Toward Particle Universals*

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1 Overview

Discourse particles are a topic of perennial interest in semantics and pragmatics, but one where very little is settled. A big question: are there 'particle universals'? The hope: yes. In this talk:

- Meaning components for particles
- Review of (some) analyses of the Japanese particle *yo*
- Revamped analysis in terms of issues
- Extension to Thai particle *na* and its phonological variants

2 Background: Formal analyses of *yo*

2.1 McCready

McCready (2005, 2008, 2009) (etc) concentrates on uses of *yo* which give a forceful impression and seem to emphasize an assertion or try to push it through against some (perceived) hearer resistance.

(1) a. A: saki Jon-ga kaetta
just.now John-NOM went.home
'John just went home.'

b. B: uso!
lie
'No way!'

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c. A: kaetta #(yo)
went.home (YO)
'He DID go home!'

This kind of use can be analyzed as an operator which directly specifies a particular kind of information transfer. The analysis was made in a dynamic setting.

- Here, the meaning of a sentence is the power it has to change the information state of an interpreter.
- When a hearer processes a new sentence, she adds the information contained in that sentence to her current stock of information. The change in information thus produced is, roughly, the meaning of the sentence. (e.g. Groenendijk and Stokhof 1991; Muskens et al. 1997)
- In such cases of 'discourse update' the new information is simply added to the information state by a process of *update*.

In DPL, information states are understood as sets of world-assignment pairs; update simply amounts to removing those pairs that do not verify the new information:

- **Update.**
$\sigma[\phi] = \{\langle w, g\rangle \in \sigma | \mathcal{M}, w, g \models \phi\}$

What happens when the information already in σ is incompatible with the new information ϕ?

- The result of update is the empty set, which corresponds in this theory to $\bot$, the absurd state = failed discourse move.

More realistically, in such cases the hearer instead modifies her stock of beliefs in such a way that the new information can be accepted (if willing).

- One way to model this process of accommodation is via standard theories of belief revision (e.g. Gärdenfors 1988; Delgrande et al. 2008).
- In such theories, a 'downdate' operator can be defined, the opposite of update. Downdate is an operation that removes content from an information state rather than adding it; I will write 'downdate with φ' as '$\downarrow \varphi$'.
- Downdating an information state σ with φ (equivalently: updating σ with $\downarrow \varphi$) yields a minimal revision of σ where φ is no longer entailed.
- In general φ will not stand or fall alone; other pieces of content will stand in entailment relations to it, and something will need to be done about these too (cf. Quine 1951).

Setting these complications aside, one can define a notion of belief revision: revising an information state σ with ϕ, written $\sigma \star \phi$, is equivalent to updating σ with $\downarrow \neg\phi; \phi$, where ';' denotes dynamic conjunction.

- **Revision.**
  $\sigma \star \varphi =_{df} \sigma[\downarrow \varphi; \varphi]$

This notion can be used to define a notion of strong assertion suitable for the analysis of *yo*-like particles. This is the version of McCready (2008).

(2) $\sigma[sassert\varphi] =$
$\sigma[\varphi]$ if $\sigma[\varphi] \neq \varnothing$
$\sigma \star \varphi$ else.

That is, update with φ if such an update is admissible (does not result in an empty—crashed—information state)–and, if not, revise with φ.

- The analysis is then extended to the more general case of nonassertive speech acts in McCready (2008).

Issue: the belief revision operation makes unrecoverable changes in information states, so is destructive. I believe this can be avoided by using the system of McCready (2015).

- Here, ISs consist of multiple substates which are unified by a merge operation on the basis of a reliability ranking; information in higher-ranked substates trumps that in lower-ranked ones in cases of conflict.

- The idea would be that *yo*φ indicates that φ should be added to a high-ranked substate in some manner; this means that *yo* can be viewed as a kind of anti-hedge.

  – The problem is the substate which should be picked out. Highest associated with the agent uttering the *yo* sentence? Highest overall? Some intermediate state? (Perhaps similar to issue of location of presupposition accommodation, cf. Beaver 2001).

- Details left for future work.

2.2 Davis

Davis (2009) considers a different type of *yo* where forcefulness is not really primary.

- Instead, in his cases, *yo* seems to highlight the relevance of an assertion to some current problem that A is trying to solve.

- Key feature: *yo* here appears with rising intonation, rather than the falling intonation associated with the previous case (and similar).

(3) In the sushi place

A. dono sushi-ni shi-yoo kana?
which sushi-Dat do-Hort PT
'Which sushi should I get?'

B. koko-no maguro-wa umai #(yo↑)
here-Gen tuna-Top good (yo)

'The tuna here is good, yo.'

(4) In front of the broken down car.

A. I'm out of gas.

B. magatta tokoro-ni gasorinsutando-ga arimasu #(yo↑)
turned place-Dat gas.station-Nom is (yo)

'There's a gas station up there around the corner, yo.'

Davis takes this to mean that *yo* marks relevant speech.

- *Yo* is defined as having two components to its meaning: a presuppositional component and an 'asserted' component.[1] The asserted content is just the sentential content.
- The presuppositional component is defined relative to a sort of decision problem. For Davis, the context is meant to determine a set of possible actions $\mathcal{A}$ from which the contextual agents are able to select.
  - We are only meant to consider the hearer's actions here as far as I can tell.
  - Might be a motivation for using a more standard notion of decision problem ...
- The presupposition allows use of *yo* only in contexts where the propositional content ϕ of the host sentence determines an optimal action.
- So there must be more than one possibly optimal action before update with ϕ, and only one after it.

The Davis 2009 analysis runs into problems involving (a) cases where a *yo*-marked utterance actually reduces the determination of a decision problem, and (b) cases where decision problems are not fully resolved by an utterance (ie. where they only eliminate some option(s)). But these are easily solvable.

[1]The formal proposal looks like this:

- $\sigma[yo\varphi]$ is defined iff
  $\exists a \in \mathcal{A}(c')\forall w_i, w_j \in \bigcap CG(c')$
  $[(a(addr)(w_i)\&w_i <_{c'} w_j \rightarrow a(addr)(w_j)]$, where $c' = \sigma[\varphi]$
  if defined, $\sigma[yo\varphi] = \sigma[\varphi]$.

2.3 Intonation, content, and pragmatics

We now have two quite different analyses for *yo*. The question now is this: what exactly should we take the content of the particle to be?

- Unfortunately, the two analyses give different stories here, and, worse, once pragmatic factors are taken into account, the two analyses turn out to have very similar results (as pointed out by Davis and McCready (ms)).

On my old account, *yo* in asserted contexts is a marker of strong assertion. Why use such a marker?

- The obvious answer is that the speaker believes that the hearer should believe the relevant content. But why should she think that?
- The reason likely is that the speaker thinks that it is useful to hold the relevant belief, either for herself or for the hearer.
- And it further seems difficult to imagine a context in which this usefulness comes other than in the form of contributing to the solution to some (salient) decision problem.

Observation (Davis): the sense that native speakers have that *yo* with falling intonation unambiguously indicates a strengthening and revision is the direct result of the denotation assigned to the intonational contour itself.

- So it is also possible to use the relevance-style denotation and have the forcefulness effects come entirely from the $\downarrow$ operator Davis associates with falling intonation (a revision operator).
- Note, however, that an implicature of forcefulness will arise here as well without $\downarrow$: since the speaker lexically marks that the information is useful, there is a strong normative sense in which the hearer really ought to believe it.
- We therefore see that each of the accounts lexicalizes a different piece of information, but the same information turns out to be carried in each case; the analyses are mirror images.

Unfortunately, both aspects follow pretty directly from Gricean considerations about assertion.

- Upshot: no real empirical way to distinguish these options.

3 Issue manipulation

I want to propose a new way of looking at all this that can capture some of the nice points of both stories. Here are the basic ideas.

1. Assume that discourse is structured via topics or issues of conversation, something like Questions Under Discussion (Roberts, 1996).

- This should be in addition to SDRT-style content-based discourse structures too, and also has to be compatible with dynamics.
- Further this content should be structured in some kind of specificity-based ranking (a la Buring 2003; Rojas-Esponda 2014).

- How to decide what the current QUD is?
  - I have a story here though it's probably wrong in its details (to take a space of decision problems and select on, or an equivalence class thereof, based on salience metrics in the style of Lewis 1996: McCready 2012), but basically we just have to do joint intention resolution and make probabilistic (Bayesian?) guesses about each other's discourse goals.
  - That's something that should be independent of this application as long as we don't make post facto assumptions about the contents of alternative sets and the like (so that our analysis is independent of the details of how the QUD and alternative set content is determined).
- Key point: possible QUDs/issues should include both *discourse-internal* and *discourse-external* issues; the former involving update and the latter more traditional decision problems.
  - Internal DPs: questions about what changes to make to information states, answers to QUDs.
  - External DPs: questions about proper action to take in non-mental scenarios.

2. Suppose that the revision meaning I talked about comes from ↓ (falling intonation) *not* the particle (I think Davis is convincing here). Then *yo* needs a meaning that's compatible with revision, but doesn't require it.

   - In general, the right analysis of particles should give a pretty prominent role to intonation I think. More on this in the following section.

Proposal (rough):

(5) Let $Inf_{DP}(q, \varphi)$ be the degree to which φ alters the resolution of the current issue q.

•Note: change in resolution, so can be de-resolving.

This is defined in terms of resolution of entropy as in van Rooij (2003), but here conceptualized more generally in terms of general decision-making.

(6) [[*yo*(φ)]]=

a. Assertion: φ

b. Conventional implicature: $Inf_{DP}(q, \varphi) > d_s$

c. Conversational implicatures resulting from this CI (as in Groenendijk 2013):

1.φ is worth updating with/useful/hearer should believe it

2.φ is not old information

This also has to be augmented with meanings for rising and falling intonation, say the following (possibly controversial).

(7) a. $\uparrow \varphi$ expresses that q is an external decision problem.

b. $\downarrow \varphi$ expresses a strong assertion that φ, from which it follows that the most salient q wrt U is $?\varphi$ (cf. McCready 2008).

Thus, *yo* indicates resolution of an issue: falling intonation means that the issue is whether to believe the *yo*-marked sentence and rising intonation that the issue is an external one, with concomitant utility-relevance.

4 Extension to Thai *na*

4.1 The particle *na* and its variants

The Thai particle *na* appears in a number of phonological variants (we follow Cooke 1989 in assuming they have a common semantic core).

- Here I will consider the primary variants *ná, nâ, náa, nâa*, and *naa*, and further restrict attention to their use in declaratives.
- These particles usually appear sentence-finally though they can also appear at clause boundaries, much like in Japanese.

The following basic interpretations and restrictions can be isolated for a sentence with content *C*. The examples and basic characterization are from Cooke (1989):

(8) *ná*: Calling attention to *C*

a. chán mây chɔ̂ɔp ná
1P.Fem.Mid not like NA
'I don't like that, (got it?)'

b. aakàat dii ná
weather good NA
'The weather's good, isn't it?'

(9) *nâ*: Lightly persuasive and impatient wrt *C*

a. kháw khoŋ ca maa nâ
she sure will come NA

'Look, she's sure to come.'

b. mây hěn sŭay ləəy. ʔìik khon sŭay kwàa nâ
not think pretty at.all other CL.person pretty more NA

'I don't think she's pretty at all. The other one is prettier.'

(10) *náa*: Begging, attempting to persuade that *C*

a. thəə ca pay nêɛ náa
you will go surely NAA

'You're going to go for sure now riiight?'

b. phûuyĭŋ khon nán sŭay náa
girl CL.Person that beautiful NAA

'Come on, she's a beauty isn't she.'

(11) *nâa*: Sustained pressure for belief in *C*

a. yen léɛw nâa
evening already NAA

'Come on, it's evening already.' [Host has been trying to keep speaker from leaving]

b. phŏm ca càt kaan ʔeeŋ nâa
1P.Masc.F will take.care things myself NAA

'OK I'll take care of things myself.'

(12) *naa*: Calling attention strongly to *C*

a. chán wâa kháw ca maa naa
1P.Fem.Mid sure she will come NAA

'Look, I'm sure she's coming.'

b. ŋaan khoŋ mây sanùk naa. chán mây yàak pay ləəy
party probably not fun NAA 1P.Fem.Mid not want go at.all

'You know, the party's probably not going to be any fun. I really don't want to go at all.'

4.2 Connections to the existing analysis

These facts are obviously reminiscent of *yo*, and also of another common Japanese particle, *ne*.

- *yo* also exhibits forcefulness, attention-calling, and appeals by the speaker for belief.

- *ne* is more or less unstudied in the formal literature, but it is usually characterized as a 'confirmation' particle as opposed to the 'informational' particle *yo* (proposal to follow).
- Further, the lengthened versions of these particles (*yoo* and *nee/naa*), though they have received less attention in the formal literature, are associated with a similar emotive quality to the lengthened Thai *náa, nâa*, and *naa*.

(13) indicates some **rough** similarities between the particles of the two languages; if these are right, a unified analysis appears desirable.

(13) a. *ná* ~ *ne/yo* with rising intonation
b. *nâ* ~ *yo* with falling intonation
c. *náa* ~ *nee/yoo* with rising intonation
d. *nâa* ~ *yoo* with falling intonation
e. *naa* ~ *yo* with falling intonation

Suggestion: both the Japanese and Thai particles can be analyzed by some combination of the following elements:

1. lexical meanings for *yo*, *ne*, and *na*
2. a semantics for rising and falling intonation
3. a meaning for vowel lengthening.

The second we have already, in outline at least, together with a semantics for *yo*.

4.3 Proposal

Here is a proposal for some basic denotations for the particles *yo, ne* (Japanese) and *na* (Thai).

- $\mathsf{E}_a(\varphi, \psi)$ is a modal operator indicating that agent a expects that ψ will hold given φ.
- Each has the speaker going 'on record' with beliefs about the information status of φ, in the usual way for expressives.

(14) [[*yo*φ]] as above.

(15) [[*ne*φ]]= (cf. Hoong and Sudo 2015)

a. Assertion: φ
b. CI: $\sigma[\varphi] = \sigma$ (ie. hearer already believes φ)
c. Implicature: s_C wants φ to be on record as common ground (cf. 'maximization' of Schlenker 2012).

(16) [[*na*φ]]=

a. Assertion: φ

b. CI: $\mathsf{E}_s(Utter(s,\varphi), \mathcal{B}_h\varphi)$

c. Implicature: φ is worth updating with, new information, etc. (cf. 6). Also, note desire for common ground as in *ne*.

On this proposal, *na* and *yo* are quite similar in their effect.

- The main difference between them lies in their base meaning, but with assertion-based implicature these differences are partly ironed out.

(7) already gave meanings for rising and falling intonation along the lines of previous work on particles: rising intonation marks relevance, and falling intonation strength of speech act. Finally, (17) takes vowel lengthening of a particle to indicate an emotive attitude of the speaker.

(17) $PT^{+}\varphi$ expresses an emotive attitude of the speaker toward either (i) φ or (ii) $\mathcal{D}_s\mathcal{B}_h\varphi$.

These elements can be assembled to yield the various interpretations of Japanese *yo, ne* and Thai *na* in the obvious way.

- We need only let every particle meaning result from the combination of the core particle meaning, the intonational contour, and lengthening, if present.
- For instance, *ná* is defined as [*na* $\cup \uparrow$], and *nâa* as [$na^{+} \cup \downarrow$].
- We thus end up with a unified analysis.

Other likely candidates in Thai for an issue-based analysis (the next immediate step for this project):

- *lâ*: indicates a shift in the current issue under discussion
- *nâ*$^{?}$: indicates that the utterance has low relevance for the current issue
- *nî*$^{?}$ indicates the converse high level of relevance

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