have to commit that the actual world is a world where Raj comes back home from war. The BOS, then, rules out $\neg\psi$ worlds, helps the speaker fulfill her conversational goal of reassurance, as well as keep her claim **non-factive**. The result is an evidence-less, non-factive epistemic modal that is able to appear in neutral contexts.

The issue of non-factivity deserves some discussion here. In their formulation of a 'strong' semantics for *must*, von Fintel and Gillies (2007, 2010) go against the general strain in the epistemic literature (that claims *must* is *weak*) and ascribe *factivity* to *must*, whereby the modalized claim *must p* is argued to entail *p*. They present a series of cogent arguments in favor of the hypothesis that *a must statement is never weak.* It is just a signal of indirectness (in terms of its evidentiality) but it is never a signal of reduced strength of utterance or reduced speaker commitment or confidence. Some of their reasoning is provided below; I refer the reader to the original work for the complete discussion.

One of their first arguments is that if we were to assume that *must* is weak as the traditional literature on epistemic modals would have it, then *must* ψ should be perfectly compatible with *perhaps* $\neg\psi$ which does not entail ψ. This prediction, however, is not borne out, no matter what the order of the conjuncts is:

(16) a. #It must be raining but perhaps it isn't raining.
b. #Perhaps it isn't raining but it must be.

(von Fintel & Gillies 2010:p. 17)

These sentences turn out to be contradictions. The authors express their worry that in uttering a weaker *perhaps* $\neg\psi$ claim, the speaker is not suggesting a reduction of the modal base whereby only $\neg\psi$ worlds are being considered. Thus, if *must* had the same property of not entailing its prejacent like *perhaps not*, then *must* should be okay with this state of affairs. This, however, is not the case.

Another of their arguments is centered around the room for retraction in the usage of epistemic modals. While modals that are traditionally considered weak such as the existential *might* or the weak necessity modal *ought* allow the speaker felicitous opportunities to distance themselves from the truth of the prejacent when it turns out to be false, a strong necessity modal like *must* does not. For example, observe the contrast in the exchanges below:

(17) a. John: It *might* be raining.
b. Bill: [Opens curtains] No, it's not! You're wrong!
c. John: Well, I only said that it *might* be, so technically I'm not wrong.

(18) a. John: Chris *ought* to be mowing the lawn right now.
b. Bill: [Opens curtains] No, he's not! You're wrong!
c. John: Well, I only said that he *ought* to be, so technically I'm not wrong.

(19) a. John: It *must* be raining.
b. Bill: [Opens curtains] No, it's not! You're wrong!
c. John: #Well, I only said that it *must* be, so technically I'm not wrong.

(Inspired by von Fintel & Gillies 2010:17-19)

The claim here is that from a strength approach to *must*, the pattern above is not surprising - combining *only* and *must* sounds as cringeworthy as saying *John only ate all of the cookies*. Under a view that positions *must* at the lower rungs of epistemic strength, the pattern of discord between *only* and *must* above is not predicted.

Coming back to the RR problem, we now understand the role of BOS in effecting non-factivity better. An INFERENTIAL *nishchoi* claim is factive, as we discussed above, assuming that, in the strength debate, the side of factive epistemic modals is more convincing. *In the IR case, the ordering source is empty* (á la Kratzer 1981, 1991). However, the REDUCTIVE version of the modal has the BOS. Even though it picks a set of worlds in which the speaker's discourse goal of reassurance is satisfied, the BOS *cannot* and *does not* ensure that the world of evaluation is in that set. Recall Figure 2 - the world of evaluation is in the modal base but outside both the circles (in the yellow section of the figure). This fact impairs the strength of the modal - *it is no longer factive.* This impairment is one of the crucial reasons why the epistemic necessity modal can be uttered even when the speaker has no (indirect) evidence for the prejacent.

At this juncture, one may ask a question regarding the nature of the modal base in the RR. If it is indeed an evidence-neutral context, then how and why are we still operating inside an epistemic modal base in deriving the evidence-less-ness of the RR? The answer to that lies in the *nature of the kernel in the two cases*. Given that communication occurs with utterances produced and understood by the discourse participants in relation to their doxastic domains, it is not surprising that even in the evidence-less case we would still be operating within a knowledge-centered *epistemic* modal base. Crucially, given that modal bases are formed by logical closure of the propositions in the kernel ($B_K = \bigcap K$), *what is in the kernel determines the shape of the epistemic modal base*. In the RR case, the kernel does not contain any directly settled propositions that bear on the question of whether or not the prejacent holds; while in the RR case, there are crucial clues in the kernel to make the speaker *infer* that the prejacent must hold. This difference in the nature of the kernel gives yields two very different modal bases in the IR and RR cases, even though in both cases the modal base is still epistemic in nature.

The reader might have observed the presence of parenthetical elements such as *don't worry* in sentence-initial positions in several of the examples presented above. I included them because their presence makes the RR easier to get [5]. Consequently, I propose that these parentheticals like *don't worry*, and its Bangla counterparts such as *dekhben* 'you will see', *chinta korona* 'don't worry', etc. are *overt syntactic realizations* of the BOULETIC ordering source that imposes discourse requirements on the modal base. An uncontroversial prediction of this hypothesis would be that in all languages that allow modals with the RR, such overt parenthetical elements should help achieve the reading more easily than if they were covert/absent.

[5]Intonation plays a somewhat productive role in getting the RR too, but a discussion of that in any detail is beyond the scope of this paper.

4.2. Incompatibility with the past

This section will provide an explanation for the incompatibility between the RR and the past tense, as we saw in (8a). The main claim is that due to the nature of the ordering source, a Gricean Generalized Implicature arises that blocks co-occurrence of the RR with the past. Let us do a quick review of the implicature theory in Grice (1975) before we see how it applies to the problem at hand.

The cornerstone of Grice's pragmatic theory of human conversation are his maxims - the Cooperative Principle (a super maxim), and the Maxims of Quality, Quantity, (Relation) Relevance and Manner (see Lewis 1976, Joshi et al. 1984, Levinson 2000, Horn 1984, Wilson & Sperber 2004, Benz 2006 for different variants of the theory of maxims). A *conversational implicature* arises when the following three conditions are met.

(20) A speaker who, by saying *p* has implicated that *q*, may be said to have *conversationally implicated* that *q* given that:

a. he is presumed to be adhering to the conversational maxims and the cooperative principle;

b. the supposition that he has awareness of the fact that *q* is required in order to make his saying *p* is consistent with the presumption above;

c. the speaker thinks that it is upon the hearer to calculate that the supposition above is required.

(Grice 1975:49-50)

The guiding idea beside these definitive conditions is that the conversational implicature is an inference that the hearer in a conversation is *compelled* to make in order to continue to assume that the speaker is being cooperative [6].

A *generalized implicature* is an important subclass of conversational implicatures. The following passage (Grice 1975:56) brings out the distinctions that Grice makes between particularized and generalized implicatures:

> I have so far considered only cases of what I might call particularized conversational implicature that is to say, cases in which an implicature is carried by saying that p on a particular occasion in virtue of special features of the context, cases in which there is no room for the idea that an implicature of this sort is NORMALLY carried by saying that p. But there are cases of generalized conversational implicature. Sometimes one can say that the use of a certain form of words in an utterance would normally (in the ABSENCE of special circumstances) carry such-and-such an implicature or type of implicature. Noncontroversial examples are perhaps hard to find, since it is all too easy to treat a generalized conversational implicature as if it were a conventional implicature. I offer an example that I hope may be fairly noncontroversial.

[6] see Hirschberg 1985 for problems with Grice's formulation and for a more fully specified version

In other words, generalized conversational implicatures are those that, in the absence of special contextual features, are carried by certain words *normally* in a sentence. Irrespective of context, Gricean Generalized Implicatures (GGIs) are present because they are associated with the specific forms of words being used in the utterance.

In this paper, I will use the GGI idea in making the following claim: In examples such as (8a), repeated below in (21a), there is a GGI of the form as specified in (22):

(21) *Yesterday, Mina's son Shyam visited the town where his grandmother lives. Mina is worried that he didn't visit his grandmother, who was waiting to see him. Sita is reassuring Mina:*

a. *#Chinta korona, Shyam* ***nishchoi*** *or dida'r sathe dekha*
worry do.2P.NEG, Shyam surely/must his grandmother.GEN with meet
koreche giye
do.3P.PASTPRF go.IMPV
Intended: 'Don't worry, I am sure Shyam met his grandmother.'

(22) GGI: **If an epistemic modal is used in talking about an event at a past time *t*, then at utterance time *u*, (where $t < u$), the speaker has to have evidence or knowledge about the event that took place at *t*.**

Using *nishchoi* and a past event together, thus, results in the hearer assuming that the speaker has *actual inferential evidence for the prejacent*. This assumption yields the unavailability of the RR - the existent implicature of there being valid, conclusive inferences about past events blocks out a reading where the hearer calculates an inference that the speaker is just using the modal to reassure the hearer. And crucially, the IR is not available anyway because it is a context where the speaker actually has no evidence, and thus has made no inference about the prejacent.[7]

The assumption of possession of actual knowledge when an epistemic modal or evidential is used with past morphology is not uncommon in the world's languages. In Turkish, the past tense/past perfect is often a marker of DIRECT evidentiality, whereby using the past signals that there is complete or almost complete knowledge of the event on the part of the speaker. In the case of non-past events, this is not the case. Gül (2006) uses Plungian's (2001) categorization of 'Retrospective' evidence to classify the evidence-type denoted by the past tense marker *-mIs*, where *the evidentially marked situation is before the utterance time* (*p* before T_0). The usage presupposes that the speaker has *direct access to knowledge about the event.* In their work on Tibetan evidentiality, de Villiers et al. (2009) report a similar situation for the Tibetan past tense marker *song*, whose usage signals the presence of direct evidence on the part of the speaker.

I claim that when combined with the past tense morphology, the use of *nishchoi* is no longer calculated as a reassuring strategy, because a strong flavor of speaker-inference is already present. This is the reason we have infelicity in *nishchoi*-past combination such as in (21a). It should be mentioned here that one should not take this to mean that the modal cannot appear with the past tense at all; in a context with INFERENTIAL evidence (i.e. *not* an evidence-neutral

[7]Note that, unsurprisingly, the English *must* cannot occur in a context like (21a), because of the lack of INDIRECT evidence.

context), *nishchoi* is perfectly felicitous, with the speaker's kernel allowing him to make a valid inference about a past event:

(23) *John and Ram are roommates. John has been away for a few days and returns home to find empty alcohol bottles and trash everywhere. He exclaims:*

a. *Ami chilam na bole kal nishchoi ekhane purodomey parti*
I be.PERF neg COMP yesterday surely/must here in full blast party
hoyeche/hoyechilo!
happen.3P.PERF/happen.3P.PAST
'Since I wasn't here, there must have been a crazy party here yesterday!'

Unsurprisingly, only an IR of the modal is felicitous here (given the non-neutral nature of the context).

Since GGIs are the pragmatic implications of a speech act, arrived at by Gricean reasoning, they cannot arise at a sub-locutionary level, a point made most explicitly in Ducrot (1969), and later in Cohen (1971) (as cited in Recanati 2003). Hence, to demonstrate that the implicature we have been describing so far is indeed a GGI, I embed it in the antecedent of a conditional:

(24) *#Jodi Ram nishchoi or dida'r sathe dekha korechilo giye,*
if Ram surely/must his grandmother.GEN with meet do.3P.PAST go.GO.IMPV,
tahole or dida ta bollenni keno?
then his grandmother that say.NEG why?
Intended meaning: 'If Ram had met his grandmother (as I infer that he had), then why didnt she say so?'

In the example above, the GGI we specified in (22) is no longer available. There is no knowledge or evidence at utterance time *u* presupposed on the part of the speaker about the event that took place at *t*. The only interpretation with which (24) would be acceptable is a metalinguistic move where I tell you that *'Ram nishchoi met his grandmother'*, and you seek to challenge that with the utterance in (24). Then *nishchoi* no longer signals the presence of inferential evidence in that case anyway, but is just a mirror of the previous interlocutor's statement.

5. Residual issues

5.1. Possibility modals

One of the main reasons the RR problem needed an explanation was that epistemic *necessity* modals, with universal quantificational properties and a strong evidential component specified for inference, appeared to be felicitous in evidence-neutral contexts. The pragmatic desires of the speaker were shown to be affecting the modal base in a crucial way, where an ordering source was shown to exist to fulfill the speaker's conversational goal of reassuring the hearer. One can hypothesize that the universal quantificational aspect of epistemic necessity modals

lend an especially reassuring flavor to an utterance of the type I discussed, given that it is a statement about *all* accessible worlds. This makes one wonder: what about possibility modals? Do they have the REDUCTIVE reading too? If yes, do they serve the purpose or reassurance, given their existential quantificational force?

Empirically, it appears to be the case that possibility modals *do* allow the RR. This is demonstrated with epistemic possibility modals from Bangla and Hindi below:

(25) *Context: said as reassurance to someone worried about Mina's uncared-for relatives in Chicago.*

a. *Chinta korona, Mina* ***hoyto*** *oder saathe dekha korte Chicago*
worry do.2P.NEG, Mina might/possibly them with meet do.IMPV Chicago
jaabe
go.3P.FUT
'Dont worry, Mina might go to Chicago to meet them.' BANGLA

b. *Chinta mat kijiye, Mina* ***shayad*** *unse milne Chicago*
worry NEG do.2P.PRES, Mina might/possibly they.INSTR meet.IMPV Chicago
jayegi
go.3P.FUT.FEM
'Don't worry, Mina might go to Chicago to meet them.' HINDI

In both the examples above, the IR is absent, and only the RR is present, as we saw in the necessity cases. While felicity of the RR is achievable via these utterances, the question remains if the conversational goal of reassurance is indeed being fulfilled. Most certainly, a distressed mother would be soothed better with the modal force of necessity (albeit even in the face of complete lack of evidence) than the modal force of possibility. In other words, it is arguably the case that a REDUCTIVE possibility modal makes a much weaker statement than a REDUCTIVE necessity modal. The BOS picks out a set of worlds that fulfill the speaker's conversational goal, and *even within* that set of worlds in which the world of evaluation quite possibly does not exist (recall the whole discussion in Section 4.1), a possibility modal quantifies existentially. This tells us why reassurance with the help of a necessity modal is more forceful. The forcefulness of a reassuring claim with *nishchoi* is thus more productively used in evidence-neutral constructions.

5.2. Adverbials vs. auxiliaries

In English, speakers consistently report that *modal adverbs* or *modal adverb complexes* such as *definitely, probably, certainly, quite possibly / it's quite possible that, most probably, surely,* etc. allow the RR quite productively:

(26) *Said in reassurance to a soldier's mother whose son is away at war:*

a. Don't worry, Raj will *definitely* come back home soon.
b. Don't worry, Raj will *certainly* come back home soon.
c. Don't worry, Raj will *most probably* come back home soon.
d. Don't worry, Raj will *surely* come back home soon.

Notice that while the RR appears to be easily available with these epistemic modal adverbs, the reading becomes much harder to get with *modal auxiliaries*, as shown below. The salient (and only possible) reading in (27) is the INFERENTIAL one:

(27) a. Don't worry, Raj *must* be coming back home soon!
b. Don't worry, Raj *might* be coming back home soon!
c. Don't worry, Raj *should* be coming back home soon!
d. Don't worry, Raj *could* be coming back home soon!
e. Don't worry, Raj *may* be coming back home soon!

In all of the examples with auxiliaries above, native speakers distinctly perceive the need for the speaker to have contextual or prior clues that leads to a statement of inference. In other words, the modalized claims in (27) would be infelicitous in evidence-neutral contexts, while the modalized claims in (26) can be felicitously uttered in neutral contexts. This very interesting dichotomy between epistemic auxiliaries and epistemic adverbials in the same language calls for an explanation, as well as remains to be tested if the same distinction exists in other languages with auxiliaries. We leave a detailed discussion of those issues for future work.

6. Conclusion

The main aim of this paper was to demonstrate that discourse goals can affect the formal semantic representations of epistemic modality. This paper provides empirical basis for the claim that epistemic modals can and do appear in certain neutral contexts cross-linguistically. To this end, the data presented shows that epistemic modals, robustly believed to contain a strict evidential restriction of non-direct evidence can occur in evidence-neutral contexts where that restriction is not met. The Bangla modal *nishchoi* is used to shape the empirical discussion, and a formal semantic-pragmatic analysis was presented to locate such usages within the greater literature on modality and evidentiality. The analysis provided is centered around the epistemic modal base, where an additional ordering source is shown to yield non-evidential readings of epistemic modals, thus arguing that discourse goals can affect formal representations of modality.

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Diti Bhadra
Department of Linguistics,
Rutgers University
diti.bhadra@rutgers.edu

Abbreviations

RR Reductive Reading
IMPV Imperfective
FUT Future
IR Inferential Reading
BOS Bouletic Ordering Source
GGI Gricean Gneralized Implicature
PASTPRF Past Perfect
PERF Perfect
NEG Negation
GEN Genitive
HON Honorific
MASC Masculine
FEM Feminine
CL Classifier

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