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.Interog  
   b. Is John coming↓ F.Interog  
   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↓  F  
   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  
      John is coming, right?  
      ‘I wonder whether John is coming.’  
   b. John-ga kuru darou ka↓ F  
      ‘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↓  F  
      ‘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.’

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 ¬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.]

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.
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.

<table>
<thead>
<tr>
<th></th>
<th>Rising</th>
<th>Declorative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interrogative</td>
<td>ungrammatical tag question (‘, right?’)</td>
<td></td>
</tr>
<tr>
<td>Declarative</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Falling</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interrogative</td>
<td>self-addressing question</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(‘I wonder’/‘Let’s think’)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>statement</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(‘I have a bias’/‘I bet’)</td>
<td></td>
</tr>
</tbody>
</table>

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, <S, O, P, D, I>. Values of Issue orientation [O] range over \( \theta \) (a proposition) and \( \neg \theta \). 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 to the agent who prefers adoption of the proposition \( \theta \), 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)):

<table>
<thead>
<tr>
<th></th>
<th>S</th>
<th>O</th>
<th>P</th>
<th>D</th>
<th>I</th>
</tr>
</thead>
<tbody>
<tr>
<td>Claim</td>
<td>E</td>
<td>( \theta )</td>
<td>E</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>Concession</td>
<td>E</td>
<td>( \theta )</td>
<td>A</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>Denial</td>
<td>E</td>
<td>( \theta )</td>
<td>A</td>
<td>E</td>
<td>A</td>
</tr>
<tr>
<td>Retraction</td>
<td>E</td>
<td>( \theta )</td>
<td>E</td>
<td>A</td>
<td>E</td>
</tr>
</tbody>
</table>

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:

<table>
<thead>
<tr>
<th>Parameter Settings</th>
<th>Rising Interrogative</th>
<th>Falling Interrogative</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt; S, O, P, D, I &gt;</td>
<td>&lt; E, θ, A, A, A &gt;</td>
</tr>
<tr>
<td>Rising Interrogative</td>
<td>&lt; S, O, P, D, I &gt;</td>
<td>&lt; E, θ, E, E, E &gt;</td>
</tr>
<tr>
<td>Falling Interrogative</td>
<td>&lt; S, O, P, D, I &gt;</td>
<td>&lt; E, θ, E, E, E &gt;</td>
</tr>
</tbody>
</table>

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):

<table>
<thead>
<tr>
<th>Parameter Settings</th>
<th>Rising Interrogative</th>
<th>Rising Declarative</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt; S, O, P, D, I &gt;</td>
<td>&lt; E, θ, A, A, A &gt;</td>
</tr>
<tr>
<td>Rising Interrogative</td>
<td>&lt; S, O, P, D, I &gt;</td>
<td>&lt; E, θ, A, A, A &gt;</td>
</tr>
<tr>
<td>Rising Declarative</td>
<td>&lt; S, O, P, D, I &gt;</td>
<td>&lt; E, θ, A, E, E &gt;</td>
</tr>
</tbody>
</table>

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: < E, θ, E, (·), E >

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

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.

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

<table>
<thead>
<tr>
<th></th>
<th>(&lt; S, O, P, D, I &gt;)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RI</td>
<td><em>darou-ka</em></td>
</tr>
<tr>
<td>RD</td>
<td>ungrammatical</td>
</tr>
<tr>
<td>FI</td>
<td><em>darou-ka</em></td>
</tr>
<tr>
<td></td>
<td>self-addressing question</td>
</tr>
<tr>
<td></td>
<td>(‘I wonder’/‘Let’s think’)</td>
</tr>
<tr>
<td>FD</td>
<td><em>darou</em></td>
</tr>
<tr>
<td></td>
<td>statement</td>
</tr>
<tr>
<td></td>
<td>(‘I have a bias’/‘I bet’)</td>
</tr>
</tbody>
</table>

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.

References


