

Darou AS A DEICTIC CONTEXT SHIFTER*

YURIE HARA AND CHRISTOPHER DAVIS

City University of Hong Kong and University of the Ryukyus

1 Introduction

This paper investigates the distribution of the Japanese sentence-final particle *darou*. We proceed by examining the grammaticality and interpretation of *darou*-sentences while varying parameters such as clause type, boundary tone, and pragmatic context, and propose that *darou* is both a deictic expression pointing to the speaker's beliefs as well as a context-shifter that manipulates the context in order to circumvent a possible violation of Gricean Quality.

The paper is structured as follows. In Section 2, we look closely at *darou*-sentences in different clause types and with different boundary tones and argue that the semantic function of *darou* is to restrict the modal base for the prejacent proposition to the speaker's beliefs. In Section 3, we compare the use of *darou* with another sentence-final morpheme, *youda*, under different evidence contexts and propose that *darou* is a context shifter. Section 4 concludes the paper.

2 *Darou* as a Deictic

2.1 Basic Paradigm

Falling Declaratives When *darou* is attached to the end of a plain declarative as in (1), the whole sentence indicates that the speaker has a bias toward the prejacent proposition *John-ga kuru* 'John is coming'.

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

The conclusion that plain declaratives with *darou* must express "the speaker's bias" is supported by the following observations: 1) co-occurrence restrictions with probability adverbs, and 2) obligatory wide-scope reading under *because*-clauses.

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Sugimura (2004) observes that *darou* can co-occur with high-probability adverbs (2) but not with low-probability adverbs (3).

- (2) kare-wa tabun/kitto kuru darou.
 he-TOP probably/certainly come DAROU
 ‘Probably/Certainly, he will come.’
- (3) *kare-wa moshikasuruto kuru darou.
 he-TOP maybe come DAROU

(Sugimura, 2004)

This asymmetry suggests that *darou* requires some minimal degree of bias toward the preadjacent proposition, which conflicts with the low degree of commitment expressed by the low probability adverb in (3). The contrast between (4) and (5) shows that the agent of this bias needs to be the speaker. In (4), the speaker’s assessment of the likelihood of rain is the cause of him bringing his umbrella. The infelicity of (5) results from the fact that the bias contributed by *darou* cannot be shifted, and so the sentence ends up meaning that the speaker’s bias toward ‘it will rain’ has caused John to bring an umbrella, instead of the intended reading according to which *John*’s assessment of the likelihood of rain causes him to bring his umbrella.

- (4) boku-wa ame-ga furu darou kara kasa-o mot-te it-ta
 I-TOP rain-NOM fall DAROU because umbrella-ACC have-and go-PAST
 ‘Because it will rain (I bet), I took an umbrella with me.’
- (5) ??John-wa ame-ga furu darou kara kasa-o mot-te it-ta
 John-TOP rain-NOM fall DAROU because umbrella-ACC have-and go-PAST
 ‘Because it will rain (I bet), John took an umbrella with him.’

Contrasts like those above show that in falling declaratives, *darou* marks the *speaker’s bias* toward the preadjacent proposition.

Rising Interrogatives Interrogatives in Japanese are marked with the sentence final particle *ka*. *Darou* cannot be used in such an interrogative construction with a final rising intonation (L% H% in the J_ToBI system (Venditti, 2005)). Native speakers judge examples like the one in (6), with a pitch profile like that in Figure 1, as deviant or ungrammatical in out of the blue contexts, although as we will see later such uses can be made felicitous in a very particular kind of context.

- (6) *Yurie-wa wain-o nomu darou-ka↑
 Yurie-TOP wine-ACC drink DAROU-Q

Falling Interrogatives It is not the case that *darou* is simply incompatible with interrogative constructions. If *darou* occurs within a falling interrogative, it is grammatical and interpreted as a self-addressing question, as in (7) produced with the pitch profile in Figure 2.

- (7) Yurie-wa wain-o nomu darou-ka↓
 Yurie-TOP wine-ACC drink DAROU-Q
 ‘I wonder if Yurie drinks wine.’

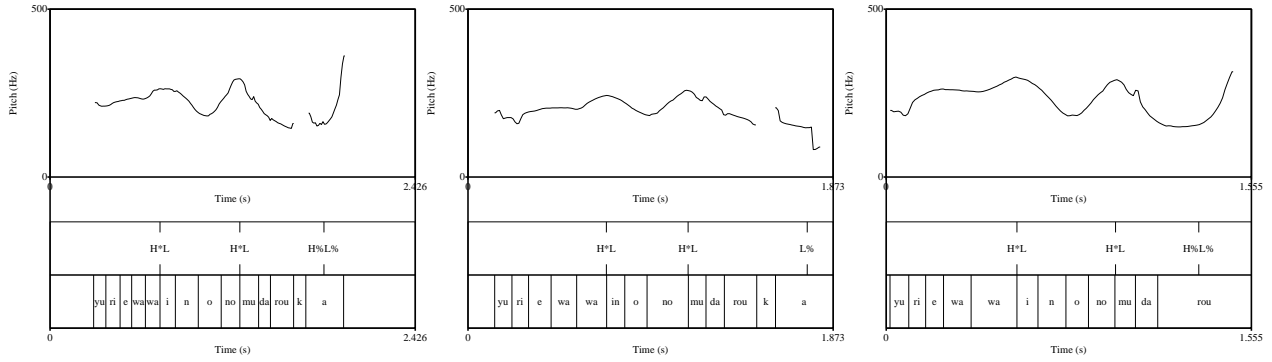


Figure 1: Rising Interrogative Figure 2: Falling Interrogative Figure 3: Rising Declarative

Rising Declaratives *Darou* is also compatible with rising declaratives, and such utterances appear to function as tag questions, as seen in (8) produced with the pitch profile in Figure 3.

- (8) Yurie-wa wain-o nomu darou↑
 Yurie-TOP wine-ACC drink DAROU
 ‘Yurie drinks wine, right?’

Summary *Darou* indicates the speaker’s bias in falling declaratives, but interpretation varies as a function of both clause type and final boundary tone.¹

	Falling	Rising
Declarative	statement (‘I bet’)	tag Q (‘, right?’)
Interrogative	self-addressed Q (‘I wonder’)	*

2.2 Discussion

The previous section gave an informal characterization of the distribution of *darou* with respect to different clause types and sentence-final intonations. In this section, we make three proposals to explain this distribution.

Proposal 1 First, we propose that *darou* functions as a discourse-level modal operator and a sentence type modifier (Zimmermann, 2004, Davis, 2009). Under our analysis, *darou* restricts the speech act so that it performs an update on the belief associated to the speaker. The following contrast supports the treatment of *darou* as a discourse-level modal. While the “normal” propositional modal *nichigainai* can occur inside embedded questions (9), *darou* cannot (10).

¹To confirm this observation objectively (see Schütze 1996), a rating experiment was conducted and reported in Hara (To appear).

- (9) Emi-ga igirisu-ni itta nichigainai ka douka kiite mita.
 Emi-NOM England-DAT went must Q or.not to.ask tried
 ‘I asked whether Emi must have left for England or not.’
- (10) *Emi-ga igirisu-ni itta darou ka douka kiite mita.
 Emi-NOM England-DAT went DAROU Q or.not to.ask tried
 Intended: ‘I asked whether Emi probably left for England or not.’

The ungrammaticality of (10) shows that the combination of *darou* with interrogatives is a root phenomenon (see Hara (2006) for more arguments).

As discussed in Section 2.1, *darou* in a plain declarative indicates the speaker’s strong bias. When used in a falling interrogative, however, the bias meaning disappears, as seen in (11).

- (11) Ashita hareru darou ka. Zenzen wakar-anai.
 tomorrow sunny DAROU Q at.all understand-not
 ‘I wonder if it will be sunny tomorrow. I have no idea.’

This shows that the bias meaning should not be encoded in the semantics of *darou* itself. How then does the bias effect of *darou* in falling declaratives come about?

The infelicity of examples like (5) shows that the holder of the bias expressed by the *darou* sentence has to be the speaker. Given this, we claim that one of the effects of *darou* is to restrict the modal base for the prejacent proposition to the speaker’s beliefs. Thus, if *darou* is used in a declarative, *p-darou* indicates that the assertive update is performed on the basis of the speaker’s beliefs, and in turn the utterance indicates the speaker’s bias. In contrast, if *darou* is used in an interrogative, the utterance questions into the speaker’s beliefs, and no bias is indicated.

In formally characterizing the effects of *darou* sentences, we use the framework of dynamic update semantics (Stalnaker, 1968, Heim, 1982), where utterances are considered as context change potentials (CCP), functions from contexts to contexts. In order to deal with the interrogatives, a context set c is defined as a set of pairs of worlds (Groenendijk, 1999, Isaacs and Rawlins, 2008). We first look at assertion, the update encoded by a declarative sentence. In a classic framework for assertion (Stalnaker, 1968), the context set is a set of worlds, and assertive update deletes from the context set those worlds which make the propositional content false. In the current model, the context set is a set of pairs worlds, hence an assertive update removes all pairs a member of which makes the propositional content false.

- (12) Assertive update (\oplus) on contexts: For some context (set) c and clause ϕ :
 $c \oplus \phi = \{ \langle w_1, w_2 \rangle \in c \mid \llbracket \phi \rrbracket^{w_1, c} = \llbracket \phi \rrbracket^{w_2, c} = 1 \}$
 (Issacs and Rawlins’ (2008) reformulation of Groenendijk (1999))

In Japanese, there is no overt marker for declaratives. We assume that there is an empty morpheme \emptyset which contributes assertive CCP semantics, as in (13). This morpheme combines with a propositional radical to encode an assertive update on the context.

- (13) $\llbracket \text{ASSERT}/\emptyset \rrbracket = \lambda p. \lambda c. c \oplus p$

Our proposal is that *darou* is a modifier of the ASSERT morpheme, requiring that the update be performed on the speaker’s beliefs, i.e., a set of doxastic worlds associated with the speaker.

$$(14) \quad \llbracket \text{darou} \rrbracket = \lambda F. \lambda q. \lambda c'. F(q)(\text{Dox}_{\text{spkr}}(c'))$$

$$(15) \quad \llbracket \text{darou} \rrbracket(\llbracket \text{ASSERT} \rrbracket) = [\lambda F. \lambda q. \lambda c'. F(q)(\text{Dox}_{\text{spkr}}(c'))](\lambda p. \lambda c. c \oplus p) \\ = \lambda q. \lambda c'. \text{Dox}_{\text{spkr}}(c') \oplus q$$

In Groenendijk's (1999) system of context update, questions do not delete worlds, but dissociates them. A question $\phi?$ deletes pairs that are composed of worlds each of which assigns a different truth value to ϕ .

$$(16) \quad \text{Inquisitive update } (\otimes) \text{ on contexts: For some context (set) } c \text{ and clause } \phi: \\ c \otimes \phi = \{ \langle w_1, w_2 \rangle \in c \mid \llbracket \phi \rrbracket^{w_1, c} = \llbracket \phi \rrbracket^{w_2, c} \} \\ (\text{Issacs and Rawlins' (2008) reformulation of Groenendijk (1999)})$$

Unlike assertive update, interrogative update in Japanese is associated with an overt morpheme, *ka*. We define *ka* as a function which takes a proposition and performs an inquisitive update on the context with the content of *p*.²

$$(17) \quad \llbracket \text{QUEST}/ka \rrbracket = \lambda p. \lambda c. c \otimes p$$

The semantic composition of *ka* and *darou* is depicted in the tree structure in (18).

$$(18) \quad \begin{array}{c} \lambda c'. \text{Dox}_{\text{spkr}}(c') \otimes p \\ \swarrow \quad \searrow \\ p \quad \lambda q. \lambda c'. \text{Dox}_{\text{spkr}}(c') \otimes q \\ \quad \swarrow \quad \searrow \\ \quad \text{darou} \quad \text{ka} \\ \quad \lambda F. \lambda q. \lambda c'. F(q)(\text{Dox}_{\text{spkr}}(c')) \quad \lambda p. \lambda c. c \otimes p \end{array}$$

An interrogative performs an inquisitive update on the context as defined in (16), while *darou* marks that the updated context is the speaker's belief (14). As depicted in (18), the utterance performs an inquisitive update on the speaker's belief $\lambda c'. \text{Dox}_{\text{spkr}}(c') \otimes p$. In case of a falling interrogative, the utterance expresses a self-addressing question.

Proposal 2 To address the contrast in the falling and rising interrogative with *darou*, repeated here as (19) and (20), we need to understand the semantic contribution of the final tunes \uparrow / \downarrow .

$$(19) \quad \text{Yurie-wa wain-o nomu darou-ka}\downarrow \\ \text{Yurie-TOP wine-ACC drink DAROU-Q} \\ \text{'I wonder if Yurie drinks wine.'}$$

²As discussed by Kratzer and Shimoyama (2002), the morpheme *ka* can be attached to *wh*-words to form indefinites, e.g., *dare-ka* 'someone'. To unify both usages, Kratzer and Shimoyama (2002) use Hamblin's (1973) semantics of questions which defines a question as a set of propositions. It is not clear whether Groenendijk's (1999) system of questions can be employed to define this function of *ka*. Groenendijk's (2009) recent model of inquisitive semantics define a question as a disjunction of propositions, thus it might be more promising to offer a unified account for the morpheme. We do not entertain this possibility as it is beyond the scope of this paper.

- (20) *Yurie-wa wain-o nomu darou-ka↑
 Yurie-TOP wine-ACC drink DAROU-Q

Following Bartels' (1999) work on English, we propose that the final rising tune indicates that the utterance is directed at an addressee. According to Bartels (1999), the H% tone in the sentence-final rising tune H-H% in English indicates that the utterance is directed at an addressee as in (21), and serves to emphasize the speaker's expectation that the addressee will resolve the posed question.

- (21) S: (Interested friend) So you actually got yourself a job at the embassy — I'm impressed.
 Do you speak Portuguese? (Bartels, 1999:p. 152)
 H* H-H%

In contrast, a falling tune (H-L%) lacks this H% tone. Thus, an utterance with a falling tune (H-L%) is not construed as targeting the addressee in the same way; the question is merely posed as in (22).

- (22) S: (Overworked official) This form here says you're applying for jobs LB18 and LB27. I
 suppose you know the requirements. (Bartels, 1999:p. 152)
 Do you speak Portuguese?
 H* H-L%

Going back to the Japanese tones, we propose that the boundary rising tone ↑ (L%H%) is an intonational morpheme which indicates that the utterance is directed at an addressee. Moreover, if the utterance contains a deictic expression, it shifts the deictic center to the addressee.

Proposal 3 We further propose that the effect of the intonational morpheme ↑ (L%H%) is blocked by an overt intervening force marker. In (20), the overt force marker *ka* blocks the shifting of the deictic center of *darou* to the addressee.

- (23) *
-
- $\lambda F.\lambda q.\lambda c'.F(q)(\text{DO}_{\text{X}_{\text{spkr}}}(c'))$

Because of this morphological blocking, (20) cannot be interpreted as a question which inquires into the addressee's belief, and instead gives a meaning that can be paraphrased as 'Do you know whether I believe Yurie drinks wine?' This is a strange question, since the addressee is not normally in a better position to make judgements about the speaker's beliefs than the speaker himself. Falling interrogatives with *darou* lack the intonational morpheme, and no shifting occurs. Therefore, falling interrogatives simply perform an inquisitive update on the speaker's beliefs.

There are special circumstances where a rising interrogative with *darou* can be felicitous; for example, a quiz show situation like that in (24).

- (24) Doitsu-no shuto-wa doko deshoo ka↑
 Germany-GEN capital-TOP where DAROU.POLITE Q
 'Where is the capital of Germany?'

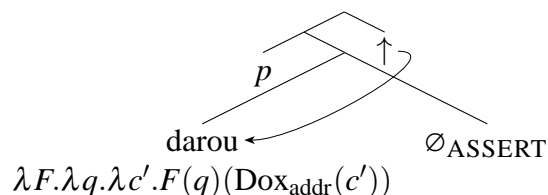
Deshoo is the polite form of *darou*. The fact that a rising *deshoo-ka* can be naturally used in a quiz show is consistent with our analysis, because the questioner can be understood as asking about his/her own knowledge, which the questioner must accurately answer to win the game.

Finally, recall that a rising declarative with *darou* expresses a confirmation question, repeated here as (25).

- (25) Yurie-wa wain-o nomu darou↑
 Yurie-TOP wine-ACC drink DAROU
 ‘Yurie drinks wine, right?’

As shown in the tree structure (26), the assertive force marker is the covert morpheme ‘ $\emptyset_{\text{ASSERT}}$ ’. Covert morphemes, by hypothesis, do not block deictic shifting, and so the intonational morpheme \uparrow can shift the deictic center of *darou* to the addressee. The utterance has the effect of updating the addressee’s beliefs (more precisely, the addressees’ public beliefs as modeled by Gunlogson (2003)), in a way that can be paraphrased as ‘I’m assuming that in your belief, Yurie drinks wine.’

(26)



2.2.1 Interim Summary

In this section, we looked at the interaction between *darou*, clause types, and boundary tones, summarized as follows:

	Falling	Rising
Decl.	statement (‘I bet’)	tag Q. (‘, right?’)
Interrog.	self-address. Q. (‘I wonder’)	* OK as a quiz question

In accounting for this paradigm, we proposed that *darou* is a discourse-level modal and sentence-type modifier, which restricts the speech act such that the updated context is calculated relative to the speaker’s beliefs. Furthermore, the rising tone $\uparrow/L\%H\%$ in Japanese is an indexical shifter which shifts the deictic center to the addressee. In case of rising interrogatives, the shifting process is blocked due by the overt intervener *ka*. In falling declaratives, the shifting succeeds and the bias-meaning is associated to the addressee. We conclude that *darou* is a deictic expression, whose referent is set to the speaker by default but can be shifted by other speech-act level operators like $\uparrow/L\%H\%$.

3 *Darou* as a Context Shifter

This section compares the distribution of *darou* with the evidential morpheme *youda*, and argues that these sentence-final morphemes should be analyzed as context-shifters in the sense of (Davis

et al., 2007). We couple this account with optimality theoretic constraints (Zeevat, 2004) to account for the distribution of these morphemes.

3.1 *Darou* and *Youda*: Basic Data

In Section 2, we saw that a falling declarative with *darou* indicates that the speaker has a bias toward the prejacent proposition. We derived this bias interpretation by arguing that *darou* restricts the modal base to the speaker's beliefs, and assertive update then targets this set of public beliefs. The speaker should have good grounds for such a move if he or she has directly witnessed the event expressed by the sentence. However, *p-darou* is not felicitous in contexts where the speaker has direct evidence for *p*.

(27) Direct Evidence

a. Context: The speaker was drinking with John and witnessed him drinking a lot.

- b. #Kinou John-wa wine-o takusan nonda darou.
 yesterday John-TOP wine-ACC many drank DAROU
 'I bet John drank a lot of wine yesterday.'

(Modified translation of Izvorski's (1997) example)

Furthermore, the use of *darou* appears to be infelicitous when the speaker has indirect perceptual evidence for the prejacent proposition:

(28) Indirect Perceptual Evidence

a. Context: There are a lot of empty wine bottles in John's room.

- b. # Kinou John-wa wine-o takusan nonda darou.
 yesterday John-TOP wine-ACC many drank DAROU
 'John drank a lot of wine yesterday, I bet.'

(29) Indirect Perceptual Evidence

a. Context: My ex-girlfriend's last name on the alumni phonebook has changed.

- b. # kanojo-wa mou kekkon-shita darou.
 she-TOP already marriage-did DAROU
 'She is married by now, I bet.'

(Morimoto, 1994)

Specifying the exact range of contexts where *darou* is felicitous turns out to be rather difficult. Following are some examples where it can be felicitously used.

(30) a. Context: John likes wine very much.

- b. Kinou John-wa wine-o takusan nonda darou.
 yesterday John-TOP wine-ACC many drank DAROU
 'John drank a lot of wine yesterday, I bet.'

(31) a. Context: It has been seven years since I broke up with my ex-girlfriend.

- b. kanojo-wa mou kekkon-shita darou.
 she-TOP already marriage-did DAROU
 'She is married by now, I bet.'

(Morimoto, 1994)

On the basis of data like those above, Hara (2006) argued that the interpretation of *p-darou* represents the speaker's epistemic bias for *p* derived from reasoning and not from observable (direct or indirect) evidence. This generalization is not ideal, in that it is negatively defined and does not reveal the core property of the morpheme. One of the goals of this paper is to improve the characterization of the contexts where the morpheme can appear.

In order to achieve this goal, it is useful to compare *darou* with the evidential morpheme *youda* (Aoki, 1986, McCready and Ogata, 2007). *Youda* is similar to *darou* in that it cannot be used when the speaker has direct evidence for the event expressed by the preajcent proposition:

(32) Direct Evidence

- a. Context: The speaker was drinking with John and witnessed him drinking a lot.
- b. # Kinou John-wa wine-o takusan nonda youda.
yesterday John-TOP wine-ACC many drank YOUDA
'It seems that John drank a lot of wine yesterday.'

Unlike *darou*, however, indirect evidence context licenses the use of *youda*.

- (33) a. Context: There are a lot of empty wine bottles in John's room.
- b. Kinou John-wa wine-o takusan nonda youda.
yesterday John-TOP wine-ACC many drank YOUDA
'It seems that John drank a lot of wine yesterday.'
- (34) a. Context: My ex-girlfriend's last name on the alumni phonebook has changed.
- b. kanojo-wa mou kekkon-shita youda.
she-TOP already marriage-did YOUDA
'It seems that she is married by now.'

Aoki (1986) generalizes the distribution of *youda* as follows: the use of *youda* requires "some visible, tangible or audible evidence collected through his own senses to make an inference" (p. 231). The requirement for tangible indirect evidence blocks *youda* from appearing in those contexts where *darou* was seen to be felicitous:

- (35) a. Context: John likes wine very much.
 - b. # Kinou John-wa wine-o takusan nonda youda.
yesterday John-TOP wine-ACC many drank YOUDA
'It seems that John drank a lot of wine yesterday, I bet.'
 - (36) a. Context: It has been seven years since I broke up with my ex-girlfriend.
 - b. # kanojo-wa mou kekkon-shita youda.
she-TOP already marriage-did YOUDA
'It seems that she is already married.'
- (Morimoto, 1994)

3.2 Presuppositional account

One possible account for these sentence-final particles is to treat them as presupposition triggers, as in (37).

- (37) a. *Youda* presupposes that “some visible, tangible or audible evidence collected through his own senses to make an inference” (Aoki, 1986) is available.
 b. *Darou* presupposes that no such evidence is available.

While this would account for the distribution described above, it suffers both empirical and conceptual problems.³ First, unlike normal presupposition triggers, *darou* and *youda* are obligatory in the contexts where they fit. The omission of *darou* or *youda* in the following makes the utterance infelicitous.

- (38) a. Context: It has been seven years since I broke up with my ex-girlfriend.
 b. kanojo-wa mou kekkon-shita #(darou).
 she-TOP already marriage-did DAROU
 ‘(I bet) she is married by now.’
- (39) a. Context: My ex-girlfriend’s last name on the alumni phonebook has changed.
 b. kanojo-wa mou kekkon-shita #(youda).
 she-TOP already marriage-did YOUDA
 ‘(It seems that) she is married by now.’

In contrast, normal presupposition triggers can be omitted without causing infelicity. In English, the phrase *manage to VP* presupposes that it is difficult to VP. In (40), the context satisfies the presupposition. However, the context does not require the use of *manage to VP*, as shown by the felicity of the version in which it is omitted.

- (40) a. Context: It was very difficult to open the door.
 b. But, John managed to open it.
 But, John opened it.

Second, there is a conceptual problem if we compare the “presuppositions” of *youda* and *darou* laid out in (37). The requirements says that *darou* or *youda* cannot appear in the contexts where the alternative expressions should appear. This characterization is redundant. We propose that this redundant specification is unnecessary, by arguing for a set of principles which generalize the distribution of both items rather than postulating a lexical specification for each entry.

3.3 Proposal: Context markers/shifters

The previous section showed that treating *darou* and *youda* as presupposition triggers is problematic. Instead, we argue that these morphemes have an expressive context-shifting semantics (Davis et al., 2007), and that the choice (or lack) of evidential is determined through optimality theoretic competition (Zeevat, 2004).

3.3.1 Regulating Quality

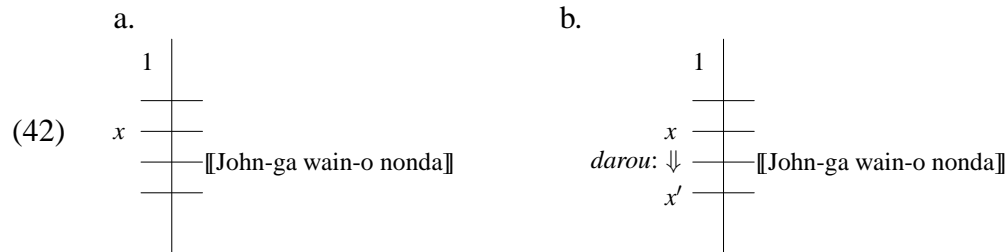
Davis et al. (2007) propose a contextual parameter, C_τ , which sets a lower threshold on the subjective probability required for felicitous assertion. For example, a context where $C_\tau = .95$

³Similar problems are pointed out by Zeevat (2004) for the presuppositional accounts for English/Dutch/German particles

would require a speaker to have at least a 95% subjective probability for any proposition he asserts. This parameter is a contextually variable and probabilistic version of the first component of Grice's Maxim of Quality (1975):

- (41) a. Do not say what you believe to be false.
 b. Do not say that for which you lack adequate evidence.

The first component of the Maxim of Quality prohibits conversational agents from uttering a sentence if they do not fully believe it to be true. However, one might sometimes want to convey information for which one is not certain enough to satisfy Quality. One way to circumvent a possible violation of Maxim of Quality is to use hedges or evidentials. Davis et al. (2007) analyze evidentials as a means by which speakers can *shift* the threshold for felicitous assertion. For instance, imagine that the speaker wants to assert *John-ga wain-o nonda* 'John drank wine', but the speaker's subjective probability for the proposition is actually lower than the value x required by the default context, as depicted in (42-a). The morpheme *darou* serves to lower this contextually required value so that the speaker can utter the sentence without violating Quality.



Davis et al. (2007) define the function μ_c which returns a probability threshold on the basis of different evidential morphemes in a given context. They then propose a context-shifting semantics of evidential morphemes, according to which they set the contextual threshold C_τ on the basis of μ_c applied to the type of evidence specified by the morpheme. The value of this function can be very subjective and context-dependent, as Davis et al. (2007:p. 10) notes:

In most realistic contexts c , direct evidence is stronger than hearsay evidence, so we might have $\mu_c(\mathbf{direct}) = .98$ and $\mu_c(\mathbf{hearsay}) = .75$. However, in (perhaps farfetched) contexts c in which direct perception is unreliable but speakers are scrupulous about passing on information only after it has been verified up to epistemic limits, $\mu_c(\mathbf{hearsay})$ might be higher than $\mu_c(\mathbf{direct})$.

This analysis privileges the first component of (41). Evidence is only used indirectly as a means of setting a lower bound on subjective belief. In this paper, we modify the analysis to capture Grice's idea that Quality is fundamentally a two-dimensional pressure, by defining the contextual threshold as a 2-tuple $C_\tau = \langle ev, x \rangle$, where ev is a set of *evidential values* and $x \in [0, 1]$.

We define the Japanese sentence-final particles as context shifters.⁴

⁴McCready and Ogata (2007) analyze *youda* along with other Japanese evidentials as dynamic epistemic modals. We believe that even if we adopt the semantics proposed by McCready and Ogata (2007) for *youda*, *youda* and *darou* can engage in the same optimality theoretic competition discussed in Section 3.3.2. We leave this complication aside, noting only that the data discussed in the previous section strongly suggest that *darou*, if not *youda*, should be treated as a context-shifter rather than as a standard modal operator.

- (43) a. Uttering *p-youda*
 \approx uttering *p* in a shifted context *C* where: $C_\tau = \langle \textit{indirect}, \mu_c(\textit{indirect}) \rangle$
- b. Uttering *p-darou*
 \approx uttering *p* in a shifted context *C* where: $C_\tau = \langle U, \mu_c(U) \rangle$

The function of each morpheme is schematized in Figure 4. In a default context where no particle is used, we suggest that *ev* is typically set to be direct perceptual evidence, and the threshold *x* for subjective probability is set relatively high. If the particle *youda* is used, *ev* is specified as indirect perceptual evidence and *x* as $\mu_c(\textit{indirect})$. If *darou* is used, *ev* is set to the set of *all* evidence types (*U*), and *x* to $\mu_c(U)$.

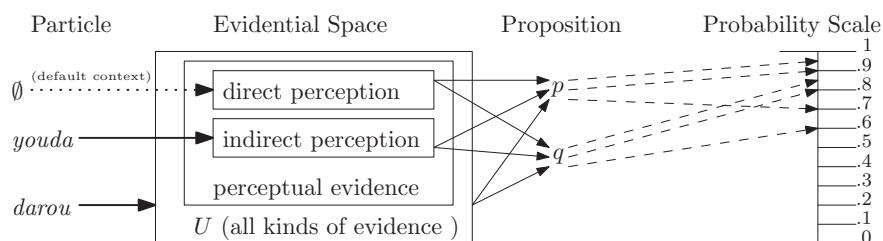


Figure 4: Particles, Evidence, and Probability

3.3.2 OT Constraints

We account for the distribution of *darou* and *youda* presented in Section 3.1 using the context-shifting semantic account laid out above in conjunction with Optimality Theory Pragmatics (Blutner and Zeevat, 2004). The Gricean Maxim of Quality is formalized as a high-ranked (presumably inviolable) OT constraint, QUALITY, as in (44).

- (44) QUALITY:
 If a speaker *S* asserts a proposition *p* in a context where $C_\tau = \langle ev, x \rangle$,
 the following must hold:
 $P_s(p) \geq x$ and $E_s(p) \in ev$,
 where $P_s(p)$ is the speaker's subjective probability for *p* and $E_s(p)$ is the kind of evidence the speaker has for *p*.

QUALITY outranks the violable economy constraint *PARTICLE, which militates against any use of particles.

- (45) *PARTICLE:
 Don't use particles. (Zeevat, 2004)

In context (46), the use of *youda* is ruled out by QUALITY, since this is a context in which the speaker has *direct* perceptual evidence, and use of *youda* moves us into a context requiring *indirect* perceptual evidence. The use of *darou* is fine according to QUALITY, since it shifts us to a context in which *all* evidence is permitted. The use of *darou* is ruled out by *PARTICLE, leaving the bare declarative as the winner, as depicted in Tableau (47).

- (46) a. The speaker directly witnessed him drinking a lot.
 b. Kinou John-wa wain-o takusan nonda \emptyset /[#]darou/[#]youda.
 yesterday John-TOP wine-ACC many drank \emptyset /DAROU/YOUDA
 ‘John drank a lot of wine yesterday.’

(47)

<i>p</i> , direct	QUALITY	*PARTICLE
a. \Rightarrow <i>p</i>		
b. <i>p</i> -darou		*!
c. <i>p</i> -youda	*!	*

In (48), the speaker does not have perceptual evidence for *p*, so use of the bare declarative is blocked by QUALITY. The use of *youda* is also blocked by QUALITY; *youda* only shifts C_τ to include indirect perceptual evidence, while in (48) the speaker has neither direct nor indirect perceptual evidence for his assertion. Since *darou* expands the evidential threshold to include non-perceptual evidence sources, QUALITY demands the use of *darou*, as shown in Tableau (49).

- (48) a. John likes wine very much (background knowledge).
 b. Kinou John-wa wain-o takusan nonda [#] \emptyset /[#]darou/[#]youda.
 yesterday John-TOP wine-ACC many drank \emptyset /DAROU/YOUDA
 ‘John drank a lot of wine yesterday.’

(49)

<i>p</i>	QUALITY	*PARTICLE
a. <i>p</i>	*!	
b. \Rightarrow <i>p</i> -darou		*
c. <i>p</i> -youda	*!	*

In (50), the speaker has indirect, but not direct, perceptual evidence for *p*. Marking the utterance with *youda* suffices to expand the evidential threshold to one in which assertion of *p* does not violate QUALITY, as seen in (51).

- (50) a. There are a lot of empty wine bottles in John’s room.
 b. Kinou John-wa wain-o takusan nonda [#] \emptyset /[#]darou/*youda*.
 yesterday John-TOP wine-ACC many drank \emptyset /DAROU/YOUDA
 ‘John drank a lot of wine yesterday.’

(51)

<i>p</i> , indirect	QUALITY	*PARTICLE
a. <i>p</i>	*!	
b. <i>p</i> -darou		*
c. <i>p</i> -youda		*

The infelicity of *p*-darou in (50) is due to a quantity implicature (see also Blutner, 2000). As shown in Figure 4, the evidential values compatible with *youda* (indirect perceptual evidence) are a proper subset of those compatible with *darou*, i.e., *indirect* \subset *U*. This means that an utterance of *p*-*youda* is, in a sense, more informative than *p*-*darou*. It is not more informative in terms of the proposition being expressed, which is the same in both utterances. Rather, it is more informative in terms of the speech act being performed. Since *darou* loosens the context to a greater degree than *youda*, the resulting utterance is less constrained and, hence, less informative. According to Grice’s Quantity maxim, uttering *p*-*darou* in contexts like (50) leads to infelicity since the speaker

is in effect understating the value of the evidence he actually has. This pressure should also be captured by a constraint, like the one stated informally in QUANTITY:

(52) QUANTITY: Make your contribution as informative as possible.

Providing the appropriate formalization for this constraint is a goal left for future research. The effect, however, should be to punish moves to the degree that they loosen contextual constraints. In the present discussion, this means the constraint will punish utterances to the degree that they expand the range of permissible evidence, and also to the degree that they lower the threshold for subjective probability. The unmarked assertion of *p* will be unpunished by this constraint. The use of *youda* will likely violate the constraint with respect the probability threshold, which will be lower for indirect perceptual evidence than for direct perceptual evidence. The use of *darou* will presumably incur an even greater violation of the constraint, because in addition to its effect on the probability threshold, it also loosens the requirements on evidence to the maximal degree possible, by allowing *all* kinds of evidence. This leads to a tableau like the one below, in which for the purpose of illustration we take the *youda* utterance to incur a single violation of QUANTITY, and the *darou* utterance to incur two violations.

(53)

<i>p</i> , indirect	QUALITY	QUANTITY	*PARTICLE
a. <i>p</i>	*!		
b. <i>p-darou</i>		**!	*
c. <i>p-youda</i>		*	*

3.4 Interim Summary

This section compared the distribution of *darou* and *youda* under different evidence contexts, and proposed that *darou* and *youda* are context shifters which change the value of the contextual threshold C_τ to circumvent a possible violation of Gricean Quality constraint. The distribution of the particles is explained by combining this dynamic account with OT-style competition between candidate utterances.

4 Conclusion

This paper examined the use of *darou* under different clause types, prosodic patterns and pragmatic contexts and argued that *darou* is a deictic context shifter. We first investigated the interaction between the clause type and boundary tone of *darou*-sentences. The investigation revealed that the semantics of *darou* contains a deictic component, since the use of *darou* indicates that the prejacent proposition is consistent with *the speaker's* belief. We also compared the distribution of *darou* and *youda* under different evidence contexts and proposed that *darou* and *youda* are context shifters. The distribution of the particles is explained by the combination of their effects on the context and pragmatic competition.

There are a number of questions which arise from the proposals in this paper. In Section 2, where we looked into the clause types and intonation, we did not consider the pragmatic context. The relationship between pragmatic context and interpretation/felicity we saw with falling declaratives cannot necessarily be carried over to other types. For example, in (54), both the speaker and addressee possess direct evidence for the prejacent proposition. Nonetheless, the use of *darou* is felicitous.

- (54) a. Context: Both the speaker and addressee witnessed that Yurie drank wine yesterday.
 b. Yurie-ga kinou wain-o nonda darou?
 Yurie-NOM yesterday wine-ACC drank DAROU
 ‘Yurie drank wine yesterday, right?’

A possible explanation for this unexpected felicity is that a different set of OT constraints are involved in the speech act of confirmation.

Second, in this paper, we only consider a bare declarative and *youda*-sentence as alternative candidates competing with a *darou*-sentence. However, Japanese has a wide range of evidential expressions, such as *rasii*, *mitai*, *soo* etc. It is an open question whether it is possible to extend the analysis to these items.

Third, the nominalizing morpheme *no* can lift the restriction against perceptual evidence in falling declarative *darou* sentences, as seen in (55).

- (55) a. Context: The speaker saw a lot of wine bottles in John’s room.
 b. John-ga kinou wain-o takusan nonda no darou.
 John-NOM yesterday wine-ACC much drank NML DAROU
 ‘John seemed to have drunk a lot of wine last night.’

This morpheme can, in addition to a nominalizer, potentially be analyzed as a question marker as well. Investigating the interaction between these sentence-final particles and different linguistic and pragmatic contexts should reveal how the effects of different particles combine with each other and the linguistic context to determine subtle properties of the resulting speech acts.

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