Daroo as an entertain modal: an inquisitive approach

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1 Introduction

Many languages express question meanings morpho-syntactically and prosodically. In Japanese, the question particle *ka* marks a sentence as interrogative (1) with or without rising prosody ('↑' henceforth; L%H% in J_ToBi (Venditti 2005a)). A question-like meaning can also be expressed by a declarative sentence with rising intonation (2).

(1)   John-ga   kuru ka↑ / ↓   (2)   John-ga   kuru↑
       John-NOM come Q   John-NOM come
       'Is John coming?'   'John is coming?'

Although all of these utterance types express some kind of question meaning, previous analyses (Büring and Gunlogson 2000; Nilsenova 2002; Gunlogson 2003; Truckenbrodt 2006; Westera 2013; Sudo 2013; Northrup 2014; Malamud and Stephenson 2015; Farkas and Roelofsen 2017) agree that they are not completely interchangeable. This study examines the interaction between the Japanese modal particle *daroo*, sentence type and intonation, which sheds new light on the influence of sentence types and intonational contours on the interpretation of sentences. I propose that *daroo* is a root-level modal which involves a deictic element pointing to the speaker's knowledge. The

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semantics of *daroo* is defined in the framework of inquisitive dynamic epistemic logic (Ciardelli and Roelofsen 2015), which provides a model in which modal operators can embed both declarative and interrogative sentences. As for the contribution of rising intonation, I propose that Final Rise is used to indicate that the speaker is uncertain about her discourse move, since her evidence is not strong enough to update the common ground. Thereby, the addressee is invited to support her discourse move. A detailed investigation of *daroo* reveals an interesting paradigm with respect to parameters such as clause type, intonation and pragmatic context.

2   Basic Paradigm

2.1   Falling Declaratives: *daroo↓*

When *daroo* is attached to the end of a plain declarative as in (3), the whole sentence indicates that the speaker has a bias toward the prejacent proposition *John-ga kuru* 'John is coming'.

(3)   John-ga   kuru daroo↓
      Jonn-NOM come DAROO
      'John is coming, I bet./Probably, John is coming.'

The conclusion that falling *daroo*-declaratives must express "the speaker's bias" is supported by the following observations:[1] 1) their co-occurrence with probability adverbs is restricted, and 2) they have an obligatory wide-scope reading under *because*-clauses.

2.2   Falling Interrogatives: *daroo ka↓*

Polar interrogatives in Japanese are marked with the sentence final particle *ka*. If *daroo* occurs within such a falling interrogative, it is interpreted as a self-addressing question, as in (4) produced with the pitch profile in Figure 1(a).

(4)   Marie-wa wain-o   nomu daroo   ka↓
      Marie-TOP wine-ACC drink DAROO Q
      'I wonder if Marie drinks wine.'

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[1] See Sugimura (2004) and Hara (2006) for the supporting data and arguments.

(a) Falling Interrogative   (b) Rising Declarative   (c) Rising Interrogative

FIGURE 1 Pitch Profiles of Falling Interrogative, Rising Declarative/Interrogative

Put another way, by uttering a construction like (4), the speaker is inquiring into his or her own knowledge state, i.e., entertaining an issue, namely the question of whether or not Marie drinks wine.

2.3 Rising Declaratives: *daroo*↑

Turning to the rising counterparts of the above two types, *daroo* can be used in declaratives with Final Rise intonation (L%H% in the J_ToBI system (Venditti 2005b)). Such utterances appear to function as tag/confirmation questions, as seen in (5) produced with the pitch profile in Figure 1(b).

(5) Marie-wa wain-o   nomu daroo↑
     Marie-TOP wine-ACC drink DAROO
     'Marie drinks wine, right?'

In other words, in uttering a Final Rise *daroo*-declarative, the speaker indicates her bias toward the prejacent 'Marie drinks wine' and seeks agreement from the addressee. Thus, the rising contour seems to allow the holder of the bias to be the addressee as well as the speaker.

Note that even with rising contour, the speaker's bias does not disappear. When the context is such that the speaker is epistemically neutral, a rising *daroo*-declaratives is infelicitous:

(6) Context: A has no idea what Marie likes. A asks B if Marie drinks wine.

     A: #Marie-wa wain-o   nomu daroo↑
         Marie-TOP wine-ACC drink DAROO
         'Marie drinks wine, doesn't she?'

2.4 Rising Interrogatives: *daroo ka*↑

Finally, *daroo* seems to be incompatible with Final Rise interrogative constructions. Native speakers judge examples like (7), with a pitch profile like that in Figure 1(c), as deviant or unacceptable.

(7) #Marie-wa wain-o   nomu daroo   ka↑
     Marie-TOP wine-ACC drink DAROO Q
     'I'm wondering if Marie drinks wine, right?'

3 Proposals

The investigation of the data in the previous section shows that *daroo* can express the speaker's or the addressee's bias and that it can embed either a declarative or an interrogative.[2] In order to derive the distribution and interpretations, I make the following proposals.

(8) a. Proposal 1
         Daroo is a root-level modal operator E_{SPKR}, which expresses epistemic issues associated to the speaker, SPKR.
     b. Proposal 2
         The Final Rise intonation ↑ indicates the speaker's uncertainty.

Proposal 1 further breaks down into the following two sub-proposals:

(9) Sub-proposal 1.1: Syntactically, *daroo* is a root-level operator, which moves to [Spec CP] to check off its uninterpretable feature, [uROOT].
     Sub-proposal 1.2: Semantically, *daroo* is an Entertain Modality, E_{SPKR}, in Inquisitive Epistemic Logic, henceforth IEL (Ciardelli and Roelofsen 2015).

In understanding the effects of *daroo* sentences, the current paper assumes the framework of update semantics (Stalnaker 1968; Heim 1982), in which utterances are considered as context change potentials (CCPs), i.e., functions from contexts to contexts. More specifically, an utterance of φ updates an input context associated with an attitude holder with the propositional content of φ by taking the intersection of the content of the input context and the propositional content. In IEL, as we will see below, both contexts to be updated and propositions are modelled as inquisitive states, so both declarative and interrogative updates can be uniformly defined as intersecting the input context with the propositional content. Let M be an inquisitive epistemic model, w a possible world and C a variable over contexts. Then, the interpretation of an utterance of φ can be defined as in (10). $[\![\varphi]\!]^{M,w}$ is a CCP: it acts as a function which updates the input context with the propositional content of φ.

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[2] To confirm this observation objectively (see Schütze 1996), two rating experiments were conducted, which are not presented in the current paper for space reasons. The first experiment is briefly reported in Hara and Davis (2013a).

(10) $\llbracket \varphi \rrbracket^{M,w} = \lambda C.C \cap [\varphi]$, where $[\varphi]$ is the propositional content of φ.

In the following subsections, I motivate each sub-proposal in (9) with linguistic data and show how it is implemented.

3.1   Sub-Proposal 1.1: *Daroo* as a Root-Level Modal

First, I propose that *daroo* functions as a root-level modal operator (Zimmermann 2004; Davis 2009).[3] Under this analysis, *daroo* expresses epistemic knowledge associated with the speaker. The empirical data presented in Hara and Davis (2013b) show that *daroo* is a root-level modal which takes wider scope than the "normal" propositional modals. The agent of the knowledge must always be the speaker. Formally, *daroo* translates as an entertain modality E_{SPKR}. The root-oriented-ness of *daroo* is syntactically realized using the uninterpretable feature $[u\text{ROOT}]$, which needs to be checked off by the matching feature $[\text{ROOT}]$ at C_{root}.

(11) $[\text{CP2 daroo}_i/\text{[uROOT]} [\text{C2}' \text{ TP } [t_i \, \varnothing_{\text{DECL}}/ka_{\text{INTEROG}}]]] \text{C1}/\text{[ROOT]}]$

This LF configuration (11) predicts that *daroo* embeds the combination of the sentence-radical p and the sentence-type marker $\varnothing_{\text{DECL}}/ka_{\text{INTEROG}}$, i.e., *daroo*($p$-$\varnothing_{\text{DECL}}$) and *daroo*($p$-$ka_{\text{INTEROG}}$), which translate to $E_{\text{SPKR}}p$ and $E_{\text{SPKR}}?p$, respectively. As we will see below in Section 3.2, inquisitive epistemic logic indeed provides a system in which modal operators can embed both declarative and interrogative sentences.

3.2   Sub-Proposal 1.2: *Daroo* as an Entertain Modal

Next, we define the interpretation of the modal component of *daroo*, namely E_{SPKR}. An interesting feature of the syntax of *daroo* is that it can take both a declarative and interrogative as its argument. Thus, the semantics of *daroo* should be able to handle issues raised by interrogatives as well as information brought by declaratives.[4]

Inquisitive epistemic logic (IEL) (Ciardelli and Roelofsen 2015) offers a framework that can model the process of raising and resolving issues and defines an entertain modality that deals with the issues that the agents entertain. The current paper claims that *daroo* is a linguistic realization of the entertain modality the agent of which is the speaker SPKR. The following section briefly goes over the relevant technicalities of IEL.

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[3] For the reasons of space, I omit the data and discussion to motivate this proposal. See Hara and Davis (2013b).

[4] Moreover, although *daroo* in a falling declarative indicates the speaker's bias toward the embedded proposition, the bias meaning disappears in falling interrogatives (data omitted for space reasons).

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Inquisitive epistemic logic

IEL is an extension of epistemic logic where the framework is enriched with an inquisitive component. IEL models how the information is associated with a set of agents. Let $\mathcal{W}$ be the set of all possible worlds. As with standard epistemic logic, an information state is identified with a set of possible worlds. Inquisitive epistemic logic introduces another dimension which can characterise the issues that are entertained by the agents. An issue is defined as a set of information states:

(12) a. An information state s is a set of possible worlds, i.e., $s \subseteq \mathcal{W}$.
  b. An *issue* $I \subseteq \wp(\mathcal{W})$ is a non-empty, downward closed set of information states.

In inquisitive epistemic logic, there are two modal operators, a knowledge modality K and an entertain modality E. K encodes an agent's information state just like standard epistemic logic, while E encodes an agent's inquisitive state, which encapsulates the issues that the agent entertain. As discussed above, I argue that the modal particle *daroo* translates to the modality operator E with the agent SPKR:

(13) *daroo* $\rightsquigarrow E_{\text{SPKR}}$

Semantics of the entertain modality E

An inquisitive epistemic model M is defined as in (14).

(14) An inquisitive epistemic model for a set $\mathcal{P}$ of atomic sentences and a set Π of issues is a tuple $M = \langle \mathcal{W}, V, \Sigma_{\mathcal{A}} \rangle$ where:
  a. $\mathcal{A}$ is a finite set of agents.
  b. $\mathcal{W}$ is a set, whose elements are called *possible worlds*.
  c. $V : \mathcal{W} \rightarrow \wp(\mathcal{P})$ is a *valuation map* that specifies for every world w which atomic sentences are true at w.
  d. $\Sigma_{\mathcal{A}}$ is a set of *state maps* $\Sigma_a : \mathcal{W} \rightarrow \Pi$, each of which assigns to any world w an issue $\Sigma_a(w)$[5]

In inquisitive epistemic logic, each agent is associated with an inquisitive state $\Sigma_a(w)$ that encodes the issues that are entertained by a at w, and the information state $\sigma_a(w)$ is obtained by taking a union of the inquisitive state:

(15) $\sigma_a(w) := \bigcup \Sigma_a(w)$.

In other words, $\Sigma_a(w)$ represents both the information and inquisitive states of the agent and we do not need $\sigma_a(w)$ as an independent notion in

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[5] $\Sigma_a(w)$ observes factivity and introspection conditions. See Ciardelli and Roelofsen (2015).

the logical model.

The following definition (16) defines the conditions when a state s supports (notation: $\models$) a sentence:

(16)   Let M be an inquisitive epistemic model, s an information state in M and g an assignment function from variables Var to agents $\mathcal{A}$.

    a. $\langle M, s \rangle \models p \Longleftrightarrow p \in V(w)$ for all worlds $w \in s$

    b. $\langle M, s \rangle \models \neg\varphi \Longleftrightarrow$ for all non-empty $t \subseteq s$, $\langle M, t \rangle \not\models \varphi$

    c. $\langle M, s \rangle \models \alpha \vee \beta \Longleftrightarrow \langle M, s \rangle \models \alpha$ or $\langle M, s \rangle \models \beta$

Note that the proposition expressed by a sentence φ is defined as a set of all states that support φ:

(17) $[\varphi] := \{s \subseteq \mathcal{W} | s \models \varphi\}$

Note also that we treat $?p$ as an abbreviation of $p \vee \neg p$. Thus, the support condition for polar interrogatives is the same as that for disjunction:

(18) $\langle M, s \rangle \models ?\alpha \Longleftrightarrow \langle M, s \rangle \models \alpha$ or $\langle M, s \rangle \models \neg\alpha$

Let us now look at the modal operators, K and E. First, when K is applied to a declarative α, $K_a\alpha$ is supported by s iff α is true everywhere in $\sigma_\alpha(w)$ for any $w \in s$. That is, α is compatible with the information available to a at any $w \in s$, which is concurrent with the knowledge modality in standard epistemic logic.

(19) $\langle M, s \rangle \models K_a\varphi \Longleftrightarrow$ for any $w \in s$, $\langle M, \sigma_a(w) \rangle \models \varphi$

Let us look at the state depicted in Figure 2(a) as an illustration. Following Ciardelli and Roelofsen (2015), only the maximal element of each issue is represented in the diagrams. Our language only has two atomic sentences, p and q and our model consists of four worlds, $\mathcal{W} = \{w_{11}, w_{10}, w_{01}, w_{00}\}$ such that $V(w_{11}) = \{p\}$, $V(w_{10}) = \{p\}$, $V(w_{01}) = \{q\}$, and $V(w_{00}) = \{q\}$. In Figure 2(a), $\sigma_a(w_{11})$ supports p and $\sigma_a(w_{10})$ supports p. Since for any $w \in s$, $\sigma_a(w)$ supports p, s supports $\models K_a p$.

(a) $\langle M, s \rangle \models K_a p$ (b) $\langle M, s \rangle \not\models K_a ?p$, $\langle M, s \rangle \models E_a ?p$
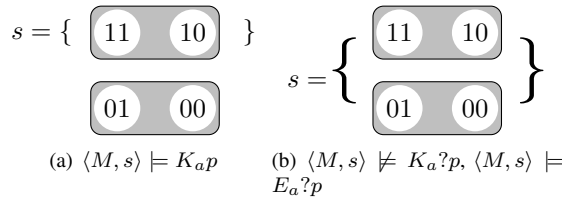
FIGURE 2

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Note that the state depicted in Figure 2(b) does not support $K_a?p$.

Finally, we are ready to define the entertain modality E. When the entertain operator E applies to φ, a state s supports $E_a\varphi$ just in case φ is supported by any $t \in \Sigma_a(w)$ for any $w \in s$. Intuitively, $E_a\varphi$ states that once the issues entertained by a are resolved, φ will be supported:

(20) $\langle M, s \rangle \models E_a\varphi \Longleftrightarrow$ for any $w \in s$ and $t \in \Sigma_a(w)$, $\langle M, t \rangle \models \varphi$

The state depicted in Figure 2(b) supports $E_a?p$. All states support either p or $\neg p$: $\{w_{11}, w_{10}\}$ supports p, $\{w_{01}, w_{00}\}$ supports $\neg p$, $\{w_{11}\}$ supports p, $\{w_{10}\}$ supports p, $\{w_{01}\}$ supports $\neg p$, and $\{w_{00}\}$ supports $\neg p$. Thus, for any $w \in s$ and any $t \in \Sigma_a(w)$, t supports $p \vee \neg p$. Therefore, s supports $E_a?p$.

One fact about the relation between K and E is important to the current paper. If the embedded sentence is a declarative α, $E_a\alpha$ entails $K_a\alpha$.[6] Since $K_a\alpha$ entails $E_a\alpha$, $E_a\alpha$ is equivalent to $K_a\alpha$.

(21)   For any declarative α and agent $a \in \mathcal{A}$, $K_a\alpha \equiv E_a\alpha$.

3.3   Proposal 2: Final Rise ↑ as an Uncertainty Marker

Section 3.1 emphasized that the holder of the knowledge expressed by *daroo* with falling intonation must be the speaker. As discussed in Sections 2.3, however, the speaker uses a *daroo*-declarative is uttered with Final Rise to seek agreement from the addressee, thus the bias appears to be attributed not only to the speaker but also to the addressee. I claim that this attribution of the bias to the addressee is pragmatically derived by the semantics of Final Rise which semantically encodes the speaker's uncertainty (Ward and Hirschberg 1985).[7]

To implement this semantically-encoded discourse effect of uncertainty, I adopt the notion of the conversational "scoreboard" model developed in the literature (Roberts 1996; Gunlogson 2003; Northrup 2014; Malamud and Stephenson 2015; Farkas and Roelofsen 2017). The idea is that the discourse context may contain multiple components each of which registers a certain type of discourse history. For the current purpose, Northrup's (2014, 39) evidential base evidB, which is "the set of propositions that, when taken together, serve to underwrite a commitment."

I propose that the Final Rise is a marker of minimal speaker authority.[8] A Final Rise semantically indicates that the commitment to the prejacent proposition is derived from the minimal evidential base evidB$_{\text{min}}$. Let D be a set

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[6] See Ciardelli and Roelofsen (2015, 1657) for the definitions of entailment and equivalence.

[7] The idea is inspired by the work by Truckenbrodt (2006) and Westera (2013).

[8] This is what Northrup (2014) proposes for the Japanese particle *ne*, thus the Final Rise is synonymous to the particle *ne*.

of discourse participants and AUTH_a be a measure function from a sentence to a numerical value that represents how much authority the discourse agent a can accumulate. Then, following Northrup's (2014, 116) notation, the side discourse effect of $\varphi \uparrow$ is defined as follows:

(22)   Side discourse effect of $\varphi \uparrow$
         Any commitment to φ is derived from a base $\mathsf{evidB}_{\mathrm{min}}$ such that
         $\mathsf{evidB}_{\mathrm{min}} = \{\psi | \forall a \in D.\mathsf{AUTH}_a \geq \mathsf{AUTH}_{\mathrm{SPKR}}\}$

Now, let us see what happens when the Final Rise is attached to a *daroo*-declarative (5). The logical form of (5) denotes the main discourse effect as $\lambda C.C \cap [K_{\mathrm{SPKR}}p]$. The Final Rise attached to the LF gives rises to a side effect that the speaker's commitment to p is derived from a minimal evidential base $\mathsf{evidB}_{\mathrm{min}}$. Thus, the speaker is not fully confident to add the proposition expressed by p to the common ground. Since the speaker uttered a declarative sentence, she desires to add p to the common ground. As a result, the speaker invites the addressee to be committed to p, because it is the only way to add p to the common ground.

To recapitulate, the Final Rise is a marker of uncertainty, more precisely, a marker of minimal speaker authority.

4   Deriving the Interpretations

Equipped with the interpretation function and the machinery of the IEL, we are ready to derive the intricate semantics of the Japanese modal *daroo*. The main proposals are: 1) *daroo* is an entertain modality E_{SPKR} (13), and 2) a Final Rise $\uparrow$ indicates the speaker's uncertainty (22).

4.1   Falling Declaratives

Let us see how these two proposals derive the paradigm summarized above, starting from a falling declarative like (3).

Daroo is an entertain modality E_{SPKR}, and given Fact (21) when the embedded sentence is a declarative, E_{SPKR} and K_{SPKR} are equivalent. Recall that $[\varphi]$ is the proposition expressed by a sentence φ, i.e., the set of all states that support φ.

(23)   a.   LF: $p\text{-}daroo \rightsquigarrow E_{\mathrm{SPKR}}p \equiv K_{\mathrm{SPKR}}p$
        b. $[\![K_{\mathrm{SPKR}}p]\!]^{M,w} = \lambda C.C \cap [K_{\mathrm{SPKR}}p]$

Therefore, (3) denotes a CCP $\lambda C.C \cap [K_{\mathrm{SPKR}}p]_{M,g}$, where p ='John is coming'. After the announcement, 'John is coming' is established in the speaker's information state.[9]

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[9] $[K_{\mathrm{SPKR}}p]$ seems too strong for the intuition reported in Sections 2, that is, 'the speaker has a bias toward p'. This is analogous to a long-standing puzzle in linguistics known as the weakness

4.2 Falling Interrogatives

Let us turn to falling *daroo*-interrogative sentences like (4). Recall that the entire construction $E_a?p$ is always a declarative even if the embedded sentence is an interrogative:

(24) a. LF: *p-daroo ka*$\rightsquigarrow E_{\text{SPKR}}?p$
      b. $[\![E_{\text{SPKR}}?p]\!]^{M,w} = \lambda C.C \cap [E_{\text{SPKR}}?p]$

Thus, (4) denotes the CCP, $\lambda C.C \cap [E_{\text{SPKR}}?p]$. After the update, for any $t \in \Sigma_{\text{SPKR}}(w)$, $\langle M, t \rangle \models ?p$. That is, 'whether or not Marie drinks wine' is supported as soon as the issues of SPKR are resolved, which can be paraphrased as: the speaker wonders whether Marie drinks wine.[10]

4.3 Rising Declaratives

Recall that a rising *daroo*-declarative seems to express a meaning similar to a tag question (5). As already discussed in Section 3.3, the semantic and pragmatic computation of (5) is as follows:

(25) a. LF: *p-daroo*$\rightsquigarrow E_{\text{SPKR}}p \equiv K_{\text{SPKR}}p$
      b. Main effect
          $[\![K_{\text{SPKR}}p]\!]^{M,w} = \lambda C.C \cap [K_{\text{SPKR}}p]$
      c. Side effect: Any commitment to p is based on $\mathsf{evidB}_{\min}$
      d. Pragmatic effect: the speaker invites the addressee to be committed to p, i.e., $\lambda C.C \cap [K_{\text{ADDR}}p]_M$

Thus, (5) denotes the CCP $\lambda C.C \cap [K_{\text{SPKR}}p]$ while the Final Rise indicate the speaker's commitment to p is based on the speaker's minimal evidential base. Since the speaker intends to add p to the common ground, she invites the addressee to commit himself to p, resulting in a function similar to English tag questions.

4.4 Rising Interrogatives

Finally, we address the infelicity of rising *daroo*-interrogatives (7). Again, the rising intonation $\uparrow$ indicates that the speaker's commitment to $?p$ is based on $\mathsf{evidB}_{\min}$.

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intuition of *must*. For the current purpose, I assume that the bare assertion p and the modalized *p-daroo* are in pragmatic competition (see Karttunen 1972; Kratzer 1991) and defer detailed discussions to the existing literature (von Fintel and Gillies 2010; Lassiter 2014, a.o.).

[10] The entertain modality E_a does not exclude the case where the agent has a bias towards a certain answer to the question. In other words, updating an inquisitive state with $E_a?p$ and $K_a p$ consecutively does not lead the state to be absurd. That is, $\Sigma_a(w) \cap [E_a?p]_{M,g} \cap [K_a p]_{M,g} \neq \emptyset$. Indeed it is possible for $?p$-*daroo*$\downarrow$ to be felicitously followed by p-*daroo*$\downarrow$ (the data omitted for space reasons). This contrasts with Ciardelli and Roelofsen's wonder modality W_a, defined as: "$W_a\varphi := \neg K_a\varphi \wedge E_a\varphi$" (Ciardelli and Roelofsen 2015, 1659).

(26)   a.   LF: $?p\text{-}daroo \rightsquigarrow E_{\text{SPKR}}?p$
       b.   Main effect $[\![E_{\text{SPKR}}?p]\!]^{M,w} = \lambda C.C \cap [E_{\text{SPKR}}?p]_{M,g}$
       c.   Side effect: Any commitment to $?p$ is based on $\mathsf{evidB}_{\min}$
       d.   Pragmatic effect: the speaker invites the addressee to be committed to $?p$, i.e., $\lambda C.C \cap [E_{\text{ADDR}}p]_M$

Thus, the main effect of the utterance should be the same as the falling interrogative (24). At the same time, the speaker indicates her certainty in her commitment to $?p$. The oddness of this discourse move can be explained in two ways. First, the speaker is wondering if p is true or not but she is also not sure if her evidence base is strong enough to let her entertain $?p$. In other words, (24) is paraphrased as 'I am wondering if Marie drinks wine, right?' This is odd because unlike the declarative case, the speaker does not need a strong evidential base to entertain an issue. Second, if the speaker indeed intends to invite the addressee to be committed to $?p$ since she is not sure, then she should pose a simple question $?p$, *Marie-wa wain-o nomu ka?* 'Does Marie drink wine?'. In either way, the speaker ends up making an illicit or pragmatically redundant move, thus rising *daroo*-interrogatives like (7) are perceived as infelicitous.[11]

5   Conclusion

I proposed that *daroo* is a root-level modal operator E_{SPKR}, which expresses epistemic knowledge associated to the speaker, SPKR and the Final Rise indicate the speaker's uncertainty. The first proposal is divided into two sub-proposals. First, *daroo* moves to [Spec CP] to check off its uninterpretable feature, [uROOT], resulting in the logical form $E_{\text{SPKR}}\varphi$, in which the modal operator E_{SPKR} embeds the declarative or interrogative sentence. Second, the semantics of *daroo* is assigned in the framework of inquisitive epistemic semantics. In particular, *daroo* translates as an entertain modality E_{SPKR} and $E_{\text{SPKR}}\varphi$ expresses that the speaker is entertaining an issue denoted by φ. When the embedded sentence is a declarative α, $E_{\text{SPKR}}\alpha$ is equivalent to $K_{\text{SPKR}}\alpha$. Thus, *daroo*-declaratives describe the epistemic state of the speaker. As can be seen, this equivalence allows us to maintain the uniform semantics for *daroo* as an entertain modality. The following table summarizes the main and side discourse effects expressed by *daroo*-sentences.

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[11] A Final High, a variant of a rising interrogative $?p$-DAROO $\uparrow$ seems possible in a special context such as a quiz show or an instructive/Socratic questioning context (data omitted for space reasons). I speculate that with a Final High, there is a shifting of the epistemic agent from SPKR to ADDR.

	Falling	Rising
Declarative	*p-daroo*↓ $\rightsquigarrow$ *p-darou* Main: $K_{\mathrm{SPKR}}p$	*p-daroo*↑ $\rightsquigarrow$ *p-darou*↑ Main: $K_{\mathrm{SPKR}}p$ Side: p is bsed on $\mathsf{evidB}_{\min}$
Interrogative	*p-daroo ka*↓ $\rightsquigarrow$ *?p-darou* Main: $E_{\mathrm{SPKR}}?p$	*p-daroo ka*↑ $\rightsquigarrow$ *?p-darou*↑ Main: $E_{\mathrm{SPKR}}?p$ Side: $?p$ is bsed on $\mathsf{evidB}_{\min}$

TABLE 1 The main and side discourse effects of *daroo*-sentences

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