A NOTE ON LICENSING CONTRASTIVE TOPICS WITH UNIVERSAL QUANTIFIERS*

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1. Introduction

In recent formal semantic studies on Japanese, various proposals have been made to capture the meaning and behaviors of Contrastive Topic marker *-wa* (hereafter "CT-*wa*") in Japanese. As exemplified in (1), CT-*wa* is generally known as a particle that contributes to conveying an 'uncertainty' (or 'ignorance') flavor (Kuno 1973, among many others).

(1) Hanako-wa ki-ta.
Hanako-CT come-Past

'At least Hanako came.'

The approaches to CT-*wa* are broadly divided into semantic analysis (or 'lexicalist' analysis) and pragmatic analysis (or 'non-lexicalist' analysis). Representative semantic analysis includes Hara (2006) who argues that CT-*wa* requires the existence of stronger alternatives and Sawada (2007, 2022) who treats CT-*wa* as a particle that encodes comparative semantics. Both semantic approaches share the view that the implication made by CT-*wa* is triggered by its lexical entry. In a pragmatic view, the heavy lifting is a contribution of pragmatic reasoning. Tomioka (2010) proposes that CT-*wa* is essentially a generator of alternatives of speech-acts, and Oshima (2008, 2021) and Hirayama (2019) treat this kind of *-wa* as a realization of a marker ('contrastive topic' in a sense of Büring (2003)) which affects the discourse structure built up based on Questions under Discussion (QUDs, Roberts 1996) in a certain way.

The initial aim of this paper is to highlight data that may be problematic for most of the existing theories of CT-*wa*, paying special attention to a case in which this particle attaches to a universal quantifier. The key observation is the following, which was first presented by Ido (2021), as far as we know. Note that the data in (2) is modified considerably from her original data.

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(2) [A concierge (= 'B') and a guest (= 'A') are talking at a hotel check-in counter.]
A: Kono foomu-no doko-no kinyuu-ga hitsuyoo-desu ka?
this form-Gen which-Gen fill.in-Nom necessary-Cop Q

'Which part of the form should I fill out?'

B: Zenbu-wa kinyuu huyoo-desu. Onamae-dake-de ii-desu.
all-CT fill.in unnecessary-Cop name-only-Cop okay-Cop

'You do not need to fill out the entire form. Only your name is required.'

Intriguingly, as will be discussed in detail in the next section, CT-*wa* with a universal quantifier (i.e., *zenbu-wa* 'all-CT') is licensed without a clause-mate negation (typically *nai* 'not' in Japanese). As seen below, when CT-*wa* appears with a universal quantifier, a lack of negation leads to oddness (Hara 2006).

(3) a. #Zen'in-wa ki-ta.
everyone-CT come-Past

'[lit.] Everyone-WA came.'

b. Zen'in-wa ko-nakat-ta.
everyone-CT come-Neg-Past

'[lit.] Everyone-WA didn't come. (It is not the case that all the people came.)'

To the best of our knowledge, no studies have attempted to explain this sort of fact. The purpose of this paper is to take some representative approaches of CT-*wa* listed above and examine whether they predict the empirically desirable outcome. Demonstrating the limitations of the existing accounts, we will show that a view that the meaning of CT-*wa* is almost identical to English *at least* captures the distribution of CT-*wa* with universal quantifiers comprehensively. As a consequence, we will clarify what part of the meaning is based on semantics and what part is based on pragmatics, which would provide a piece of the answer to the long-lasting question of what exactly is the meaning that CT-*wa* encodes.

The paper is structured as follows. Section 2 introduces a set of facts on the licensing condition of CT-*wa* with universal quantifiers. Section 3 overviews three major theories of CT-*wa* and then examines how they predict the data introduced in Section 2. Section 4 provides a new but preliminary analysis. Section 5 concludes.

2. Basic Facts: '∀ + CT' with/without Negation

As observed by Hara (2006), a sentence with universal quantifier marked by CT-*wa* becomes unacceptable when it is uttered without a clause-mate negation ((3), repeated in (4) below). This does not hold in cases of non-universal expressions such as numerals, as exemplified in (5).

(4) a. #Zen'in-wa ki-ta.
everyone-CT come-Past

'[lit.] Everyone-WA came.'

b. Zen'in-wa ko-nakat-ta.
everyone-CT come-Neg-Past

'[lit.] Everyone-WA didn't come. (It is not the case that all the people came.)'

(5) a. 5-nin-wa ki-ta.
five-Cl-CT come-Past

'At least five people came.'

b. 5-nin-wa ko-nakat-ta.
five-Cl-CT come-Neg-Past

'[lit.] Five people-WA didn't come. (It is not the case that five people came.)'

Ido (2021), however, presents the fact that appears to be an exception: there is a case where sentential negation is not required when CT-*wa* marks a universal quantifier. Consider (2), repeated in (6), and additionally (7) for example. As the English translations in the examples indicate, each of the sentences in (6) and (7) has a ¬∀-reading. A notable feature of this sort of example is that a predicate contains a negative prefix: *hu-* in *huyoo* 'unnecessary' (: (6)), *mi-* in *mikaimei* 'unexplored'(: (7a)), and *hi-* in *hikookai* 'private' (: (7b)).

(6) [A concierge and a guest are talking at a hotel check-in counter.]
A: Kono foomu-no doko-no kinyuu-ga hitsuyoo-desu ka?
this form-Gen which-Gen fill.in-Nom necessary-Cop Q

'Which part of the form should I fill out?'
B: Zenbu-wa kinyuu huyoo-desu. Onamae-dake-de ii-desu.
all-CT fill.in unnecessary-Cop name-only-Cop okay-Cop

'You don't need to fill out the entire form. Only your name is required.'

(7) a. Kono iseki-no zenbou-wa mikaimei-da.
this site-Gen full.extent-CT unexplored-Cop

'It is not the case that the full extent of this archaeological site has been explored.'

b. Kono bunsho-no zenbun-wa hikookai-da.
this text-Gen full.text-CT private-Cop

'It is not the case that the full text of this document is public.'
(slightly modified from (22a,b) in Ido (2021: 126))

As in canonical cases like (4), what puzzles us is that the positive counterpart does not license

CT-*wa* with the universal quantifier. Take (6) for instance. If we replace the predicate *huyoo* 'unnecessary' with the positive *hitsuyoo* 'necessary' as shown in (8) below, the sentence becomes unacceptable.

(8) #Zenbu-wa kinyuu-ga hitsuyoo-desu.
all-CT fill.in-Nom necessary-Cop
'[lit.] The entire form-WA needs to be filled out.'

Although one may suspect that negative morphologies including *hu-*, *mi-*, or *hi-* undertake the role of sentential negation (i.e., scoping over the universal quantifier), this way of analysis will be rejected in later discussions because of an empirical problem.

3. Examining the Current Approaches

In what follows, let us examine how the existing analyses make predictions for the fact that CT-*wa* with a universal quantifier can be licensed in a sentence without clause-mate negation. This paper pays special attention to the three theories: Tomioka (2010), Hara (2006), and Sawada (2007, 2022). We will not address theories based on Büring-style analysis (e.g., Oshima 2008, 2021, Hirayama 2019).

3.1. Tomioka (2010): CT-*wa* Operates on Speech-acts

Let us start with the pragmatic (or 'non-lexicalist') approach to CT-*wa*. Tomioka (2010) proposes that CT-*wa* necessarily generates a set of speech acts (cf. Tomioka 2016). He argues that a focal accent on a CT evokes a non-singleton focus value, and the topic marker *wa* functions as a sort of 'guarantor' of the maximal scope (i.e., the speech-act level) of the focus value. Then, the effect of uncertainty is generated out of a set of alternative speech acts with the help of the typical Gricean reasoning and inferences (Grice 1975). The interpretation of the sentence (4b) is analyzed as follows.

(9) Zen'in-wa ko-nakat-ta. '[lit.] Everyone-WA didn't come.' (= (4b))
a. LF (simplified): **Op** [Assert [$_p$ ¬ [[ALL-*wa*]$_{CT}$ came]]],
where **Op** is an alternative-generating operator and Assert is an assertion operator.
b. A set of alternatives (generated by **Op**):
{ assertion that x did not come | $x \in D_e$ }
= { **Assertion** that ALL did not come, **Assertion** that MOST did not come, **Assertion** that SOME did not come, … }
c. Pragmatic inference:
(i) The speaker made the assertion that ALL did not come.
(ii) There are no other assertions made in the alternative set derived by CT.
(iii) There must be a reason the speaker did not make those assertions.
(iv) The reason would be that the speaker does not know exactly how many came. That is, she at least knows that it is not the case that ALL did not come.

To put it simply, the uncertain implication of sentences with CT-*wa* is induced pragmatically by leaving some speech-act alternatives unuttered.

(10) represents how the positive case (4a) leads to the oddness. Of importance here is that the assertion made by the speaker entails all the other alternatives.

(10) #Zen'in-wa ki-ta. '[lit.] Everyone-WA came.' (= (4a))
  a. LF (simplified): **Op** [Assert [$_p$ [ALL-*wa*]$_{CT}$ came]],
  b. A set of alternatives:
    { **Assertion** that ALL came, **Assertion** that MOST came, **Assertion** that SOME came,...}
  c. Pragmatic inference:
    (i) The speaker made the assertion that ALL came.
    (ii) There are no other assertions made in the alternative set derived by CT.
    (iii) There must be a reason the speaker did not make those assertions.
    (iv) The reason is that the other alternatives are excluded since they are entailed by the original assertion; uttering them violates the maxim of Quantity, deriving a set { **Assertion** that ALL came, ~~**Assertion that MOST came**~~, ~~**Assertion that SOME came, …**~~ }.

The step (iv) in (10c) means that all the alternatives other than the asserted one are excluded. Then, the motivation to use CT-*wa* is lost; in this situation, the speaker can just utter an unmarked counterpart "*Zen'in(-ga) kita*" 'Everyone came,' which is structurally/semantically simpler than the CT-marked form "*Zen'in-wa*$_{CT}$ *kita*" 'Everyone-*wa*$_{CT}$ came,' thereby the former becomes infelicitous. The idea behind this way of analyzing (4a) is that CT-*wa* is a more marked option than an ordinary focus; a sentence with CT should be stronger than one with focus, but when there is no difference, the CT option becomes infelicitous. Note that Tomioka does not assume an independent pragmatic constraint to derive this infelicity, but we can utilize the general principle (11) by Crnič (2011), for example. The occurrence of CT-*wa* in (4a) will violate this principle because of its vacuity.

(11) *Principle of non-vacuity* (Crnič 2011: 110)
  The meaning of a lexical item used in the discourse must affect the meaning of its host sentence (either its truth-conditions or its presuppositions).

Let us turn to see the central data given in (6), where CT-*wa* with universal quantifier is licensed without clause-mate negation. The problem is that this way of treatment ends up predicting that (6) is unacceptable as (4a), contrary to the fact.

(12) Zenbu-wa kinyuu huyoo-da. '[int.] You don't need to fill out the entire form.' (= (6))
  a. LF (simplified): **Op** [Assert [$_p$ [ALL-*wa*]$_{CT}$ *huyoo-da*]],
  b. A set of alternatives:
    { **Assertion** that x is unnecessary | $x \in D_e$ }
    = { **Assertion** that ALL is unnecessary, **Assertion** that MOST are unnecessary, **Assertion** that SOME is unnecessary, … }

c. Pragmatic inference:
   (i) The speaker made the assertion that ALL came.
   (ii) There are no other assertions made in the alternative set derived by CT.
   (iii) There must be a reason the speaker did not make those assertions.
   (iv) The reason is that the other alternatives are entailed by the original assertion; uttering them violates the maxim of Quantity, deriving a set { **Assertion** that ALL is unnecessary, ~~**Assertion that MOST are unnecessary**~~, ~~**Assertion that SOME is unnecessary, …**~~ }.

The inference in (12c) goes in the same way as (10). Since the utterance proposition *p* entails all the other alternatives in (12b), only *p* is a member of the alternative set. Then, the use of CT-*wa* should be vacuous in the sense that the item does not affect the meaning of its host sentence (cf. (11)), hence predicting an unfavorable outcome.

3.2. Hara (2006): CT-*wa* Requires Stronger Alternatives

Let us move on to see semantic (or 'lexicalists') approaches. Modeling after what is known as the 'structured meaning' approach to focus (von Stechow 1990, Krifka 2001), Hara (2006) defines the interpretation of CT-*wa* as follows.

(13) Let *w* be a world variable, *sp* the speaker, F the focus-marked elements, B the background, R restriction, CON a contrastive operator, Dox a set of doxastic worlds, CON(*w*)(*sp*)(B(F))
   a. asserts: B(F)(*w*)
   b. presupposes: $\exists F'[[F' \in R] \,\&\, [B(F') \Rightarrow B(F)] \,\&\, [B(F) \not\Rightarrow B(F')]]$
      (i.e., there exists B(F′) which is stronger than B(F))
   c. implicates: $\exists w' \in \mathrm{Dox}_{sp}(w)$: $\neg B(F')(w')$ (i.e., it is possible that ¬B(F′).)

To put it simply, CT-*wa* requires some alternatives that are semantically stronger than the original assertion, and the satisfaction of this presupposition induces the uncertainty implicature that those stronger alternatives may be false.

Hara's approach captures the basic contrast in (4). (14) below shows that the existence of negation is essential to license CT-*wa* when it co-occurs with a universal quantifier.

(14) Zen'in-wa ko-nakat-ta. '[lit.] Everyone-WA didn't come.' (= (4b))
   a. asserts: $\neg\forall x.[\mathbf{person}(x) \rightarrow \mathbf{came}_w(x)]$
   b. alternatives: $\neg\forall x.[\mathbf{person}(x) \rightarrow \mathbf{came}_w(x)]$, $\neg\exists x[\mathbf{person}(x) \,\&\, \mathbf{came}_w(x)]$
   c. presupposes: There exists B(F′) (= $\neg\exists x[\mathbf{person}(x) \,\&\, \mathbf{came}_w(x)]$) which is stronger than B(F) (= $\neg\forall x[\mathbf{person}(x) \rightarrow \mathbf{came}_w(x)]$).
   d. implicates: It is possible that ¬B(F′) in *w*′ (= $\exists x[\mathbf{person}(x) \,\&\, \mathbf{came}_{w'}(x)]$).

The asserted proposition in (14a) '$\neg\forall x.[\mathbf{person}(x) \rightarrow \mathbf{came}_w(x)]$' has a stronger scalar alternative '$\neg\exists x[\mathbf{person}(x) \,\&\, \mathbf{came}_w(x)]$,' and thus the presupposition is met, (14c). The

asserted proposition is therefore compatible with CT-*wa* and induces an implicature that '*it is possible that someone came*,' (14d).

In Hara's analysis, the absence of negation leads to infelicity as follows.

(15) #Zen'in-wa ki-ta. '[lit.] Everyone-WA came.' (= (4a))
  a. asserts: $\forall x.[\mathbf{person}(x) \rightarrow \mathbf{came}_w(x)]$
  b. alternatives: $\forall x.[\mathbf{person}(x) \rightarrow \mathbf{came}_w(x)]$, $\exists x[\mathbf{person}(x) \,\&\, \mathbf{came}_w(x)]$

In (15), none of the possible scalar alternatives in (15b) (i.e., $\exists x[\mathbf{person}(x) \,\&\, \mathbf{came}_w(x)]$) entails the original assertion (15a), hence causing presupposition failure.

Although this line of approach succeeds in explaining the contrast above, it fails to capture the acceptable data in (6) partially repeated below, where a clause-mate sentential negation is missing.

(16) Zenbu-wa kinyuu huyoo-desu. (= (6))
  all-CT fill.in unnecessary-Cop

  'You don't need to fill out the entire form.'

The same trouble as (15) happens when the meaning of CT-*wa* in (13) applies to (16).

(17) Zenbu-wa kinyuu huyoo-desu. 'You don't need to fill out the entire form' (= (6)/(16))
  a. asserts: $\forall x.[\mathbf{form}(x) \rightarrow \mathbf{unnecessary}(\mathbf{filled\text{-}in}(x))]$
  b. alternatives: $\forall x.[\mathbf{form}(x) \rightarrow \mathbf{unnecessary}(\mathbf{filled\text{-}in}(x))]$,
    $\exists x[\mathbf{form}(x) \,\&\, \mathbf{unnecessary}(\mathbf{filled\text{-}in}(x))]$

CT-*wa* should presuppose that there exists a stronger alternative than the asserted one, but in (17b) all the alternatives are entailed by the original assertion, which leads to presupposition failure. Sentences like (16) are thus predicted to be odd, contrary to the fact that they are not.

Readers might consider NP-internal negative prefixes including *hu-* in (16) to scope over the universal quantifier, thereby generating strong alternatives. That is, assuming that *huyoo* 'unnecessary' is decomposed into *hu-* + *yoo* and *hu-* as a sentential negation scopes over the proposition as (18a), alternatives generated in (16) contain a stronger one as (18c).

(18) a. LF (simplified): CON $[_p$ ***hu***$\neg$ [[ALL]$_F$ necessary]]]
  b. asserts: $\neg\forall x.[\mathbf{form}(x) \rightarrow \mathbf{necessary}(\mathbf{filled\text{-}in}(x))]$
  c. alternatives: $\neg\forall x.[\mathbf{form}(x) \rightarrow \mathbf{necessary}(\mathbf{filled\text{-}in}(x))]$,
    $\neg\exists x[\mathbf{form}(x) \,\&\, \mathbf{necessary}(\mathbf{filled\text{-}in}(x))]$

The situation illustrated above satisfies the presupposition of CT-*wa*; there is an alternative that is stronger than the original one (i.e., '$\neg\exists x[\mathbf{form}(x) \,\&\, \mathbf{necessary}(\mathbf{filled\text{-}in}(x))]$'). However, this line of account is not empirically preferable, because in Japanese the NP-internal negation cannot scope over the universal quantifier in the first place (cf. De Clercq

2020). Compare the sentence with the canonical negation (19) and the one with the NP-internal negation (20).

(19) Subete kinyuu-ga hitsuyoo-de-wa nai yo. [∀ > ¬ ; ¬ > ∀]
all fill.in-Nom necessary-Cop-Top Neg Prt

'[lit.] Not all forms need to be filled out.'

(20) Subete kinyuu(-ga) huyoo-da yo. [∀ > ¬ ; ??¬ > ∀]
all fill.in(-Nom) unnecessary-Cop Prt

'[lit.] All forms are unnecessary to be filled out.'

(19) is acceptable in both contexts, for example, in which for each item in the form it is not necessary to fill in (thus it may be submitted on a blank sheet) when checking in at a hotel ('∀ > ¬' reading) and in which only the address and signature part need to be filled in ('¬ > ∀' reading). (20) on the other hand is natural only in the former context, indicating that *hu-* cannot behave as a sentential negation. From this observation, we can see that the alternative way illustrated in (18) cannot save Hara's analysis.

3.3. Sawada (2007, 2022): CT-*wa* Encodes Scalar Comparatives

Sawada's (2007, 2022) approach departs from both Tomioka (2010) and Hara (2006) in that his treatment of CT-*wa* assumes likelihood-based comparatives among alternatives, arguing that CT-*wa* can be characterized as a mirror image of *even*. The core of his proposal is that CT-*wa* has dual use: when it attaches to a non-scalar element, it has a polarity reversal function, whereas when it attaches to a scale-invoking element, it functions as a scalar particle that encodes comparative semantics as shown in (21). I will focus only on this latter usage for the paper. Although the uncertainty implication by CT-*wa* may not be the primary interest of his study, unlike Tomioka and Hara's approach, his proposal assumes that the meaning is encoded as a part of the lexical semantics (in '$\Diamond\neg q$' below).

(21) Where C is a set of alternatives and $>_{unlikely}$ stands for less likelihood relation,
$[\![wa_{CT}]\!]^w = \lambda p.\, p(w) \,\&\, \exists q \in C.\, [\, q \neq p \wedge \Diamond\neg q] \,\&\, \forall q \in C.\, [\, q \neq p \rightarrow q >_{unlikely} p]$

Briefly, CT-*wa* takes a proposition p and returns it with (i) the uncertainty meaning that there exists an alternative q such that q is not identical to a prejacent p and $\neg q$ is possible, and with (ii) the scalar meaning that p is the least unlikely (i.e., the most likely) among the alternatives.[1]

The illustrations below show how the proposal works for the basic data, starting with CT-*wa* with sentential negation.

[1] Sawada assumes that the scalar and uncertainty meanings conveyed by CT-*wa* are non-at-issue, either presuppositions (Sawada 2007) or conventional implicatures (Sawada 2022).

(22) Zen'in-wa ko-nakat-ta. '[lit.] Everyone-WA didn't come.' (= (4b))
⟦ (4b) ⟧^{w} =
a. $\neg\forall x.[\mathbf{person}(x) \rightarrow \mathbf{came}_w(x)]$ &
b. $\exists q.[\, q \neq [\neg\forall x.\mathbf{person}(x) \rightarrow \mathbf{came}_w(x)] \wedge \Diamond\neg q]$ &
c. $\forall q.[\, q \neq [\neg\forall x.\mathbf{person}(x) \rightarrow \mathbf{came}_w(x)] \;\rightarrow\; q >_{unlikely} [\neg\forall x.\mathbf{person}(x) \rightarrow \mathbf{came}_w(x)]\,]$
where C = { $\neg\forall x.[\mathbf{person}(x) \rightarrow \mathbf{came}_w(x)]$, $\neg\exists x[\mathbf{person}(x)$ & $\mathbf{came}_w(x)$ }

(22) informally says (a) '*it is not the case that everyone came*' (= **assertion**), (b) '*it is possible that someone came*' (= **uncertainty**), and (c) '*not everyone's coming is more likely than no one's coming*' (= **scalarity**). Without negation, the sentence becomes infelicitous because of the derived meanings below.

(23) #Zen'in-wa ki-ta. '[lit.] Everyone-WA came.' (= (4a))
⟦ (4a) ⟧^{w} =
a. $\forall x.[\mathbf{person}(x) \rightarrow \mathbf{came}_w(x)]$ &
b. $\exists q.[\, q \neq [\forall x.\mathbf{person}(x) \rightarrow \mathbf{came}_w(x)] \wedge \Diamond\neg q]$ &
c. $\forall q.[\, q \neq [\forall x.\mathbf{person}(x) \rightarrow \mathbf{came}_w(x)] \;\rightarrow\; q >_{unlikely} [\forall x.\mathbf{person}(x) \rightarrow \mathbf{came}_w(x)]\,]$
where C = { $\forall x.[\mathbf{person}(x) \rightarrow \mathbf{came}_w(x)]$, $\exists x[\mathbf{person}(x)$ & $\mathbf{came}_w(x)$ }

(23) means (a) '*it is the case that everyone came*,' (b) '*it is possible that no one came*,' and (c) '*everyone's coming is more likely than someone's coming*.' The uncertainty meaning in (23b) evidently contradicts the original assertion in (23a). Moreover, (23c) may go against the normal course of events, since based on the entailment relation of the quantity/numerical scale, the greater the number of people who come, generally the less likely it is.

Let us apply Sawada's account to the case with NP-internal negation. (24) below represents the derived interpretation of (6)/(16).

(24) Zenbu-wa kinyuu huyoo-desu. 'You don't need to fill out the entire form' (= (6)/(16))
⟦ (6)/(16) ⟧ =
a. $\forall x.[\mathbf{form}(x) \rightarrow \mathbf{unnecessary}(\mathbf{filled\text{-}in}(x))]$ &
b. $\exists q.[\, q \neq [\forall x.\, \mathbf{form}(x) \rightarrow \mathbf{unnecessary}(\mathbf{filled\text{-}in}(x))] \wedge \Diamond\neg q]$ &
c. $\forall q.[q \neq [\forall x.\mathbf{form}(x) \rightarrow \mathbf{unnecessary}(\mathbf{filled\text{-}in}(x))]$
$\rightarrow q >_{unlikely} [\forall x.\mathbf{form}(x) \rightarrow \mathbf{unnecessary}(\mathbf{filled\text{-}in}(x))]]$,
where C = { $\forall x.[\, \mathbf{form}(x) \rightarrow \mathbf{unnecessary}(\mathbf{filled\text{-}in}(x))]$,
$\exists x[\mathbf{form}(x)$ & $\mathbf{unnecessary}(\mathbf{filled\text{-}in}(x))]$ }

Again, this is self-contradictory. (24) asserts that *all the items in the form are unnecessary to be filled out* (: (24a)), but at the same time says that *it is possible that there is no item that is unnecessary to be filled in* (by $\Diamond\neg q$ in (24b) i.e. '$\Diamond\neg\exists x[\mathbf{form}(x)$ & $\mathbf{unnecessary}(\mathbf{filled\text{-}in}(x))]$'). The scalarity (24c) is also weird: it states that '*filling out all items in the form are unnecessary' is more likely than 'filling out some items in the form are unnecessary*,' but that does not always have to be the case. Suppose that a hotel normally does not require guests to fill out *some* of the items on the form (e.g., occupation or company name) when they check-

in, but today is a busy season and there are many guests, so the hotel does not require guests to fill out *all* of the items on the form (including e.g., name or contact information) to shorten the check-in time. That is, in this context, *'filling out some items in the form are unnecessary*' is more likely than '*filling out all items in the form are unnecessary*.' In such a context, according to (24c), the sentence (6)/(16) should be bad, contrary to the intuition that it is still acceptable.

3.4. Summary

So far, it has become clear that all three main approaches discussed are problematic when trying to explain the fact that a universal quantifier with CT-*wa* is licensed by an NP-internal clause-mate negation, which has been overlooked in the literature. Tomioka's (2010) approach makes the use of CT-*wa* semantically/pragmatically vacuous, Hara's (2006) approach suffers from presupposition failure, and Sawada's (2007, 2022) approach results in self-contradiction.

4. Yet Another Look: CT-*wa* as Superlatives

Before concluding the paper, I would like to suggest a new direction that we should take to give an account of the elusive licensing condition of CT-*wa*. For the study, a more detailed and comprehensive analysis will be left for the future.

I propose that the semantic core of the meaning of CT-*wa* is a comparison among alternatives, as claimed by Sawada (2007, 2022), but I depart from his analysis in two respects. First, the speaker uncertainty should not be lexicalized in the semantics. Instead, I claim that the uncertainty effect arises at the level of pragmatics, triggered by the semantics. Specifically, the semantic contribution of CT-*wa* provides a partial answer to the question in a discourse where the precise answer is requested.[2] Second, the associated scale is not fixed to 'unlikelihood' but should be more flexible with respect to a given context.

I argue that the meaning of CT-*wa* is almost identical to the one of English *at least* in Chen's (2018) sense.[3] Assuming Bobalijk's (2012) hypothesis that the representation of the superlative properly contains that of the comparative (known as *Containment Hypothesis*, Bobalijk (2012:4)), Chen (2018) decomposes *at least* into the preposition *at*, the comparative *-less* and the superlative morpheme *-est*, and claims that *at least* has the semantic

[2] The account is in line with Oshima (2008, 2021) and Hirayama (2019) in that a sentences with *wa* contributes to resolve a given QUD-tree partially.

[3] Readers familiar with Japanese may have an intuition that the closest Japanese expression corresponding to *at least* is *sukunakutomo*. However, as pointed out by Mizutani and Ihara (2022), these two expressions behave differently in various respects, making it difficult to analyze them in the same way.

representation in (25), which derives the truth conditions of (26a) as (26c):[4]

(25) $[\![$ *at least* $]\!]^{w,c} = \lambda\alpha.\exists\gamma \in C\,[\gamma(w) \wedge \forall\beta \in C\,[\beta \neq \alpha \rightarrow \mu_c(\alpha) < \mu_c(\beta)]]$
where α, β, γ are propositions of type st, μ_c is a covert measure function and C is a set of alternatives associated with focus.

(26) a. John at least won a silver medal.
implicates: The speaker does not know whether John won a silver or a gold medal.
b. LF: *at least* [John won a [silver]$_F$ medal].
c. $[\![$ (26a) $]\!]^{w,c} = \exists\gamma \in C\,[\gamma(w) \wedge \underline{\forall\beta \in C\,[\beta \neq [\![\text{John won a silver medal}]\!] \rightarrow \mu_c([\![\text{John won a silver medal}]\!]) < \mu_c(\beta)]}\,]$
d. C = { ~~John won a bronze medal,~~ John won a silver medal, John won a gold medal }

The superlative part (underlined in (26c)) demands that the prejacent α is the lowest among its alternatives; this amounts to excluding the lower one (i.e., 'John won a bronze medal') from the domain C (as illustrated in (26d)). The truth condition in (26c) asserts that there is one proposition γ in the domain C consisting of the prejacent 'John won a silver medal' and the relevant higher alternatives such that γ is true. To put it simply, (26c) is true if and only if John won a silver *or* gold medal. Since this leaves open whether the relevant alternatives in C are true in a given discourse, the speaker does not provide the most informative unique answer to the question under discussion (QUD, Roberts 1996), thereby the uncertainty implication arises.

I argue that Chen's (2018) analysis of *at least* can be directly applied to CT-*wa.* Assuming that CT-*wa* has a meaning identical to *at least* as in (27), the truth condition for the data in (6)/(16), which the existing analysis had problems capturing, can be represented as (28c).[5]

(27) $[\![\ wa_{\text{CT}}\ ]\!]^{w,c} = \lambda\alpha.\exists\gamma \in C\,[\gamma(w) \wedge \forall\beta \in C\,[\beta \neq \alpha \rightarrow \mu_c(\alpha) < \mu_c(\beta)]]$

(28) a. Zenbu-wa kinyuu huyoo-desu. 'You do not need to fill out the entire form' (= (6))
b. LF: *wa* [ALL$_F$ unnecessary to fill out]
c. $[\![$ (6) $]\!]^{w,c} = \exists\gamma \in C\,[\gamma(w) \wedge \forall\beta \in C\,[\beta \neq [\![$ it is unnecessary to fill out ALL $]\!] \rightarrow \mu_c([\![$ it is unnecessary to fill out ALL $]\!]) < \mu_c(\beta)]\,]$
d. C = {$\forall x.[$ **form**(x) → **unnecessary**(**filled-in**(x))], $\exists x[$**form**(x) & **unnecessary**(**filled-in**(x))]}

The measure function μ_c above is construed as 'the amount/number of items that need to be

[4] Chen (2018) assumes two different LFs for 'epistemic' and 'concessive' readings of *at least*, but we set aside this difference and only focus on the former reading in which the truth of a prejacent is not entailed.

[5] The truth condition (27) ignores the compositionality of *wa* for simplicity. To be precise, *wa* does not take a proposition directly, but it has to take an F-marked element for the first argument at least. Refer to Hirayama (2019, Ch.3) for the relevant discussion.

filled out.' The superlative requirement in (28c) then satisfies; the prejacent that *all* items are unnecessary to be filled out (i.e., there are *no* items that need to be filled out) is less than its relevant alternative that *some* items are unnecessary to be filled out (i.e., there may be *some* items that need to be filled out).

The initial part of the truth condition in (28c) moreover requires that there is at least one proposition γ in the domain such that γ is true. Importantly, the speaker in this context knows that the prejacent (i.e., 'all items are unnecessary to be filled out') is *not* true; (6)/(16) is felicitous only in the context where *not all but some* items in the form are necessary to be filled out. This excludes the prejacent from the possible alternatives that could be true. The only γ that can satisfy the truth condition is thereby '$\exists x$[**form**(x) & **unnecessary**(**filled-in**(x))].' The truth of this proposition (i.e., 'some items are *unnecessary* to be filled out') implicates that 'some items are *necessary* to be filled out,' which corresponds to the desired interpretation for (6)/(16).

Notice that the semantic representation in (28c) does not specifically state how many items on the form are (un)necessary to be filled out, i.e., whether it is '*some items in the form are necessary to be filled out*,' '*most items in the form are necessary to be filled out*,' or '*few items in the form are necessary to be filled out*,' etc.[6] In other words, the speaker does not provide the most informative answer to the given QUD (e.g., "How much/which part should the addressee fill out?"), hence conveying the uncertainty implication.

In what follows I illustrate that the current proposal also works for the basic contrast presented in (4). The truth conditions of (4a) and (4b) are represented as (29) and (30), respectively.

(29) a. #Zen'in-wa ki-ta. '[lit.] Everyone-WA came.' (= (4a))
b. LF: *wa* [ALL$_F$ came]
c. $[\![$ (4a) $]\!]^{w,c} = \exists\gamma \in C\,[\gamma(w) \wedge \forall\beta \in C\,[\beta \neq [\![\text{ALL came}]\!] \rightarrow \mu_c([\![\text{ALL came}]\!]) < \mu_c(\beta)]\,]$
d. C = { $\forall x.$[**person**(x) → **came**$_w$(x)], $\exists x$[**person**(x) & **came**$_w$(x)] }

(30) a. Zen'in-wa ko-nakat-ta. '[lit.] Everyone-WA didn't come.' (= (4b))
b. LF: *wa* [¬ [ALL$_F$ came]]
c. $[\![$ (4b) $]\!]^{w,c} = \exists\gamma \in C\,[\gamma(w) \wedge \forall\beta \in C\,[\beta \neq [\![\text{ALL did not come}]\!] \rightarrow \mu_c([\![\text{ALL did not come}]\!]) < \mu_c(\beta)]\,]$
d. C = { $\neg\forall x.$[**person**(x) → **came**$_w$(x)], $\neg\exists x$[**person**(x) & **came**$_w$(x)] }

(29) indicates that the infelicity of (4a) arises because of the semantic vacuity of CT-*wa*. Informally put, the superlative meaning causes vacuity since no higher alternatives exist in the domain. That is, the associated content (i.e., everyone) is the upper bound in the first

[6] This becomes more clear when one considers that the domain in (28d) is precisely a richer set of members, C = { ALL is unnecessary to be filled out, MOST are unnecessary to be filled out, SOME is unnecessary to be filled out, FEW is unnecessary to be filled out, …}, although it is omitted above for the sake of simplicity.

place, given μ_c stands for 'number of people who came.'[7] Recall that the superlative part of the truth condition (i.e., '$\forall\beta \in C\ [\beta \neq \alpha \rightarrow \mu_c(\alpha) < \mu_c(\beta)]$') requires all the alternatives non-identical to the prejacent to be ranked above the prejacent. When no higher alternatives exist, the contribution of the superlative meaning becomes vacuous. Given the general constraint against vacuous quantification in natural language (e.g., (11)), the use of CT-*wa* in (4a) becomes infelicitous.

In (30), the measure function μ_c is assumed to be 'the number of people who did not come.' Then, the superlative requirement that all the alternatives that are non-identical to the prejacent ranked above the alternatives is fulfilled in a non-trivial way (i.e., $\neg\forall x.[\mathbf{person}(x) \rightarrow \mathbf{came}_w(x)] <_\mu \neg\exists x[\mathbf{person}(x)\ \&\ \mathbf{came}_w(x)]$). Given the initial part of the truth condition (i.e., '$\exists\gamma \in C$: $\gamma(w)$…'), the utterance also conveys that there is one element γ in C such that γ is true in w. Since the utterance conveys either 'it is not the case that everyone came' or 'no one came,' it fails to provide a unique answer, which leads to the uncertainty effect that the speaker does not know exactly how many did not come.

The proposal has the following theoretical aspects when compared to the previous accounts introduced in Section 3. First, as Tomioka (2010) does, the infelicity of 'CT-*wa* + universal quantifiers' without sentential negation (e.g., (4a)) is explained by the semantic vacuity. Second, as in Hara's (2006) analysis, the uncertainty effect of CT-*wa* happens at the pragmatic level, triggered by the semantics of itself. Furthermore, as mentioned earlier, similar to Sawada's (2007, 2022) analysis, CT-*wa* in our proposal denotes comparative semantics among alternatives. However, while he assumes the associated scale is fixed to an unlikelihood scale like *even*, the present analysis assumes that the scale is context-sensitive. Finally, whereas CT-*wa* in all the previous accounts has been considered to entail a prejacent, in our analysis CT-*wa* does not necessarily do so: the lexical entry in (27) involves a somewhat weaker truth condition than the previous ones in that it only requires any one of the relevant alternatives.

5. Concluding Remarks

We have investigated the meaning contribution of CT-*wa* to sentences with universal quantifiers. We have shown that none of the current theories can explain the basic facts, viz. that CT-*wa* with a universal quantifier can be licensed without a clause-mate negation if the predicate contains certain NP-internal negation. We have proposed a new lexical entry for CT-*wa* that accounts for the observed facts in a descriptively adequate way.

Future research must show that the proposal produces a favorable outcome for more extensive facts on CT-*wa* that have not been examined in this paper. Further empirical distribution of Japanese NP-internal negations also needs to be clarified, especially in terms

[7] The infelicity here is called the *top-of-the-scale effect* (TSE) generally observed in superlative expressions cross-linguistically (Chen 2018).

of their scopal properties (cf. De Clercq 2020).

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