Resolving teleological QUDs with/without discourse particles and cocatives

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Introduction A pragmatic mechanism behind obligatory insertions of the elusive class of discourse particles (DPs) has not been clarified so far. In this study, focusing on the Japanese DP *yo* and its interaction with vocatives, we claim that insertions of certain types of DPs should follow from the mechanism of exhaustification and QUD resolving.

Puzzle and new data Although *yo* exhibits different functions depending on the intonation accompanying it (Davis 2009;2011, Oshima 2014, McCready & Davis 2020), for the work, we focus on *yo* with rising intonation ⇑ (henceforth, "*yo*" is assumed to mean "*yo*+⇑"). As exemplified in (1a), in the context where there is something that the addressee needs to pay attention to, the insertion of *yo* is mandatory (Davis 2009, among many others). Interestingly, however, the occurrence of the vocative increases the acceptability of the sentence without *yo*, (1b).

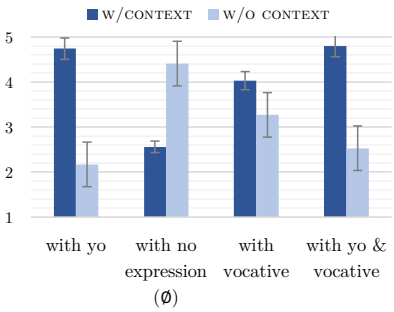
(1) Context: The speaker sees Mary hasn't noticed her train has arrived.

a. *Densha kita* { #∅ / *yo* }. 'The train train came {∅ / YO} is here.'

b. *Mary*, *densha kita* {∅ / *yo*}. M.VOC train came { ∅ / YO }

We conducted a naturalness rating survey to examine how sentences with/without *yo*/vocatives appear depending on the context, as shown in Figure 1. For the condition "with CONTEXT", we prepared contexts where a propositional content is something that the addressee needs to pay attention to (e.g. (1)). For "without CONTEXT", we used contexts where the content is *not* something that the addressee should notice, e.g. "*Both the speaker and Mary notice that the train has arrived*". The result shows that in "with CONTEXT", both sentences with *yo* and vocatives are judged more natural than sentences with no expression (*yo* vs. ∅: 4.74 vs. 2.56, $t = 8.99, p < .0001$; vocatives vs. ∅: 4.03 vs. 2.56, $t = 7.69, p < .0001$). Surprisingly, although both sentences with *yo* and vocatives were judged to be natural in "with CONTEXT", we found that *yo* is significantly preferred to vocatives (4.74 vs. 4.03, $t = 2.91, p < .05$). (More detailed information about the survey has been omitted for reasons of space.) What is the mechanism that can capture the contrasts? Concretely, why is *yo* not obligatorily to occur if a vocative is inserted? How does a vocative raise the acceptability while at the same time making the sentence less preferable to *yo*?

Figure 1: Average naturalness of sentences with yo/no expression/vocatives and with/without CONTEXT



Mandatory exhaustive implicature and QUD Let us first derive the case where the absence of *yo* makes the sentence unnatural. We assume that people interpret sentences exhaustively with respect to the Question under Discussion (QUD, Roberts 2012, Beaver & Clark 2008). Here, we utilize Rudin's (2018) discourse model that bifurcates QUD into doxastic/epistemic one 'QUD_{dox}' (i.e., a question about what the world is like) and teleological one 'QUD_{tel}' (i.e., a question about what the contextually salient decision problem is like), $\text{QUD} = \langle \text{QUD}_{dox}, \text{QUD}_{tel} \rangle$. Since declarative sentence type expresses a commitment to a claim about facts (e.g. Farkas & Bruce 2010), declaratives by default resolve QUD_{dox}. Assuming that sentential focus is possible (Büring 2016), exhaustification via the exhaustive operator EXH (Fox 2007, a.o.) is mandatory when there is no other element that uses alternatives activated by focus and the QUD. In (2), for instance, the given QUD_{dox} is completely resolved since the sentence entails the truth of p and at the same time exhaustifies the stronger alternatives.

(2) QUD^{c}_{dox}: *What's the matter?* $= \{p, q, r, ...\}$
$[\textit{Densha kita}]_F$ ∅. 'The train is here ∅.' LF: EXH $[\, p$: the train is here $]_F$
$\Rightarrow \text{QUD}^{c'}_{dox} = \{p, \sout{q, r, ...}\}$ (**fully resolved** (or at least partially resolved) **QUD**)
("ϕ" represents an answer and "$\sout{\phi}$" an exhaustified alternative)

In (2), the given QUD_{dox} is completely resolved since the sentence entails the truth of p and at the same time exhaustifies the stronger alternatives. In contrast, if the QUD is teleological (cf. (1a)), the sentence cannot eliminate any possibilities in the alternative set, (3).

(3) QUD^{c}_{tel}: *What should the addressee pay attention to?* $= \{\Box_{\mathcal{P}}(p), \Box_{\mathcal{P}}(q), \Box_{\mathcal{P}}(r), ...\}$, where $\Box_{\mathcal{P}}(\phi)$ stands for 'the addressee should pay attention to ϕ'.
#[*Densha kita*]$_F$ $\emptyset$. 'The train is here $\emptyset$.' LF: EXH $[p$: the train is here $]_F$
$\Rightarrow \text{QUD}^{c'}_{tel} = \{\Box_{\mathcal{P}}(p), \Box_{\mathcal{P}}(q), \Box_{\mathcal{P}}(r), ...\}$ (**non-eliminated QUD**)

Under the QUD theory, only partial (or complete) answers to the current QUD can be relevant in the discourse (Roberts 2012). Since the sentence in (3) just asserts p and exhaustifies all the alternatives to p in a set of alternatives $alt_p = \{p, q, r, ...\}$, it does not eliminate any possibilities in QUD_{tel}, and thus fails to be relevant. (But see Agha & Warstadt (2020) for *reductive* answers.)

The meaning of *yo* and vocatives Let us move on to see the case of *yo* and vocatives. We borrow from Davis (2011) (cf. Uegaki 2019) the idea that *yo* resolves a contextually salient QUD about *what the addressee should do/notice* (cf. the "guide to action" use, Davis 2011), and assume that *yo* is defined only when QUD_{tel} = "What should the addressee notice?" is at issue in the context. The meaning of *yo* that we define for the analysis is (4): *yo* is a focus particle which takes a prejacent as its focus argument and indicates that (i) the addressee should pay attention to the prejacent, $\Box_{\mathcal{P}}\phi_w$, and that (ii) the stronger alternatives are not the things to be paid attention to in c, $\Box_{\mathcal{P}}\psi \notin \text{Q}^{c}_{tel}$. In short, *yo*($\phi$) implies that ϕ is the most *optimal* content that the addressee should notice.

(4) ϕ-*yo* is defined only if QUD_{tel} = "*What should the addressee notice?*" is at issue in c.
If defined, $[\![\, \phi\text{-}yo \,]\!]^{w,c} = \phi_w \wedge \Box_{\mathcal{P}}\phi_w \wedge \forall\psi \in alt_\phi : \phi \not\Rightarrow \psi \rightarrow \Box_{\mathcal{P}}\psi \notin Q^{c}_{tel}$

For the semantics of vocatives, we follow the idea of Eckardt (2014) (cf. Predelli 2008) that a prejacent of a vocative is *a message* that the addressee should receive, and define the meaning in (5); ϕ-VOC indicates that (i) the addressee of the utterance context is Φ_{voc}, and (ii) she should notice ϕ.

(5) ϕ-VOC is defined only if $\Phi_{voc} = \text{ADDR}_c$, where Φ_{voc} is the term denoted by VOC.
If defined, $[\![\, \phi\text{-VOC} \,]\!]^{w,c} = \phi_w \wedge \Box_{\mathcal{P}}(\phi)$

(6) QUD^{c}_{tel}: *What should the addressee pay attention to?* $= \{\Box_{\mathcal{P}}(p), \Box_{\mathcal{P}}(q), \Box_{\mathcal{P}}(r), ...\}$
a. [*Densha kita*]$_F$ *yo*. 'The train is here YO.' LF: YO $[p$: T is here $]_F$
$\Rightarrow \text{QUD}^{c'}_{tel} = \{\Box_{\mathcal{P}}p, \cancel{\Box_{\mathcal{P}}q, \Box_{\mathcal{P}}r, ...}\}$ (**fully resolved QUD**)
b. *Mary*, [*Densha kita*]$_F$. 'Mary, the train is here.' LF: VOC $[$ EXH $[p$: T is here $]_F\,]$
$\Rightarrow \text{QUD}^{c'}_{tel} = \{\Box_{\mathcal{P}}p, \Box_{\mathcal{P}}q, \Box_{\mathcal{P}}r, ...\}$ (**partially resolved QUD**)

As shown in (6), the analysis captures the fact that both *yo*(p) and VOC(p) are felicitous answers in (1). In (6a), the sentence with *yo* fully resolves the given QUD_{tel} by (i) giving the answer $\Box_{\mathcal{P}}\, p$ and (ii) exhaustifying the stronger alternatives. The sentence with VOC in (6b), on the other hand, resolves the QUD_{tel} by identifying $\Box_{\mathcal{P}}\, p$ as the answer to the QUD_{tel} (just like *yo* does), but the other possibilities (namely $\Box_{\mathcal{P}}\, q, \Box_{\mathcal{P}}\, r$, etc.) are remained unresolved since these are not exhaustified (EXH in (6b) only exhautifies the stronger alternatives to p in alt_p, namely $q, r, ...$). That is, VOC(p) is a partial and relatively weak answer to QUD_{tel} in (6), which is why *yo*(p), the stronger and more informative answer than VOC(p), is preferred. (Note (a): the co-occurrence of *yo* and VOC does not give rise to redundancy (cf. (1b) and Figure 1), because each has a meaning that the other does not have, cf. (4),(5). Note (b): the analysis can also capture the case where the current QUD is *non*-teleological (i.e., doxastic) although the illustration is omitted in the abstract for space reason.)

Comparison with *Maximize Presupposition* *Maximize Presupposition* (MP, Heim 1991, a.o.), which postulates *presuppose as much as possible!*, assumes that *yo* and "$\emptyset$" (without *yo*) are in lexical competition, {YO, $\emptyset$}, assuming that the meaning of *yo* is a presupposition (cf. McCready 2009). Then, MP correctly predicts that *yo* is required when the presupposition of *yo* is fulfilled (i.e. when there is a QUD_{tel} which is relevant to what the addressee should notice) whereas $\emptyset$ is required when the presupposition is not met. However, (at least the 'local' version of) MP fails to capture the case where the insertion of *yo* is *not* obligatory if a vocative arises (cf. (1b)); the MP theory predicts that *yo must* occur if such a QUD_{tel} is at issue (regardless of whether a vocative occurs). Another empirical advantage of our account based on QUD resolving is that it can capture the preference between *yo* and vocatives (i.e. the fact that *yo* is preferable over vocatives in a context with QUD_{tel}). The study thus contributes to providing a piece of empirical evidence for the view that certain elusive DPs should be considered to follow from the mechanism of exhaustification and QUD, not a general pragmatic principle MP (cf. Bade 2016).