

On the Semantics and Pragmatics of the Japanese Particle *Yo*

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Abstract

The Japanese sentence-final particle *yo* has several functions: in general, it serves to mark new information and emphasize the sentence it modifies, creating an effect of insistence. It can also, in modally subordinate, have a modal meaning. This paper provides an analysis of *yo* within a modal dynamic semantics based on (sets of) epistemic states.

This paper considers the meaning and use of the Japanese particle *yo*, one of the class of Japanese particles known as the *sirase* ‘notification’ particles (cf. Masuoka and Takubo 1989). A position commonly found in the literature is that the *sirase* particles serve to introduce new information to a hearer, while the function of the other main class of Japanese particles, the *kakunin* ‘confirmation’ particles, is to mark information that the speaker takes to be already known to the hearer. The *sirase* particles, or at least *yo*, also have another function, however; they emphasize the content of the sentence they appear in, in some sense making it stronger. I will combine these two facts about *yo* in a dynamic semantic analysis. The final part of the paper considers another use of *yo* on which it has a modal interpretation.

1 *Yo*: the Facts

The particle *yo* has no obvious truth-conditional effects. In (1), adding *yo* seems to provide emphasis, or adds a sense of urgency to the utterance.

- (1) Taroo-ga kita (*yo*)
Taro-NOM came (*YO*)
‘Taro came.’

It is often claimed in the literature that *yo* is used with sentences whose propositional content is not already known to the hearer. The proposal that *yo* marks new information accounts for the infelicity of using *yo* in (2), just in case the sentence is used as a reminder of the meeting time to a person who knows it already. Use of *yo* is possible, however, if the hearer seems to have forgotten the meeting time (e.g. he doesn’t seem to be going anywhere even though it’s already 2:55).

- (2) Kyoo no miitingu wa sanji kara desu (# *yo*)
Today GEN meeting TOP 3:00 from COP (*YO*)
‘Today’s meeting starts at 3:00.’ (Suzuki Kose, 1997)

Here, because the hearer already knows the proposition expressed, use of *yo* is disallowed. I believe that this idea is essentially right.

Noda (2002) claims that *yo* has additional functions in addition to simply marking new information. For Noda, *yo* indicates that the speaker believes that the hearer should recognize, and accept, the propositional content of the sentence. Thus, the content marked by *yo* must

not only be new to the hearer, but also believed by the speaker to be of importance to the hearer. If the speaker believes the *yo*-marked information to be irrelevant to the hearer for whatever reason, use of *yo* is infelicitous.

Yo produces a sense of insistence in declaratives (and also imperatives, though I will not consider them here), as if the hearer is being urged to accept the proposition in its scope. Dialogues in which the hearer has expressed dubiety about the truth of that proposition provide cases in which this element of *yo*'s meaning comes out clearly, as noted by McCready (2005).

- (3) a. A: saki Jon-ga kaetta
 just.now John-NOM went.home
 ‘John just went home.’
 b. B: uso!
 lie
 ‘No way!’
 c. A: kaetta #(yo)
 went.home (YO)
 ‘He DID go home!’

Another interesting fact about *yo* is that it can license modal subordination, even in the absence of modals in the second sentence, as shown in (4). This fact is very surprising, in that *yo* itself is not generally interpreted as modal, as the above examples illustrate.

- (4) ookami-ga kuru kamosirenai. \emptyset /soitu anata-o taberu yo.
 wolf-NOM come might \emptyset /that-guy you-ACC eat YO
 ‘A wolf_i might come in. It_i (will) eat you first, man (rough gloss).’

Interestingly, although the particles are not always modal, they do seem to be interpreted in a modal manner in modal subordination contexts: (4), for example, is understood in the conditionalized manner familiar from previous accounts of modal subordination like those of Roberts and Frank (Roberts, 1989; Frank, 1997). One might conjecture that the presence of a modal in the sentence preceding the one with the particle is enough to induce a modal flavor. But this is not the case, as shown by (5). As it turns out, a particular kind of discourse connection is necessary for a modal interpretation. The second sentence must be *weakly caused* by the first. I will clarify this notion further below.

- (5) John-wa ima suupaa ni it-tei-ru nitigainai. soko-no sake-wa
 John-TOP now supermarket to go-PROG-NPST must. there-GEN alcohol-TOP
 totemo yasui n da yo
 very cheap EMPH COP YO
 ‘John must be at the supermarket now. The liquor’s very cheap there, man.’

The goal of the next section is to provide a semantics for *yo* that can account for these contrasts.

2 Analysis

I will use the modification of the dynamic modal semantics of Asher and McCready (2004) proposed in McCready (2005). This semantics is based on epistemic possibilities, defined as follows:

- Set $E_{\alpha,0} \subseteq \mathcal{P}(W \times \$)$, where $\$$ is the set of all assignment functions.
- $E_{\alpha,n+1} \subseteq \mathcal{P}(W \times \$ \times E_{\alpha,n})$
- $\mathcal{E}_\alpha \subseteq \mathcal{P}(\bigcup_{n \in \omega} E_{\alpha,n})$

Every set of epistemic possibilities \mathcal{E}_α is thus well-founded. The logic also has sets of deontic possibilities \mathcal{D}_α constructed in a similar fashion. Dynamic contexts that form the inputs to the interpretation of formulas are 4-tuples of $\langle w, f, \mathcal{E}_\alpha, D_\alpha \rangle$ for some α . I refer to the third element of an information state σ as $3(\sigma)$, where 3 is a projection function from σ onto its third element. More generally, we make use of the projection functions $1, 2, 3, 4$ to pick out the world, assignment function, set of epistemic possibilities, or set of deontic possibilities of a context element respectively.

A dynamic DPL style semantics can be stated in terms of these new context elements.

- $\sigma \Vdash Rt_1, \dots, t_n \Vdash^A \sigma'$ iff $\sigma = \sigma' \wedge \langle \|t_1\|_{(1(\sigma), 2(\sigma))}^A \cdots \|t_n\|_{(1(\sigma), 2(\sigma))}^A \rangle \in R_{1(\sigma)}^A$
- $\sigma \Vdash t_1 = t_2 \Vdash^A \sigma'$ iff $\sigma = \sigma' \wedge \|t_1\|_{(1(\sigma), 2(\sigma))}^A = \|t_2\|_{(1(\sigma), 2(\sigma))}^A$
- $\sigma \Vdash \phi \wedge \psi \Vdash^A \sigma'$ iff $\sigma \Vdash \phi \Vdash^A \sigma' \circ \Vdash \psi \Vdash^A \sigma'$
- $\sigma \Vdash \neg \phi \Vdash^A \sigma'$ iff $\sigma = \sigma' \wedge \neg \exists w'', h \sigma \Vdash \phi \Vdash^A \sigma \frac{1(\sigma)}{w''}, \frac{2(\sigma)}{h}$
- $\sigma \Vdash \exists x \phi \Vdash^A \sigma'$ iff $\exists a \in A \sigma \frac{a}{x} \Vdash \phi \Vdash^A \sigma'$, where $\sigma \frac{a}{x}$ is the result of replacing $2(\sigma)$ with $2(\sigma) \frac{a}{x}$

The definition of discourse update makes use of a notion of descendent satisfaction, along with a revision function \star on epistemic possibilities involving a partial ordering on the elements of epistemic possibilities (cf. Lewis 1973b). This partial ordering forms a system of spheres centered around each element σ . A set of such elements can also have a system of spheres $S(\epsilon) = \{\cup(S_n(\sigma)) : \sigma \in \epsilon\}$.

- Definition of Descendance and Satisfaction by epistemic possibilities
 - σ has a ϕ descendant σ' iff $\sigma[\phi]\sigma'$
 - $\langle \epsilon, \epsilon' \rangle \models_d \phi$ iff every $\sigma \in \epsilon$ has a ϕ descendant in ϵ' .
 - $\|\phi\| = \{\langle \sigma, \sigma' \rangle : \sigma' \text{ is a } \phi \text{ descendant of } \sigma\}$
 - Let $S_n(\epsilon)$ be the smallest sphere around ϵ such that elements in $S_n(\epsilon)$ have ϕ descendants. Then $\epsilon \star \|\phi\| = \{\sigma : \exists \sigma' \in S_n(\epsilon) \sigma \text{ is a } \phi \text{ descendant of } \sigma'\}$.
 - $\mathcal{E} \star \|\phi\| = \{\epsilon \star \|\phi\| : \epsilon \in \mathcal{E}\}$.
- Definition of Discourse Update:
 - Let ϕ be a modal free formula. Then σ is a ϕ discourse update of σ' iff $\exists \sigma''$ such that $(\sigma'[\phi] \Vdash^A \sigma'' \wedge 1(\sigma) = 1(\sigma'') \wedge 2(\sigma) = 2(\sigma''))$ and $3(\sigma) = 3(\sigma') \star \|\phi\| \wedge \forall \epsilon \in 3(\sigma) \forall \sigma''' \in \epsilon \ 2(\sigma''') =_x 2(\sigma)$ for all x free in ϕ

- Let ϕ be a formula of the form *might* ϕ , *would* ϕ or $\phi \Rightarrow \psi$. Then σ is a ϕ discourse update of σ' iff $\sigma'[\phi]^A\sigma$

Modal operators are defined making use of $3(\sigma)$, for epistemic modalities, and $4(\sigma)$, for deontic modalities.

- $\sigma[\textit{might}\phi]_A\langle 1(\sigma), 2(\sigma), \mathcal{E}' \rangle$, where $\mathcal{E}' = \{\epsilon' : \exists \epsilon \in 3(\sigma) \langle \epsilon, \epsilon' \rangle \models_d \phi\}$,
if there is such an ϵ ;
 $\sigma[\textit{might}\phi]_A\emptyset$ otherwise.
- $\sigma[\textit{would}\phi]_A\langle 1(\sigma), 2(\sigma), \{\epsilon' : \exists \epsilon \in 3(\sigma) \langle \epsilon, \epsilon' \rangle \models_d \phi\} \rangle$,
if $\forall \epsilon \in 3(\sigma) \exists \epsilon^* \langle \epsilon, \epsilon^* \rangle \models_d \phi$;
 $\sigma[\textit{would}\phi]_A\emptyset$ otherwise.

The deontic modalities *should* and *could* are similar, except that they act on the fourth element of the context tuple.

Now I move to the analysis of *yo*. We need to lay some groundwork before giving the actual semantics. First, I will define an operator \mathcal{B} that lives on epistemic states: $\mathcal{B}_X\varphi$ will indicate that the individual X believes φ . I will make use of this predicate in modeling the new information and ‘hearer importance’ effects of *yo*.

- $\sigma \parallel \mathcal{B}_X\varphi \parallel \sigma'$ iff $\forall \epsilon [\epsilon \in 3(\sigma') \rightarrow \forall \psi [\textit{believe}(x, \psi) \rightarrow \wedge \epsilon \models \psi] \rightarrow \epsilon \models \varphi]$.

Second, we need a notion of *strong assertion*, which will be used in modeling the ‘insistence’ effect of *yo*. I define a predicate *Sassert* that acts to ensure that update with its complement is defined by using a dwndate operation (Gardenfors, 1988).

- $\sigma \parallel \textit{Sassert}(\varphi) \parallel \sigma'$ iff
 - if $1(\sigma) \in \bigcup 3(\sigma)$, then $\sigma \parallel \varphi \parallel \sigma'$, and
 - iff $1(\sigma) \notin \bigcup 3(\sigma)$, then $\sigma' = \sigma'''$, where $\sigma \parallel \downarrow \neg\varphi; \varphi \parallel \sigma'''$.

The final element we need is a notion of weak causal dependence. I will make use of SDRT (Asher and Lascarides, 2003) here and define a discourse relation *Dep* that applies to modal subordination contexts. $\textit{occasion}_C(p, q)$ holds just in case p weakly causes q in the sense that q cannot occur without p also holding (cf. the *weak causation* of Lewis 1973a).

- $\langle \alpha, \beta, \gamma \rangle \wedge \textit{Epist_mod}(\alpha) \wedge \textit{occasion}_C(\alpha, \beta) > \textit{Dep}(\alpha, \beta)$
- $\textit{occasion}(p, q) \longleftrightarrow ((p \rightarrow \diamond q) \wedge (\neg p \rightarrow \neg \diamond q))$

Now we can move to the actual analysis. On my analysis, the meaning of *yo* is underspecified and depends on information about causal relations. In particular, I take the meaning selected for *yo* to depend crucially on the discourse relation holding between the *yo*-marked sentence and another element in the discourse structure: specifically, if the *yo* sentence is connected to another discourse segment by *Dep*, a modal meaning for *yo* is selected. The particular implementation of this idea makes use of the SDRT formalism for underspecification: here $l_i : \varphi_i$ is a labelled formula, and R a relation between labels.

- Rules for *yo* meanings:

- $\exists \pi' \exists R [yo_?(\varphi, l) \wedge R(l, \pi) \wedge Dep(\pi', \pi) > yo_{\diamond}(\varphi, l)]$
- $\exists \pi' \exists R [yo_?(\varphi, 1) \wedge R(l, \pi) > yo_{sassert}(\varphi, l)]$

The above captures the distinction between modal and nonmodal *yo*. Two elements of *yo*'s meaning are completely invariant, however, corresponding to the notions of new information and hearer relevance. The notion of new information I will capture using a presupposition about hearer beliefs. Using the \mathcal{B} operator, I define two invariant elements of *yo*'s meaning: a presupposition that the speaker believe the proposition *yo* applies to to be new information, and an assertion that (s)he believes it to be something the hearer should know. In addition to these invariant elements, the meaning of *yo* is defined separately for modal and nonmodal *yo*. Note that this analysis, despite what is in some sense a nonlocal dependence, is fully compositional because of the appeal to underspecification.

- Presupposition of *yo*: $\forall \epsilon \in \mathcal{Z}(\sigma) : \langle \epsilon, \epsilon \rangle \models \mathcal{B}_S \neg \mathcal{B}_H \varphi$
- Semantics of *yo* $\sigma \models \mathcal{B}_S \text{should} \mathcal{B}_H \varphi \parallel \sigma'$ and
 - $\sigma \models yo_{sassert}(\varphi) \parallel \sigma'$ iff $\sigma \models sassert(\varphi) \parallel \sigma'$
 - $\sigma \models yo_{\diamond}(\varphi) \parallel \sigma'$ iff $\sigma \models might(\varphi) \parallel \sigma'$

On this analysis, *yo* is modal just in case there is a causal dependence between the propositional content of the *yo*-marked sentence and the content of some earlier, modalized, discourse segment. In case there is no such dependence, *yo* forces update with the propositional content of the sentence it appears in (if update with that sentence is accepted, of course).

How does this semantics account for the facts about *yo* discussed above? The fact that *yo* is used to mark new information is encoded directly in the presupposition above. On my semantics, *yo* is in part a revision operator; I argue that the effects of insistence follows from this by Gricean reasoning. One need not use a revision operator if one is confident that one's statement will be accepted. Noda's (2002) intuition that use of *yo* requires the information to be relevant to the hearer is captured by the statement that the speaker believes that the hearer should believe that information; such a belief indicates that the speaker believe the information has some relevance to the hearer, exactly as desired.

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