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SENTENCE-FINAL *-ka-yo* IN JAPANESE: A COMPOSITIONAL ACCOUNT *

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1 Introduction

The presence of sentence-final particles (SFPs) *-ka* and *-yo* in Japanese is by no means a new observation: the former is a question marker, and the latter is what is thought to minimally be a “notification” marker that informs the addressee of some new information (McCready, 2005, 2006, 2009, Davis, 2009, 2011, Oshima, 2011). The semantics of each SFP has been of abundant interest in studies of illocutionary force, but the interaction of the two is a fairly new enterprise (Davis, 2009, 2011). In this paper, I propose a compositional account of the sentence-final duo *-ka-yo* using dynamic semantics. New empirical observations regarding *-ka-yo* will be presented along the way to motivate an approach differing from that of Davis (2011). This proposal highlights the capability of a compositional process, rather than any particular force head, to bring about enriched illocutionary meaning in discourse.

The paper will be organized as follows: in §2, I will describe basic observations about *-ka-yo*; §3 will be an overview of dynamic semantics. In §4 I will outline Davis (2011)’s account of *-ka-yo*, and in §5 I provide counterexamples against his analysis. I will present my proposal in §6, and I end in §7 with further puzzles surrounding *-ka-yo*, and broader implications of this project.

2 Basic Observations

Consider the following canonical uses of *-ka-yo*:

- (1) [*Context: You hate essay questions. You were really hoping that there wouldn’t be one on the exam. But alas, an essay question.*]
sakubun-mondai -ka -yo
essay-question KA YO
‘Damn, an essay question!’

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- (2) [Context: Your friend is irrationally angry at the new cashier, who is really slow. You tell your friend:]
 sokomade okoru -ka -yo
 that.far get.angry KA YO
 ‘Holy shit dude, you’re (getting) that angry?!’

Note that only polar (i.e., resembling yes/no questions) *-ka-yo* constructions will be analyzed in this paper (for an analysis of WH *-ka-yo* constructions, see Davis (2011)). 4 observations are relevant for this paper. First, expressions with *-ka-yo*, despite the presence of the question particle, is not a question in the canonical sense; (1) and (2) are not answer-seeking. Second, (1)-(2) both express some sort of surprise on the speaker’s part. Third, this surprise is (often) an unpleasant one. And finally, *-ka-yo* comes with a markedly aggressive (and masculine) tone, as approximated in the translation. Appended to the fourth observation is that this aggression is so stylistically marked that it’s almost an act¹; in fact, very natural examples of *-ka-yo* are often comical and carry a *tsukkomi* — “straight man”² — undertone.

3 Background: Dynamic Semantics

To account for the peculiar interpretation of *-ka-yo* described above, I will be using *dynamic semantics* in my analysis, following predecessors in SFP semantics, particularly concerning *-yo* (McCready, 2006, Davis, 2009, 2011, Oshima, 2011). Dynamic semantics is a model of context change; sentential forces are defined in terms of *context change potentials* (CCPs), which is a function from contexts to contexts — it takes in the current context C and returns a newly updated context C' . If we take the discourse context to be the Common Ground (CG) (Stalnaker, 1978), a CCP dictates how the CG gets updated. Adopting a Gunlogsonian view of the CG , any context involves each discourse participant’s associated set of Public Beliefs (PB) (Gunlogson, 2004). The PB of any discourse participant is the set of propositions he is publically committed to. This means that the CG is the intersection of every discourse participant’s PB set. If we simplify the discourse to just two discourse participants — the speaker and the addressee — the CG can be modeled in the following way for any context C :

$$(3) \quad CG_{SPKRC, ADDR_C}^C = PB_{SPKRC}^C \cap PB_{ADDR_C}^C$$

The idea behind Gunlogson (2004)’s model is that illocutionary force is defined in terms of what substructure of the discourse gets updated. For example, a declarative sentence (i.e., a DECL force head with a propositional complement) is an update to some discourse participant x ’s PB :

$$(4) \quad \llbracket \text{DECL } p \rrbracket = \lambda x. \{ \langle C, C' \rangle \mid p \in PB_x^{C'} \} \quad (\text{Davis, 2011})$$

A forced sentence like (4) is of type $\langle e, \langle c, \langle c, t \rangle \rangle \rangle$, a function from an individual to CCP function. Following Davis (2011), I will use the variable S (for *forced Sentence*) to refer to objects of this type. The catch in (4) is that this forced declarative sentence does not specify *which* discourse participant’s PB gets updated. An intonational morpheme provides this information: a

¹ And when the aggression is sincere, you may get an exaggeratedly masculine speech style, such as with most of Davis (2011)’s examples, which are taken from a manga/anime series.

² As in the “straight man” (*tsukkomi*) vs. the “comical man” (*boke*) in a comedy duo

falling contour (\downarrow) specifies this discourse participant as the *speaker*, and a rising contour (\uparrow) says that it's the *addressee*. Below is an example with falling contour:

$$(5) \quad \llbracket \text{DECL } p \downarrow \rrbracket = \{ \langle C, C' \rangle \mid p \in PB_{\text{SPKRC}}^{C'} \}$$

$$(6) \quad \llbracket \downarrow \rrbracket = \lambda S_{\langle e, \langle c, \langle c, t \rangle \rangle \rangle} . S(\text{SPKRC}) \quad (\text{if } S = S_{\text{decl}})$$

For interrogatives, the CCP can be thought of in terms of updates to discourse participants' *Public Question* sets (*PQ*) (Davis, 2011), not public belief sets. Taking insight from Roberts (1996)'s notion of *Question Under Discussion* (QUD), this dynamic semantics approach to questions envisions discourse participants having "stacks" (a totally ordered set) of questions under consideration in the discourse. This can be written as $PQ_x^C[0]$ (Davis, 2011), where x is some discourse participant and the zero in $[]$ representing the 0th (top most) question in the stack, or the one under deliberation in C . This is the *immediate public question* for x in C .

Compositionally, this means that if a question Q (i.e., a set of possible answers (Hamblin, 1973)) merges with an interrogative force head, it returns an $\langle e, \langle c, \langle c, t \rangle \rangle \rangle$ function:

$$(7) \quad \llbracket \text{INTER } Q \rrbracket = \lambda x . \{ \langle C, C' \rangle \mid PQ_x^C[0] = Q \} \quad (\text{Davis, 2011})$$

Once again, this forced sentence (question) is underspecified at this point as to whose question stack is being updated by virtue of Q being asked. *Rising* contour may resolve this to the speaker (exemplified below):

$$(8) \quad \llbracket \uparrow \rrbracket = \lambda S_{\langle e, \langle c, \langle c, t \rangle \rangle \rangle} . S(\text{SPKRC}) \quad (\text{if } S = S_{\text{inter}})$$

$$(9) \quad \llbracket \text{INTER } Q \uparrow \rrbracket = \{ \langle C, C' \rangle \mid PQ_{\text{SPKRC}}^{C'}[0] = Q \}$$

One modification that I will make to the account above is the inclusion of the intuition that questions aren't just asked by some discourse participant — they are asked *to* some other discourse participant as well. To capture this notion, I will make interrogatives of type $\langle e, \langle e, \langle c, \langle c, t \rangle \rangle \rangle \rangle$, and following suit, \uparrow a contributor of two arguments:

$$(10) \quad \llbracket \text{INTER } Q \rrbracket = \lambda x \lambda y . \{ \langle C, C' \rangle \mid PQ_{x \curvearrowright y}^{C'}[0] = Q \}$$

$$(11) \quad \llbracket \uparrow \rrbracket = \lambda S_{\langle e, \langle e, \langle c, \langle c, t \rangle \rangle \rangle \rangle} . S(\text{SPKRC})(\text{ADDR}_C) \quad (\text{if } S = S_{\text{inter}})$$

$$(12) \quad \llbracket \text{INTER } Q \uparrow \rrbracket = \{ \langle C, C' \rangle \mid PQ_{\text{SPKRC} \curvearrowright \text{ADDR}_C}^{C'}[0] = Q \}$$

$PQ_{x \curvearrowright y}^{C'}[0]$ can be read as "the immediate public question for x in C' , posed to y ." (12) says that Q is the immediate public question that the speaker posed to the addressee, which is a natural interpretation of a default rising interrogative. One benefit of introducing the recipient of the question as an argument is the compatibility of such approach with the intuition that not all questions are directed at everyone in discourse. We can think of discourse as something that keeps track of not just who is asking what, but who is answering what as well. A more immediate benefit of this approach is that this allows for *self-posed* questions as well, which will be crucial in accounting for the behavior of *-ka-yo*. But before proceeding to the analysis, I will briefly outline Davis (2011)'s account of *-ka-yo*.

4 Davis (2011): -ka-yo

To my knowledge, Davis (2011) is the only compositional account of *-ka-yo* prior to this work. Building on Davis (2009), his account of *-ka-yo* is that it has the CCP of coercing the addressee to agree with the speaker. Below are his examples:

- (13) sonna mono taberu -ka -yo
 such thing eat KA YO
 ‘Is he going to eat something like that? (No, he isn’t)’
 ≈ ‘What the hell! He isn’t going to eat that!’
- (14) sonna mono taberu -no -ka -yo
 such thing eat EVID KA YO
 ‘Is he going to eat something like that? (Yes, he is)’
 ≈ ‘Holy shit! He’s going to eat that!’

His observation is that (13) and (14) form a minimal pair: *p-ka-yo* vs. *p-no-ka-yo*, the latter with an evidential marker, the former without. The difference in interpretation is that the *-no*-less variant has a speaker bias for $\neg p$, but that the *-no*-ful variant has a speaker bias for *p*. Based on this, he proposes that what (a *-no*-less) *p-ka-yo* does is that it gets the addressee to agree with the speaker that $\neg p$. He accomplishes this compositionally by combining the work of *-ka* and *-yo*. The following subsections will briefly outline CCP semantics involving the two particles to set up how this works.

4.1 -Ka and INTER: Interrogative Marker

The job of the particle *-ka* is to take a proposition and turn it into a question (a polar question for our purposes). (15) is a *-yo*-less version of (2) to show the compositionality of the question counterpart.

- | | | |
|------|---|--|
| (15) | a. sokomade okoru
that.far get.angry
‘(you) are that angry’ | b. sokomade okoru -ka?
that.far get.angry KA
‘Are (you) that angry?’ |
|------|---|--|

Questions denote sets of propositions (Hamblin, 1973). The issue for polar questions like (15b) is the following: how many, and exactly which, propositions are in the set? There are at least two possibilities:

- (16) a. $\llbracket p \text{ -ka} \rrbracket = \{p, \neg p\}$
 b. $\llbracket p \text{ -ka} \rrbracket = \{p\}$

(16a) presents an option where a yes/no interrogative is represented as a set of both the positive answer and the negative answer. Contrastingly, the other option in (16b) is a singleton set: the polar question encodes just the positive answer, which is the proposition overtly present in the question. I will follow Davis (2011) in arguing for the singleton set characterization of polar questions.

Under Davis (2011)’s account, the force head INTER must combine with this question to say that this is the immediate public question of some discourse participant, so we get the following:

$$(17) \llbracket p \text{ -ka INTER} \rrbracket = \lambda x. \{ \langle C, C' \rangle \mid PQ_x^{C'}[0] = \{p\} \}$$

Before a discourse participant is fed into this function to saturate the individual argument, Davis rhetoricalizes this interrogative with a silent operator, RHET. The motivation for this is that *p-ka-yo* expressions are not actual information-seeking questions, despite the presence of the question particle (as seen earlier). By *rhetorical*, he means that the answer to the question is available in the updated context. Below is his denotation for such operator:

$$(18) \llbracket \text{RHET} \rrbracket = \lambda S \lambda x. \left\{ \langle C, C' \rangle \mid \begin{array}{l} \langle C, C' \rangle \in S(x) \wedge \forall q \in PQ_x^{C'}[0] : \\ q \in PB_x^{C'} \vee \neg q \in PB_x^{C'} \end{array} \right\}$$

RHET modifies any forced sentence *S* and says the following: Require that the immediate question (of some discourse participant) be settled by the public belief of that discourse participant in all output contexts of the resulting CCP. Simply put, it says “when the question gets asked, some discourse participant will know the answer already.” Now we must determine whose *PB* and *PQ* we are dealing with — this is -yo’s job.

4.2 -Yo and DECL

Recall that declarative sentences — DECL *p* — is underspecified as to *whose PB* is being updated. As seen already, intonational morphemes can supply this information, e.g., a falling intonation ↓ associates the *PB* with the speaker. -yo can also supply this information (Davis, 2011). Davis’s proposal is that -yo associates any *PB* or *PQ* with both the speaker *and* the addressee. Below are his examples that underlie this intuition.

- | | |
|--|--|
| <p>(19) a. eiga-wa hachi-ji kara -da
 movie-TOP 8-o’clock at be
 ‘The movie starts at 8 o’clock’</p> | <p>b. eiga-wa hachi-ji kara -da -yo
 movie-TOP 8-o’clock at be YO
 ‘(For your information), the movie starts at 8 o’clock’</p> |
|--|--|

Both (19a) and (19b) mean ‘the movie starts at 8 o’clock’ at a basic level. The difference in the utterance with -yo is *informativity* — the speaker is expressing in (19b) that the fact that the movie starts at 8 o’clock is new information for the addressee. This is roughly translatable as “FYI (for your information)” or “in case you didn’t know” in English. It is clear from this interpretation that *p* is being added to the *addressee*’s information state when *p-yo* is uttered. Relating back to CCPs, this is why Davis argues that -yo updates the *PB* of not just the speaker, but the addressee too. One way to formalize this is the following:

$$(20) \llbracket \text{yo} \rrbracket = \lambda S.S(DP_C)$$

(Where *DP* = discourse participants)

Importantly, the nature of this informative particle changes depending on the intonational contour associated with it. The context for rising (↑) -yo and falling (↓) -yo are differentiated below (adapted from Davis (2011)):

- (21) a. [Context: You and your friend are going to see a movie. He wants to eat before going, but doesn't realize that it's already 7:20pm. The movie starts at 8:00pm. You say:]
 eiga-wa hachi-ji kara -da -yo↑
 movie-TOP 8-o'clock at be YO
 '(For your information) the movie starts at 8 o'clock'
- b. [Context: Your friend asks, "The movie starts at 9pm, right?" It actually starts at 8:00pm. You tell him:]
 eiga-wa hachi-ji kara -da -yo↓
 movie-TOP 8-o'clock at be YO
 '(Let me correct you), the movie starts at 8 o'clock'

-yo↑ in (21a) is the more neutral variant, whose meaning is something closer to 'here is some new information for you.' In addition to the informative flair, there is an implication that the speaker wants for the addressee to do something with this newly acquired information of his — in this example, the suggested action is likely "let's eat later, not now". This is what Davis calls the "Guide to Action" use of rising -yo. Since -ka-yo is unacceptable with the rising intonation, the nature of this guide to action use will not be explored in this paper (See Davis (2011) for an analysis, and Oshima (2011) for a counteranalysis).

-yo↓ in (21b) is less neutral. It has a distinct *corrective* nature to it; that is, the speaker is explicitly correcting some wrong belief that the addressee previously held. Davis calls this the "Corrective" use of falling -yo (see Oshima (2011) for another angle of this analysis). He formalizes this using context *downdating*:

$$(22) \quad [\downarrow_{yo}] = \lambda L. \{ \langle C, C' \rangle \in L \mid \exists x \in DP_C, \exists q : q \in PB_x^C \wedge q \notin PB_x^{C'} \} \quad (\text{Davis, 2011})$$

I use L (for "Locution") as a variable representing objects of type $\langle c, \langle c, t \rangle \rangle$. $[\downarrow]$ is a locution modifier that poses a restriction on -yo's CCP: It adds a requirement that there be another proposition q that is a public belief of some discourse participant y in the input context C , but is eliminated from y 's public beliefs in the updated context C' . This y is pragmatically resolved to be the addressee (see Davis (2011) for the motivation for this move). In other words, the falling intonation tells the addressee to revise some proposition q that is incompatible with p , the uttered proposition.

As Davis observes, the -yo in -ka-yo is (obligatorily) a falling one, meaning that it is corrective. I agree with this intuition. So, piecing together everything in his proposal so far, p -ka-yo produces this overall effect in its CCP; let's say p = "he would eat something like that":

1. Speaker has a default bias for *he would not eat something like that*, the negative version of the proposition explicitly in the question (he calls this the Question Bias Principle)
2. *Would he eat something like that* is the immediate public question of both the speaker and the addressee in the output context
3. This question is settled by a proposition that is in the speaker's AND the addressee's public belief set in the output context: *he would not eat something like that*
4. But there is some discourse participant (i.e., the addressee) who must give up a prior commitment to another proposition that is incompatible with *he would not eat something like that*: e.g., *he would eat something like that*

This produces the effect that he desires overall: line 3 requires a rhetorical requirement on the addressee's public beliefs, not just the speaker's, so this can be interpreted as the speaker pressing the addressee into agreement that *he would not eat something like that*, which was his default bias.

I agree with Davis's move in line 4 concerning the corrective nature of *-yo*↓, which means that I will be adopting (22) in my analysis of *-ka-yo*. However, I will be making modifications to some of the other assumptions Davis has been making about *-yo* and *-ka-yo*, which I will outline in the next section.

5 Counterexamples to Davis (2011)

I depart from Davis (2011)'s analysis in two ways:

1. (*-no*-less) *p-ka-yo* does not fundamentally have a speaker bias for $\neg p$; it denotes speaker surprise for *p*
2. *-yo* updates the public belief set of only the *addressee*, not the speaker and the addressee

In this section, I will motivate these two moves via further empirical observations about *-ka-yo* not addressed in Davis (2011).

5.1 *p-ka-yo* Does Not Have a Negative Speaker Bias (kinda)

Recall that Davis (2011)'s proposal revolves around the intuition that the presence or absence of *-no* (evidential marker) makes a difference in the interpretation of *-ka-yo* expressions: *p-ka-yo* carries a speaker bias for $\neg p$, but *p-no-ka-yo* does not. The relevant contrast is replicated below:

- (23) sonna mono taberu *-ka -yo*↓
 such thing eat KA YO
 'Is he going to eat something like that? (No, he isn't)'
 ≈ 'What the hell! He isn't going to eat that!'
- (24) sonna mono taberu *-no -ka -yo*↓
 such thing eat EVID KA YO
 'Is he going to eat something like that? (Yes, he is)'
 ≈ 'Holy shit! He's going to eat that!'

I am interested in the bare, *-no*-less variant for the purposes of this paper, so I will leave aside the discussion of what *-no* contributes to the semantics of *-ka-yo*. What does matter to me, however, is whether it is absolutely and always true that there is negative speaker bias in *p-ka-yo*. I argue that this is *not* always the case. Consider the following counterexamples:

- (25) [Context: *You open a bag of chips. Your dog is super excited. He barks, drools, whines.*]
 sonnani hoshii *-ka -yo*↓
 that.much want KA YO
 'Good god, you want it that much?!'
- (26) [Context: *Your boss is scolding you and your colleague. Your colleague sees that the boss's pant zipper is open, and laughs under his breath. You say to him:*]
 kono kuuki *-de warau -ka -yo*↓
 this vibe in laugh KA YO
 'Damn it, you're laughing right now?!'

Clearly, the *p-ka-yo* examples above (and (2) from earlier) do not express speaker bias for $\neg p$. These simply express that the speaker is surprised by *p*, and that he is disturbed by this. In fact, Davis's example in (23) be turned around to not have a negative bias with a particular intonation:

- (27) sonna mono [taberu]_F -ka -yo↓
 such thing eat KA YO
 'Is he going to eat something like that? (No, he isn't)'
 ≈ 'What the hell! He isn't going to eat that!'
- (28) sonna mono taberu -ka -yo↓ (no focus)
 such thing eat KA YO
 'Is he going to eat something like that? (Yes, he is)'
 ≈ 'Holy shit! He's going to eat that!'

In (27)/(23), prosodic focus is present on the predicate. This forces the $\neg p$ -bias interpretation. Without the focus in (28), the negative bias disappears: the speaker is simply surprised about *p*. This holds for the previous examples in (25)-(26) too; with the provided interpretation (no negative bias), there is *no* focus on the verb. But when you add focus on the verb, the negative bias surfaces.

Why focus contributes to negative speaker bias is beyond the scope of this paper, but for the purposes of the present paper, my analysis is intended to capture the semantics of the more prosodically neutral variant of the two as a starting point. As such, I will be proceeding with the assumption that *p-ka-yo* simply expresses speaker surprise.

5.2 -yo Only Updates the Addressee's Public Belief Set

In this brief subsection, I argue that *-yo* only target the addressee's *PB*, which is minimally but crucially different from Davis (2011)'s idea that it targets both the addressee *and* the speaker's *PBs*. My motivation for this move is a simple one: there are cases in which where the speaker's public belief set does not get updated post *-yo* utterance.

- (29) A: kyoo tesuto -da
 today test be
 'the test is tomorrow'
- B: e? ashita desho? 'What? Isn't it tomorrow?'
 what tomorrow CONF
- A: iya kyoo -da -yo↓!
 no today be YO
 '(Let me correct you:) no, it's today!'

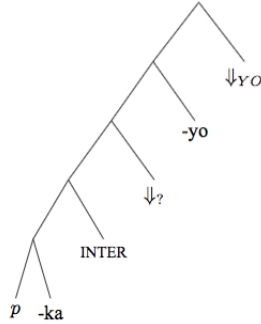
Since discourse participant A has already added 'the test is today' to her *PB* when she uttered it in her first discourse move, she should not be able to utter *the-test-is-today-YO* later in the discourse as it would be redundant to add 'the test is today' again to her *PB*. However, the above exchange is perfectly normal. I take this to mean that *-yo* only updates the *addressee's PB*, and that the speaker's *PB* remains untouched. The slightly modified denotation of *-yo* is below.

- (30) $\llbracket \text{yo} \rrbracket = \lambda S.S(\text{ADDR}_C)$

6 Proposal: *-ka-yo* as a Self-Directed Corrective

My proposal for the compositional break-down of *p-ka-yo* is as follows:

(31)



One ingredient is new: The falling intonational morpheme \Downarrow on *p-ka-INTER*. This addition stems from the observation that like *-yo*, *-ka* has a rising vs. falling variant as well:

- (32) a. sakubun-mondai -ka \Uparrow ? b. sakubun-mondai -ka \Downarrow .
 essay-question KA essay-question KA
 ‘Is this an essay question?’ ‘An essay question, eh.’

The rising *-ka \Uparrow* in (32a) marks a canonical question, i.e., a question that a speaker directs to an addressee, seeking an answer. Of interest is the falling *-ka \Downarrow* (32b). Yokoyama (2013) calls this type of “question” a self-addressed *confirmative*, with its best English approximation being the Canadian English *eh*. Informally, a confirmative is a sort of rhetorical question in which you digest new information. (32b) is something that is uttered when you see that the question in front you on the exam *is* indeed an essay question. Yes, you’re asking yourself if it is an essay question, but at the same time, you already know that it is. In this way, it is not a regular question; it is a sort of an internal monologue used to process the proposition.

We saw that \Downarrow can be a location modifier that turns a *-yo* declarative into a corrective. My proposal is that the function of \Downarrow is different depending on what type of illocutionary force it is interacting with. For interrogatives, I propose that it is a reflexivizer that turns an addressee-oriented question into a self-oriented *and* a self-answered one. The formalization is as follows:

$$(33) \quad \llbracket \Downarrow Q \rrbracket = \lambda S \lambda x. \left\{ \begin{array}{l} \langle C, C' \rangle \in S \quad \Bigg| \quad \begin{array}{l} PQ'_{x \cap x}[0] = Q \wedge x = \text{SPKR}_C \wedge \\ \forall q \in PQ'_{x \cap x} : q \in PB'_x \wedge \neg q \notin PB'_x \end{array} \end{array} \right\}$$

At first glance the denotation is a tad clumsy, but what it does is simple. The first and the second conjuncts (first line) say that the immediate public question is self-oriented to some discourse participant, who happens to be the speaker. The rest (second line) captures the notion that the answer is already known; it says that for all propositions in the public question set of the speaker in the output context, the positive proposition is in the public *belief* set of this speaker in the output context, but not the negative proposition. The latter portion is similar to Davis (2011)’s abstract morpheme RHET, but connecting *-ka-yo* to the behavior of falling *-ka \Downarrow* makes for a stronger account of the rhetoricalness, with the added bonus of intonational morphemes consistently acting

as illocution modifiers. To see how this works, let's see the above denotation used in an actual example. Suppose that $p = \text{this is an essay question}$ (example (1)).

$$(34) \quad \begin{array}{ll} \text{a. } \llbracket p \text{ -ka} \rrbracket = \{p\} \\ \text{b. } \llbracket p \text{ -ka INTER} \rrbracket = \lambda x. \{ \langle C, C' \rangle \mid PQ_x^{C'}[0] = \{p\} \} \\ \text{c. } \llbracket p \text{ -ka INTER} \Downarrow_Q \rrbracket = \lambda x. \left\{ \begin{array}{l} \langle C, C' \rangle \mid \begin{array}{l} PQ_x^{C'}[0] = \{p\} \wedge \\ PQ_{x \cap x}^{C'}[0] = \{p\} \wedge x = \text{SPKR}_C \wedge \\ \forall q \in PQ_{x \cap x}^{C'} : q \in PB_x^{C'} \wedge \neg q \notin PB_x^{C'} \end{array} \end{array} \right\} \end{array}$$

At this point, we essentially have the semantics of ‘This is an essay question, eh’: the speaker asked himself if this is an essay question, and he also is committed to the fact that it *is* an essay question. If this was just a confirmative, existential closure would perhaps take place, making this the end of the assembly line. However, the show must go on with *-yo* for our current example:

$$(35) \quad \begin{array}{ll} \text{a. } \llbracket \text{yo} \rrbracket = \lambda S. S(\text{ADDR}_C) \\ \text{b. } \llbracket p \text{ -ka INTER} \Downarrow_Q \text{ -yo} \rrbracket = \left\{ \begin{array}{l} \langle C, C' \rangle \mid \begin{array}{l} PQ_{\text{ADDR}_C}^{C'}[0] = \{p\} \wedge \\ PQ_{\text{ADDR}_C \cap \text{ADDR}_C}^{C'}[0] = \{p\} \wedge \text{ADDR}_C = \text{SPKR}_C \wedge \\ \forall q \in PQ_{\text{ADDR}_C \cap \text{ADDR}_C}^{C'} : q \in PB_{\text{ADDR}_C}^{C'} \wedge \neg q \notin PB_{\text{ADDR}_C}^{C'} \end{array} \end{array} \right\} \end{array}$$

Now we have a reflexive question where the “addressee” is asking himself $p?$, but this “addressee” happens to be the speaker; this is the CCP of a self-posed question. The final touch is the falling intonation on *-yo*:

$$(36) \quad \begin{array}{ll} \text{a. } \llbracket \Downarrow_{\text{yo}} \rrbracket = \lambda L. \{ \langle C, C' \rangle \in L \mid \exists x \in DP_C, \exists r : r \in PB_x^C \wedge r \notin PB_x^{C'} \} \\ \text{b. } \llbracket p \text{ -ka INTER} \Downarrow_Q \text{ -yo} \Downarrow_{\text{yo}} \rrbracket = \left\{ \begin{array}{l} \langle C, C' \rangle \mid \begin{array}{l} PQ_{\text{ADDR}_C}^{C'}[0] = \{p\} \wedge \\ PQ_{\text{ADDR}_C \cap \text{ADDR}_C}^{C'}[0] = \{p\} \wedge \text{ADDR}_C = \text{SPKR}_C \wedge \\ \forall q \in PQ_{\text{ADDR}_C \cap \text{ADDR}_C}^{C'} : q \in PB_{\text{ADDR}_C}^{C'} \wedge \neg q \notin PB_{\text{ADDR}_C}^{C'} \wedge \\ \exists x \in DP_C, \exists r : r \in PB_x^C \wedge r \notin PB_x^{C'} \end{array} \end{array} \right\} \end{array}$$

The final fall adds the bit where the speaker must give up his prior commitment to some proposition r (e.g., ‘this is not an essay question’). He commits himself to q ($=p$, ‘this is an essay question’) instead. In this way, the falling intonation morpheme \Downarrow turns the self-posed question into a self-posed *corrective*.

The present analysis captures the spirit of *p-ka-yo* nicely — what you thought to be true is no longer true, and you instead give into accepting the opposite to be true. That *-ka-yo* encodes surprise follows naturally from this: the speaker is surprised — and possibly annoyed

— that his expectations were violated. The aggression that often accompanies *-ka-yo* is perhaps the manifestation of this reluctant public belief update on the speaker's part. This effect is in some ways a lot like mirative markers, which are morphemes dedicated to encoding speaker surprise (Aikhenvald, 2012, DeLancey, 2001, Rett and Murray, 2013). Rett and Murray (2013) note that in languages that have them, miratives usually make natural compliments, in a surpassing-all-expectations kind of way. That is, surprises can be pleasant. It is not unreasonable then that in some languages, mirative morphemes and their more compositional cousins like *-ka-yo* make natural expressions of annoyance and frustration. Surprises can be equally unpleasant.

7 Discussion and Conclusion

In this paper I have presented a compositional account of the sentence-final particles *-ka-yo* in Japanese, taking inspiration from the dynamic semantics approach of Davis (2011) but departing from the existing analysis in crucial ways. I argued that *p-ka-yo*, at least in its prosodically unmarked form, does not denote the speaker pressuring the addressee to agree with him as proposed by Davis (2011); I proposed instead that *p-ka-yo* encodes a self-posed, self-answered, and self-corrective question.

Some questions and observations remain. Davis (2011) reports that honorific particles are ungrammatical with *-ka-yo*, but they are actually acceptable in certain contexts, especially with the reduced version of *-yo*, *-i*:

- (37) [Context: *You had plans with your friend. He cancels last minute . . . again.*]
 mata -desu -ka -i/?yo
 again HON KA YO
 '(Sigh,) again?'

Interestingly, the aggression is attenuated when *-desu* is present, reduced to the equivalent of a passive-aggressive sigh. I leave the interaction between honorifics and *-ka-yo* for future research.

Davis (2011) also observes (but remains agnostic as to why) that even though *-yo* has a rising variant, *-ka-yo* only allows for a falling *-yo↓*. I agree with this judgment for the fully articulated *-yo*, but there when it is reduced as *-i*, the rising contour is possible:

- | | |
|--|--|
| <p>(38) moo iku -n -ka -i↑?
 already go EVID KA YO
 'Are you going already?'</p> | <p>(39) isshoni iku -ka -i↑?
 together go KA YO
 'Do you want to go together?'</p> |
|--|--|

Unlike falling *-ka-yo↓*, these are true questions. It is hard to articulate how (38) and (39) differ from their *-i/-yo*-less variants, except that it is stereotypical of the speech of older speakers³. What semantic effects rising *-yo↑* has, I will also leave for future research.

A final point, possibly of sociolinguistic interest, is the emergence of an exclamative-like *-ka-yo* among younger Japanese speakers:

³At least, this is my perception.

(40) saikoo -ka -yo↓
 best KA YO
 ‘Fucking awesome!!’

(41) kawai-sugi -ka -yo↓
 cute-too KA YO
 ‘Too fucking cute!!’

The trend is to use extreme or superlative adjectives with *-ka-yo*, which produces the effect of intensifying the proposition in some way. It may be a worthwhile project to see if this is a pragmatic extension of the other *-ka-yo* cases or if this is another genre of *-ka-yo*.

The interaction of sentence-final particles *-ka* and *-yo* highlights the issue of illocutionary force and sentence types in language: what is locution, and to what extent can they be modified? *-ka-yo* in particular offers a novel perspective on speaker tendencies like surprise as a compositional process rather than a direct encoding of a particular force by discourse. With the touch of a particle, declaratives morph into interrogatives, declaratives become informatives, and interrogatives turn back into declaratives. This fluidity challenges us to test the limits and boundaries of illocutionary classes, which alone makes dissecting locution a worthwhile project in sentence meaning.

References

- Aikhenvald, Alexandra Y. 2012. The essence of mirativity. *Linguistic Typology* 16:435–485.
- Davis, Christopher. 2009. Decisions, dynamics and the Japanese particle *yo*. *Journal of Semantics* 26:329–366.
- Davis, Christopher M. 2011. Constraining interpretation: Sentence final particles in Japanese. Doctoral Dissertation, University of Massachusetts, Amherst.
- DeLancey, Scott. 2001. The mirative and evidentiality. *Journal of Pragmatics* 33:369–382.
- Gunlogson, Christine. 2004. *True to form: Rising and falling declaratives as questions in English*. Routledge.
- Hamblin, Charles L. 1973. Questions in Montague English. *Foundations of Language* 41–53.
- McCready, Eric. 2006. On the meaning of Japanese *yo*. In *New frontiers in artificial intelligence*, 141–148. Springer.
- McCready, Eric. 2009. Particles: Dynamics vs. utility. *Japanese/Korean Linguistics* 16:466–480.
- McCready, Eric Scott. 2005. The dynamics of particles. Doctoral Dissertation, University of Texas at Austin.
- Oshima, David Y. 2011. The Japanese particle *yo* in declaratives: relevance, priority, and blaming. In *New frontiers in artificial intelligence*, 40–53. Springer.
- Rett, Jessica, and Sarah Murray. 2013. A semantic account of mirative evidentials. In *Semantics and Linguistic Theory*, 453–472.
- Roberts, Craige. 1996. Information structure in discourse: Towards an integrated formal theory of pragmatics. *Working Papers in Linguistics-Ohio State University Department of Linguistics* 91–136.
- Stalnaker, Robert. 1978. Assertion. *Syntax and Semantics* 9:315–332.
- Yokoyama, Tomohiro. 2013. Re-evaluating the “question” marker *ka* in Japanese.