

Question Intonation and Lexicalized Bias Expression

Yurie Hara

Japan Society for the Promotion of Science
Kyoto University
University of Massachusetts, Amherst
yhara@ling.bun.kyoto-u.ac.jp

Abstract

This paper examines the interaction between different utterance types and the Japanese modal particle *darou*, and proposes that the decision-theoretic semantics accounts for the interaction among *darou*, sentence types and intonation.

1 Introduction

Many languages express question meanings morpho-syntactically and prosodically. For example, in English, Subject-Aux inversion mutates a statement into an interrogative, which is often accompanied by a rising contour as in (1-a). However, question meanings can be expressed by morpho-syntax alone as in (1-b). Moreover, a declarative sentence can be rendered into a question solely by a rising intonation as in (1-c).

- (1) a. Is John coming↑ R.Interrog
b. Is John coming↓ F.Interrog
c. John is coming↑ R.Decl

Similarly, in Japanese, a question particle *ka* marks a sentence as interrogative, which is sometimes accompanied by a rising contour (2-a,b). As in (2-c), a question meaning can also be expressed by a declarative sentence with a rising intonation.

- (2) a. John-ga kuru ka↑
John-Nom come Q
'Is John coming?' RI
b. John-ga kuru ka↓ FI
c. John-ga kuru↑ RD

Although all of these utterance types express some kind of question meanings, previous analyses agree upon that they are not completely interchangeable (see Bartels (1997) and Merin and

Bartels (1997) for distinctions between rising interrogatives and falling interrogatives; Gunlogson (2003) and Nilsenova (2002) for distinctions between falling declaratives and rising declaratives).

This paper examines the interaction between these utterance types and the Japanese modal particle *darou*, which offers an interesting test case and sheds new light on the ongoing discussion of the interpretations of each utterance type. *Darou* cannot be used in an interrogative construction with a rising intonation as in (3-a). If *darou* occurs within a falling interrogative, it is interpreted as a self-addressing question (3-b). *Darou* with a rising declarative appears to function as a tag question (3-c).

- (3) a. *John-ga kuru **darou** ka↑ RI
b. John-ga kuru **darou** ka↓ FI
'I wonder whether John is coming.'/'Let's think about the question whether John is coming.'
c. John-ga kuru **darou**↑ RD
'John is coming, right?'
d. John-ga kuru **darou**↓ FD
'John is coming (I bet)'

This paper is structured as follows. First, I show empirical data regarding the use of *darou* in different sentence types. In section 2.1, I go over the basic semantics of *darou* in falling declarative sentences. In section 2.2, the pitch tracks of different sentence types with *darou* are presented. Next, in section 3, I briefly review two previous studies, Merin and Bartels (1997) and Nilsenova (2002) that employ Merin's (1994) decision-theoretic approach to the description of a conversation, and analyze the meaning of intonation in English. In section 4, I extend the model formulated by the pre-

vious studies and account for the pattern sketched in section 2.2.

2 Data

2.1 Japanese *Darou*

Darou is a sentence-final particle that has a modal-flavor. When *darou* is used in a plain declarative as in (4), it expresses the speaker's bias toward the content of the prejacent proposition.

- (4) John-ga kuru **darou**.
 Jonn-Nom come DAROU
 'John is coming (I bet).' ≈ 'Probably, John is coming.'

Sugimura (2004) observes that *darou* can co-occur with high-probability adverbs, *tabun* 'probably' and *kitto* 'certainly' but cannot co-occur with a low-probability adverb, *moshikasuruto* 'maybe'. *Darou* semantically indicates a high probability, namely a bias (more than 50 %) toward the event denoted by the proposition, hence *darou* is not compatible with a low-probability adverb.

- (5) kare-wa tabun/kitto/*moshikasuruto
 he-Top probably/certainly/maybe
 kuru darou.
 come DAROU
 'Probably/Certainly/*Maybe, he will come.'
 (Sugimura, 2004)

The following data show that the agent of the bias expressed by *darou* needs to be the speaker.¹ (6-b) is infelicitous because the speaker's bias toward 'it will rain' does not cause John to bring an umbrella. In contrast, the modal meaning of the adverb *tabun* 'probably' does not have to be attributed to the speaker, hence (6-c) is felicitous.

- (6) a. boku-wa ame-ga furu **darou**
 I-Top rain-Nom fall DAROU
 kara kasa-o mot-te
 because umbrella-Acc have-and
 it-ta
 go-Past
 'Because it will rain (I bet), I took an umbrella with me.'

¹Except for the case where *darou* is embedded under an attitude predicate. The notion of 'the speaker' can be shifted in embedded utterance contexts (see Schlenker, 2003). The discussion is omitted because it is out of the scope of this paper.

- b. ??John-wa ame-ga furu **darou**
 John-Top rain-Nom fall DAROU
 kara kasa-o mot-te
 because umbrella-Acc have-and
 it-ta
 go-Past
 'Because it will rain (I bet), John took an umbrella with him.'
- c. John-wa ame-ga **tabun** furu
 John-Top rain-Nom probably fall
 kara kasa-o mot-te
 because umbrella-Acc have-and
 it-ta
 go-Past
 'Because it will probably rain, John took an umbrella with him.'

The properties of *darou* are summarized as follows:

- *Darou* indicates a bias (more than 50 %) toward the embedded proposition, i.e., p is more likely than $\neg p$.
- The agent of bias is the agent of the local speech act.

2.2 Question Intonation and *Darou*

Darou exhibits interesting and subtly distinct interpretations when it is used with different sentence types and different intonations.

Let us first look at the pitch track of a rising interrogative without *darou*. The F0 Contour was measured by an autocorrelation analysis of the PRAAT program (Boersma and Weenink, 2006). A high boundary tone is found at the end of the interrogative sentence (7) as in Figure 1 (see also Venditti, 1995).

- (7) Yurie-wa wain-o nomu-ka↑
 Yurie-Top wine-Acc drink-Q
 'Does Yurie drink wine?'

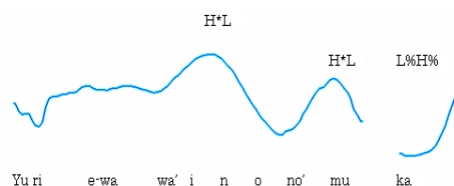


Figure 1: A rising interrogative with a high boundary tone. [speaker J.O.]

Darou cannot be used in an interrogative construction with a rising intonation. In Figure 2, the speaker is asked to pronounce (8) with a final high boundary tone, which is reported as ungrammatical by the speaker.

- (8) *Yurie-wa wain-o nomu darou-ka↑
 Yurie-Top wine-Acc drink DAROU-Q

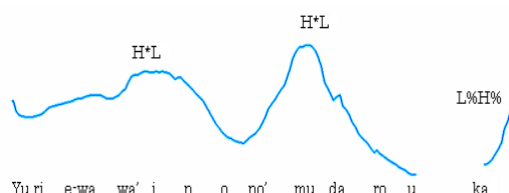


Figure 2: An interrogative construction with *darou*, which the speaker is asked to pronounce with a high boundary tone and she reports as ungrammatical. [speaker J.O.]

If *darou* occurs within a falling interrogative (Figure 3), it is interpreted as a self-addressing question.

- (9) Yurie-wa wain-o nomu darou-ka↓
 Yurie-Top wine-Acc drink DAROU-Q
 ‘I wonder if Yurie drinks wine.’

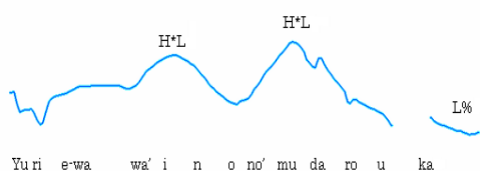


Figure 3: An interrogative construction with *darou* and a final low boundary tone. [speaker J.O.]

Darou with a rising declarative (Figure 4) appears to function as a tag question.

- (10) Yurie-wa wain-o nomu darou↑
 Yurie-Top wine-Acc drink DAROU
 ‘Yurie drinks wine, right?’

The influence of the boundary tone on interpretation is summarized in the following table.

This paper proposes that the decision-theoretic semantics accounts for the interaction among *darou*, sentence types and intonation.

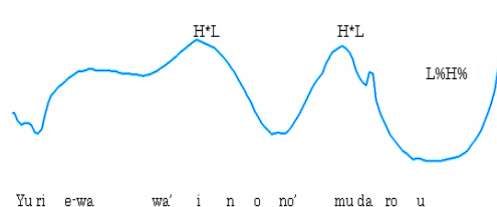


Figure 4: A declarative construction with *darou* and a final high boundary tone. [speaker J.O.]

Rising	
Interrogative	ungrammatical
Declarative	tag question (‘, right?’)
Falling	
Interrogative	self-addressing question (‘I wonder’/‘Let’s think’)
Declarative	statement (‘I have a bias’/‘I bet’)

3 Previous Studies

3.1 Merin 1994

Merin (1994) characterizes a conversation as a negotiation game among agents on what enters Common Ground. Each negotiation is executed by an Elementary Social Act, which is a transition from one negotiation state to another. Each negotiation state is instantiated by a 5-tuple, $\langle S, O, P, D, I \rangle$. Values of Issue orientation [O] range over θ (a proposition) and $-\theta$. Values of Actor-role [S], Preference [P], Dominance [D] and Initiator-role [I] range over E (Ego, the speaker) and A (Alter, the addressee). Preference takes the value corresponding the agent who prefers adoption of the proposition θ , Dominance the social power of the agent, and Initiator-role the agent who has made a Claim pertaining to the current negotiation game. The parameter setting of each Elementary Social Act is summarized in the following table (simplified from Merin (1994)):

	S	O	P	D	I
Claim	E	θ	E	E	E
Concession	E	θ	A	A	A
Denial	E	θ	A	E	A
Retraction	E	θ	E	A	E

3.2 Merin and Bartels (1997) on Intonations

Employing Merin’s (1994) model, Merin and Bartels (1997) characterize intonation as “(re-

)allocation of [D]-parameter value”:

- (11) Final Rise (Merin and Bartels, 1997)
in asking, Ego is alienating choice among alternatives (sets of possible worlds) to Alter i.e. making a Concession.
- (12) Final Fall (Merin and Bartels, 1997)
in requiring an answer from Alter, Ego is forcing Alter to commit himself to one mutually binding alternative (thus banning others from inclusion in the CG) and is thereby making a Claim.

Parameter settings for Rising interrogative and Falling interrogative are given in the following table:

	$\langle S, O, P, D, I \rangle$
Rising Interrogative	$\langle E, \theta, A, A, A \rangle$
Falling Interrogative	$\langle E, \theta, E, E, E \rangle$

To illustrate, in (13), the Final Rise indicates shift of the authority of choice from Ego (the speaker) to Alter (the hearer).

- (13) I didn't know John took a job all the way over in Redwood City.
Does he have a car now?
H* H-H%
(Merin and Bartels, 1997)

In Contrast, the Final Fall in (14) indicates Ego's demand to Alter for commitment:

- (14) John did good work for us last year.
But I doubt that we could still have him going round on his bicycle.
Does he have a car now?
H* L-L%
(Merin and Bartels, 1997)

3.3 Nilsenova (2002) on Rising Declaratives

Nilsenova (2002) examines distinctions between rising interrogatives and rising declaratives and extends Merin and Bartels's (1997) model by proposing that a rising declarative specifies Initiator-role as E (the speaker), and Dominance as A (the addressee):

	$\langle S, O, P, D, I \rangle$
Rising Interrogative	$\langle E, \theta, A, A, A \rangle$
Rising Declarative	$\langle E, \theta, A, A, E \rangle$

To illustrate, in the following examples,

Initiator-role is set to Ego, since the game of whether a proposition θ should enter the common ground is initiated by Ego. Furthermore, Dominance is set to Alter. This is either because Ego does not have necessary information to make a commitment or because Ego gives up the authority of choice to Alter in order to indicate his politeness.

- (15) a. At Tim's graduation. Tim is standing next to a woman in her sixties.
Jack: You are Tim's mother?
(Nilsenova, 2002)
- b. Waiter (to customer): My name is Carl? I'll be your waiter tonight?
(Gussenhoven and Chen 2000)

4 Lexical specification of *darou*

Integrating Merin and Bartels (1997), and Nilsenova (2002), I take the following table to be the classification of utterance types in terms of *default* parameter settings of Elementary Social Acts. (I assume with Merin and Bartels (1997) that Preference is either underspecified or defeasible within morphosyntactic and prosodic classification of utterance types (i.e., without *darou*.)

	$\langle S, O, P, D, I \rangle$
Rising Interrogative	$\langle E, \theta, A, A, A \rangle$
Rising Declarative	$\langle E, \theta, A, A, E \rangle$
Falling Interrogative	$\langle E, \theta, E, E, E \rangle$
Falling Declarative	$\langle E, \theta, E, E, E \rangle$

Furthermore, I propose that the semantics of *darou*, i.e., the speaker's bias, lexically specifies the values of Preference and Initiator-role as Ego (the speaker).

- (16) *darou*: $\langle E, \theta, E, (\cdot), E \rangle$

Let us go back to the interaction between the semantics of *darou* and the typology of utterance types. As we have seen in (8) repeated here as (17), a rising interrogative is not compatible with *darou*. Now, remember that Merin and Bartels (1997) define a rising interrogative as a Concession: Ego (the speaker/the questioner) is ready to accept Alter's Claim to be in Common Ground. Therefore, the Initiator-role of a rising interrogative is Alter, which conflicts with the meaning of *darou*

- (17) *Yurie-wa wain-o nomu darou-ka↑
Yurie-Top wine-Acc drink DAROU-Q

The falling interrogative (9) (repeated here as (18)) is compatible with *darou*, which results in the interpretation that Ego is demanding commitment from himself.

- (18) Yurie-wa wain-o nomu darou-ka↓
Yurie-Top wine-Acc drink DAROU-Q
'I wonder if Yurie drinks wine.'

Finally, the rising declarative (10) (repeated here as (19)) is also compatible with *darou* and the combination yields the interpretation of a tag question, since *darou* indicates that Ego (the speaker) prefers the adoption of the proposition.

- (19) Yurie-wa wain-o nomu darou↑
Yurie-Top wine-Acc drink DAROU
'Yurie drinks wine, right?'

The interaction between the lexical specification of *darou* and the meaning of utterance types is summarized below:

		< S, O, P, D, I >
RI	<i>darou-ka</i> ↑ ungrammatical	N/A
RD	<i>darou</i> ↑ tag question ('right?')	< E, θ, E, A, E >
FI	<i>darou-ka</i> ↓ self-addressing question (‘I wonder’/‘Let’s think’)	< E, θ, E, E, E >
FD	<i>darou</i> ↓ statement (‘I have a bias’/‘I bet’)	< E, θ, E, E, E >

5 Conclusion

To conclude, I have accounted for the influence of intonation and sentence types on interpretation of sentences with the Japanese modal particle *darou*. In particular, I integrated two previous studies on English intonation, Merin and Bartels (1997) and Nilsenova (2002), in order to provide parameter settings of four basic utterance types: rising interrogative, rising declarative, falling interrogative and falling declarative. Furthermore, I propose that *darou* lexically specifies the values of Preference and Initiator-role as the speaker. Together with the typology of social acts discussed by Merin and Bartels (1997) and Nilsenova (2002), my proposal correctly predicts the infelicity of the use of *darou* in rising interrogatives and distinct interpretations observed in rising declaratives, falling interrogatives and falling declaratives.

atives, falling interrogatives and falling declaratives.

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