Contexts, Decisions, and the Japanese Particle *yo*

Christopher Davis⋆

University of Massachusetts, Amherst
cmdavis@linguist.umass.edu

Abstract. The Japanese sentence final discourse particle *yo* is argued to contribute a non-assertive meaning component which serves as a guide to the addressee's optimal action. A semantics of *yo* is provided that accounts for its use across a range of contexts and clause types. Japanese is shown to require a particle like *yo* in many contexts to license utterances that are felicitous without particles in a language like English. The pragmatic licensing is shown to follow directly from the proposed semantics of *yo*, which conventionally encodes a relevance relation that is left implicit in a language like English.

In this paper I argue that the Japanese sentence final discourse particle *yo* indicates that the speaker's utterance is to be understood as a guide to action for the addressee. In section 1 I provide data showing that when used with assertions *yo* functions as a guide to the addressee as to what action he should choose, or what decision he should make. I show that while in English the relevance relation between an assertion and the addressee's decision problem may be left implicit, in Japanese these relations must often be overtly indicated by the use of a discourse particle. In section 2 I propose a formal analysis of *yo*'s meaning that builds on a decision-theoretic analysis of relevance due to van Rooy [1]. I extend the account to imperatives in section 3 and to questions in section 4. Section 5 concludes with a consideration of the role of particles in pragmatic reasoning about communicative intent.

1   The Particle *yo* as a Guide to Action

The interpretation of the dialogue in (1), discussed by Grice [2], relies crucially on the Maxim of Relation (i.e. *Be Relevant!*):

(1) Context: A is standing by an obviously immobilized car and is approached by B.

    A: I am out of petrol.

    B: There is a garage around the corner.

Grice notes that B's assertion gives rise to a number of implicatures, such as that the garage is (at least possibly) open, sells petrol, and so on. But he also notes that observation of the Maxim of Relation requires an unstated connection between A's and B's contributions:

> In this example, ...the unstated connection between B's remark and A's remark is so obvious that, even if one interprets the supermaxim of Manner, "Be perspicuous," as applying not only to the expression of what is said but to the connection of what is said to adjacent remarks, there seems to be no case for regarding that supermaxim as infringed in this example. (Grice [2])

The obvious connection linking B's remark to A's remark (given the nonlinguistic context) is simply that B's assertion is made in order to help A get some petrol into his car. While the connection is not direct, Grice argues that it is so obvious as to not constitute a violation of any of the maxims.

Replicating this dialogue in Japanese brings the obviousness of the connection between B's assertion and A's problem into doubt. The sentence in (2) is made by B in response to A's situation:

(2) B: kono miti-o   zutto   it-ta   tokoro ni gasorinsutando-ga
        this   road-ACC straight go-PAST place   at gas.station-NOM
        ari-masu #(*yo*)
        be-HON
        "There's a gas station straight down the road *yo*."

The plain declarative without *yo* in this context is felt by informants to be rather less natural than the version with *yo*. Native speakers report that if B uses the bare declarative without *yo*, it sounds as if B is simply stating a fact, with no connection to A's problem, and with no implication that this information will help A to resolve his problem (by getting gas at the station). The infelicity disappears if B follows his assertion with *yo*.

This pattern is quite robust, and can be seen in the following examples as well. In examples (3) and (4), the context is such that the hearer faces some kind of dilemma, and B's assertion is meant to provide information that will guide A in making a decision. In each case, B's assertion is infelicitous as a plain declarative with no particle, but becomes completely natural with the addition of *yo*.

(3) A: aa, mayot-ta.   dono susi-ni   si-you   ka na.
        Oh at.a.loss-PAST which sushi-DAT do-HORT   Q   PRT
        "I'm stuck - I wonder which sort of sushi I should get?"

B: koko-no   maguro-wa oisi-i   #(*yo*)
   here-GEN   tuna-TOP tasty-NONPAST #(*yo*)

"The tuna here is good #(*yo*)."

(4) A: tabe-te-kara eiga-o   mi ni ik-ou   ka na
      eat-INF-from movie-ACC see to go-HORT Q PRT

"I wonder if I should eat before going to the movie?"

B: mou   7-ji   sugi deshou? eiga-wa   8-ji   kara
   already 7-o'clock past right   movie-TOP 8-o'clock from
hajimar-u   #(*yo*)
start-NONPAST #(*yo*)

"It's already 7, right? The movie starts at 8 #(*yo*)."

In the dialogue in (3), A indicates his indecision as to which kind of sushi he should eat. B responds by saying that the tuna is quite good. The implication here is that, since the tuna is good, the hearer should get the tuna. But if B uses the bare declarative in this context, the sequence is infelicitous. Native speakers strongly prefer the version with *yo*.

A similar situation is seen in example (4). Here, A has indicated that he is trying to decide whether he should eat before going to the movies, or whether he should just go straight to the movies. B responds by first saying that it is already seven, and that the movie starts at eight. The implication here is that there is not enough time to eat before going to the movies, and that A should therefore go straight to the movies without eating. Just as in (3), the bare assertion is infelicitous in this context. By using *yo* with the second assertion, the speaker indicates that this fact, in conjunction with the previous one, is sufficient to rule out the possibility that the speaker goes to eat before going to the movie.

A similar generalization is found with assertions that are used to suggest that the addressee do something other than what she is currently doing. The following examples show that in such situations, the bare declarative is infelicitous, while the same sentence with *yo* is perfectly natural.

(5) Context: The addressee is waiting for a train, and wants to get on, but doesn't notice that it has arrived. The speaker knows this, and says:

densha ki-ta   #(*yo*)
train   come-PAST #(*yo*)

"The train is here #(*yo*)."

(6) Context: The speaker knows that the addressee must attend a meeting, but even though the meeting time is fast approaching, the addressee is not getting ready to go. The speaker says:

miitingu-wa san-ji   kara desu   #(*yo*)
meeting-TOP 3-o'clock from be.HON #(*yo*)

"The meeting starts at 3 #(*yo*)."

In both of these examples, the assertion is not made primarily in order to transmit the information encoded by the sentence to the hearer. Rather, the purpose is to guide the hearer's action. In (5), the speaker knows that the hearer wants to get on the train when it comes, and expects that the information that the train has arrived will be sufficient to cause the addressee to stop what she is doing and get ready to board. Similarly, in (6) the speaker knows that the addressee plans to go to the meeting, and that the information that the meeting is starting soon will be sufficient to cause the hearer to stop what she is doing and go.

The examples in this section serve to show that, in Japanese, when an assertion is made in order to guide the addressee's action, the relevance relation between the information asserted and consequence for the addressee's action must be explicitly indicated by the use of a discourse particle. In the next section I give a formal analysis of the semantic contribution of *yo* which I argue serves to make these assertions felicitous precisely because it encodes the kind of relevance relation that, in English, is left implicit.

2   Formal Analysis

In this section I argue that the use of *yo* in assertions tells the addressee that the information conveyed by the assertion, in conjunction with information in the common ground, is sufficient to resolve the addressee's contextual *decision problem*. The proposal makes use of some notions from decision theory,[1] in particular a contextually-specified set of *alternative actions* and a measure of an action's optimality in terms of an agent's *utility*. The analysis builds on the work of van Rooy [1], who argues that a contextual decision problem plays a crucial role in resolving the semantically underspecified meaning of questions.

The essential object that a decision problem relies on is a set of relevant actions from which the agent must choose. This set of actions will vary from context to context. Formally, this is represented by the set $\mathcal{A} = \{a_1, a_2, \ldots, a_n\}$ containing each of the n relevant options for the agent. These actions are taken as primitives of the model, so that a decision problem makes reference both to possible states of the world, and to possible actions that may be taken in the world. But van Rooy [1] notes that any set of alternative actions $\mathcal{A} = \{a_1, a_2, \ldots, a_n\}$ gives rise to a set of propositions $\mathcal{A}^* = \{a_1^*, a_2^*, \ldots, a_n^*\}$, such that every proposition $a_i^* \in \mathcal{A}^*$ consists of the set of worlds w for which there is no action a_j that is strictly more optimal than a_i in w. In other words, the proposition a_i^* collects all those worlds in which the action $a_i \in \mathcal{A}$ is at least as optimal as all other actions $a_j \in \mathcal{A}$. Optimality is defined in terms of the agent's utility function U, which maps world-action pairs onto the real numbers, and thus serves to order the set of actions at a given world. This ordering is intended to capture the preferences of the agent at different worlds. In terms of the agent's utility function U, the proposition a_i^* is defined as in (7).

---

[1] See Benz et al [3] for an introduction to decision theory and game theory oriented towards applications in linguistics, and the references cited therein.

(7) $a_i^* = \{w \mid U(a_i, w) \geq U(a_j, w) \text{ for all } a_j \in \mathcal{A}$

  With this apparatus in place, van Rooy [1] provides the following example of how the set of propositions $\mathcal{A}^*$ can be used to provide a basis for what counts as a resolving answer to a question in a given context. Imagine a context in which an agent wants to get an Italian newspaper. Assume that there are only three worlds u, v, w that the agent considers possible. In u one can buy an Italian newspaper only at the station, in v one can buy an Italian newspaper only at the palace, and in w one can buy an Italian newspaper at both the station and at the palace. The decision problem for the agent is to choose between the actions in the set $\mathcal{A} = \{s, p\}$, where s is the action *go to the station* and p is the action *go to the palace*. The action s is strictly more optimal than p in u, p is strictly more optimal than s in v, and s and p are equally optimal in w, so that $s^* = \{u, w\}$ and $p^* = \{v, w\}$. This gives rise to the set $\mathcal{A}^* = \{\{u, w\}, \{v, w\}\}$. The structure of $\mathcal{A}^*$, van Rooy argues, can help us to understand what counts as a resolving answer to the question in (8).

(8)   Where can I buy an Italian newspaper?

Given the preceding context, this question is naturally understood as being satisfactorily resolved with a mention-some answer. This intuition is explained by appealing to a relevance ordering of answers that makes answers that pick out exactly one element of $\mathcal{A}^*$ optimal. The optimal answers to the question given $\mathcal{A}^*$ in this context are the propositions $\{u, w\} = $ *at least at the station* and $\{v, w\} = $ *at least at the palace*. This explains the fact that the answer in (9) is interpreted as mention-some, since that is the interpretation that maximizes relevance to the addressee's decision problem.

(9)   (You can buy an Italian newspaper) At the station.

If we replicate this dialogue in Japanese, we find that the answer is more natural with *yo* than without:

(10)   A: itaria-no   sinbun   doko de ka-e-ru?
          Italy-GEN   newspaper where at buy-can-NONPAST
          'Where can I buy an Italian newspaper?'

      B: eki   de ka-e-ru   (yo)
          station at buy-can-NONPAST (yo)
          'You can buy one at the station (yo).'

B's response in (10) is felt by informants to be rather more natural with *yo* than without, though the difference is a bit subtle. If we change the dialogue minimally so that A does not ask an overt question of B, then B's response is felt to be highly unnatural without the use of *yo*, as shown in (11).

(11)   A: itaria-no   sinbun   yomi-tai   na
          Italy-GEN   newspaper read-want PRT
          'I really want to read an Italian newspaper.'

> B: eki de ka-e-ru   #(yo)
>   station at buy-can-NONPAST #(yo)
>   'You can buy one at the station #(yo).'

This fact is reminiscent of those seen in the last section. I account for these facts by arguing that yo functions as an indication of the way in which an utterance is expected to relate to the addressee's contextually salient decision problem. Unlike English, where the relationship between an assertion and the addressee's decision problem is left implicit, I show that in Japanese it must often be made explicit with the use of a particle like yo.

  I propose that yo(S) contributes a meaning, separate from the main asserted content of the sentence, that indicates that there is a particular action that is optimal for the addressee after updating the context with S.

(12) $[\![yo(\text{S})]\!]^c =$
  a. $[\![\text{S}]\!]^c$
  b. $\exists a \in \mathcal{A} \ \forall w \in W \ [w \in \cap \text{CG}(c') \rightarrow w \in a^*]$
   where $c' = [\![\text{S}]\!]^c$

The denotation in (12) says the following: First, the complement of yo is passed up unmodified for further semantic computation in (12a). The complement of yo is a sentence that is 'typed' by a force operator (ASSERT, IMP, etc.), so S is a function from contexts to contexts. The denotation in (12b) is the contribution of yo, and says that all worlds consistent with the post-update common ground are ones in which the action a is optimal. That is, after updating the context with yo's complement S, the set of worlds consistent with the common ground is a subset of a^*. This is just to say that the action a is optimal for the addressee given the post-update common ground. The contribution of yo is given on a separate tier of meaning. I tentatively suggest that yo be treated as an expressive operator, in the sense of Potts [4], although we could follow McCready [5] in treating this relevance-related aspect of yo's meaning as presuppositional.

  Looking at the dialogue in (11), we can see how the semantics of yo in (12) can help guide the hearer to an appropriate understanding of the purpose of the assertion. A's assertion in (11) does not directly ask where one can buy newspapers. But A makes it clear that he would like to buy an Italian newspaper, and thus a decision problem corresponding to that indicated by the overt question in (8) is lurking in the background. B's assertion is intended to help A resolve this problem. But unlike English, a bare assertion is infelicitous in this context in Japanese. The use of yo serves to tell the addressee what the point of the utterance is; the semantics of yo makes explicit reference to a contextually salient decision problem, and indicates that this problem is resolved in the post-update context, i.e. the context returned by the complement of yo.

  The semantics in (12) can account for the example in (3) in a similar way. The example is repeated in (13).

(13) A: aa, mayot-ta. dono susi-ni si-you ka na.
   Oh at.a.loss-PAST which sushi-DAT do-HORT Q PRT

"I'm stuck - I wonder which sort of sushi I should get?"

B: koko-no   maguro-wa oisi-i $\#(yo)$
    here-GEN   tuna-TOP   tasty-NONPAST $\#(yo)$

"The tuna here is good $\#(yo)$."

For simplicity, assume that there are only two sorts of sushi on the menu, tuna and salmon. A is trying to decide which of these to order. The set of contextually salient actions for A is thus $\mathcal{A} = \{t, s\}$ consisting of the actions $t =$ "order the tuna" and $s =$ "order the salmon". A is happy with either tuna or salmon, but wants to eat something tasty. Assume further that A has never eaten at this restaurant, and does not know whether the tuna is tasty, or whether the salmon is tasty. Consider a set of possible worlds $\{u, v, w\}$ such that in u only the tuna tastes good, in v only the salmon tastes good, and in w both the tuna and the salmon taste good. A just wants to get sushi that tastes good, but doesn't know which of these three worlds she is in.

A's decision problem in this context gives rise to the set of action propositions $\mathcal{A}^* = \{\{u, w\}, \{v, w\}\}$. The set $\mathcal{A}^*$ contains propositions that group together worlds for which the optimal choice of sushi is the same. The proposition $t^* = \{u, w\}$ is the set of worlds in which the action $t =$ "order the tuna" is optimal, while the proposition $s^* = \{v, w\}$ is the set of worlds in which the action $s =$ "order the salmon" is optimal. Notice that the world w is an element of both t^* and s^*, since in that world both the tuna and the salmon are good, and thus it is equally optimal (as far as tastiness is concerned) to order either one.

Given this set up, it can be seen that B's assertion serves to update the context so that all worlds compatible with the common ground in the post-update context are ones in which the action $t =$ "order the tuna" is optimal for the addressee. More concretely, the pre-update context was such that all of the worlds $\{u, v, w\}$ were consistent with the common ground. B's assertion serves to eliminate v from the common ground, since v is a world in which tuna is not tasty. This leaves the worlds $\{u, w\}$ in the post-update common ground. But each of these worlds is also in the proposition t^*, so that all the worlds consistent with the post-update common ground are ones in which the action $t =$ "order the sushi" are optimal. This suffices to license the use of yo in this context. It also shows the way in which use of yo indicates the relevance of an assertion. In this case, use of yo indicates that the asserted proposition is sufficient to resolve the addressee's decision problem, since the post-update context contains only worlds in which it is optimal to order tuna.

A similar analysis applies to the example in (2), in which the contextually salient decision problem is how A can get gas in the car. In a realistic context, there are going to be any number of potential options for A, including calling AAA on his cell phone, walking down any number of streets in search of a gas station, syphoning gas from a car in a nearby parking lot, etc. By using yo with his assertion, repeated in (14), B indicates that, after learning the asserted information, the addressee's decision problem is resolved, since he can walk to the gasoline station to purchase gasoline.

(14) kono miti-o   zutto   it-ta   tokoro ni gasorinsutando-ga
      this road-ACC straight go-PAST place   at gas.station-NOM
      ari-masu *yo*
      be-HON   *yo*
      'There's a gas station straight down the road *yo*.'

More formally, what B is indicating with his use of *yo* is that all of the worlds in
the post-update context are ones in which a particular action is optimal. Which
action is the optimal one is not made explicit by the semantics of *yo*, but can
be inferred by the same pragmatic mechanisms that apply in English, where the
equivalent assertion without *yo* is understood to resolve the addressee's decision
problem, in this case by suggesting that the addressee go to the station up the
road to get gas. The difference between English and Japanese is that in Japanese
this relevance relation between the asserted content and the addressee's decision
problem must be made explicit by a particle like *yo*, while in English it can be
left completely implicit.

   In the preceding examples, the addressee's contextual decision problem was
more or less explicitly given by the preceding linguistic context, but we also have
examples in which *yo* is used without any previous linguistic clue to the decision
problem being referenced. In these examples, the non-linguistic context plays a
particularly crucial role in understanding the meaning of *yo*. Without a preceding
linguistic context that sets up a decision problem faced by the addressee, use of
yo typically indicates that the addressee should do something other than what
he or she is currently doing. This can be seen in example (5), repeated in (15).

(15) Context: The addressee is waiting for a train, and wants to get on, but
      doesn't notice that it has arrived. The speaker knows this, and says:

      densha ki-ta   #(*yo*)
      train   come-PAST #(*yo*)
      'The train is here #(*yo*).'

We can represent the set of alternative actions for the addressee in this context
as $\mathcal{A} = \{b, s\}$, where b = "get ready to board the train" and s = "keep sitting".
In the context in which the speaker makes the assertion in (15), the addressee is
sitting down, and there is no indication that she is going to get ready to board
the train. But it is common ground that the addressee wants to get on the train,
and furthermore that once the train has arrived it is necessary to get ready to
board the train in a timely fashion in order not to miss it. The assertion in
(15) thus serves to update the common ground in such a way that all worlds
consistent with the post-update context are ones in which it is optimal for the
addressee to stop sitting and get ready to board the train.

   The same pattern is seen in the example in (6), repeated in (16).

(16) Context: The speaker knows that the addressee must attend a meeting,
      but even though the meeting time is fast approaching, the addressee is
      not getting ready to go. The speaker says:

miitingu-wa san-ji kara desu #(*yo*)
meeting-TOP 3-o'clock from be.HON #(*yo*)

'The meeting starts at 3 #(*yo*).'

In this context, the set of relevant alternative actions that *yo* makes reference is something like $\mathcal{A} = \{g, \neg g\}$, where g = "go to the meeting now" and $\neg g$ = "do not go to the meeting now". The behavior of the addressee suggests that, without intervention, she is not going to get ready to go to the meeting, and her behavior is thus consistent with $\neg g$ rather than g. The speaker expects her assertion in (16) to be sufficient to get the addressee to go the meeting. This follows from the fact that it is common ground that the hearer must attend the meeting, and so in all worlds consistent with the common ground in which the meeting is starting soon, the optimal action for the addressee is to get ready to go, since otherwise she will be late or miss the meeting.

Examples like those in (15) and (16) in which the relevant decision problem is indicated only by nonlinguistic context are ones in which it is particularly infelicitous not to use *yo*. The generalization seems to be that bare assertions become infelicitous to the extent that the preceding linguistic context fails to explicitly provide a question that the assertion addresses. The generalization can be seen by comparing B's assertion in (17) in response to each of the two preceding utterances of A.

(17) A: a. itaria-no sinbun doko de ka-e-ru?
           Italy-GEN newspaper where at buy-can-NONPAST

           'Where do they sell Italian newspapers?'

       b. itaria-no sinbun yomi-tai na
          Italy-GEN newspaper read-want PRT

          'I really want to read an Italian newspaper.'

      B: eki de ka-e-ru (*yo*)
         station at buy-can-NONPAST (*yo*)

      'You can buy one at the station (*yo*).

If A asks the question in (17a), then B's assertion is of a form that directly picks out one of the propositions that constitutes a resolving answer to the question. In this case, native speakers report that B's answer without *yo* is not so bad, although there seems to be a preference for the response with *yo*. At a more subtle level, speakers report an intuition that if B's answer does not have *yo*, then it is just answering the question asked by A, while using *yo* seems to indicate more directly that the speaker expects the addressee to go to the station as a result of learning the information asserted.

If A makes a statement like that in (17b), then B's assertion without *yo* is completely infelicitous. Native speakers consistently report a very strong intuition that a bare assertion in this context is completely unacceptable. By using *yo*, B's assertion becomes felicitous in this context, and moreover conveys the fact that B expects this information to help A get an Italian newspaper. We

thus see that the felicity of bare assertions in Japanese degrades rapidly insofar as the assertion is meant to resolve a decision problem that is implicit in the context, but which has not been directly encoded by a preceding question by the addressee.

The analysis of *yo* to this point has relied on the use of propositions a^* which collect the set of worlds in which a is the optimal action. For van Rooy [1], optimality is derived from the addressee's utility function U. But we can imagine other ways of determining optimality. For example, we might group together those worlds in which the action a is optimal according to the law, or we might group together those worlds in which action a is optimal according to one's obligations. The example in (18) provides evidence that *yo* is sensitive to these other kinds of optimality.

(18)   Context: The addressee is driving at a speed of 55 miles per hour.

      koko-no   seigensokudo-wa jisoku   40-mairu da   #(*yo*)
      here-GEN   speed.limit-TOP per.hour 40-mile   COP   #(*yo*)

      'The speed limit here is 40 miles per hour #(*yo*).'

The speaker can use the sentence in (18) felicitously in a context in which it is known that the addressee wants to follow the law (or wants to avoid a ticket, etc.), and thus expects the addressee to lower his speed as a result of learning that he is going 55 mile per hour in a 40 mile per hour zone. The use of *yo* in this context is predicted by the account presented thus far.

But the speaker can also use the sentence in (18) felicitously in a context in which it is known that the addressee is a reckless law-breaker, and in fact gets such a thrill from breaking the law that he breaks it whenever he can. In such a context, the speaker does not expect the addressee to lower his speed as a result of learning the information asserted. But the speaker can still use the sentence in (18), and the sentence is understood to mean something like *The speed limit here is 40 mph, and so you should slow down, whether or not you will.* Just as in the previous context, the bare assertion is infelicitous in this context. The *yo*-marked assertion in (18) indicates that the addressee should, according to the law, slow down, but the bare assertion does not.

To make this discussion more formal, consider a context in which there are two possible worlds, u and v, such that in u the speed limit is 40 mph, while in v the speed limit is 55 mph. And consider the set $\mathcal{A} = \{f, s\}$ consisting of the actions $f = $ *drive 55 mph* and $s = $ *drive 40 mph*. According to the law, it is optimal for a person to drive at the speed limit, so that we get the two propositions $f^{*(\text{law})} = \{v\}$ and $s^{*(\text{law})} = \{u\}$ which express the fact that driving at 55 mph is optimal according to the law in v and driving at 40 mph is optimal according to the law in u. Before the speaker in (18) makes her assertion, it is not common ground which of the two worlds corresponds to the actual world. The addressee is currently going 55 mph and gives no indication of slowing down, so that he clearly seems bent choosing action f. But after updating with the speaker's assertion in (18), the only world compatible with the common ground is u, so that in all worlds in the post-update context the action s is optimal

according to the law. This has the effect of indicating to the addressee that, according to the law, he should slow down.

This example indicates that we should make our action propositions a^* sensitive to factors other than just optimality with respect to the addressee's utility function. The situation here is similar to that of modals, whose interpretation is standardly taken to depend on a contextually supplied modal base and ordering source, following the proposals of Kratzer [6] [7]. In the same way, it seems that we should allow the way in which the set of action propositions $\mathcal{A}^*$ is derived from the set of actions $\mathcal{A}$ depend on the context. In many cases, the propositions $a_i^* \in \mathcal{A}^*$ will collect together the worlds in which action a_i is optimal with respect to the addressee's preferences, but in other cases will collect together worlds in which a_i is optimal according to the speaker's desires, the law, custom, etc.

3 Imperatives with *yo*

We have seen that with assertions *yo* is used to indicate that all worlds consistent with the post-update common ground are such that a particular action is optimal for the addressee. Unlike assertions, the context change potential of imperative sentences does not serve to update the common ground. Instead, imperatives encode something like an update the addressee's To-Do List [8]. An imperative can be seen as encoding an action that the speaker requests the addressee to perform. When used with imperatives, *yo* seems to indicate that the common ground is such that the addressee should do the action encoded by the imperative. That is, *yo* in an imperative sentence indicates that the action encoded by the imperative is optimal, with respect to some contextually specified ordering, given the common ground.

Consider the following example: A has made dinner for B, putting a lot of effort into the process. A notices that B doesn't seem to be eating his food, and gets upset about this, since she worked so hard to cook dinner for B. She then says:

(19) tabe-te   *yo*
      eat-IMP   *yo*
      'Eat *yo*.'

Native speakers report that by using *yo* in this context, A is not only telling B to eat, but is also pointing to the fact that B *should* eat, in this context because A has gone to the trouble to make the food for him. The imperative without *yo* does not have this implication. In this context, it is already common ground that the speaker went to a lot of trouble to make dinner for the addressee. The use of *yo* indicates that it follows from this (and other facts in the common ground) that it is optimal for the addressee to eat his dinner. Optimal in what sense? In this case, the optimality is determined by the speaker's desires, or perhaps by the addressee's obligations.

We can compare the imperative in (19) with the assertion in (20).

(20) isshoukenmeini tsukut-ta   nda *yo*
      with.much.effort make-PAST PRT *yo*

      'I put a lot of effort into this *yo*.'
      (Implied: 'And therefore you should eat it.')

The sentence in (20) asserts that the speaker went to a lot of trouble to make the addressee dinner, and the use of *yo* indicates that from this it follows that the addressee ahould eat. By contrast, as we saw, the imperative in (19) directly encodes the action that the addressee should do, and the use of *yo* indicates that the addressee should do this on the basis of what is already in the common ground.

The example in (21) combines the assertion with the imperative.

(21) A: isshoukenmeini tsukut-ta   nda kara tabe-te *yo*
          with.much.effort make-PAST PRT so   eat-IMP *yo*

          'I put a lot of effort into this, so eat *yo*.'

Here, A explicitly indicates the basis for her suggestion that B really should eat the food, namely because A has made it for him, and therefore it follows from politeness, consideration for A's feelings, or the like that B should eat.

Another example illustrating the same pattern is given in (22). This example is based on a scenario from the popular comic/animation Doraemon.[2] Nobita (N) is talking with Gian (G), and telling him that he can hit a baseball 100 meters. Gian doesn't believe him, so Nobita says the following:

(22) N: uso dat-tara hana de   supagetti tabe-te-mise-ru!
          lie be-if   nose with spaghetti eat-INF-show-NONPAST

          'If I'm lying then I'll eat spaghetti through my nose!'

When Nobita tries to demonstrate his ability to hit the baseball 100 meters, he fails. At this point Gian says:

(23) G: oi, Nobita, hana kara supagetti tabe-ro *yo*
          hey, Nobita, nose from spaghetti eat-IMP *yo*

          'Hey, Nobita, eat spaghetti from your nose *yo*.'

In this example the use of *yo* by Gian serves to indicate that it follows from the fact that Nobita failed to hit the ball that he is obligated, because of his promise, to eat spaghetti from his nose. Native speakers report the intuition that the imperative in this context is a bit degraded without *yo*. In fact, the English translation *Hey, Nobita, eat spaghetti from your nose* feels rather unnatural in this context as well. A more natural thing to say would be *Hey, Nobita, you have to eat spaghetti from your nose*, in which a modal is used to say that Nobita is obligated to eat spaghetti from his nose. In Japanese, *yo* serves the same purpose as the modal in the English example, since it says that eating spaghetti from

---

[2] Thanks to Masashi Hashimoto for pointing this example out to me.

his nose is optimal according to Nobita's obligations given the current common ground, i.e. that given the common ground Nobita is obligated to eat spaghetti from his nose.

The example in (24) is from McCready [9].

(24) mata nanika   at-tara   soudan   ni ki-te   kudasai (*yo*)
      again something be-COND consultation for come-IMP please   (*yo*)

      'If anything else happens, please come talk to me again.'

McCready notes that if the sentence in (24) occurs with *yo*, then "the speaker seems to have personal reasons for wanting the hearer to consult with him", while the same sentence without *yo* has no such implication. This can be understood by assuming that in this context optimality is defined relative to the speaker's desires, so that the use of *yo* says that all worlds consistent with the common ground are worlds in which it is optimal according the speaker's desires that the addressee come to talk to the speaker.

These examples all lead to the following generalization: With assertions, *yo* is used to indicate that the asserted content is sufficient, given the common ground, to make some action optimal for the addressee. On the other hand, with imperatives *yo* indicates that the pre-update common ground is sufficient to make the action encoded by the imperative optimal, relative to some contextually specified ordering, for the addressee. This follows from the fact that, with imperatives, the post-update common ground is the same as the pre-update common ground, because the CCP of imperatives targets the addressee's To-Do List rather than her beliefs. The semantics of *yo* says that all the worlds compatible with the *post*-update common ground are ones in which a particular action is optimal. But since with imperatives the post-update common ground is the same as the pre-update common ground, this is the same as saying that an imperative with *yo* conveys that all worlds compatible with the *pre*-update common ground are ones in which a particular action, namely the one encoded by the imperative, is optimal.

4   Questions and *yo*

Compared to declaratives and imperatives, little has been written about the behavior of *yo* in interrogatives. In fact, with canonical information-seeking questions, *yo* seems to be simply ungrammatical, as noted by Shirakawa [10]. He gives the following examples:

(25) a. mada, ame, fut-te-ru   ka (**yo*)
          still   rain fall-PROG-NONPAST Q (**yo*)

          'Is it still raining?'

      b. nomimono, nani-ga   ar-u   ka (**yo*)
          drink   what-NOM be-NONPAST Q (**yo*)

          'What do you have to drink?'

    c. ima, nan-ji   da   ka wakari-masu ka (*yo)?
       now what-time COP Q know-HON   Q (*yo)
       'Do you know what time it is now?'

These are all information-seeking questions, with the canonical syntax for questions in Japanese using the question particle *ka*.

    The fact that the sentences in (25) are bad (even ungrammatical) with *yo* cannot be attributed to just the form of the sentence, however. Shirakawa gives the following examples of sentences containing the question marker *ka* that are grammatical with *yo*.

(26)   a. kimi-no kyuuryou de ie-ga   tate-rare-ru   ka (yo)
        you-GEN salary   with house-NOM build-can-NONPAST Q (yo)
        'You think you can build a house with your salary!?'

       b. konna   hon, dare-ga ka-u   ka (yo)
        this.kind.of book who-NOM buy-NONPAST Q (yo)
        'Who the hell would buy a book like this!?'

The questions in (26) are not information seeking, but rhetorical, as I have tried to indicate in my translations. The sentence (26a) can be used if the speaker is convinced that the hearer cannot in fact build a house with his salary, while the sentence in (26b) can be used if the speaker is convinced that no one would buy the kind of book in question. The syntax of the rhetorical questions in (26) is no different than that of standard information-seeking questions like those in (25), suggesting that the restriction of *yo* to rhetorical questions must be accounted for in terms of semantics or pragmatics rather than syntax.

    How can the contrast in felicity of *yo* in rhetorical questions versus information-seeking questions be explained? One possibility would be to treat rhetorical questions as assertions, and collapse the treatment of *yo* in rhetorical questions with its treatment in assertions. Then one could state a restriction to the effect that *yo* is infelicitous in interrogatives, but that rhetorical questions are assertive rather than interrogative. This analysis would commit us to the view that rhetorical questions are semantically assertions. Han [11] has argued, though, that the assertive character of rhetorical questions is due to pragmatic reasoning. I would like to suggest a way in which the behavior of *yo* in rhetorical questions can be explained without assuming that rhetorical questions are semantically assertions.

    A special case of a decision problem is one in which an agent is trying to decide what she should believe about the world. In a possible worlds setting, this amounts to the question of which of all the possible worlds the agent in fact inhabits. In a given context, the agent may be interested in which of a set of disjoint sets of possible worlds the actual world inhabits; that is, she may wish to know the state of the actual world with respect to some question, where questions are understood as partitions on the set of possible worlds. The agent's problem can be cast as a decision problem in which each possible action corresponds to picking a cell of the partition to believe. We can represent such actions as b_p for each proposition p that picks out a cell in the partition induced by the question

under consideration. For a question with n cells (i.e. possible answers), there will be n distinct actions b_{p_i} of believing in the proposition corresponding to the ith cell, giving the action set $\mathcal{A} = \{b_{p_1}, b_{p_2}, \ldots, b_{p_n}\}$.[3]

Viewed in this way, the Question Under Discussion (QUD) of Roberts [12][13] is reduced to a special case of a decision problem in which the discourse participants are all trying to decide which answer to a contextually salient question they should believe. For every question $Q = \{p_1, p_2, \ldots, p_n\}$ there is a corresponding decision problem $\mathcal{A} = \{b_{p_1}, b_{p_2}, \ldots, b_{p_n}\}$. If the context set[4] in a context c entails some $p_i \in Q$, then the question Q is resolved in c, as is the corresponding decision problem as to which proposition in Q the agent(s) should believe.

By asking a question Q, the speaker is introducing the decision problem of which of the elements of Q should be believed. This fact can be used to understand the behavior of yo in rhetorical questions as well as its infelicity in non-rhetorical questions. The question Q gives rise to a contextual decision problem $\mathcal{A}$. The corresponding set of action propositions $\mathcal{A}^*$ consists of propositions $b_{p_i}^*$ consisting of all those worlds in which it is optimal to believe the proposition $p_i \in Q$. Optimality in this case can be equated with truth; it is optimal for the agent to believe the proposition p in just those worlds in which p is true. The use of yo indicates that all worlds in the post-update context set are ones in which a particular action $a \in \mathcal{A}$ is optimal. This amounts to saying that using yo with a question indicates that the post-update context set entails an answer to the question. But a question does not serve to add a proposition to any discourse participant's discourse commitments, and does not change the common ground. Thus the post-update common ground is identical to the pre-update common ground when a question is used.[5] We thus predict that the use of yo in a question indicates that the pre-update common ground entails an answer to the question being asked. This is precisely what we find. As we saw, the use of yo in a question forces a rhetorical interpretation, indicating that the answer to the question is already known to all discourse participants.

The example in (27) seems to violate the generalization that yo cannot occur with information-seeking questions.

(27) dare-ga   boku-no biiru-o   non-da   *nda yo*
      who-NOM   me-GEN   beer-ACC   drink-PAST   *yo*

---

[3] Of course the partition induced by the relevant question may contain an infinite number of cells, in which case the agent faces a choice consisting of an infinite number of potential actions. Similarly, we can imagine other decision problems in which the set of relevantly distinct possible actions is infinite. For ease of exposition and analysis, I consider cases in which the set of possible actions is finite. Even in cases where the number of possible actions is infinite, we might imagine that only a finite subset is actually considered by the agent, in which case the simplification to action sets with finite cardinality can still be profitably employed.

[4] The context set consists of all worlds consistent with the common ground.

[5] This gives rise to the question of exactly what dynamic effect a question has. Following the partition semantics of question denotations, I suggest that the CCP of a question is to partition the context set. Partitioning a set of worlds does not eliminate worlds from the set.

'Who drank my beer *nda yo*?'

The sentence in (27) constitutes a request for information; it is used in situations where the speaker does not know who drank his beer and wants the hearer to tell him who did. Note that the sentence in (27) contains *nda*, which I have left unglossed, rather than the question particle *ka*. It is rather clear that *nda* is not simply a variant question particle. For one thing, the question particle in a wh-question can be replaced with *nda* and still be interpreted as a question, while the question particle in a yes/no question cannot be replaced with *nda* while retaining its interrogative meaning. Another contrast between questions with *nda* and questions with *ka* is that the latter can be embedded, while the former cannot.

Morphologically, *nda* seems to be a contracted form of *no da*, which in turn consists of the nominalizer *no* and the copula *da*. This suggests that a sentence ending with *nda* is syntactically a declarative, and might have a different context change potential than canonical questions with *ka*. This view is supported by examples like (28) showing that *nda* is used to form assertions. The example in (29) is interpreted pragmatically as an imperative, but also seems to be syntactically and semantically an assertion, as indicated in the gloss.

(28) boku-no biiru-o maiku-ga non-da *nda*
me-GEN beer-ACC Mike-NOM drink-PAST *nda*
'Mike drank my beer.'

(29) omae-ga tabe-ru *nda*
you.ANTI.HON-NOM eat-NONPAST *nda*
'You will eat.'

These examples suggest the possibility that wh-interrogatives with *nda* might not be associated with the same context change potential as canonical questions. I tentatively suggest that wh-interrogatives with *nda* should be treated as a kind of assertion or imperative. A sentence like that in (27) would then correspond to an assertion like *The question is who drank my beer* or an imperative like *Tell me who drank my beer*. The use of *yo* in wh-interrogatives formed with *nda* would then work the same as in assertions or imperatives. Pursuing this idea further would require a proper analysis of the function of *nda*, which is beyond the scope of this paper.

5 Particles and Pragmatics

We saw that the kind of dialogue in (1) was argued by Grice to exhibit such an obvious relevance relation between B's remark and the prior remark of A that no maxim violations were risked. But in Japanese, bare assertions are not supported in these kind of contexts. Rather, the relevance relation has to be overtly indicated with the use of a particle. Why should there be cross-linguistic variability in the pragmatic licensing conditions of basic assertions?

It may be that if a language has discourse particles that provide a kind of scaffolding for pragmatic inference, then failure to use an available particle is not free of pragmatic implications. In particular, failure to use *yo* or a similar particle in Japanese gives rise to inferences that do not occur in English, since English has no discourse particles with which to form comparison classes. A similar situation is seen in the system of honorific marking in Japanese. Japanese has an exceptionally rich system of honorifics and anti-honorifics. The example in (30a) from Potts and Kawahara [14] contains what Harada [15] calls *performative honorification*. This example can be contrasted with the one in (30b) which differs minimally in that it does not contain the performative honorific.

(30) a. Mary-ga   ringo-o   tabe-**masi**-ta
          Mary-NOM apple-ACC eat-**perf.hon**-PAST

   i. 'Mary ate the apple.'

   ii. 'I am speaking nicely to you.'

   b. Mary-ga   ringo-o   tabe-ta
          Mary-NOM apple-ACC eat-PAST

   'Mary ate an apple.'

The contribution of the performative honorific is roughly described by the gloss in (30a-ii).[6] As indicated, the effect of the morpheme is to express politeness to the addressee. In contrast, the sentence in (30b), which lacks an honorific, does not contain any meaning component indicating the speaker's politeness, or lack thereof, toward the addressee. But using a non-honorific sentence like the one in (30b) has the effect of being non-polite. That is, if the addressee is someone to whom polite speech is socially appropriate, the use of a non-honorific sentence like that in (30b) will sound rude. This is not because the sentence encodes anything like non-politeness. Rather, since the option in (30a) exists, if the speaker fails to use it, he indirectly indicates that he is being non-polite to the addressee. One cannot opt out of the system; a speaker cannot simply choose to never use honorifics, and allow other linguistic and and non-linguistic features of his behavior to indicate the politeness that is conventionally encoded by the honorific. Once a system of grammaticized honorification is in place, failure on the part of the speaker to use an honorific is interpreted as non-politeness on the part of the speaker.

The same pattern holds in the examples of assertions in Japanese whose pragmatic felicity requires the use of a particle. Although in English, which lacks a system of discourse particles, the relevance of these assertions to the context is dealt with pragmatically, we see that similar examples in Japanese require the use of a particle. Since the Japanese particle *yo* conventionally encodes a relevance relation between the content of an utterance and some decision facing the addressee, failure to use *yo* tends to indicate a lack of such a relationship. Thus, the sort of relevance relation that in English depends purely on pragmatic inference requires the support of discourse particles in Japanese. The system of

---

[6] Potts and Kawahara [14] argue that this meaning component is expressive.

particles supports the pragmatics of communicative intent, in the same way that the system of honorifics provides scaffolding for the pragmatics of politeness.

References

[1] van Rooy, R.: Questioning to resolve decision problems. Linguistics and Philosophy **26** (2003) 727–763

[2] Grice, H.P.: Logic and conversation. In Cole, P., Morgan, J.L., eds.: Speech Acts. Volume 3 of Syntax and Semantics., Academic Press (1975)

[3] Benz, A., Jäger, G., van Rooy, R.: 1. Game Theory and Pragmatics. In: An Introduction to Game Theory for Linguists. Palgrave MacMillan, Houndsmills, Basingtoke, Hampshire (2005)

[4] Potts, C.: The Logic of Conventional Implicatures. Oxford University Press (2005)

[5] McCready, E.: Particles: Dynamics vs. utility. Japanese/Korean Linguistics 16, CSLI (in press)

[6] Kratzer, A. Words, Worlds, and Contexts. New Approaches in Word Semantics. In: The Notional Category of Modality. de Gruyter, Berlin (1981) 38–74

[7] Kratzer, A. Semantics: An International Handbook. In: Modality. de Gruyter, Berlin (1991) 639–650

[8] Portner, P.: The semantics of imperatives within a theory of clause types. In Watanabe, K., Young, R.B., eds.: Proceedings of Semantics and Linguistic Theory 14, NY, CLC Publications (2005)

[9] McCready, E.: The Dynamics of Particles. PhD thesis, University of Texas Austin (2005)

[10] Shirakawa, H.: Hatarakikake toikake no bun to shuujoshi yo [Imperatives, interrogatives, and the sentence final particle *yo*]. Nihongo Kyouiku Gakka Kiyou **3** (1993)

[11] Han, C.H.: Interpreting interrogatives as rhetorical questions. Lingua **112**(3) (2002) 201–229

[12] Roberts, C.: Information structure in discourse: Towards an integrated formal theory of pragmatics. In Yoon, J.H., Kathol, A., eds.: OSUWPL Volume 49: Papers in Semantics. The Ohio State University Department of Linguistics (1996)

[13] Roberts, C.: Context in dynamic interpretation. In Horn, L., Ward, G., eds.: Handbook of Contemporary Pragmatic Theory. Blackwell (2004)

[14] Potts, C., Kawahara, S.: Japanese honorifics as emotive definite descriptions. In Watanabe, K., Young, R.B., eds.: Proceedings of Semantics and Linguistic Theory 14, Ithaca, NY, CLC Publications (2004) 235–254

[15] Harada, S.I.: Honorifics. In Shibatani, M., ed.: Syntax and Semantics, Volume 5: Japanese Generative Grammar. Syntax and Semantics, Volume 5: Japanese Generative Grammar. Academic Press, New York (1976) 499–561