A Scope Theory of Contrastive Topics

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Abstract

Contrastive Topics (CTs) in Japanese mimic foci more than topics in many ways. Their prosodic properties are essentially the same as the pattern found with foci, and information structurally, they can correspond to new information. In my previous work (Tomioka 2010), I argued that CTs always involve contrasted speech acts, and this paper presents further evidence for this hypothesis by closely examining how CTs and foci interact. The proposed analysis leads to a new set of questions, one of which is how a focus and a CT are distinguished when they appear simultaneously in one sentence. I argue that a focus is subjected both to the exhaustifying operation at the level of proposition and to the set-generating operation at the level of speech act whereas a CT must be spared from the exhaustification below speech act. The differentiation is achieved via the 'selective binding' approach to association with focus proposed by Wold (1996).

Keywords: topic, focus, contrast, scalar implicature, speech act, selective binding

1. Introduction

Contrastive Topics (CTs, henceforth) are a multi-faceted phenomenon that cannot be analyzed comprehensively in a small project like the current paper. I would like to begin, therefore, by defining what the scope of the paper is and where the limitations lie. First of all, I will focus almost exclusively on CTs in Japanese - contrasted expressions that come with the particle *wa*. As far as I know, CTs with the particle *(n)un* in Korean are, to a large extent, comparable to the Japanese counterparts. All of us who have worked on comparative studies between the two languages know, however, that we should not be surprised if we find some interesting micro-variations between them. I therefore do no intend

to proclaim that my account should be unconditionally extended to the Korean CT construction. I nonetheless hope that the proposed analysis is of some use in explaining the Korean facts as well. Cross-linguistic variations beyond Japanese and Korean must wait for another occasion. CTs in complex sentences, such as in conjunctions or embedded sentences, add to the phenomenon another layer of intricacy that I cannot properly discuss at this point. I will therefore concentrate on appearances of CTs in simple, root sentences. I expressed my general view on CTs as contrasted speech acts in Tomioka (2010), and the main topic of this paper is one of the unresolved issues in that paper, namely the interactions between foci and CTs. My working hypothesis is that a CT is actually nothing but an instance of focus. The primary difference between a CT and a garden-variety (free) focus is the levels at which their focus values (sets of alternatives) are 'used up'; hence, I call my analysis a scope theory of CT. This paper examines some of consequences of this hypothesis.

2. Contrastive Topics and Contrasted Speech Acts

My proposal for Japanese CTs can be summarized as follows. The focal accent on a CT generates a non-singleton focus value in the sense of the traditional Alternative Semantics for Focus (cf. Rooth 1985, 1992, Kratzer 1991 among others). These focus alternatives of a CT are preserved until the computation reaches the speech act level, which, following Krifka (2001, 2002), I assume to be explicitly represented in syntax. The preservation of the focus values is the primary function of the topic marker *wa*. The presence of alternative speech acts encourages the hearer to speculate why the speaker did not carry out any speech acts among the alternatives other than the very act that she engaged in. The pragmatic effect of uncertainty, non-finality, and/or incompleteness is the result of the hearer's speculation on alternative speech acts.

The analysis is based on a variety of empirical facts concerning Japanese CTs, some much discussed in the past and others new. They are in many ways epitomized by examples like (1).

(1) Trying to give an advice on where to visit in Japan, one might say:

KYOOto-ni-wa/KYOOto-ni-WA   *iki-nasai*
Kyoto-to-TOP/Kyoto-to-TOP   go-imperative

'(At least) go to KYOto.'

First, as the parenthesized *at least* in the English translation suggests, (1) elicits a scalar implicature or a pragmatic effect very similar to it. CTs are often connected to such pragmatic weakening (cf. Jackendoff 1972, Carlson 1983, Büring 1997, Lee 1999, Hara 2006, among others), and Japanese CTs are no exceptions. Second, Japanese CTs do not receive special prosody distinct from focus. It is hard, therefore, to motivate a theory of CTs that makes crucial use of two distinct accents (e.g. Büring 1997, 2003, Kadmon 2001). Furthermore, a CT can be the sole focal element in a sentence. In other words, a CT in Japanese can, but need not, be accompanied by another focal expression. In (1), for instance, the predicate *iki-nasai* 'go-imperative' does not get focal accent; on the contrary, its pitch is dramatically reduced as a result of the 'post-focal reduction' process (cf. Ishihara 2003, among others), which lowers the pitch range of the material that linearly follows a focused item. These facts do not sit well with an analysis that treats a CT as a thematic topic that is contrastive (e.g. Valduvi & Vilkuna 1998). Another obvious point in example (1) is its sentence form; it is an imperative sentence, and Japanese CTs indeed appear in sentences containing various speech acts: assertions, interrogatives, imperatives, exhortatives (*let's do X*), volitionals (*I shall do X*), and performatives. While the pragmatic weakening of a CT is often associated with the knowledge state of the speaker, the use of a CT can be independent of it. For instance, the speaker may utter a sentence with a CT out of politeness, intentionally leaving out information that is known to the speaker but judged inappropriate or impolite by the speaker. This is a challenge to a knowledge-based account, most notably Hara (2006) and Hara & van Rooij (2007).[1] The speaker's knowledge is not necessarily relevant to CTs in non-assertion sentences, such as the imperative example in (1), and the theory cannot easily be extended to those cases of CTs where politeness is the main motivation for their uses. Finally, one cannot miss the morphology; the same particle is used for a CT and a so-called Thematic Topic (TT).

In my analysis, a CT is treated as an instance of focus, and no special semantic function, apart from generating alternatives, is associated with it. It is not a topic in the sense of the Topic-Focus articulation, and there is nothing that

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[1] Yabushita (2008) raises a similar point. Also see Wagner (2008) for discussion of related issues in connection to Rise-Fall-Rise intonation (RFR).

keeps a CT from corresponding to new information. There is also no reason to suppose that CTs are limited to assertions, and with alternative speech acts, one is invited to speculate all sorts of reasons for the alternative acts being left out. Although the speaker's knowledge being partial may often be the most salient in our reasoning, some contexts encourage us to seek out reasons other than the speaker's knowledge. Finally, the role of the particle is argued to be the guarantor of CT's focus value beyond the speech act level. This is where a CT and a TT converge. If there is any linguistic expression that can take scope beyond the speech act level, the most likely candidate is a TT. In one branch of theories of sentence topics, first advocated by Jacob (1984) and later elaborated by Krifka (2001), Endriss (2009) and Endriss & Hinterwimmer (2010), a topic selection is regarded as a speech act of its own. A sentence topic, therefore, lies outside of the scope of the speech act operated on the main sentence. This 'outside of a speech act operator' is the common denominator for a CT and a TT.

The bottom line of the idea is that a CT is just an instance of focus whose focus value (a non-singleton set of alternatives) happens to be 'resolved' or 'used up' at the level higher than a proto-typical focus. I therefore call my analysis a scope theory of CT.[2] It is also a minimal theory of CT because it does not call for any special presuppositions, implicatures, or construction-specific rules. In the following section, we will see how the possible interpretations of a CT are restricted by the presence of the focus option. More concretely, the two focalizing strategies compete, and due to the presence of a stronger meaning associated with focus, the focus option is preferred to the CT option. It is also vital for a theory like mine to have a proper way to distinguish two focal expressions, and Section 3 will be devoted to this issue. I will examine a sentence containing both a CT and a focus and demonstrate that focus-sensitive operators are selective binders. Adopting Wold's (1996) analysis of nested foci, I suggest that a focus is bound twice: once by the exhaustive operator that

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[2] In using the term 'scope' for focus, I mean a specific point of structure where the set of alternatives is computed. The statement 'a CT out-scopes a focus' means that the focus value of a CT is computed at a structurally higher position than that of a focus. It should not be confused with the semantic scope of quantifiers. Quantified CTs often must take scope narrower than other scope-bearing elements, such as negation (cf. Büring 1997, Hara 2006).

generates strong meaning and the second time by the set-generating operator at the speech act level. A CT, on the other hand, gets caught only by the higher operator over speech acts.

2. Focus vs. Contrastive Topic

2.1. Focus Wins

The necessity of considering focus in determining possible interpretations of CTs is exemplified by a sentence like (2), where a focused measure expression is marked with *wa*.

(2)   How many people will come to the party?

    ZYUU-Nin-wa/ZYUU-nin-WAkuru-desyoo.
    TEN-CL-top/Ten-CL-TOP   come-evid
    '(At least) Ten people will come, (as far as I can tell).'

This sentence elicits a set of alternative assertion acts of the form 'assertion that X-many people will come,' and the hearer is invited to think about possible reasons for the speaker's not making any assertion other than the assertion that 10 people will come. The reason for for not asserting fewer than 10 is obvious: asserting 9 (or fewer) people will come when you know that at least 10 people will come would not be considered cooperative since you are asserting a proposition that is weaker and hence is less informative. The story is different for not asserting more than 10. It seems perfectly reasonable to speculate that the reason for the speaker's not asserting that 11 (or more) people will come is because she knows that such a proposition is false. If we allow this kind of reasoning, we would arrive at the conclusion that the speaker meant that exactly 10 people will come. This is not right. (2) never receives the 'exactly 10' interpretation.[3] I argued in Tomioka (2010) that we can keep out the strong,

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[3] Chung-min Lee (pc) pointed out to me that this is not entirely true. I speculate that he may have in mind a case like (i).

  (i)I have ten cousins, and…

'exactly' reading for a measure phrase CT by letting the focus strategy compete with the CT marking. Consider the utterance context of (2) again. One could have said (3) instead of (2).

(3) How many people will come to the party?

    ZYUU-Nin kuru-desyoo
    TEN-CL   come-evid
    'Ten people will come.'

In this example, the measure expression is without the particle *wa* and is interpreted as the focus of the sentence. As is typically the case with a focused numeral, it carries the 'exactly N' implicature. Since this strategy is always available for the speaker, the hearer must take it as a part of her reasoning for a CT. Specifically, the hearer must find a reason why the CT marking on the measure phrase is chosen over the focus strategy without *wa*. Since the use of focus would lead to the strong, 'exactly 10' meaning, the hearer now subtracts that meaning from the possible interpretations for the measure phrase CT. The result is the weaker, 'at least 10' interpretation.

    ROKU-NIn-wa   niHOn-ni sunde-imasu-ga (nokori-no) YO-NIn-wa
    SIX-people-Top   Japan-in live-prog-but   rest-gen   FOUR-people-top
    KAIgai-ni   imasu
    abroad-in   be
    '(Of my ten cousins), SIX of them live in JaPAN, and the remaining
    FOUR live abROAD.'

It is certainly true that there is no scalar meaning associated with the CT numerals in (i), in which the two (proportional) numbers are overtly contrasted with each other. It is also true, as pointed out by C.-M. Lee, that cases like (i) show a different prosodic pattern: while the pitch peak in (3) can be either on the numeral or the particle *wa*, (i) requires the numerals to bear the pitch peak. In this paper, I would like to focus on cases where a CT numeral is used as an answer to a *how many/much* question, which necessarily induces the 'at least' implicature.

2.2. Focus Wins: More Case Studies

There are several more pieces of evidence for the idea of the focus-CT competition. In Tomioka (2010), I presented the case of the infelicitous CT marking of a universal quantifier in an affirmative sentence.

(4) #MINNA-wa/Minna-WA   kita.
    ALL-Top/All-TOP   came
    '[All people]$_{CT}$ came.'

The infelicity of such constructions was noted by Hara (2006), who provided an account based on a scalar presupposition specifically tailored for a CT. Hara argues that the use of a CT requires that there be at least one scalar alternative that is stronger than the asserted one. The CT marking on *minna* 'all (people)' in (4) would generate the following set of scalar alternatives.

(5) {(assert that) all people came, (assert that) most people came, (assert that) some people came, (assert that) no one came}

The problem is the asserted proposition is the strongest among the alternatives that do not contradict the assertion. Hara's scalar presupposition correctly predicts the infelicity of (4). Since I advertised my analysis as a minimal theory of CT, however, I would rather seek an alternative account without CT-specific presuppositions. The idea of competition between focus and CT turns out to be useful in this case as well. In the same utterance context as in (4), the speaker could have said (6).

(6) MINNA-ga   kita
    all-nom   came
    'All people came.'

(6) would generate exactly identical alternatives as those shown in (5). Is there any reasoning that allows us to conclude the speaker has chosen (4) over (6)? The answer is no. The proposition that no one came would contradict (6), and all the others are weaker propositions than (6). Therefore, the generalization is that the use of a CT is disallowed when it does not distinguish its interpretation

from that of a focus. (7) is another instance in which the indistinguishable reasoning between CT and focus makes the CT choice infelicitous.

(7) Among Ken, Erika, and Mari, who won the match?
   #ERIka-wa/ERIka-WA   kat-ta
   ERIKA-top/ERIKA-TOP   win-past
   ''[Erika]$_{CT}$ won.'

The question in (7) presupposes that there is one and only one winner. In other words, the set of alternatives for (7) is (8a), not (8b).

(8) a. {(assert that) Ken won, (assert that) Erika won, (assert that) Mari won}
    b. {(assert that) Ken won, (assert that) Erika won, (assert that) Mari won,
        (assert that) Ken and Erika won, (assert that) Ken and Mari won,
            (assert that) Erika and Mari won, (assert that) all the three won}

In a case like this, asserting that Erika won implies that neither Ken nor Mari won. This would be another instance in which Hara's scalar presupposition comes into play. Such a presupposition is dispensable, however, if we assume the preference of focus to CT when the two strategies lead to the same reasoning on the hearer's part.

There are a few more phenomena that follow naturally from the focus-CT competition. If the pragmatic weakening of a CT is due to the existence of a focus strategy as an alternative option, then it is expected that no obligatory weakening takes place when the focus strategy is independently blocked. This prediction is borne out. Consider (9).

(9) Did both Erika and Ken pass?

   ERIka-wa/ERIka-WA   ukat-ta
   Erika-CT/Erika-CT   pass-past
   "[Erika]$_{CT}$ passed."

While it is still possible to conjecture that the speaker does not know the outcome for Ken, the strong meaning is not blocked. In other words, we can

entertain the possibility that the speaker implied that Ken did not pass. The reason for the survival of the strong meaning is the unavailability of focus. In the context of (9), (10) is not an appropriate answer.

(10) Did both Erika and Ken pass?

    #ERIka-ga   ukat-ta
    Erika-nom   pass-past
    "[Erika]$_F$ passed."

Therefore, no competition arises, and the strong meaning survives.[4]

    Another piece of evidence comes from CT marking of disjunctive NPs. Imagine the following discourse.

(11) Who passed?

    [ERIka-ka KEn]-ga   ukat-ta
    Erika-or Ken-nom   pass-past
    "[Erika or Ken]$_F$ passed."

The answer in (11) is doubly exhaustive. As a complete answer to the question *who passed?*, it carries the implicature that no one other than Erika or Ken passed. At the same time, the disjunction *ka* 'or' brings out the typical scalar implicature that not both of them passed. If the disappearance of the stronger, exhaustive meaning with a CT is tied to its competition with focus, then the CT counterpart of (11) should eliminate the focus-related strong meaning but preserve the 'not both' meaning. This is precisely what happens in (12).[5]

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[4] It is important to note that the option of using *–dake* 'only' does not come into play. We are in a situation very similar to the implicature associated with a numeral. In order to obtain the 'exactly N' reading for a numeral, we cannot consider the expression *exactly N* as an option.

[5] It is possible to weaken the 'not both' meaning by placing high pitch on the disjunctive particle *ka* or by adding *dotiraka* 'either' to the disjunctive phrase.

  (i)   a. *[Erika-KA Ken]-wa/WA   ukat-ta*

(12) Who passed?

    [ERIka-ka KEn]-wa/WA   ukat-ta
    Erika-or Ken-CT   pass-past
    "[Erika or Ken]$_{CT}$ passed." This can mean "One of them passed, but I am not   sure if people other than Erika or Ken passed."

The last relevant fact for the focus-CT competition is a 'mention-some' question (cf. van Rooij 2004). Consider (13).

(13) Where can I buy the *Japan Times* around here?

    a. Soo-desu-nee, kono-hen-nara, [EKI-no BAITEN-de]   utte-imasu-yo
       let me see,   around.here-if [Station-Gen Kiosk-at] sell-Prog-Evid
    b. _____, #[EKI-no BAITEN-de-wa/WA] utte-imasu-yo
                          Station-Gen Kiosk-at-top/TOP sell-Prog-Evid
    "Let me see… Around here, they are sold at the KIOSK of the TRAIN STATION."

The purpose of asking the question in (13) is to obtain a copy of the *Japan Times* to read, and to do so, one need not have a complete list of vendors who sell the paper. Therefore, the answer in (13a), which employs the non-CT, focus strategy, does not mean to indicate that the station's kiosk is the only place in the area that sells the newspaper. In a sense, it is already a partial answer, but it nonetheless satisfies the need of the speaker. Interestingly, the CT answer

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    Erika-OR Ken-CT   pass-past

    b. [Erika-ka Ken-no DOTIRAKA]-wa/WA ukat-ta
       Erika-or Ken-gen EITHER-CT   pass-past
       "[EITHER Erika or Ken]$_{CT}$ passed."

Both sentences mean something close to 'at least one of the two passed.' They can be followed by such a statement as 'But I am not sure if both of them passed.'

(13b) is felt to be inappropriate in this context. The following is the rationale that the current proposal can offer. With (13b), the hearer is invited to speculate why the speaker did not give any other assertions of the same form. In the utterance context described above, the reason should be clear. The exhaustive answer is not required, and giving one example answer (*the kiosk of the station*) is sufficient. However, one gets the same conclusion from the non-CT, focal answer (13a). Thus, the context offers no particular reason for the CT version to be used, which leads to the infelicity of (13b).

In this section, we have observed a number of focus-CT interactions and their semantic and/or pragmatic effects. The range of possible interpretations of a CT is influenced by the availability of the focus strategy. Since focus is more informative, whenever the two strategies are compared, the focus wins over the CT if the speaker knows enough or feels confident enough to use the former. On the other hand, there are some contexts in which the two strategies are not distinguishable. In such cases, the focus option is preferred over the CT option. These facts collectively support the inclusion of strategy comparison in the Gricean reasoning. The use of a CT urges the hearer to think about what could/might have been said instead of or in addition to what was actually said. In this process, it is critical to realize that the CT option was chosen over the focus option, and the hearer is invited to speculate the reason for the speaker's choice. This process is responsible for limiting the possible interpretations of CTs and the infelicity of using them when the two strategies are not sufficiently distinguished.

All through my argument so far, I have taken it for granted that focusing leads to stronger meaning, and I have been completely vague about how this stronger meaning comes about. I advertise my analysis of CTs as a scope theory in which a CT is just an instance of focus whose focus semantic values are interpreted high (= at the speech act level). Therefore, it is of critical importance that focus and CT interpretations are differentiated. My proposal invites another question: do we not also evoke a similar sense of alternative speech acts when we use focus instead of CT? If so, where does the difference between the two strategies lie? These are the issues that I will address in the following section.

3. Grammar of (Anti-)Exhaustivity

3.1. Exhaustive Operator in Syntax

How does the exhaustive meaning of focus come about? One idea is found in Krifka (1995), who proposes that so-called 'free' focus is actually an instance of association with focus; the operator it associates with is the assertion operator. I follow Krifka's idea that focus is always associated with some operator, but the relevant operator is not a speech act operator but one that specifically derives exhaustivity. Fox (2006), for instance, advocates the view that the exhaustivity associated with disjunction and other scalar items is derived via the exhaustivity operator (Exh). [6]

(14) Exh $(A_{<st,t>})(p_{st})(w)$ = $p(w)$ & $\forall q \in NW(p,A): \neg q(w)$ (= Fox 2006, (15))
   Notes: $A_{<st,t>}$ = a set of (scalar) alternatives
   NW (p,A) = a set of alternatives that are not weaker than p

Although Fox does not specifically discuss the exhaustivity associated with contrastive focus, its potential to be extended to contrastive focus is quite obvious.[7] So, focus is necessarily caught by the Exh operator while a CT is spared from exhaustification and the alternatives generated by it move up to the speech act level. How could this distinction be made?

3.2. Focus Index and Selective Binding

The issue becomes crucial when a CT is accompanied by a focus. While a CT can be the sole focalized element in a sentence, it can appear with an additional focus.

(15) Who ate what?

   ERIka-wa   MAME-o   tabe-ta   (kedo)
   Erika-top   beans-acc   eat-past   (but)
   'Erika ate beans (but ...)'

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[6] (14) is not the final version that Fox endorses, but it is simpler and serves our purpose perfectly well.

[7] Fox himself is quite receptive to this possibility (Fox 2006, footnote 13).

This sentence receives an interpretation very similar to the English A-/B-accents (cf. Jackendoff 1972, Büring 2003) and the German Rise-Fall contour (Büring 1997, Krifka 1998). From the meaning specified in (14), it is obvious that the Exh operator sits at the level of proposition (or more generally, at the level of sentence radical). Since a CT is structurally lower than this operator, it becomes crucial to prevent the focus value of a CT from accidentally getting caught by the Exh operator. Although LF movement of a CT over the Exh operator may seem like a reasonable option, I expressed skepticism about this option in Tomioka (2010). [8] If one opts for a different solution, the best candidate is Kratzer's (1991) idea of focus indices. Furthermore, we postulate that focus-sensitive operators, such as the Exh operator, are indexed so that, for any given focus-sensitive operator, only the co-indexed focus expressions are computed. Specifically, I adopt the system of 'selective binding' of focus indices that Wold (1996) developed. First, let us assume the following LF for (16).

(16) $[Op_1 \ [_{Speech \ Act \ P} \ Assert \ [_{IP} \ Exh_2 \ [_{IP} \ [ERIka-wa]_1 \ [MAME-o]_2 \ tabeta \ ]]]]$

The first operator Op_1 is a simple alternative-generating operator without any quantificational meaning whereas Exh_2 is an index-sensitive version of our previous Exh. Their meanings are represented below.

(17) a. $[\![Exh_i \ \alpha \ ]\!]^g = \lambda w. \ [\![\alpha]\!]^g(w)=1 \ \& \ \forall p \in NW(p, \{[\![\alpha]\!]^{g \ \cup \ \{<i,x>\}} | x \in D\tau\})$
$[p(w)=0]$
b. $[\![Op_i \ \alpha \ ]\!]^g = \{[\![\alpha]\!]^{g \ \cup \ \{<i,x>\}} | \ x \in D\tau\}$

Another important ingredient in Wold's analysis is the Novelty Condition on focus indices:

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[8] In Tomioka (2010), I raised two issues concerning LF raising of a CT over the speech act level. First, a quantificational CT does not necessarily take wide scope, which means that semantic reconstruction becomes necessary. Second, a verb, an adjective, or a part of a complex predicate (but not the entire complex predicate) can be a CT, and it is hard to motivate LF movement of such elements.

(18) For a focus-sensitive operator Ω $[\![\Omega_i\ \alpha\ ]\!]^g$ is defined only if $i \notin Dom(g)$

In other words, beyond the constituent that contains Ω and its sister, $g(i)$ is not defined. When $i \notin Dom(g)$, we ignore the index, so $[\![\beta_i]\!]^g = [\![\beta]\!]^g$. The way this indexing system works can be illustrated by (19).

(19) $[_{XP}\ \ldots\ [_{YP}\ Op_2\ [_{ZP}\ \ldots..\ [\beta]_2\ _F\ \ldots.\ ]]$

The index 2 is introduced to the domain of g when the derivation reaches the focus-sensitive operator (Op_2), so in any constituent below (i.e., ZP and below), the index does not contribute to the meaning. Thus, $[\![\beta_i]\!]^g = [\![\beta]\!]^g$, and $[\![[_{ZP}\ \ldots..\ [\beta]_2\ _F\ \ldots.\ ]]\!]^g = [\![[_{ZP}\ \ldots..\ [\beta]\ \ldots.\ ]]\!]^g$. In the process of interpreting YP, the focus index is bound by the operator and yields a set denotation (the exact denotation depends on the meaning of the operator in question). Beyond the operator (e.g., XP in (19)), the index 2 is no longer in the domain of g, so it makes no contribution. In other words, the set meaning is used up at the level of YP and will not be recycled beyond that level. With this theory of focus indexing, the two semantic values of (16) are computed as follows. The (parenthesized) part is the implicature.

(20) a. $[\![[_{IP}\ Exh_2\ [_{IP}\ [ERIka\text{-}wa]_1\ _F\ [MAME\text{-}o]_2\ _F\ tabeta\ ]]\ ]\!]^g = \lambda w.$ Erika ate beans in w and for all $p \in NW(p, \{\lambda w.\ \exists x.\ P(x)$ and Erika ate x in w | $P \in D_{<e,t>}\})$, $p(w)=0$. *The proposition that Erika ate beans (and nothing else).*

b. $[\![[Op_1\ [_{Speech\ Act\ P}\ Assert\ [_{IP}\ Exh_2\ [_{IP}\ [ERIka\text{-}wa]_1\ [MAME\text{-}o]_2$ tabeta $]]]]]\!]^g = \{$assertion that x ate beans (and nothing else) | $x \in D_e\}$

Unfortunately, this is not right. (20b) is a set of assertions of the form 'assert that x ate beans (and nothing else)', which would lead to the uncertainty/incompleteness implicature that the speaker may not know whether the other people did the exclusive eating of beans. This does not capture the meaning of (15). What we need is the implicature that the speaker may be unsure <u>what</u> the other people ate.

3.3. Double Indexing of Focus

To amend the selective binding analysis, let us go backward and try to understand what kind of alternative speech acts are needed. Instead of (20b), we should have (21).

(21) {assertion that there is x such that P(x) and y ate x | x $\in$ D$_e$, P $\in$ D$_{<e,t>}$}

We can get (21) by letting the alternative-generating Op at the speech act level bind both the CT and the focus. Since the focus needs to be bound by the Exh operator at the IP level, we assign two indices to the focus.

(22) [Op$_1$ $_2$ [$_{Speech\ ActP}$ Assert [$_{IP}$ Exh$_3$ [$_{IP}$ ERIka-wa$_1$ [[MAME-o]$_2$]$_3$ tabeta]]]]

This may look a little exotic, but a similar case has been reported in the past. Krifka (1991) pointed out that one focused expression can be bound by two distinct focus-sensitive operators.

(23) a. I once only drank [WIne]$_F$.
    b. I also once only drank [[WATer]$_F$]$_F$

(23b) means that, in addition to the exclusive drinking of wine at some point, I also had an experience of the exclusive drinking of water on another occasion. Wold (1996) revisits this example and proposes the double-indexing on *water*.

(24) I also$_1$ once only$_2$ drank [[WATer]$_1$]$_2$

At the point where the smaller VP *only$_2$ drank [[WATer]$_1$]$_2$* is interpreted, the index 1 is not in the domain of g, so we ignore it. The indexed *only$_2$* introduces the index 2 to the domain of g, and the object *[[WATer]$_1$]$_2$* is now replaced with a variable. This variable is the basis of generating the alternative VP meanings over which *only$_2$* quantifies. When we proceed beyond the VP level, the index on the *only$_2$* (i.e., the index 2) is no longer in the domain of g, according to the Novelty Condition specified in (18). When the larger VP *also$_1$ once only$_2$ drank [[WATer]$_1$]$_2$* is interpreted, the index 1 is added to the domain for g, *[[WATer]$_1$]$_2$* turns into a variable that is to be bound by *also$_1$*.

With the double-indexing and the novelty condition on focus indices, we now have the following computations for (21).

(25) a. $[\![_{IP}$ Exh$_3$ $[_{IP}$ [ERIka-wa]$_1$ [MAME-o]$_2$]$_3$ tabeta $]\!]$ $]\!]^g$ = λw. Erika ate beans in w and for all p $\in$ NW(p, $\{[\![_{IP}$ [ERIka-wa]$_1$ [MAME-o]$_2$]$_3$ tabeta $]\!]$ $]\!]^{g \cup <3, P>}$ | P $\in$ D$_{<e,t>}\}$), p(w)=0.

= λw. Erika ate beans in w and for all p $\in$ NW(p, $\{$λw. $\exists$x. P(x) and Erika ate x in w | P $\in$ D$_{<e,t>}\}$, p(w)=0.   [= (20a)]

b. $[\![$Op$_{1,2}$ $[_{SpeechActP}$ Assert $[_{IP}$ Exh$_3$ $[_{IP}$ [ERIka-wa]$_1$[MAME-o]$_2$]$_3$ tabeta]]]]$]\!]^g$

= $\{$ $[\![$Assert $[_{IP}$ Exh$_3$ $[_{IP}$ [ERIka-wa]$_1$ [MAME-o]$_2$]$_3$ tabeta $]\!]$ $]\!]^{g \cup <1, x> \cup <2, P>}$ | x $\in$ D$_e$, P$\in$ D$_{<e,t>}\}$

= $\{$assertion that there is x such that P(x) and y ate x | x $\in$ D$_e$, P $\in$ D$_{<e,t>}\}$ [= (21)]

(25b) correctly generates the kind of alternative speech acts that would lead to the implicature that the speaker may be unsure what people other than Erika ate.

3.4. Consequences and Implications

The conclusion we reached above is that a focus is bound twice whereas a CT is always spared from being bound by the Exh operator at the level of proposition. Double-indexing on focus seems independently needed, and there are no reasons to suppose that the same strategy should not be exploited in the focus/CT co-occurrence case. The proposal nonetheless raises several questions. Although I am not ready to give definitive answers to them yet, I believe that some preliminary discussions of them will be useful.

First of all, one might wonder what the focus operator at the speech act level does. The current version gives it no special meaning apart from generating a set of speech acts, and the mere existence of alternative speech acts is claimed to be sufficient for the hearer to entertain the kind of Gricean reasoning that leads to the pragmatic effects of CTs. There is an alternative approach to it, however. It has been pointed out in the literature (e.g., Krifka 2008, citing John Searle's work on speech acts) that 'negation' of a speech act is typically weak. The effect can be seen by the negation of a performative sentence: *I do not promise to leave* is weaker than *I promise not to leave* while *I do not want to leave* and *I want not to leave* are often interchangeable. Recall that the essential part of the meaning of the Exh operator is the negation of (non-weak) alternatives. If the operator at the speech act level is an Exh and has the 'speech act negation' as a part of its meaning, the result is the implicature that the speaker engaged in the ordinary value speech act but did not perform any other acts in the set of alternatives. This is precisely

what the hearer's Gricean reasoning derives. In other words, the speech act version of Exh embodies in its meaning the pragmatic reasoning associated with CTs. The emerging picture is exhaustificatio as the default strategy for focusing. A focus elicits a set of alternatives, and the set must be made good use of. It can serve as the domain for a focus-sensitive operator (e.g., *only*, *always*, *even*). When there is no overt operator that requires a focus alternative, it must be caught by an Exh at the propositional level, the speech act level, or both. The idea of 'speech act Exh' presents an interesting alternative to the 'underspecified' operator of the current version, but I cannot think of any empirical facts that favor one approach over the other.

The second issue that naturally arises from the current proposal is the double-indexing of focus. The co-occurrence of a focus and a CT within one sentence makes it necessary for the focus to be bound twice. Does the double-binding also take place when there is no CT to accompany a focus? (26) illustrates a scenario where a focus is always bound twice.

(26) $[\text{Op}_1 \ [_{\text{Speech Act P}} \ [_{\text{IP}} \ \text{Exh}_2 \ [_{\text{IP}} \ \dots \ [[\text{focus}]_1]_2 \ \dots \ ]]]]$

The idea behind (26) is that focalization, either as a focus or a CT, always leads to the generation of alternative speech acts. Unlike the CT counterpart, however, focus highly restricts the pragmatic reasoning that the hearer can entertain. The strong meaning that results from the Exh practically eliminates all the possibilities but one: the speaker knows/believes that the alternative propositions are false. Thus, we can no longer speculate that the speaker may be uncertain or that the speaker might have failed to mention other propositions out of politeness.

The general picture that emerges from the current discussion of foci and CTs is quite similar to Hara's (2006, Chapter 2) interpretation of Schulz & van Rooy (2006). Hara suggests that a CT is subjected to the general operation that corresponds to the typical Gricean reasoning (*grice* operation of Schulz & van Rooij 2006), but it cannot undergo the exhaustification process based on the notion of 'opinionated speaker' (*eps* operation of Schulz & van Rooij 2006). Fox (2006) calls his Exh operator the structural realization of opinionated speakerhood, and the thesis that some pragmatic reasoning has syntactic realizations is further extended to the general Gricean reasoning as well. The two operators sit at different structural positions; the Gricean operator is always higher than the opinionated speaker operator.

4. Closing Remarks and Remaining Issues

Extending my previous analysis of CTs, I have examined how foci and CTs interact. The availability of using focus constrains possible interpretations of the CT counterpart as a consequence of the competition between the two strategies. I have also proposed a way to differentiate two focal expressions by adopting Wold's idea of selective binding and double-indexing of focus.

In Tomioka (2010), I left behind many issues as my homework. The focus/CT interaction and the mechanism of differentiating the two focalizing strategies was one of the unresolved problems, and I hope that I made a little progress here. The remaining issues are crosslinguistic variations (including micro-variations between Japanese and Korean), CTs in complex sentences—such as conjunctions and embedding under attitude verbs—and a variety of syntactic positioning effects (cf. Vermeulen 2008). Although I believe that satisfactory accounts for these issues within the current proposal are possible, I will have to leave them for other occasions in the future.

References

Büring, Daniel. 1997. The Great Scope Inversion Conspiracy, *Linguistics and Philosophy* 20, 175–194.

Büring, Daniel. 2003. On D-trees, beans, and B-accents, *Linguistics and Philosophy* 26, 511-545.

Carlson, Lauri. 1983. *Dialogue Game: An Approach to Discourse Analysis*. Dordrecht: Reidel.

Endriss, Cornelia. 2009. *Quantificational Topics – A Scopal Treatment of Exceptional Wide Scope Phenomena. Studies in Linguistics and Philosophy*. Springer.

Endriss, Cornelia, & Stefan Hinterwimmer. 2010. The Interpretation of Topical Indefinites as Direct and Indirect Aboutness Topics. In Zimmermann, Malte &Caroline Féry (eds.) *Information Structure: Theoretical, Typological and Experimental Perspectives*. Oxford University Press: Oxford, 89-114.

Fox, Danny. 2006. Free choice and a theory of scalar implicature. Ms., MIT.

Hara, Yurie. 2006. *Grammar of Knowledge Representation: Japanese Discourse Items at Interfaces*. Doctoral Dissertation, University of Delaware.

Hara, Yurie, & Robert van Rooy. 2007. Contrastive topics revisited: A simpler set of Topic-alternatives, talk presented at NELS, University of Ottawa.

Ishihara, Shin-ichiro. 2003. *Intonation and Interface Conditions*. Doctoral Dissertation, MIT.

Jackendoff, Ray. 1972. *Semantic Interpretation in Generative Grammar*. Cambridge: MIT press.

Jacobs, Joachim. 1984. Funktionale Satzperspektive und Illokutionssemantik, *Linguistische Berichte* 91, 25-58.

Kadmon, Nirit. 2001. *Formal Pragmatics*. London: Blackwell.

Kratzer, Angelika. 1991 Representation of focus. In von Stechow, Arnim & Dieter Wunderlich (eds.), Handbook of Semantics. Berlin: De Gruyter, 825–834.

Krifka, Manfred. 1991. A compositional semantics for multiple foci constructions. In Moore, S., & A. Z. Wyner (eds.) *Proceedings of the 1st Semantics and Linguistic Theory (SALT 1)*, Cornell University.

Krifka, Manfred. 1995. The semantics and pragmatics of polarity items, *Linguistic Analysis* 25, 209-257.

Krifka, Manfred. 1998. Scope inversion under rise-fall contour in German, *Linguistic Inquiry* 29 (1), 75–112.

Krifka, Manfred. 2001. Quantifying into question acts, *Natural Language Semantics* 9, 1-40.

Krifka, Manfred. 2002. Embedded speech acts, handout for the talk given at Workshop *In the Mood*, Graduiertenkolleg *Satzarten: Variation und Interpretation*, Universität Frankfurt am Main.

Lee, Chung-Min. 1999. Contrastive topic: A locus of the interface. In Turner, K. (ed.) *The Semantics/ Pragmatics Interface from Different Points of View* 1. London: Elsevier, 317-341.

van Rooy, Robert. 2004. Utility of mention-some questions, *Research on Language and*

Computation 2, 401-416.

Rooth, Mats. 1985. *Association with Focus*. Doctoral Dissertation, University of Massachusetts at Amherst.

Rooth, Mats. 1992. A theory of focus interpretation, *Natural Language Semantics* 1, 75-116.

Schulz, Katrin, & Robert van Rooij. 2006. Pragmatic meaning and non-monotonic reasoning: The case of exhaustive interpretation, *Linguistics and Philosophy* 29, 205-250.

Tomioka, Satoshi. 2001. Contrastive topics operate on speech acts. In Zimmermann, Malte &Caroline Féry (eds.) *Information Structure: Theoretical, Typological and Experimental Perspectives*. Oxford University Press: Oxford, 115-138.

Vallduví, Enric & Maria Vilkuna. 1998. On rheme and kontrast, in Culicover, Peter & Louise McNally (eds.), *Syntax and Semantics, Vol. 29: The Limits of Syntax*. San Diego, CA: Academic Press, 79–108.

Vermeulen, Reiko. 2008. Topics in Japanese: A unified analysis of contrastive and non-contrastive topics. Ms., University College London.

Wagner, Michael. 2008. A compositional analysis of contrastive topics. In Muhammad Ab- durrahman, Anisa Schardl, & Martin Walkow (eds.), *Proceedings of NELS 38*, volume 2, 415–428.

Wold, Dag. 1996. Long distance selective binding: The case of focus, Galloway, Teresa, and Justin Spence (eds.) *Proceedings from Semantics and Linguistic Theory (SALT) 6*, Cornell University, 311-328.

Yabushita, Katsuhiko. 2008. Partition semantics and pragmatics of contrastive topics. In *Current Issues in Unity and Diversity of Languages: Collection of the Papers Selected from the CIL 18*, Linguistic Society of Korea, Seoul, 2183-2202.