

The English Negative not as a Modifier

Shinsho Miyara

University of the Ryukyus

1. Introduction

In this paper, it is claimed that the English negative not is a modifier within the framework of a categorial grammar. This view of not as a modifier is not entirely new; in fact, Lee (1985) suggested a similar analysis for prenominal negation, but did not develop the same analysis for preverbal or other types of negation. In section 2, the category of modifiers is defined and an outline of not as a modifier is presented. In section 3, the syntactic basis of preverbal not is discussed. In section 4, the present analysis of prenominal not is compared with a recent study of prenominal negation. In section 5, the semantics of not as a modifier is examined by dealing with scopal interactions between the negation operator and quantifiers. In section 6, the result of discussion in the preceding sections is summarized. Throughout the paper, the semantics of tense is disregarded since it does not seem to seriously affect the present discussion.

2. Syntactic Categories of not

In this section, I will propose the categorial status of the English negative not within the framework of a categorial grammar.

In general, any modifier restricts the meaning of an expression of a certain category, and its addition to the category does not create any new syntactic category for the whole expression. The term modifier is, thus, defined here as a category of X/X , i.e. a category taking an expression of category X to form a larger expression of the same category X , where X is a phrasal category. At the outset of this argument, I propose that the negative not in English should be a modifier. When not is taken as a modifier in the sense above, it may have the following categories:

- (1) a. $\text{not}_{NP/NP}$ (e.g. [NP_{not} [NP_a sound]])
b. $\text{not}_{PP/PP}$ (e.g. [PP_{not} [PP without reason]])
c. $\text{not}_{VP/VP}$ (e.g. [VP_{not} [VP leave]])
d. $\text{not}_{VP/VP}$ (e.g. [VP_{not} [VP to leave]])
e. $\text{not}_{S/S}$ (e.g. [S_{not} [S that Bill likes pizza]])

- (2) a. not_{AP/AP} (e.g. [_{AP}not [_{AP}(extremely) uninteresting]])
 b. not_{ADVP/ADVP} (e.g. [_{ADVP}not [_{ADVP}(very) long age]])

As in the above, most syntactic categories permit the presence of the negative not in preceding positions, whether as in 2 they are modifier categories in themselves or not.

Modifier categories in 1-2 should be sharply distinguished from no occurring in the so-called 'specifier' position. These specifiers co-occur with lexical categories, as in:

- (3) a. no_{NP/N} (e.g. [_{NP}no [_Nanswer]])
 b. no_{AP/A} (e.g. [_{AP}no [_Agood]])

In 1 and 2, not indicates various categories as modifiers. In 2, AP and ADVP are modifiers in themselves and will be represented as NP/N and VP/VP or S/S, respectively. Previously, all the translations of these not's uniformly express a propositional negation, i.e. the domain of negation is a proposition, in spite of the fact that the logical types of negative modifiers in 1-2 are all different. For example, not in 1a and not in 1c will be translated as $\lambda P \lambda P \neg [P \{yP\{y\}}]$ (cf. Lee (1985:187)) and $\lambda P \lambda y \neg [P\{y\}]$ respectively, where P is a variable ranging over properties of properties and P a variable over properties and y a variable over individuals. That is, in the above translations the negation operator \neg is expressed as a function having as its domain a proposition, i.e. $P\{yP\{y\}}$ or $P\{y\}$.

The fact that the English negative not manifests various categories is not necessarily peculiar from the standpoint of relationships among lexical items of the same phonetic forms. The adverb happily can be used as a manner adverb or a sentence adverb. It is well known that the difference is in the scope of adverbial modification; VP in 4a and S in 4b.

- (4) a. Ben would happily take care of his wife's parents.
 b. Happily, Jane escaped the accident.

As was suggested in Thomason and Stalnaker (1973), Ikeya (1977), among others, in 4a the property of being in a happy state of taking care of his wife's parents, expressed by the VP, is given to the subject Ben at the time of the application of the VP-meaning to the subject NP. In 4b, happily of category S/S has nothing to do with the subject Jane, but expresses the speaker's state of being happy that Jane escaped the accident.

The verb believe of non-modifier category can either have VP/S, one having a complement sentence in the object position (as in 5a), or (VP/NP)/VP (i.e. TVP/VP), one having an NP object and an infinitival clause (as in 5b).

- (5) a. Mary believes that Bill is intelligent.
 b. Mary believes Bill to be intelligent.

The two homophonous verbs of distinct categories would be related by a meaning postulate suggested in Thomason (1976), or by

a lexical rule in Dowty (1978).

$$(6) \quad \Box \forall x \forall P \forall \mathcal{P} [\text{believe}_{VP/S} ' \wedge (\mathcal{P}(P)) (x) \leftrightarrow \text{believe}_{TVP/VP} ' (P) (\mathcal{P}) (x)]$$

$$(7) \quad \text{believe}_{TVP/VP} ' = \lambda P \lambda \mathcal{P} \text{believe}_{VP/S} ' \wedge (\mathcal{P}(P))$$

Different from the non-modifier categories in 5, a difference in the scope of modification induces a difference in meaning, as shown in 4. We should not make use of such formal means as meaning postulates and lexical rules with regard to the relationship between the two homophonous adverbs in 4. In this respect, modifiers, like adverbs and negatives, are different from verbs.

3. Preverbal not

In the present analysis, as in 1c, the preverbal not can be of category VP/VP as a modifier. In some previous analyses, not is treated as a pre-S element (cf. Jackendoff (1969)) or a part of AUX (cf. Ladusaw (1979)). In English, both sentence adverbs and auxiliaries can occur immediately before verbs too. In this section, I will further examine the categorial status of not in comparison with sentence adverbs, or auxiliaries in preverbal position.

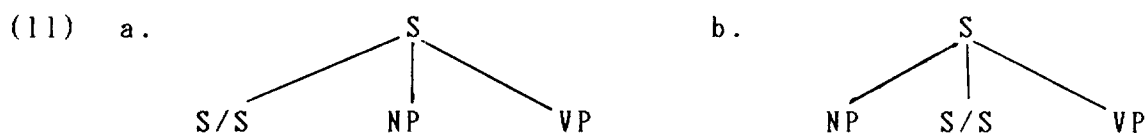
Typically, as in 8-10, sentence adverbs appear in the three syntactic positions; i.e. in sentence-initial position, in preverbal position, and in sentence-final position.

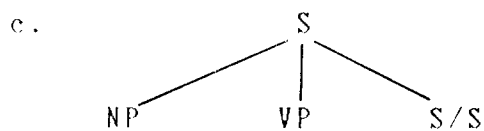
- (8) a. Certainly Bill will find the way out.
 b. Bill will certainly find the way out.
 c. Bill will find the way out certainly.

- (9) a. Foolishly Mary invited Alan's mother.
 b. Mary foolishly invited Alan's mother.
 c. Mary invited Alan's mother foolishly.

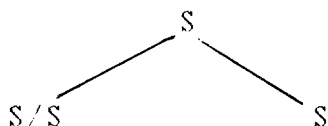
- (10) a. Frequently John came here.
 b. John frequently came here.
 c. John came here frequently.

Since sentence adverbs are characterized as S/S (i.e. the category that modifies an S-expression), the direct representation of the above three possible syntactic positions becomes possible by trinary branching trees in 11. The binary branching trees in 12 cannot directly represent these three syntactic positions, but only two syntactic positions, i.e. sentence-initial position and sentence-final position.

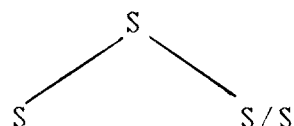




(12) a.



b.



The argument of the distribution of sentence adverbs in 11-12 is reinforced by the natural assumption that only sisters can be permuted. That is, in 8-10 sentence adverbs, the subject NP, and the VP are reordered and, thus, they should be sisters as shown in 11. If the word order in 13a below is the basic one, permutation takes place within parentheses in 13b-c and there is seen a word order change between not and certainly in 13d. The grammaticality of 13c shows that the sentence adverb certainly and the auxiliary will can be reordered. And the ungrammaticality of 13b and 13d shows that neither of them can be permuted with the negative not. If the above assumption of permutability is further applied to the fact of 13, the sentence adverb certainly and the auxiliary will should be sisters, but they show no sisterhood to not.

- (13) a. Bill certainly will not find the way out.
 b. *Bill certainly (not will) find the way out.
 c. Bill (will certainly) not find the way out.
 d. *Bill will not certainly find the way out.

The reason why 13d is ungrammatical could be that sentence adverbs have wider scope than not, because in general whatever comes to the left is wider in scope. It appears that this prediction is borne out when we see that only 14a is an adequate paraphrase.

(14) Bill fortunately didn't go.

- a. It is fortunate that Bill didn't go.
 b. *It is not the case that Bill fortunately went.

On the other hand, when, as in 15 and 16, sentence adverbs and auxiliaries of the same categorial definition, S/S, are juxtaposed, either one is wider than the other.

(15) Peter will certainly win.

- a. It is predicted that it is certain that Peter should win.
 b. ?It is certain that it is predicted that Peter should win.

(16) Peter certainly will win.

- a. It is certain that it is predicted that Peter should win.
 b. ?It is predicted that it is certain that Peter should win.

From the fact of 13-16, it is suggested that the scope of not is narrower than that of a sentence adverb when they are juxtaposed, and that the categorial definition of not should be different from that of sentence adverb or auxiliary.

To discover what the categorial definition of not should be, let us first consider the syntactic property of so. It replaces the repeated VP-expression, get excited, in 17 only when the VP does not contain the negative not, whereas in 17c neither replaces the whole expression of the repeated VP with the preceding not.

- (17) a. The player got excited. So did the spectators.
b. The player got excited. *So did the spectators get excited.
c. The player didn't get excited. {Neither, *so} did the spectators.
d. The player didn't get excited. *Neither did the spectators get excited.

In 17, neither so nor neither replace regular verbs but VP-expressions. When not is contained as a modifier in a VP, it becomes possible to make a generalization that in 17c, neither functions as a pro-form of a VP containing not and in 17a, so functions as a pro-form of 'affirmative' VP.

There is another usage of so which behaves like a VP-modifier, represented as VP/VP: in 18b, it has the function of emphasizing the affirmative aspect of a VP-expression. The syntactic distributions of not in 18a and so in 18b are mutually exclusive, so they both may belong to the same syntactic class.

- (18) a. Mary did not tell the truth.
b. Mary did so tell the truth.
c. Mary told the truth, but Jane didn't.

Even if not is contained as a modifier in a VP, 18c still can be a case of VP-deletion where an internal VP is ellipsized.

Both not and so appear in the position of some adverbs to indicate the negation or affirmation of the repeated complement sentence. Modals (i.e. auxiliaries) or sentence adverbs do not have such a function.

- (19) Do you think he will come to the party?
a. They say not.
b. They say so.
c. *They say should.
d. *They say certainly.

As shown in 20a and 20b, manner adverbs of category VP/VP usually do not occur in the typical positions of sentence adverbs in 8-10. 20c should be taken as a case where the adverb slowly appears in the final position of VP rather than S. Examples in 20 were borrowed from Ikeya (1977).

- (20) a. *Slowly he did not test the bulb.
 b. *He slowly did not test the bulb.
 c. He did not test the bulb slowly.

Likewise, neither not nor so can appear in the above positions of slowly.

- (21) a. *Not John left (or *Not John did leave)
 b. *John not did leave
- (22) a. *So John says (or *So John does say)
 b. *John so says

We have seen that not is syntactically quite similar to so as a modifier (represented as VP/VP) or manner adverbs of category VP/VP and that it is syntactically different from sentence adverbs of category S/S. From the above arguments, it seems to be conclusive that syntactically the preverbal not should not be represented as S/S, but rather as VP/VP.

If the preverbal not is taken as being in the category VP/VP, then it may have the following co-occurrence restriction:

- (23) The negative not of category VP/VP must occur immediately after an AUX element to which a tense is suffixed.

This constraint motivates an operation in 'Do-Support' (Chomsky (1957)) or movement of not. In the negative sentence 24a, to meet the above 23, it is necessary to insert an element, do, for a tense to be attached to. In 25a-b, the constraint is not satisfied until 'Affix-Hopping' (Chomsky (1957)) is applied between pres and can. Only when the above 23 is effected by the movement of not, as in 26c, does it become possible to prevent the past participle en in 26b from being stranded.

- (24) Ken did not work hard.

- a. Ken past [_{VP} not work hard]
 b. ⇒ Ken do^{past} [_{VP} not work hard]

- (25) Bill cannot jump over the fence.

- a. Bill pres can [_{VP} not jump over the fence]
 b. ⇒ Bill can^{pres} [_{VP} not jump over the fence]

- (26) Jane may not have finished the work.

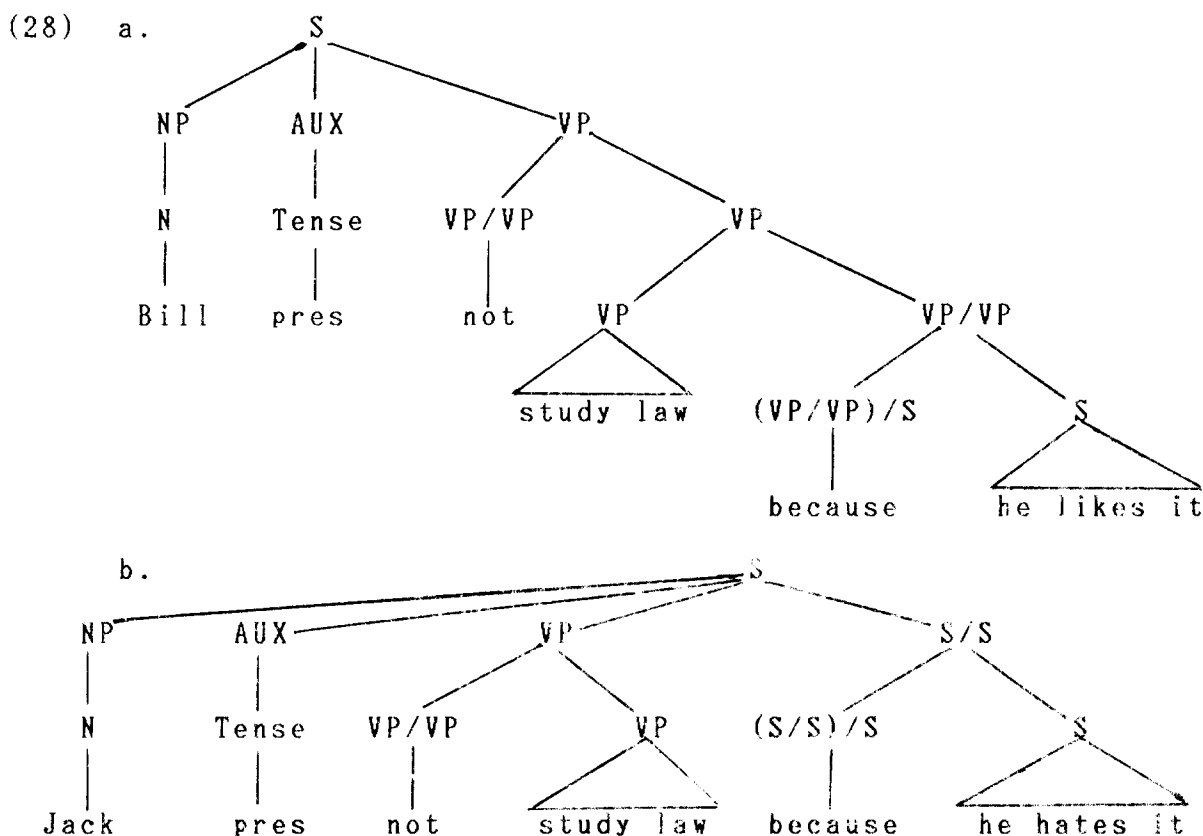
- a. Jane pres may have-en [_{VP} not finish the work]
 b. ⇒ Jane may^{pres} have-en [_{VP} not finish the work]
 c. ⇒ Jane may^{pres} not have [_{VP} finish^{en} the work]

In the present analysis of not, the movement of not is involved only in the case of 26 and motivated by the constraint in 23.

The present analysis of the preverbal not is the direct representation of negation scope, for the scope of the negative

not with the categorial specification of VP/VP is its c-command domain, i.e. VP. Different scopes of negation in 27a and 27b are represented as in 28a and 28b respectively. The negation scope in 28a contains the because-clause, which is outside the scope of negation in 28b.

- (27) a. Bill does not study law because he likes it.
 b. Jack does not study law because he hates it.



As in the because-clause of 28 and the happily of 5, many adverbials, whether lexical or clausal, manifest the alternation between VP/VP and S/S.

I will henceforth employ the category name NEG, characterized as VP/VP, for the preverbal negative not in order to distinguish it from the other VP-modifiers like manner adverbials.

4. Prenominal not.

According to the present categorial analysis of not, the prenominal not is NP/NP, whose categorial definition is (t/(t/e))/(t/(t/e)). In this section, I will outline a recent study of the prenominal not, suggested in Abe (1985), and point out some problems of his analysis. In his study, not is invariably treated as c/t whether it occurs prenominally or preverbally. In this respect, Abe's study of prenominal negation

and the present analysis of not as a modifier are contrastive.

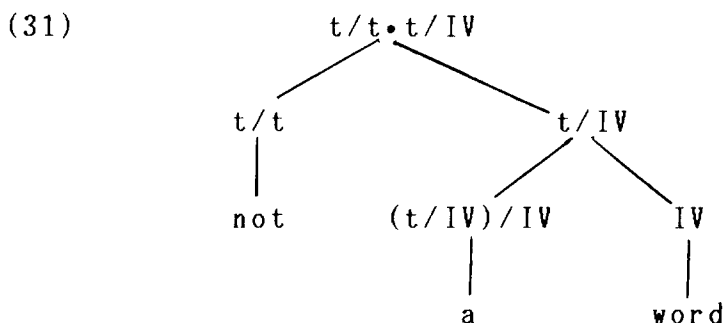
It has been pointed out by Jackendoff (1969), Lasnik (1976), and many others that the negative not in prenominal position does not occur in the object position, but only in the subject position.

- (29) a. Not every statesman is rich.
 b. *John said not a word.
 c. Not a word did John say.

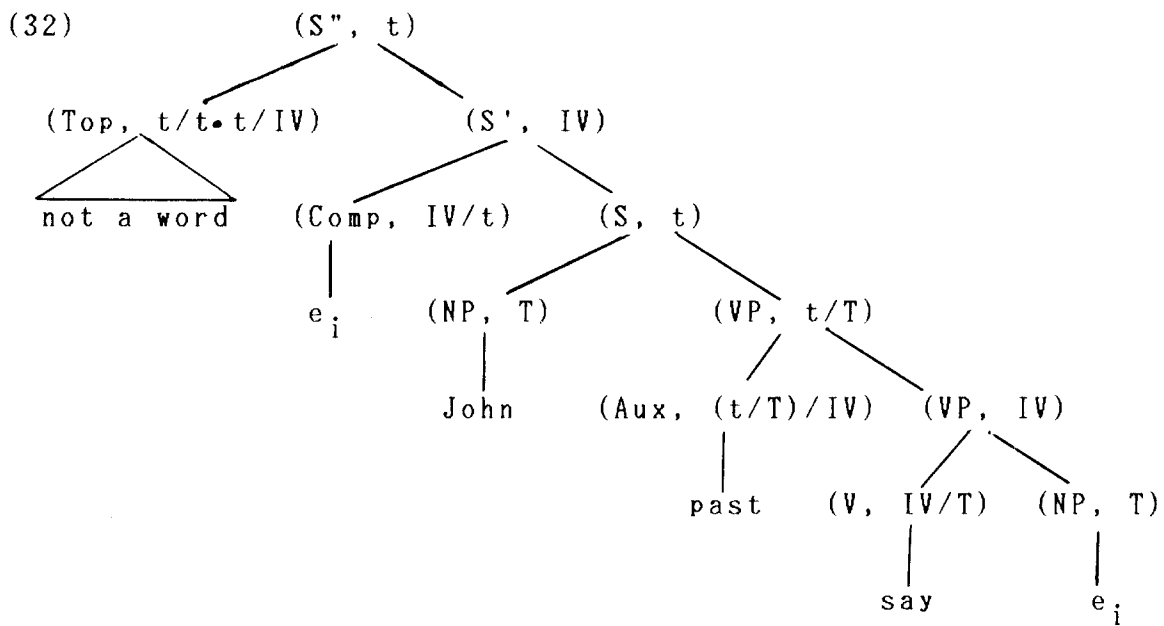
As was argued in Abe (1985), Postal's (1974) examples of coordination in 30 clearly indicate that the not forms a part of NP, not that, as argued in Jackendoff (1969), not occupies the pre-S position.

- (30) a. Not many colonels and not many majors were demoted yesterday.
 b. Not much wheat and not much barley was sold to the Turks.

To capture the above characteristics of the prenominal not, Abe (1985) introduces the formation of a new 'semantic' category (represented by $a/b \cdot b/c$), which is the result of the combination of two functor categories when the domain of one category (a/b) is identical to the range of another (b/c). Since not is assigned t/t in his categorial system, it is combined with a word of t/IV to form an expression of category $t/t \cdot t/IV$, as shown in 31:



The 'composite function' category $t/t \cdot t/IV$ in 31 cannot be combined with a transitive verb of $IV/(t/IV)$ (or IV/T), but only with an expression of IV , to form an expression of t . There is, thus, no possibility of generating sentences like 29b. On the other hand, since $t/(t/IV)$ (or t/T) is assigned to a verb phrase containing AUX in Abe's system, it can be combined only with the subject of t/IV (or T), not with the composite category $t/t \cdot t/IV$ in 31. Abe can thus claim that such a composite function category occurs not in the subject position, but in the topic position, as in the following:

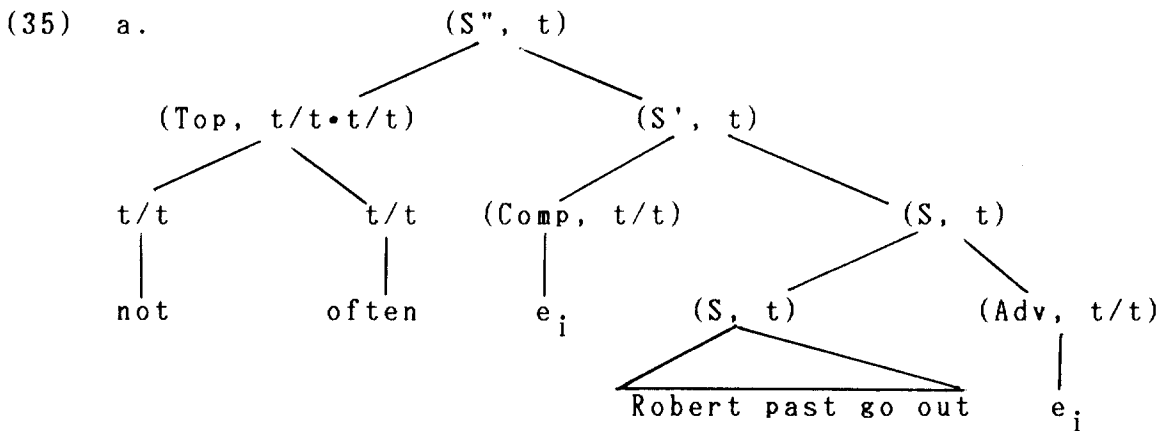


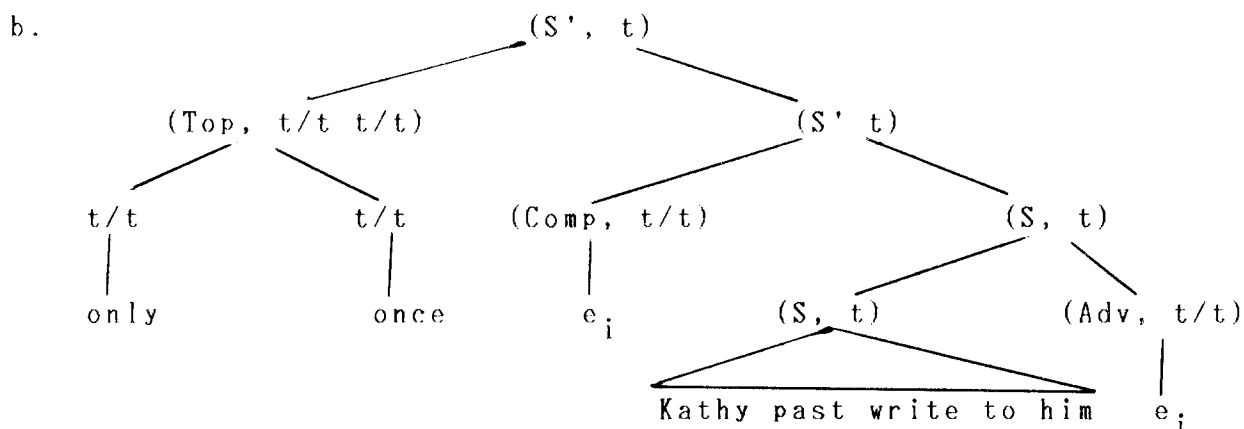
In 32, each node is labeled with a pair (A, B) where A is a syntactic category and B a semantic category.

If the analysis of 32 is extended to 33 and 34, both not often and only once form a composite-function category $t/t•t/t$, as shown in 35a, which, in fact, was suggested in Abe 1985.

(33) Not often did Robert go out.

(34) Only once did Kathy write to him.





As indicated in 35, often and once should have category t/t as adverbials of frequency, but not and only are different from them. Just as not in 1 modifies many phrasal categories, only modifies NPs, VPs, \bar{V} Ps, PPs, etc.:

- (36) a. Only [_{NP} the man] came
 b. The man only [_{VP} came to see her]
 c. The man came only [_{VP} to see her]
 d. The man likes only [_{NP} the teacher]
 e. The man cooks only [_{PP} on weekends]

Just as not cannot appear in the positions of S/S in 11a (cf. 21a), only in 36a cannot. In 36a, only is of category NP/NP, i.e. a category that modifies an NP-expression. Therefore, the category of not and only should not be the same as the t/t or S/S of sentence adverbs like often and once. On the other hand, not and only are different in that the former cannot modify NPs in the original object position and co-occurs with 'indefinite' NPs, while the latter can modify object NPs in the original position, as indicated in 36d, and co-occurs with both 'definite' and 'indefinite' NPs:

- (37) a. Not [a man] came.
 b. *Not [the man] came.

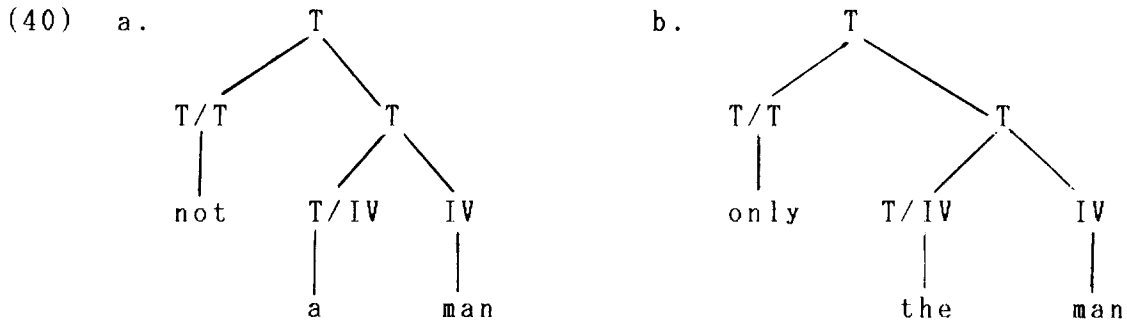
- (38) a. Only [a man] came.
 b. Only [the man] came.

In spite of the above syntactic differences between sentence adverbs and not or only, the same category t/t is assigned in the analysis of 35.

On the basis of the above syntactic argument, such expressions as not often and only once should rather be analyzed as in 39:

- (39) a. b.

And the prenominal not and only in 37a and 38b would have (t/IV)/(t/IV), or T/T, as in:



The categories t/t and T/T are 'modifiers' in the sense defined in section 2.

In this section, it has been shown that not and only in the initial position of an S are not modifiers of the S but those of the subject NP. But the analysis incorporating 'composite function' (Abe (1985)) is based on an incorrect syntactic analysis of not and only in the initial position of S. The present analysis of not as a modifier renders unnecessary to introduce a new group of semantic categories created by means of 'composite function'. Besides, in Abe's analysis, Comp receives semantic-category specifications of IV/t in 32 and t/t in 35, and S' receives the specifications of IV in 32 and t in 35. But in the present analysis, it will be shown that such varied categorial specifications of Comp or S' (equivalent to \bar{S}) are precluded and that the complementizer that has a unique categorial specification, i.e. t/t. In the next section, the present analysis of the negative not is developed.

5. Proposed Analysis of Negation

In this section, we will explore the semantic analysis of not as a modifier.

5.1 Preverbal Negation and Quantifiers in Object Position

The preverbal not, with the categorial characterization of VP/VP, has its c-command domain of VP as the negation scope. We will see some consequences of this analysis.

When quantifiers appear in object position, they usually interact with preverbal negation to induce scope ambiguity as shown in 41-42. But 43 is unambiguous.

(41) Bill didn't find a deer.

- a. There were no deer that Bill found.
- b. There was a certain deer that Bill didn't find.

- (42) Bill didn't find all the deer.
 a. Bill found some of the deer.
 b. Bill found none of the deer.

- (43) Bill didn't find every deer.
 a. Bill found some of the deer.
 b. *Bill found none of the deer.

As in 44a, the affirmative sentence of 41 is, however, unambiguous though 44b, with the intensional verb seek, is ambiguous. They both have a de re reading in which some particular individual, denoted by the NP in the object position, is involved and Bill stands in a relation to that individual. In addition, 44b can be true even if the object NP lacks any specific reference in the actual world, but there is no such de dicto reading in 44a.

- (44) a. Bill found a deer.
 b. Bill sought a unicorn.

Montague's truth-conditional model-theoretic semantics equally provides both de re and de dicto readings with the above two sentences in 44. It is then necessary that the de dicto reading of sentences like 44a should be excluded from any adequate model. To capture this restriction, Montague 1974 proposed the following meaning postulate:

- (45) $\exists S \forall x \forall \mathcal{P} \square [\mathcal{S}(x, \mathcal{P}) \leftrightarrow \mathcal{P}\{\hat{y}[S\{x, y\}]\}]$, where \mathcal{S}
 translates find, love, lose, eat, or date.

By the use of such a meaning postulate, it becomes possible to secure the unambiguous meaning of 44a and to constrain the class of admissible models.

To account for the ambiguous interpretation of 41 and 42 as well as the unambiguous interpretation of 44a, I propose that the meaning postulate in 45 should be effective. The difference of ambiguous and unambiguous interpretations depends on that of optional and obligatory application of the meaning postulate in question. The optional application comes from scopal interactions between a quantifier and the negation operator or between two different quantifiers. There are some other consequences of the use of the meaning postulate in 45,¹ but I will limit the present discussion to interactions of the scopes of quantifiers and the negation operator.

We will now examine the translation of 41. The preverbal not is translated as $\lambda P \lambda y \neg [P\{y\}]$ in which the scope of negation is demarcated. Then, sentence 41 has the following translation:

- (46) $\neg[\text{find}' (\hat{P} \exists x [\text{deer}'(x) \ \& \ P\{x\}]) (b)]$

One particular instantiation of Montague's meaning postulate in 45 will be like this:

$$(47) \forall \mathcal{P} \forall x \square [\text{find}'(\mathcal{P})(x) \leftrightarrow \mathcal{P}\{\hat{y}[\text{find}'_*(y)(x)]\}]$$

The application of 47 to the logical form in 46 results in the reduced formula:

$$(48) \lambda P \exists x [\text{deer}'(x) \ \& \ P\{x\}] (\hat{y} \neg [\text{find}'_*(y)(b)]) \\ \implies \exists x [\text{deer}'(x) \ \& \ \neg [\text{find}'_*(x)(b)]]$$

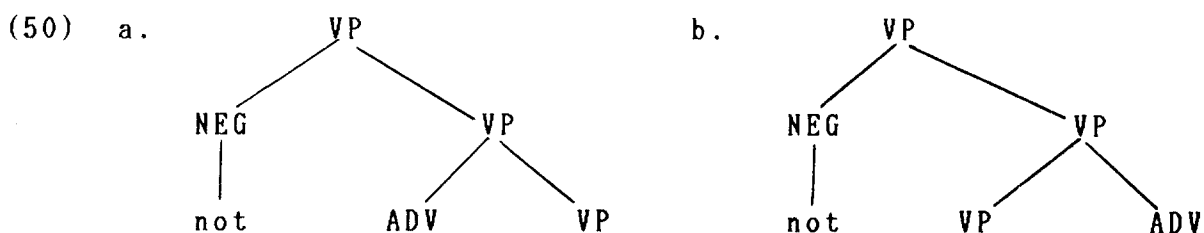
In 46, negation has wider scope than the existential quantifier, yielding the reading 41a. On the other hand, the meaning postulate in 45 provides a means to get another possible interpretation 41b, when, as shown in 48, the quantifier has wider scope than negation.

The two possible interpretations of 42 will be given through the completely same procedure of translation as that of 41. The results are shown below.

$$(49) \quad \text{a. } \neg [\text{find}'(\hat{P} \forall x [\text{deer}'(x) \rightarrow P\{x\}]) (b)] \\ \quad \text{b. } \forall x [\text{deer}'(x) \rightarrow \neg [\text{find}'_*(x)(b)]]$$

For some unclear reason, however, the application of the meaning postulate in 45 should be prevented to yield the unambiguous meaning of 43. It seems necessary to state such a restriction that the quantifier scope of every is always narrower than negation scope.

As was pointed out in Ikeya (1977), among many others, differences in the linear ordering of two elements change their scopal relations in English. Since the preverbal not is never preceded by any manner adverb, the former must have wider scope than the latter though both of them are characterized as VP/VP. In the present analysis, it is predicted that the scope of preverbal negation is wider than the scope of manner adverb, but narrower than that of sentence adverb. This scopal relation between the preverbal not and manner adverbs (with category name ADV) is represented in the following tree:



On the basis of the structural relation between not and adverbs, it becomes unnecessary to posit a category for 'an adverb-modifying negative' (Ikeya (1977)), characterized as (VP/VP)/(VP/VP), in order to indicate the denial of the slow speed of testing as the reading of 51. This aspect of reading is correctly represented by 52.

(51) John didn't test a bulb slowly.

(52) a. $\neg[\text{slowly}'(\hat{\text{test}}'(\hat{P}\exists x[\text{bulb}'(x) \ \& \ P\{x\}]))(j)]$
 b. $\exists x[\text{bulb}'(x) \ \& \ \neg[\text{slowly}'(\hat{\text{test}}_*'(x))(j)]$

5.2 Prenominal Negation

In what follows, we will consider some cases of prenominal not.

Following Abe's analysis suggested in 32, suppose that not a word is placed at the position of Top(ic). I will extend this analysis to other types of sentences; any phrase that is preposed to the front of an S is in the position of TOP, to which wh-words or topicalized phrases are moved. I propose for relative clauses and topicalized sentence the following syntactic rule and the corresponding semantic rule:

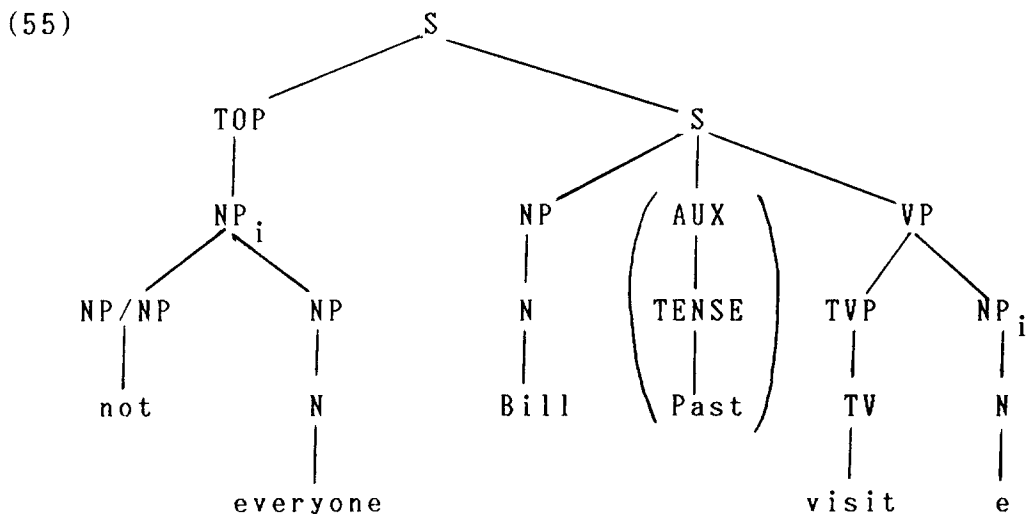
(53) S = TOP S
 0' = $\lambda u_i[2'](\hat{1}')$

where 0, 1, 2 refer to S (to the left of an arrow), TOP, (rightmost) S respectively and 0', 1', 2' are translations of elements in respective categories.³ The syntactic rule in 53 is based on the view that both S and \bar{S} are categorially defined as t, though S refers to a matrix sentence and a relative or an appositive clause and \bar{S} to a complement sentence with its complementizer.

We will now see the application of rule 53 to the following sentences:

(54) a. Not everyone did Bill visit.
 b. Not often did Bill visit Mary.

The structure of 54a and the rough translation procedure are indicated below.



- (56) a. $\text{not} \Rightarrow \lambda \mathcal{P} \lambda P \neg [\mathcal{P}\{\hat{y}P\{y\}\}]$
 b. $\text{not everyone} \Rightarrow \lambda P \neg [\forall x [\text{person}'(x) \rightarrow P\{x\}]]$
 c. $\text{not everyone; Bill (past) visit e}_i$
 $\Rightarrow \lambda \mathcal{P}_i [\text{visit}'_i(\mathcal{P}_i)(b)] (\hat{P} \neg [\forall x [\text{person}'(x) \rightarrow P\{x\}]])$
 $\Rightarrow \text{visit}'(\hat{P} \neg [\forall x [\text{person}'(x) \rightarrow P\{x\}]]) (b)$

(By the application of the following instantiation of a meaning postulate Montague 1974 suggested,

$$\forall \mathcal{P} \forall x \square [\text{visit}'(x, \mathcal{P}) \leftrightarrow \mathcal{P}\{\hat{y}[\text{visit}'_*(y)(x)]\}]$$

the formula in 56c results in a reduced one:)

- d. $\lambda P \neg [\forall x [\text{person}'(x) \rightarrow P\{x\}]] (\hat{y}[\text{visit}'_*(y)(b)])$
 e. $\neg [\forall x [\text{person}'(x) \rightarrow \text{visit}'_*(x)(b)]]$

In the formula 56e, the universal quantifier is within the scope of negation to yield the meaning of partial negation. The translation procedure of 54b goes in a parallel way.

The present analysis correctly shows that, as indicated in the above 55-56, prenominal negation interacts only with a quantifier in the TOP-position. Thus, it is not affected by any quantifier in the other syntactic positions, as in 57, or by the preverbal not, as in 58b:

- (57) Not every boy dated a girl.
 (58) a. Not many students came.
 b. Not many students didn't come.

5.3 Preverbal Negation and Quantifiers in Subject Position

In the present analysis, the subject position is always outside the scope of preverbal negation, and only the meaning of 59a or 60a is expected for sentence 59 or 60:

- (59) Some students didn't come.
 a. There was a student who didn't come.
 b. *No students came.
 (60) All the students didn't come.
 a. None of the students came.
 b. Not all the students came.

The meaning in 60b is not predictable from the present analysis, but I will leave this problem open here.

6. Summary

In this paper, it was claimed that the English negative not is syntactically a modifier of category X/X where X is any phrasal category. This claim was endorsed by many of the syntactic arguments of the preverbal not and the prenominal not as modifiers. Furthermore, the present analysis of not as a modifier correctly predicts that (i) preverbal negation interacts with quantifiers in object position to induce scope ambiguity; but that (ii) the scopal relation between preverbal negation and quantifiers in subject position does not induce ambiguity (though the appearance of the meaning 60b remains unsolved); and that (iii) prenominal not in the TOP-position interacts with no other quantifier or negation in positions excluding TOP. To account for scopal interactions between quantifiers and the negation operator, I suggested an extended use of Montague's meaning postulate stated in 45.

Notes

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1

See Miyara (1990) for further discussion of Montague's meaning postulate in 45.

2

There are some other clear distinctions between all and every though they both can be translated as the universal quantifier; As in i, all can co-occur with uncountable nouns, but every cannot. In addition, the former co-occurs with plural nouns and the latter with singular nouns.

(i) all (the) gas
*every gas

(ii) all (the) pens
every pen

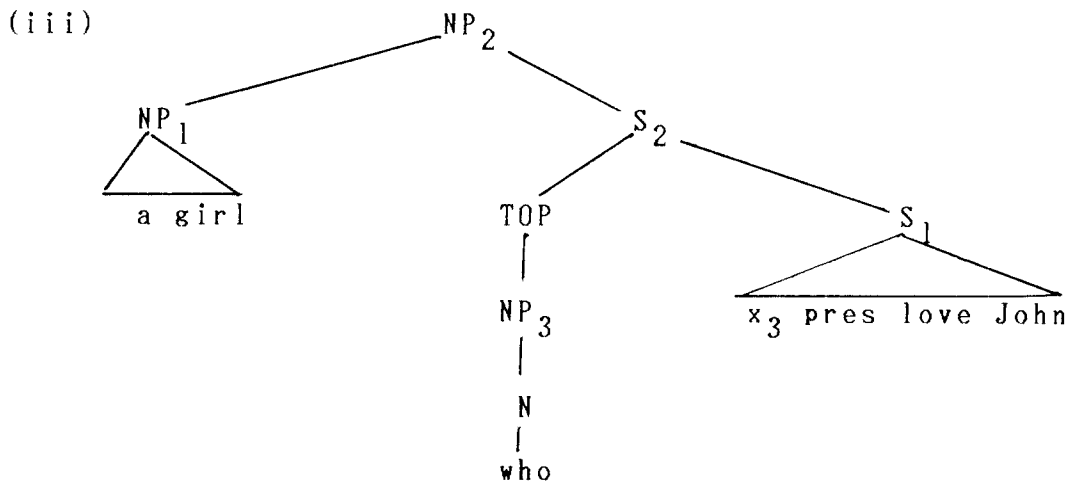
But it is not clear whether such differences in co-occurrence restrictions between all and every can be directly related to differences in interactions with negation scope or whether the restriction on scopal interactions of every in 43b should be merely taken as due to another lexical property.

3

To prove the validity of the rule in 53, I will illustrate the translation procedure of a relative clause construction in i, in conjunction with a relativization rule ii suggested in Bach and Cooper (1978).

(i) a girl who loves John

(ii) NP = NP S
 O' = $\lambda R[1'](\hat{x}_n[2])$



(iv) $S_1: \mathcal{D}\{\hat{\text{love}}'(\hat{P}P\{j\})\}$
 $\text{who}_1: \lambda PP\{x_3\}$
 $S_2: \lambda \mathcal{P}_i[\mathcal{P}_i\{\hat{\text{love}}'(\hat{P}P\{j\})\}](\hat{P}P\{x_3\})$
 $\Rightarrow \text{love}'(\hat{P}P\{j\})(x_3)$
 $NP_1: \lambda Q \exists x[[\text{girl}'(x) \& R\{x\}] \& Q\{x\}]$
 $NP_2: \lambda R[\lambda Q \exists x[[\text{girl}'(x) \& R\{x\}] \& Q\{x\}]](\hat{x}_n[\text{love}'(PP\{j\})(x_3)])$
 $\Rightarrow \lambda Q \exists x[[\text{girl}'(x) \& [\text{love}'(PP\{j\})(x)]] \& Q\{x\}]$

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