Focus, Contrastive Topic and Theories of Focus

Hae-Kyung Wee* †
Sejong University

Hae-Kyung Wee. 2001. Focus, Contrastive Topic and Theories of Focus. *Language and Information 5.1*, 87–106. This paper categorizes currently available theories of focus into two major types: a 'discourse structure approach' (DSA) and a 'sentence structure approach' (SSA). The former, DSA, is intended to refer to a type of approach that analyzes focus only in terms of the discourse structure in which a focused sentence occurs. The Alternative semantics approach, which is the most widely available theory of focus, belongs to this. The latter, SSA, is meant to refer to a type of theory that analyzes focus in terms of sentence-internal structure. This study supports the SSA by revealing some empirical problems of the DSA that arise in analyzing two different kinds of focus, the A-accented focus and the B-accented focus (contrastive topic), and provides a brief sketch of a comprehensive analysis of focus and contrastive topic. (**Sejong University**)

1. Overview: Discourse structure vs. Sentence structure

To the extent of my knowledge, the major theories of focus currently available in the field can be mainly divided into two. One is a kind of approach that analyzes focus only in terms of DISCOURSE STRUCTURE in which the focused sentence occurs, and the other line of research analyzes the phenomenon of focus based on SENTENTIAL STRUCTURES of the focused sentence itself. The first approach, what I call "discourse structure approach" (DSA, henceforth), refers to Rooth's Alternative semantics theory of focus and others adopting the same spirit such as von Fintel (1994), Roberts (1996), and Büring (1994, 1999a, 1999b). They share a common feature in that they characterize the function of focus in terms of the discourse structure in which the focused sentence occurs. The second approach, what I call "sentence structure approach" (SSA, henceforth), includes the Structured Meaning approach, advocated by Krifka (1991) and von Stecow (1991) among others, and others like Steedman (1994) who analyzes focus in terms of categorial grammar, Herberger (1998) who purports a davidsonian approach of focus and others like Peregrin (1995), Erteschik-Shir (1997), and Lembrecht (1994). This second type of theory of focus could be viewed as having a commonality in that they try to capture the meaning of focus in terms of the sentence structure induced by the focus/topic. Another common feature shared by these theories is that they consider focus to function as a "predication" of the non-focused part of the sentence.

In this paper, I will support the SSA over the DSA by discussing two different types

of focus, the so-called "A-accented focus" and the "B-accented focus" or contrastive topic (CT, henceforth).

The distinction between A-accent and B-accent originates from Bolinger (1961) and is adopted by Jackendoff (1972), who associates the two kinds of intonational pattern with different discourse functions. The A-accent is a kind of falling accent and the B-accent is a (rise)-fall-rise accent. The A-accent can be said to carry the information of *rheme*, whereas the B-accent is said to carry *theme* information, and I assume this corresponds to contrastive topic marking *nun* in Korean[1] As seen in (1) and (2), under Pierrehumbert's (1980) description of intonational patterns, this fall-rise contour can be described as L+H* LH%, which is a pitch accent consisting of an ordered pair of two tones, low (L) and high (H), followed by the L phrase accent and ending with the rising boundary tone (H%). Since "*" marks accented syllables, the accented syllable is aligned with the H tone of the L+H*LH% pitch accent. The falling accent is described as H*LL%, which consists of a high (H) pitch accent and the falling boundary tone (L%).

(1) a. A: What did the kids eat?
    b. B:[FRED]$_{B-accent}$ ate [the BEANS]$_{A-accent}$.
    L+H*LH%   H*L L%
    c. A: What about John?
    d. B: [JOHN]$_{B-accent}$ ate [the POTATOES]$_{A-accent}$.
       L+H*LH%   H*L L%

(2) a. A: What did the kids eat?
    b. B: They ate [the BEANS]$_{A-accent}$.
    H*L L%

We will first show that the DSA (Discourse Structure Approach) has many empirical problems due to the fact that they disregard the sentence internal structure of focus. In section 2, we will see that DSA cannot capture an important sentential function of the B-accented focus, that is, CT. In section 3, it will be shown that DSA allows an infelicitous question-answer pair, *i.e.*, an *under-focused* or an *over-focused* answer to given wh-questions. Finally, in section 4, a brief sketch of a comprehensive analysis of the A-accented focus and the B-accented focus or CT-focus will be provided.

2. Interpretation of Contrastive Topic

Assuming the correspondence between the English B-accent and the Korean Contrastive Topic *nun*-marking and also Assuming that the term *focus* refers to a constituent associated with a prominent phonetic accent, I will use the terminologies, CT, B-focus, and B-accented focus interchangeably for the rest of the paper. In this section, I will first try to grasp the interpretation of CT and review the Alternative Semantics accounts for CT, which are outlined in Büring (1994, 1999a, 199b) and Roberts (1996). We will see that in these frameworks the function of (*contrastive*) *topic* as well as *focus* are defined in terms of the discourse structure, which is represented by sets of (sets of) propositions or structures of questions. This approach does not consider its sentence-internal function

---

1. There can be other ways that can encode the category of contrastive topic in English and in other languages. According to Vallduvi & Vilkuna (1998), Finish marks this category by prosodic prominence and syntactic position, and Lee (1998) claims that the so-called 'topicalization' as in a sentence like 'these examples, I found in Gundel', discussed in Carlson(1983) also creates a contrastive topic.
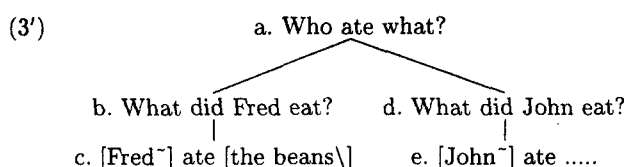
or structure to be induced by focus or topic. Problems with this type of theory will be pointed out and it will be shown that they are due to its taking a DSA.

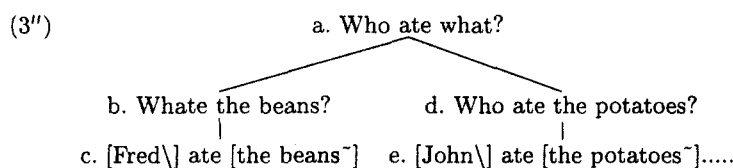## 2.1 Discourse Structure Approach to CT

This line of research including Roberts (1996) and Büring (1994, 1999a, 1999b) suggests that a CT provides a partial answer to a big question. Consider the dialogue in (3). Henceforth, the symbols \ and ‾ will be used to indicate the A-accent and the B-accent, or CT, respectively.

> (3) A: who ate what?
>   B: [Fred‾] ate [the beans\]
>   B': [Fred\] ate [the beans‾].

In this approach, the function of CT-marking for *Fred* in (3B) is viewed as providing just a partial answer to the question (3A). In other words, the answer in (3B) constitutes an answer to a sub-question of a structured question as illustrated in the following:

(3')   a. Who ate what?

         b. What did Fred eat?   d. What did John eat?
                  | |
         c. [Fred‾] ate [the beans\]   e. [John‾] ate .....

Question (3'a) is split up into sub-questions such as 'what did Fred eat?', 'what did John eat?' If we go by food rather than people, on the other hand, as in (3B'), the sub-questions would be as follows:

(3'')   a. Who ate what?

         b. Whate the beans?   d. Who ate the potatoes?
                  | |
         c. [Fred\] ate [the beans‾]   e. [John\] ate [the potatoes‾].....

So (3B') is considered to presuppose the structure as in (3'') in this approach. Roberts (1996) suggests that both (3B) and (3B') presuppose (3A) and the location of the L-H boundary tone (LH%) of the B-accent indicates that they presuppose distinct sub-questions. According to her, (3B) presupposes (3A) and the sub-question, *what did Fred eat?* in (3'b) and answers the sub-question. Accordingly, the CT functions to provide a partial answer to a big question.

Taking a similar position to Roberts, Büring (1994) provides a formalism for CT, which is another instance of DSA developed in the framework of the Alternative Semantics account. We will see some empirical problems, which will be shown to be due to the lack of access to the sentence-internal informational or logical structure derived by focus and topic.

2.1.1 Felicity Condition .

Büring (1994) assumes that at any stage of a discourse there is a restricted range of possibilities for where the conversation might move to next. This range of possibilities is viewed as a set of sentences with which the conversation might be continued. Büring calls this set a *topic* (which is distinct from CT), and the most straightforward way to establish a *topic* is to ask a question. For example, in discourse

(4), the question is represented as a set of propositions, T as in (5a), supposing that there are only two comestibles, *the beans* and *the potatoes*, and there are two children, *Fred* and *John*, in the discourse model.

(4) a. A: What did the kids eat?
  b. B: The kids ate [the BEANS\] $_{\text{A-accent}}$.
  c. B: [FRED$^-$]$_{\text{B-accent}}$ ate [the BEANS\]$_{\text{A-accent}}$.
  d. A: What about John?
  e. B: [JOHN$^-$]$_{\text{B-accent}}$ ate [the POTATOES\]$_{\text{A-accent}}$.

(5) a. T = {the kids ate u| u∈D}
    = {the kids ate the beans, the kids ate the potatoes}
  b. [[kids]]= {Fred, John}

The A-accented part in (4b), *i.e. rheme* information, must be the information which is asked for by the question. Following Rooth (1985), a second semantic value, the *focus semantic value*, $[s]^F$, is derived from a sentence which has *rheme* information like (4b). The *focus semantic value* is obtained by replacing the alternatives for the focused part. That will be a set of propositions as in (6).

(6) $[4b]^F$ ={the kids ate the beans, the kids ate the potatoes}

In order for a sentence s to be appropriate, the *focus semantic value* of *s*, or its contextually restricted subset, must be the same as T, which is the set of propositions representing the question. So, the *focus semantic value* of (4b), which is (6), should be the same as the set of propositions in (4a) established by the question (4a), so that the response (4b) is an appropriate response to the question (4a).

Now, consider (4c). As assumed, since the question is about all the children in the domain, that is *Fred* and *John*, the answer given in (4c) is not a full answer. Assuming that an answer is supposed to include all true propositions for the given question, B's answer in (4c) is not an appropriate answer, since it is not answering about *John* It is acceptable, however, as a felicitous answer with the B-accent on *Fred* in English, and with *nun* marking in Korean. Since the answerer is aware of the existence of children other than *Fred*, she uses the B-accent to indicate that it is a partial answer to the question. Büring refers to this accent as the *topic accent*. Büring regards this topic as *sentence internal topic (s-topic)*, which is distinguished from the *discourse topic (d-topic)*, that is T, established by the preceding question. We can see that Büring's *s-topic* corresponds to CT in Korean, which is manifested as the B-accent in English.

For a sentence which contains a B-accent or CT, Büring proposes another semantic value called *topic semantic value*, $[s]^t$ for short. This is essentially the same as the given T except that the *topic semantic value* partitions the given discourse topic in terms of the *s-topic*. That is *Fred vs. John* in this case. The *topic semantic value* is obtained by replacing the CT itself with the alternatives to the CT. In the case at hand, the *topic semantic value* will be the set of propositions as in (7a), and we will get the *focus and topic semantic value* of (4c), that is $[4c]^{tf}$, as in (7b).

(7) a. $[4c]^t$ = {Fred ate [the beans]$_F$, John ate [the beans]$_F$ }
  b. $[4c]^{tf}$ = {Fred ate the beans , Fred ate the potatoes , John ate the beans , John ate the potatoes }
  c. $[4c]^f$ = {[Fred]$_T$ ate the beans, [Fred]$_T$ ate the potatoes}

According to Büring, the *s-topic* serves to narrow the *d-topic* so that an exhaustive answer can be given. In case of (4c), the function of the *s-topic*, *Fred*, is narrowing the *d-topic* by replacing the original *d-topic* (4a) with (8) below. Then, B's answer about *Fred* only provides the exhaustive answer for the *s-topic*, but not for the *d-topic*.

$$(8) \text{ s-topic of (4c)} = \{\text{Fred ate [the beans]}_F\}$$
$$= \{\text{Fred ate the beans, Fred ate the potatoes}\}$$
$$= [4c]^f$$

Note that the *topic and focus semantic value* of (4c), i.e. $[4c]^{tf}$ in (7b), is equivalent to the *d-topic*, *T*, established by question (4a), which is (5a). Note also that (4c)'s *s-topic* in (8) is the same as its *focus semantic value* given in (7c). Büring then formulated a felicity condition of discourse that can accommodate both (4c) and (4e) as in (9):

(9) A sentence s can be appropriately uttered given a topic T iff
    a. $\bigcup [s]^{tf} = \bigcup T$ and[2]
    b. $[s]^o$ is an appropriate response to $[s]^f$.

According to Büring (1994), an *appropriate response* means *exhaustive* true answers to the given question. In the case of (4c), $[4c]^{tf}$ is the same as the *d-topic* (5a), and $[4c]^o$ (the normal semantic value of (4c)) is the true and exhaustive answer to $[4c]^f$ provided in (7c). The constraint (9a) checks if the *s-topic* is one of the propositions of the set, *d-topic*. For example, it checks if (4c) is a relevant answer to the given question. This constraint filters out an irrelevant answer such as (10B):

(10) A: What did the kids eat?
    B: Mom ate [the beans]$_{A-accent}$.

In (4c), since we know that the alternatives to the *s-topic* and the alternatives to the *focus* of (4c) are the same as the *d-topic*, *T*, established by the question (4a), (4c) obeys the constraint (9a). That is, the actually uttered sentence generates the set of propositions and it is the same as the set *T*. The constraint (9b) requires us to consider the narrowed set excluding the alternatives to the *s-topic* from the *d-topic*, i.e. excluding the propositions about *John* in this particular example. These excluded propositions are called *residual d-topic*. (4b) is the exhaustive list of the true propositions from the set consisting of the propositions about *Fred* only.

As long as the sentence *s* provides an appropriate (true and exhaustive) answer to the narrowed *s-topic*, the utterance *s* can be regarded as an appropriate response, even though it does not provide an exhaustive answer for the original question. Once it is narrowed down into the *s-topic*, $[4c]^f$, it serves as the *d-topic* for $[4c]^o$ — the normal semantic value of (4c). Given that the *s-topic* is the CT, the above procedure is the constraining mechanism for a CT- marking as in (4c).

The accounts for English CT-marking obtained via structuring questions and sub-questions such as Büring (1994) and Roberts (1996) share the same feature that they are based on the perspective of information structure stemming ultimately from Carlson's (1983) dialogue game approach. And they are also the same in that they belong to what I call "discourse structure approach". This kind of approach certainly reveals some very important aspect related to CT, especially an aspect governed by a general pragmatic strategy employed for informative cooperative communication. And this line

---

2. The set of propositions, T (set of sets of worlds) is trivialized into a single set of worlds, $\bigcup T$.

of researches seems to correctly capture the DISCOURSE function of CT: Speaking from the perspective of a question-answer dialogue, CT functions to provide a partial answer to a given question, indicating that the sentence could serve as the answer to a sub-question which is a part of a super question. In addition, these works of Büring (1994, 1999a) and Roberts (1996) made an important contribution to the study of CT and serve as the great foundation for further development of formal semantic theories for CT not only in English but also in Korean and Japanese. However, I found these theories fail to capture some important sentential aspects of the meaning of CT and focus in general, which will be shown in the following section.

2.1.2 Distinction of A-B Pattern and B-A Pattern. As Büring (1998) himself points out about Roberts (1996), Büring (1994)'s formalism cannot capture the difference between the discourse structures for each version of the answers in (3B) and (3B'). In B?ring, there is no rule to predict or govern the distribution of the A-accented focus and the CT-focus in a sentence. Both versions of 'Fred ate the beans', given in (3B and 3B'), repeated here, have the same felicity condition, regardless of the choice of the A-accent and the B-accent.

(3) A: Who ate what?
    B: [Fred‾] ate [the beans\]
    B': [Fred\] ate [the beans‾].

Note that the felicity condition in (9) only concerns the relation between the super question and the focused sentence. (9a) requires the *topic and semantic value* to be the same as the super question, and the second condition determines the relation between the focused sentence and its *focus semantic value*. Thus, the immediate sub-question that the focused sentence directly answers is not included in Büring's condition (9).

This problem has something to do with the fact that this type of account does not concern the sentential characteristics of *topic* or *focus*, because the supposed information triggered by the focus or topic is derivable only via alternative propositions, which mark the sentence-external discourse structure only. As a matter of fact, as will be shown shortly, focus or CT has non-trivial sentence-internal functions that necessitate a particular structuring of the sentence. Such information cannot be captured by a discourse-structure approach like the Alternative semantics account or the language game theoretic approach. In this approach, therefore, two important points are not predicted: first, the difference between the discourse structure where (13B) occurs and that where (13B') occurs, and second, the sentential-meaning difference due to the different accent patterns, B-A vs. A-B. These will be discussed in detail in the next subsection.

The first problem was overcome in Büring (1999a,b) by establishing the *topic semantic value* as a set of sets of propositions, *i.e.*, a set of questions, and providing the following felicity condition:

(11) Question/Answer Condition
     The meaning of the question Q must match one element in the topic value of the answer A ($[Q]^o \in [A]^{ct}$)[3]

The *topic semantic value* of (3'c), which has now been called CT-value since Büring (1999a), is the following:

---

3. Since Büring (1999a), the topic semantic value marked by $[\ ]^t$ has been modified into contrastive topic semantic value or CT-value, marked by $[\ ]^{ct}$.

(12) $[3']^{ct} = \{\{x \text{ ate } y| \ y \in D\} \mid x \in D \}$
      $= \{\{\underline{\text{Fred ate the beans, Fred ate the potatoes}}\},$
      $\{\text{John ate the beans, John ate the potatoes}\}\}$

Observing the condition (11), the meaning of the previous question (3′b), 'what did Fred eat?', is contained in the CT-value of the answer (3′c), as indicated by the underlined part in (12). In the same way, in (13), the meaning of (3″b) of the answer (3″c) is contained in the CT-value of (3″c), which is the underlined set in (12).

(13) $[3''c]^{ct} = \{\{x \text{ ate } y| \ x \in D\}| \ y \in D\}\}$
      $= \{ \ \underline{\{\text{Fred ate the beans, John ate the beans}\}},$
        $\{\text{Fred ate the potatoes, John ate the potatoes}\}\}$

The difference between (3B) and (3B′) is captured by different CT-values, which indicates the difference between the discourse structures of the two patterns of the answer. Hence, we can predict in which context each version of the answers in (3B) and (3B′) can occur.

However, this version is still not enough to capture the difference caused by the different placement of the two types of focus (A-B vs. B-A). As Büring (1999b) himself noted in the section about 'implicit move', the question-answer pairs where the CT-marked sentence directly answers a super-question without the explicit sub-question are possible as in (3) and (3b′).

(3) a. Who ate what? – b. [FRED˜] ate [the BEANS\].

(3) a. Who ate what? – b′. [FRED \] ate [the BEANS ˜]

These question-answer pairs do not meet the condition in (11), but are still felicitous partial answers. The difference in meaning between the A-accent and the B-accent was originally captured via the felicity condition through the meaning of the immediate question and its answer. Hence, in the answer to a non-immediate question, the difference between the A-accent and the B-accent should be obliterated in Büring (1999a). Büring (1999b) suggests overcoming this problem by letting the system accommodate the implicit sub-question, applying the felicity condition to this accommodated immediate question and its answer and providing a general definition for the well-formedness for the discourse that allows this implicit question. However, accommodating a sub-question in such a case only for the purpose of making the answer meet the provided felicity condition is not economical.

Furthermore, there is a case where CT-marking can occur without a super question as well as a sub-question. For instance, a sentence like *the boys ate some vegetables*, occurring in a narration can play the same role as the multiple matching question as illustrated in the following:

(14) The boys ate some vegetables. [Fred˜] ate [the beans\]. And [John˜] ate [the [potatoes\].

Given that, the genuine contextual requirement cannot be said to be the presence of a matching question. But in Büring's system, the CT-marking occurring in the above context would need accommodation of the super-question as well as the sub-question. Such a system that involves redundancy would be considered less economical, and thus less desirable than any other system that could directly capture the meaning generated by the different types of focus without any redundant accommodation. A system that

could directly capture the formal difference between the A-focus and CT-focus should be preferred.

The next and foremost problem of these kinds of approaches lies in that they disregard the distinction between the sentence-internal functions of A-focus and CT-focus and the effect of these focal categories to the logical structure of the sentence where they occur. In the next section, let us see some examples that show a crucial sentence internal function of A-focus and CT.

2.2 Sentence-internal function of CT and Focus
2.2.1 Asymmetry between A-focus and CT. Consider (3), again.

(3) A: Who ate what?
    B: [Fred⁻] ate [the beans\]
    B': [Fred\] ate [the beans⁻].

There is one interpretation of the answer in (3B) which must be captured as the meaning of the B-accented focus. With the prosody specified in (3B), the person who ate the beans does not have to be only *Fred*, but the food that Fred ate should be *the beans* only.[4] In other words, the A-accented focus must have exhaustive reading with respect to the B-accented focus, but not vice versa. For instance, compare the following discourse (15).

(15) A: There were beans, corn and potatoes. What did the kids eat?
    B: [Fred⁻] ate [the beans\].①And [Bill⁻] ate [the corn\.] And [John⁻] ate [the beans\]②. And [Mike⁻] ate [the corn\].

"Korean" Fred-nun khong-ul   mekessko,
           CT beans ACC ate and
      Bill-un   oksusu-rul   mekessko,
           CT corns   ACC ate   and
      John-un   khong-ul   mekessko,
           CT beans ACC ate   and
      Mike-nun   oksusu-rul   mekesse.
           CT   corns ACC   ate

    B': a. [Fred⁻] ate [the beans\]①. And [Bill⁻] ate [the corn].
          #And [Fred⁻] ate [the potatoes\] ②

"Korean" Fred-nun   khong-ul   mekessko, ①
           CT   beans ACC ate   and
      Bill-un   oksusu-rul   mekessko,
           CT   corns ACC   ate   and
   # <u>Fred-nun oksusu-rul   mekessko,</u> ②.
           CT corns ACC ate   and

In (15B) and its Korean counterpart, even after one uttered that B-focused (*i.e.*, CT-marked) 'Fred ate the beans' in ①, one can felicitously add that someone else also ate the same thing as in ②. But in (15B'), it becomes very odd to try to add that Fred ate something else as in ②, when it has been already said that Fred ate the beans as in ①. However, if the accent types are switched, its acceptability vastly improves as in (16).

---

4. For further discussion on the exhaustivity of the A-accented focus, refer to footnote 6 and Wee (1999).

(16) [Fred\] ate [the beans⁻]. And [Bill\] ate [the corns⁻]. And [Fred\] ate [the pota-
   toes⁻].

The information of this asymmetric dependency between the A-focus and the B-focus
within the same sentence must be available directly from the sentence itself without
any consideration of the discourse structure. In other words, the semantic structure of
a sentence with a B-accent and an A-accent must reflect this property associated with
those two different types of accenting. But, in the Alternative Semantics framework, such
a distinction between the two cannot be represented in the sentential semantic structure.
In Buring's system, the CT-value ① in (15B') would be (12), repeated here.

(12) [3'c]ᶜᵗ= {{Fred ate the beans, Fred ate the potatoes},

   {John ate the beans, John ate the potatoes}}

And so would be the CT-value of ② in (15B'). And nothing predicts that an answer
like (15B') is bad, since both ① and ② can be considered to be felicitous if an implicit
immediate question, 'what did Fred eat?', is accommodated in Büring's system.

The difference between the function of CT and that of A-focus is determined only
by the relative order of packing or unpacking the set of (sets of) propositions in Büring ?
system. The inner set is the focus semantic value and the outer set is the CT-value. And
except for this (un)packing order, the A-focus and CT do not have anything different in
Büring's system.

However, as we just saw, the crucial difference between CT and A-focus is that all
the possible alternatives that could replace CT can actually be the eaters of some food,
but among all the possible alternatives as the things to be eaten, only the one associated
with the A-focus is the one actually eaten with respect to the chosen CT. For instance,
in (12') below, from the inner alternative set ①, the vegetable actually eaten is the A-
focused one only, say 'the beans' in this case, but from the outer alternative set ②, the
one who ate something can be not only the CT-focused 'Fred' but could be all the other
alternatives including 'John'.

(12') [3'c]ᶜᵗ= {{x ate y| y ∈D}①| x ∈ D}②
   = {{Fred ate the beans, Fred ate the potatoes}①,
   {John   ate   the   beans,   John   ate   the
   potatoes}}②

In other words, the A-focus excludes the other alternative food from consideration as
far as the given CT is concerned, whereas the CT-focused part still allows the other
alternatives to be considered as an eater of the particular food chosen by the A-focus. In
the Alternative Semantics, the exhaustivity of the A-focus with respect to B-focus would
avail itself by Büring's (1994) felicity condition in (9), because (9b) is assumed to require
that the appropriate answer must be the "exhaustive" true answer to the focus semantic
value of the sentence, that is, {Fred ate the beans, Fred ate the potatoes} in this case.
This is only a stipulation, however, and thus it does not provide any account of why the
answer must be the exhaustive list from the *focus semantic value* whereas it needs not
from the *topic semantic value*.

2.2.2 Multiple CTs in a sentence. Here is a further problem. Let us suppose a
multiple question with more than two wh-phrases. In Korean, it is possible to answer
with more than two CTs as in (17). And the same is true of English as illustrated in
(18).

(17) A: nwu - ka   nwuku-eke   mwue- 1   cuessni?
        Who-SUBJ   whom-DAT   what ACC gave -Q
     B: Mary-nun Fred-eke-nun   khong-ul   cuessko
            CT   DAT CT   bean ACC gave and
            John-eke-nun   kamja-lul   cuesse.
            DAT CT   potato ACC gave.
        (Sue-nun Fred-eke- nun kamja-lul   cuessko,
            CT   DAT CT   potato ACC gave and
            John-eke- nun khong-ul cuesse.)
            DAT CT beans -ACC gave

(18) A: Who gave what to whom?
     B: [MARY⁻]ₐ gave [FRED⁻]_b [the BEANS\]_c,
            and [JOHN⁻]_b [the POTATOES]_c.
        ([SUE⁻]ₐ gave [FRED ⁻]_b [the POTATOES\]_c,
            and [JOHN⁻]_b [the BEANS\]_c.)

Under Büring's (1999a) analysis, the answer in B would yield the following CT-value and focus semantic values:

(19) { {{x gave z to y| z ∈D}_c | y ∈D} | x∈D}
     ─────────────────────────────────b
     ─────────────────────────────────a

The CT-value generated by the first CT 'MARY⁻' in (18B), is the set represented by the a-labeled line in (19). This set is a set of sets of sets of propositions. In Büring's (1999a) definition, the difference between the A-accented focus and CT-focus lies in that the focus semantic value generated by the former is a set of propositions whereas the CT-value generated by the latter is a set of sets of propositions. But in the example at hand which contains two CTs, while one CT-value is a set of sets of propositions (generated by the CT 'FRED⁻'), the other CT-value, *i.e.*, what is introduced by the CT 'MARY⁻', must be a more complex type, a set of sets of sets of propositions. Even though it might be practically implausible considering the limited human cognitive capacity, even further complex layering of topic-focus structures (as an answer to a question with four wh-phrases) are possible in principle. Then, one should admit that CT-values vary depending on the number of CT-s occurring in a sentence, which sounds quite implausible.

This problematic case could also be saved if we modify the definition of the CT-value as a set of (sets of)* sets of propositions (where * indicates recursion), *i.e.*, a set of sets of sets of propositions, a set of sets of sets of sets of propositions, ... This would eventually mean that the inner most set is the *focus semantic value*, and all the outer layers of the sets are the *CT-value* for each occurrence of the CTs. In other words, the last-unpackable set is the *focus semantic value* and all the previously-unpackable sets are CT-values. Here again, however, we cannot capture the fundamental difference between the A-focus and CT-focus, that is, the exhaustivity of A-focus with respect to a particular CT and non-exhaustivity of CT-focus discussed above.

The difference observed so far between the sentential function of A-focus and that of CT-focus seems to be significantly related to the following idea. As mentioned in Jackendoff (1972), the value for CT functions as the 'independent variable', which strongly suggests a **functional** reading between the A-focus and the CT at the sentential level. Since CT serves as the independent variable and the A-focus serves as the dependent variable, the sentence is the function from the possible CT values as the input value to

the dependent A-focus value as the output value. This reading exactly matches the nature of a function: the output value with respect to a specific input value can be mapped from another input value, but not vise versa. The input value cannot be mapped to more than one output value for a function. So, the analysis of the relation between the CT and the A-focus must reflect this nature as a function.

But the formal difference between A-focus and CT-focus cannot be adequately captured in Büring's framework as well as in Roberts'. This indicates that the approaches which attempt to distinguish the A-focus and CT-focus via characterizing discourse structures in which they occur, i.e., via different structuring of propositional sets, are not enough for proper treatment of A-focus and CT-focus. In these frameworks, the formal difference between the A-accented focus and the CT-focus is defined in terms of the relative order of (un)packing the alternative sets. But we just saw the problems in this approach including the multiple CT constructions.

3. A-accented Focus

Now let us look at some problems in a case where the A-focus is the sole focus of a sentence. Specifically, we will discuss the drawback of the DSA (discourse structure approach) as an analysis of the A-accented focus, which was first presented by Krifka (1998) about the Alternative semantics approach. The Alternative Semantics approach sometimes allows infelicitous question-answer pair, i.e., an under-focused and an over-focused answer to given wh-questions.

3.1 Discourse Structure Approach: Generation of Wrong Alternatives
As seen in the previous section, in the Alternative Semantics account, an expression has focus semantic value, that is, a set of alternatives, in addition to their ordinary semantic meaning.

In this framework, congruent question-answer pairs (i) identify the meaning of the question, [Q], and the alternatives of the answer, $[A]^F$, assuming an additional contextual restriction for question meanings, RESTR. So in order to rule out incongruent question-answer pairs such as (20), each of the alternative sets, that of a question, [Q], and that of an answer, $[A]^F$, must have more than one element as its members. For meaning a, ALT(a) stands for the alternative set of a, which is a contextually relevant set of alternatives of the same type as a from the focus semantic value of a.

(20) A: Who read Ulysses?   [Q]={read(Ulysses)(x)|person(x), x∈ RESTR}=[1]
      B: *Mary read [ULYSSES]. $[A]^F$={read(x)(Mary)|x∈ALT(Ulysses)}. = [2]

The condition can be stated as in (21ii), with the identity condition of the question and the focus semantic value of the answer as in (21i).

(21) Criteria for congruent question-answer pairs Q-A.
      (i) [Q] = $[A]^F$
      (ii) #[Q] >1, (and $\#[A]^F$ > 1).

Without the condition (21ii), in the case where x∈RESTR={Mary} and x∈ALT(Ulysses) = {Ulysses}, that is, when the alternative set of the question and the answer contains only one element, i.e., [1]= [2] ={read(Ulysses)(Mary)}, (20A-B) could be incorrectly predicted to be congruent. Therefore, (21ii) as well as (21i) are necessary.

Equipped with the above conditions, however, this framework still allows some incongruent Q-A pairs. Krifka (1998) points out a problem of the Alternative Semantics account of focus with the following examples:

97

(22) a. A: What did Mary do with Ulysses?
$\{R(Ulysses)(Mary)|R \in \text{DIRECTED ACTIVITY}\}$
$=\{\mathbf{read(Ulysses)(Mary), bought(Ulysses)(Mary)}\}$
B: Mary [READ] Ulysses.
B': *Mary [read ULYSSES]: over-focused answer
$\{P(Mary)| P \in \text{ALT}(read(Ulysses))\}$
$=\{\mathbf{read(Ulysses)(Mary), bought(Ulysses)(Mary)}\}$
 b. A: What did Mary do?
$\{P(Mary)| P \in \text{DIRECTED ACTIVITY, } P \in \text{RESTR}\}$
$=\{\mathbf{read(Ulysses)(Mary), bought(Ulysses)(Mary)}\}$
B: Mary [read ULYSSES].
B': *Mary [READ] Ulysses: under-focused answer
$\{R(Ulysses)(Mary)| R \in \text{ALT}(read)\}$
$=\{\mathbf{read(Ulysses)(Mary), bought(Ulysses)(Mary)}\}$

These examples show that not only a congruent Q-A pair, *i.e.*, A-B pair in each, but also an incongruent pair, A-B' pair, could be allowed in the Alternative Semantics framework. In (22a), if the alternative set of the focused VP *read ULYSSES* is established as {read Ulysses, bought Ulysses} as in (22aB'), this over-focused answer could be wrongly allowed as a congruent answer. Likewise, if the restricted alternative set of the property of Mary for the question (22bA) is set up as {read Ulysses, bought Ulysses}, an under-focused answer as in (22bB') can be accepted as an answer to the given question. Even if each of the A-B' pairs in (4a,b) is a wrong answer to the given question, they satisfy the conditions in (21i-ii) and should be accepted as congruent answers in this framework. This is because the Alternative Semantics approach technically allows the alternative set consisting of {*Mary read Ulysses, Mary bought Ulysses*} to be generated as the restricted focus semantic value of the sentence with the VP focus as in *Mary [read ULYSSES]$_F$*.

As diagnosed by Krifka, the reason for this possibility of allowing wrong alternatives is that the Alternative Semantics account cannot look into the way the question and the meaning of the answer are composed and compare parts of these meanings. This again suggests that the sentence internal structure must be available for a proper analysis of focus.

Furthermore, the internal structure that is varied depending on the placement of focus can even affect the logical structure of the sentence. As a supportive argument for this, we will see that the logical structure of a sentence can vary depending on the placement of focus.

3.2 Logical Structure Induced by a Focus
A Prague linguist Peregrin (1995) argued for the importance of logical restructuring of a sentence determined by what the Prague linguists call *topic focus* articulation (TFA). Peregrin objects to the idea that the difference between various TFAs can be considered as a matter of felicity conditions rather than of truth conditions in the strict sense. He argues for the opposite by taking into account sentences with two quantifiers as in (23):

(23) Every man loves a woman.

The difference between the two TFAs of this sentence, as shown in (24), leads us to not only the different felicity condition but to quite different propositions.

(24) a. Every man loves [a WOMAN]$_F$.
     b. [EVERY MAN]$_F$ loves a woman.

If we assume the lambda abstraction as a representational devise of TFA[5] and adhere to the Montagovian treatment of quantified noun phrases, (24a,b) can be represented as in (25a,b), which are further reduced to (25c,d).

(25) a. $\lambda Q.\ \exists y.\ (\text{woman}(y) \wedge Q(y))(\lambda y.\ \forall x.(\text{man}(x) \rightarrow \text{love}(x,y)))$

     b. $\lambda Q.\ \forall x\ (\text{man}(x) \rightarrow Q(x))(\lambda x.\ \exists y.(\text{woman}(y) \wedge \text{love}\ (x,y)))$

     c. $\exists y(\text{woman}(y) \wedge \forall x(\text{man}(x) \rightarrow \text{love}\ (x,y))$

     d. $\forall x\ (\text{man}(x) \rightarrow \exists y\ (\text{woman}(y) \wedge \text{love}\ (x,y))$

This implies that TFA is not just a matter of felicity conditions, it is something that results in different orders and hence different scopes of quantifiers. Thus, (24a) and (24b) have different truth values in the case when every man will have a loved woman of his own, but there will be no single woman that would be loved by every man. It thus amounts to meaning that the TFA affects the logical structure of the sentence, which yields truth-conditional difference in turn.

Peregrin claims that this truth functional difference is due to the fact that the semantic subject-predicate pattern is non-isomorphic to the surface syntactic pattern, and TFA restructures the semantic pattern. For instance, for the simple sentence 'John walks', while the syntactic subject-predicate pattern is unequivocal (John being the subject and walks being the predicate), the TFA (topic-focus articulation) modifies the semantic subject-predicate pattern. In case where the subject is focused as 'JOHN walks', the semantic interpretation is not the property of walking assigned to the individual John, but rather the property of being John assigned to an anonymous walker.

Now, we have reached the main goal of this paper, that is, to show the importance of the availability of the sentence-internal logical structure for a proper theory of focus supporting the SSA over the DSA to focus. In the remaining space, I will provide a brief sketch of an alternative analysis developed in Wee (1999) and Wee (2001) to overcome the problems of the DSA. I will not provide any rigorous attempt to justify its validity for the interest of the space here.

4. Sketch of the analysis of focus and contrastive topic

4.1 A-accented focus

The above discussion on the DSA leads us to the conclusion that a focus enforces reformulation of the semantic structure of a sentence, as shown by Peregrin as well. Based on that, I proposed an analysis for A-accented focus in Wee (1999). The gist of the idea is very briefly summarized as follows:

A sentence with the sole A-focus is divided into the presupposition part and the assertion part. While the assertion is expressed by the accented part, the presupposition is expressed by the deaccented (flat intonation) part. I proposed that the *presupposed* information triggered by A-focus is semantically the same as the definite description with

---

5. Peregrin initially uses λ-abstraction to show the importance of the TFA's contribution to the truth condition of the sentence, even though he objects against the idea of using the (-abstraction as a means of analyzing focus since this λ-abstraction converges to the normal expression 'John walks': $\lambda f.f(John)(walk)$ converges to *walk(John)*. So, later he defines a special formula as the semantics of TFA articulation incorporating the basic idea of topic, *i.e.*, what really makes a sentence into a predication is the fact that one of its parts is "about" the other part. The semantic subject is what the sentence is about, and the predicate is what it says about the subject. According to him, this 'about' means that the subject is taken for granted for the whole sentence, its existence is not being disputed. This is to say that the semantic subject is connected with a presupposition. Here I just adopt his first usage of λ- abstraction for the simplicity of the discussion.

the descriptive content expressed by the deaccented part. This proposal is based on the observation that an A-accented narrow focus can occur only when a proper licensing antecedent referent is provided. This fact suggests that the focused referent must pick an old referent, as a definite anaphora does. And then I proposed that the *assertion* is the identity statement of the presupposed definite description and the referent denoted by the focused expression. For instance in (26) below, the flat intonation part or the deaccented part of a sentence (marked by the shadowed area) is analyzed as the presupposition, which has the same interpretation as the definite description with the descriptive content expressed by this deaccented part (focus frame), which is the property of 'having stolen the cookies from the cookie jar'. And the accented part is analyzed as constituting the identity predication of the presupposed referent with the accented referent.

(26) a. [JOHN]$_F$ stole the cookies from the cookie jar.

b. The agent who stole the cookies from the cookie-jar (in a relevant event) is John.

This analysis thus ends up with suggesting that the two sentences, one with an A-focus, that is, the focused constituent plus the focus frame in (26a), and the other with a definite description and the identity predication in (26b), are semantically equivalent. The *semantic subject-predicate* structure—in the sense of Peregrin discussed above— encoded by the prosodic focus in (26a) is encoded by the syntactic structure in (26b). The *(semantic) subject* part is the shaded area and the *predicate* part is the underlined area in both (26a) and (26b). The *semantic subject* part corresponds to the *presupposed* content, and the *semantic predicate* part constitutes the underlined *asserted* content.

This analysis has the following advantages over other previous theories of focus. First, the sentence internal structure determined by a focus is available and accordingly this proposal is free from the problems of DSA enumerated above. Second, the *exhaustive* interpretation associated with a focused sentence as in (26a) is accounted for by treating exhaustive interpretation of focus frame on a par with *uniqueness* interpretation of definite anaphora.[6] Third, it can capture the correct anaphoric relation of the focus frame and the antecedent that licenses the focused sentence. Fourth, it does not need a focus-particular theory, and can be accounted for by independently existing semantic theories, *i.e.*, a theory of definite description and a theory of presupposition, etc. Accordingly, it provides a low-cost economical analysis of focus, because it does not need any

---

6. The issue of exhaustivity of focus is controversial and many researchers object against it while there are also many proponents. Wee(1999) argues that exhaustivity is conveyed by this A-accented focus and that just like the uniqueness of definite expression is relativized with respect to an event variable in several previous researches, the exhaustivity of focus is also sensitive to an event variable. So dialogue (1) does not pose any problem to my exhaustivity assumption.

(1) A: Who left?
     B: [MARY OR JOHN]F left.

(1B) would mean that the unique assignment function is identical i) to the assignment function for Mary or ii) to the assignment function for John. So in either case, that is, whether the unique assignment function is identified with that for Mary or with that for John, the exhaustive list of the leavers is provided. The exhaustivity of A-focus here is therefore somewhat different from that of Groenendijk and Stokhoff (1991). Their exhaustivity is asserted in the same way as that conveyed by a word like 'only' or 'nothing but'. But the exhaustivity proposed in my analysis starts as the presupposition of a definite description's uniqueness interpretation and is preserved in the asserted identification of this presupposed referent and the focused referent. That is, the exhaustivity is presupposed and retained. But G&S's exhaustivity is an asserted information. So when the exhaustivity is not satisfied in their analysis, the sentence is false, but in my analysis just infelicity is caused.

focus-specific semantic device.

4.2 Interpretation of Contrastive Topic

Consider the discussion on the necessity of semantic restructuring of a sentence determined by the placement of an A-focus claimed by Peregrin (1995). We also need a semantic restructuring mechanism that reflects the function of B-focus, which may differ from the surface syntactic structure. The following is a brief sketch of my proposal of what exactly this semantic restructuring should be like.

4.2.1 Logical structure. A way to logically capture the observed asymmetric property of the B-accent and the A-accent with respect to the exhaustivity, discussed in 2.2.1, is to represent the sentence as an *if-then* implicational structure, encoding the CT in the *antecedent* clause and the A-focus in the *consequent* clause, provided that a proper decomposition of the presupposition from the non-presupposed part of a sentence with a CT is achieved. The implicational logical structure of a CT-marked sentence proposed here reflects one of the three main aspects of the meaning of CT, *i.e.*, i) the sentential *logical* properties, ii) the *discourse* properties, *e.g.*, the presupposed information, and iii) the *pragmatic* inference, *e.g.*, contrastive interpretation. These three aspects interact to trigger the interpretation associated with CT. We will discuss the first two aspects only and will not consider the pragmatic aspect in this paper.[7] Especially, we will concentrate on the discourse properties and its interaction with the logical structure of CT.

The idea that topic marking requires an implicational logical structure has existed for a long time especially for the topic maker *nun* in Korean and *wa* in Japanese, *e.g.*, Kuroda (1972). My position is somewhat different from the previous ones in detail, however. First, note that CT is also a kind of focus, which we defined as a constituent associated with a phonetic accent. Given that, it naturally follows that CT should share the essentially same function as the A-accented focus, that is, the function of identificational predication of a definite description with the focused referent. Second, recall that A-focus has the presupposition as a definite anaphora. CT shares this property with the A-focus, too.

For confirmation of the above features as the properties of CT, in the next subsection, let us carefully consider a possible context where a sentence with a CT can occur, so that we can properly separate the presupposition from the non-presupposed information in a given sentence.

4.2.2 Discourse Properties.

4.2.2.1. Anaphoricity of CT. One important point to be noted regarding the discourse properties of CT is that in a natural language environment, we do not need physical presence of sub-questions to license a CT, and in some cases even a matching question, or the super question, is not necessarily required, as already pointed out. Considering these facts, the minimal contextual requirement for CT-marking can be viewed as the existential statement based on which a matching relation among the involved participants can be specified. This suggests that CTs are anaphoric to some antecedents provided in the context, either from a question or from an existential statement. So it is confirmed that CT is the same as the A-accented focus in the sense that it also has the anaphoricity property. For instance, in (27a), the definiteness of each of the B-focus and the A-focus can be interpreted as *the kisser* and *the one who is kissed*, respectively, and the main

---

7. Regarding the pragmatic property, I would refer the readers to Wee (2001).

update is to identify each definite description with the focused individual, one with the B-accent, *i.e.*, as a CT, and the other with the A-accent.

(27) At the party, some girls kissed some boys. Specifically, (a) [Mary⁻] kissed [John\].
And [Sue⁻] kissed [Bill\],...

Now, consider my proposal that the functional reading between the B-focus and the A-focus can be encoded by an implicational logical structure, with the identification by B-accenting in the antecedent clause and that by A-accenting in the consequent clause. Also consider the anaphoricity of CT, discussed above. Considering these, sentence (11c) could be roughly paraphrased as in (13), given that the function of the focus is to identify a definite description with the focused constituent, as outlined above:

(28) If *the agent of the kissing event is* Mary, *its patient* is John.[8]

The *if-then* structure in (28), as a paraphrase of (27a), captures the gist of the dependency of the A-focus to the CT-focus with respect to the exhaustivity. We now can more specifically characterize the content of the presupposition triggered by the pair of a B-accent and an A-accent. As illustrated by (28), the agent, *the kisser*, and the patient, *the one who is kissed*, are definite NPs as the agent and the patient of the relevant kissing event, respectively, and definite descriptions trigger existential presuppositions. Thus, the presupposition of this sentence is the existence of the two referents with the property of *being a kisser* and the property of *being kissed*. This yields the following provisional presupposition and assertion partition of the sentence under consideration:

(29) Presupposition and assertion of (27a) (to be revised)
    a. Presupposition: $\exists xy$ [x kissed y (x and y are unique in terms of the property of *being a kisser* and *being kissed*, respectively) &
    b. Assertion: [x = Mary] $\rightarrow$ [y = John]][9]

Introducing the event variable to the above formula, following the same spirit as Herberger's (1998) davidsonian account of focus, (29) would be restated as (29′):

(29′) Presupposition and assertion of (27a) (to be revised)

    a. Presupposition: $\exists e1 \ \exists xy$ [C(e1) & past (e1) & kiss (e1) & agent(e1, x) & patient(e1, y) (x and y are unique in terms of the property of *being the agent of e1* and *the patient of e1*, respectively) &
    b. Assertion:[x= Mary] $\rightarrow$ [y = John]]

The presupposed information, which is treated as a kind of anaphora, will be bound to some previously occurred information in the discourse, which can be easily implemented into a dynamic framework like extended DRT (Van der Sandt 1992).

    One remaining problem, however, is that the presupposition proposed here is not enough to capture the *partiality* of CT. Let us move on to this issue next.

---

8. This reading does not capture the partiality of CT, and we will get back to this issue shortly.
9. The existential quantifiers are introduced provisionally for the static representation. These semi formal representations are provided only for the purposes of showing the separation of the presupposed part from the non-presupposition part of the sentence. The event variable *e* in (29′) and the other individual variables *x* and *y* can be treated dynamically as discourse referents in a dynamic framework like DRT or extended DRT.

4.2.2.2 Partiality of Contrastive Topic. Recall that a sentence with a pair consisting of a CT and an A-accented phrase can be viewed as a **function** from the possible CT values as the input value to the dependent A-focus value as the output value. Note that one pair consisting of a CT-marked phrase and an A-accented phrase should be a *partial* specification of a function, since the function must be specified as multiple pairs. Otherwise, the function would become trivial, as noted in Krifka (1998). To signal this *partiality* of CT, the CT-marking must indicate that it presupposes the existence of *multiple* pairs. In other words, we should acknowledge that one of the main functions of CT is to split the presupposed event into multiple sub-events and determine the size of the relevant sub-event by the specification of the CT value. To accommodate this partiality as well as its anaphoricity, the presupposition and assertion partition proposed in (29′) is revised into (29″).

(29″) Presupposition and assertion of (27a)

a. **Presupposition:** $\exists e1\ \exists a1p1$ [C(e1) & past (e1) & kiss (e1) & the agent(e1, a1) & the patient(e1, p1) (a1 and p1 are unique in terms of the property of *being the agent of e1* and *the patient of e1*, respectively).

b. **Assertion:** $\exists e\ \exists ap$ [e<e1 & a<a1 & the agent (e,a) & the patient (e,p) & [a= Mary] → [p = John]]

What we get from the above partition is the following information: The underlined sentence (27a) occurring in the given context **presupposes** that there is a past kissing event *e1* with its agent *a1* and its patient *p1*, and **asserts** that in an event *e*, such that $e<e1$, with the event *e*'s agent *a* such that $a<a1$, and with *e*'s patient *p*, if *a* is 'Mary', then *p* is 'John'. In (27a), the pitch accents associated with *Mary* and *John*, regardless of the type of the associated prosody, indicate that the unfocused part, or the focus frame, had occurred. That is, the presupposed event, that is, *someone kissed some other(s)*, occurred. By triggering such a presupposition on the one hand and asserting identificational predication on the other hand, CT performs a general function of a focus.

Now, we can see that the functions of B-accent or CT are i) to split the sentence structure into *if-then* implicational semantic structure and ii) to partition the presupposed event into a sub event whose size is determined by the CT-marked value, which is itself in *proper part-of* relation to the value of the relevant semantic role of the big event, and iii) to have the identificational predication function take place in the antecedent clause of the implicational structure. The first one is the function of CT as a topic, the second one is its function as a *CONTRASTIVE topic*, and the third one is its function as a *focus*. The conditions about the size of the sub-event and that of the CT-marked semantic role, i.e., $e<e1$ and $a<a1$, require that the CT-marked member must be in *proper part-of* relation to the presupposed relevant semantic role of the big event, along with the requirement that the sub-event must be in *proper part-of* relation to the presupposed big event. In other words, the CT-marked member must be smaller than the maximal list of the domain of the big event *e1*. So one of the functions of CT is to signal that there are other members remaining in the domain that are NOT picked by the current CT-marked value. These conditions therefore can capture the *partiality* property of CT.

4.2.3 Summary . In the proposed analysis, CT is a kind of focus itself, and focus functions to identify the presupposed referent with the accented referent regardless of whether it is the A-accent or the B-accent. In the A-focus in (26) above, the A-focused constituent functions to identify the unknown referent who stole the cookies from the cookie-jar with the referent of 'John'. Likewise, the CT-focus, in (27), identifies the anonymous referent who kissed somebody with the referent of 'Mary', while the A-focus

identifies the unknown referent whom Mary kissed with 'John' in the same event.

This analysis can capture not only the function of CT as a kind of focus itself but also its function to provide a partial answer. As seen in (29″), the CT phrase is analyzed as functioning to identify a presupposed referent with the B-accented referent as the agent of each sub-event e of the whole kissing event $e1$. Each of the CT-marked phrases, as the agent of the sub-event e, is anaphorically bound to a part of the previous occurrence of "the girls" which is the agent of the whole event $e1$, and the agent of the whole event $e1$ licenses the occurrence of each CT-marked phrase.

The implicational logical structure accounts for the infelicity of [2] in the discourse (15B′) repeated here.

(15)   B: [⁻Fred] ate [the beans\][1]. And [⁻Bill] ate [the corns].
          #And [⁻Fred] ate [the potatoes\] [2]

Discourse (15) has the interpretation in (15′), according to the analysis in (29″).

(15′)   There is an event $e1$ of some boys' eating some foods.
       In a sub event e such that $e < e1$,
       (i) the agent of e is Fred → the theme of e is the beans, and
       (ii) the agent of e is Bill → the theme of e is the corns and
       (iii) the agent of e is Fred → then the theme of e is the potatoes [10]...

The CT-marked agent in (i) is specified as *Fred*, while the theme is *the beans*. This implicational structure given in (i) entails that if the theme is something other than *the beans*, the agent should not be *Fred*, because proposition (i), *i.e.*, '*if the agent is Fred, then the theme is 'the beans'* logically guarantees '*if the theme is not 'the beans'*, then the agent is not Fred'. Therefore, when (i) is true, if the patient of e is other than *the beans*, then the agent of e cannot be *Fred*. But in (iii), while the theme is identified with something other than *the beans*, the agent is identified with *Fred*, which is a logical contradiction to (i). This yields the infelicity of discourse (15B).[11]

5. Conclusions

This paper showed that the discourse structure approach to focus including Alternative Semantics approach, which is the most prevalent theory of focus, and other semantic/pragmatic theories of focus which are based on the concept from the language game theory are not adequate enough for properly capturing the function of focus and contrastive topic. We saw that such theories eventually result in missing some significant sentence-internal function of focus and contrastive topic. Instead, this paper supports a type of analysis that I call "sentence structure approach" to focus where focus and topic determine the *semantic* structure non-isomorphic to the *syntactic* structure.

---

10. As specified in (29″), the agent of sub event e is smaller than the agent of the presupposed big event $e1$, encoding the partiality of CT.

11. As an anonymous reviewer pointed out, all the *if*-clauses here should be always true, and thus the *if*-clauses here are trivial. For this problem, one may consider the *if*-clause as a *when*-clause. In the semantics tradition, *if*-clause and *when*-clause are viewed as conveying the same truth conditions. The only difference between *if*-clause and *when*-clause is that the former is hypothetical and the latter is real. So in our analysis of CT in this paper, *when* might be more suitable to incorporate the event splitting idea, because each sub-event specified by a CT is a real event rather than a hypothetical one. With *when*-clause, the asymmetry of the antecedent clause and the main clause is still valid. So I will leave this option as one good possibility.

And a brief sketch of a comprehensive analysis of both A-accented focus and the B-accented focus or CT is provided. The commonality of CT and the A-accented focus is the following: (I) B-accented focus, CT, shares essentially the same function as the A-accented focus in the following sense: CT, which is also a focus, has the function of identificational predication of a definite description with the focused referent, just like the A-accented focus does. (II) CT is also anaphorically bound to a presupposed antecedent just like the A-accented focus. The differences between them are: (I) the B-accented focus must be interpreted as occurring in the antecedent clause of an implicational logical structure as the input value of a function, whereas the A-accented focus, in the consequent clause as the output value of the function, and (II) the B-accented focus is only partially bound to the antecedent.

References

Bolinger, Dwight L. 1961. Contrastive Accent and Contrastive Stress. *Language*, 37:87-96.

Büring, Daniel. 1994. Topic. In Bosche and van der Sandt (eds.), editors, *IBM Working Papers of the Institute for Logic and Linguistics* 2, pages 271-80.

‗‗‗‗‗. 1999a. Topic. In Bosche and van der Sandt (eds.) editors, *Linguistic, Cognitive, and Computational Perspectives*, pages 142-165.

‗‗‗‗‗. 1999b. On D-Trees, Beans, and B-accents. ms. UCSC.

Carlson, Lauri. 1983. *Dialogue Games: An approach to Discourse Analysis*. Reidel, Dordrecht.

Erteschick-Shir N. 1997. *The Dynamics of Focus Structure*. Cambridge University Press, Cambridge.

Groenendijk, J & M. Stokhof. 1991. Dynamic Predicate Logic. *Linguistics and Philosophy*, 14:39-100.

Herburger, Elena. 1998. Presupposition vs. Assertion: A Davidsonian Account. In E. Benedicto, M. Romero and S. Tomiok (eds.), editors, *Proceedings of Workshop on Focus*. GLSA, Amherst.

Jackendoff, Ray. 1972. *Semantics Interpretation in Generative Grammar*. MIT Press, Cambridge.

Krifka, Manfred. 1991. *A Compositional Semantics for Multiple Focus Constructions, SALT* 1:127-158.

‗‗‗‗‗. 1998. For a Structured Account of Questions and Answers. Presented at Sinn and Bedeutung 98.

Lambrecht, Knud. 1994. *Informationa Structure and Sentence Form*. University Press, Cambridge.

Lee, Chungmin. 1998. Contrastive Topic: A Locus of Interface -Evidence from Korean and English. In K. Turner et al, *The Semantics/Pragmatics Interface from Different Points of View (CriSP 1)*. Elsevier Science, Amsterdam.

Peregrin, J. 1995. Topic and Focus in a Formal Framework. In B. Partee and P. Sgall (eds.) eitors, *Discourse and Meaning: Papers in Honor of Eva Hajicova*. John Benjamin, Amsterdam.

Pierrehumbert, Janet. B. 1980. *The Phonology and Phonetics of English Intonation*. Doctoral Dissertation, MIT.

Roberts, Craige. 1996. Information Structure in Discourse: Towards an Integrated Formal Theory of Pragmatics. ms. Ohio State University.

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

‗‗‗‗‗. 1992. A Theory of Focus Interpretation. *Natural Language Semantics* 1:75-116.

‗‗‗‗‗. 1996. Focus. *The Handbook of Contemporary Semantic Theory*, In Shalom Lappin (ed.) editor, Blackwell, Oxford, pages 271-98.

‗‗‗‗‗. 1992. Presupposition Projection As Anaphora Resolution. *Journal of Semantics* 9: 333-377.

Steedman, Mark. 1991. Structure and Intonation. *Language* 67: 260-296.

Vallduví Enrich and Maria Vilkuna.1998 On Rheme and Kontrast. In P. Culicover and L. McNally (eds), editors. *The Limits of Syntax: Syntax and Semantics* vol.29. Academic Press, New York.

Von Fintel, kai. 1994. *Restrictions on Quantifier Domains*. Doctoral Disseertation, University of Massachusetts dissertation.

Von Stechow. 1991. Current Issues in the Theory of Focus. In A. Stechow and D. Wunderlich (eds.), editors, *Semantik/Semantics: An International Handbook of Contemporary Research*. de Gruyter, Berlin, pages 804-23.

Wee, Hae-Kyung. 1998. Semantics and Pragmatics of Contrastive Topic in Korean and English, In A Akasuka, H.Hoji, S. Sohn, and S. Strauss (eds.) editors, *Proceedings on the Seventh Conference on Japanese/Korean Linguistics*, CSLI.

_____. 1999. *Definite Focus*. Doctoral Dissertation, University of Groningen.

_____. 2001. *Topic and Focus: Sentential Logic, Discourse, and Pragmatics*. Doctoral Dissertation, Indiana University.