

Interrelations between Negatives and Quantifiers (II)

— Based upon the General Survey —

Mieko Kukita

Chapter I Introduction

Concerning the topic of the interrelations between quantifiers and negatives, lots of problems to remain unsolved even in these days. The severe controversies between the generative semanticians and the interpretive semanticians have revealed the interrelations between quantifiers and negatives clearly. The linguists who claim the generative semantics are Carden⁽¹⁾, G. Lakoff⁽²⁾, R. Lakoff⁽³⁾ etc., while the linguists who claim the interpretive semantics are Jackendoff⁽⁴⁾, Partee⁽⁵⁾, and so on. These linguists have claimed that the interrelations between quantifiers and negatives are related significantly to the semantic interpretation of a sentence in which they occur. In this short paper, I want to sum up the two opposite attitudes toward the interrelations between negatives and quantifiers and manifest

- (1) Carden Guy, "On Post-Determiner Quantifiers," *Linguistic Inquiry*, 1, 1970b, pp. 415-427.
_____, "A Problem with Primacy," *Linguistic Inquiry*, 1, 1970c, pp. 527-533.
_____, *English Quantifiers: Logical Structure and Linguistic Variation*, Tokyo, Taishukan, 1973.
- (2) George Lakoff, "On Derivational Constraints," *Papers from the Fifth Regional Meeting Chicago Linguistic Society*, Chicago, University of Chicago, 1969, pp. 117-139.
_____, *Irregularity in Syntax*, New York, Holt, Rinehart and Winston, 1970a.
- (3) Robin Lakoff, "A Syntactic Argument for Negative Transportation," *Papers from the Fifth Regional Meeting Chicago Linguistic Society*, Chicago, University of Chicago, 1969a, pp. 140-147.
- (4) Ray Jackendoff, "An Interpretive Theory of Negation," *Foundations of Language*, 5, 1969, pp. 218-241.
_____, *Semantic Interpretation in Generative Grammar*, Cambridge, Mass., M.I.T. Press, 1972, pp. 321-369.
- (5) Barbara Hall Partee, "Negation, Conjunction and Quantifiers: Syntax vs. Semantics," *Foundations of Language*, 6, 1970, pp. 153-165.

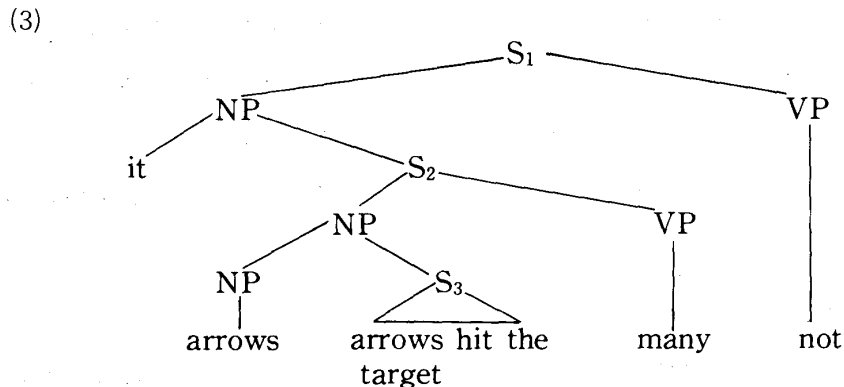
the problems to be solved. At the next opportunity, I want to propose the hypothesis concerning the interrelations between negatives and quantifiers.

Chapter II General Survey Based Upon Generative Semantics and Interpretive Semantics

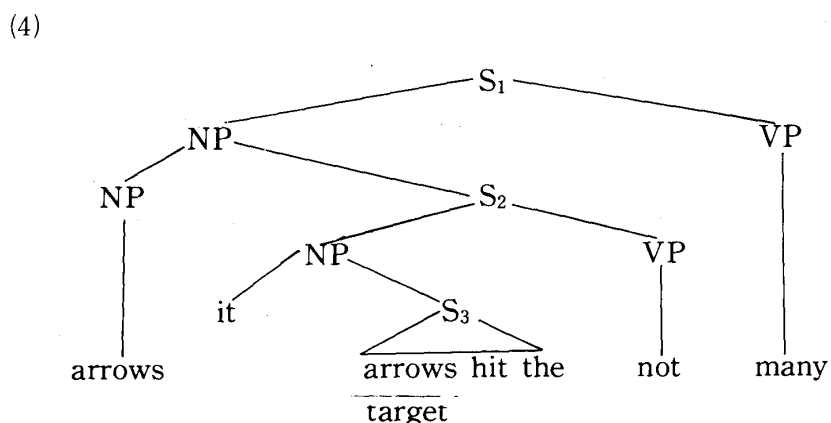
Carden and G. Lakoff, who are generative semantics, claim that negatives and quantifiers must be generated in the underlying deep structure as verbs of higher sentences, so that the semantic difference can be explained in terms of the hierarchical difference between the negative *not* and the quantifier *many* in the underlying deep structure. For example, consider the following sentences Jackendoff often uses:

- (1) Not many arrows hit the target.
- (2) Many arrows did not hit the target.

According to the analysis of generative semantics, the underlying deep structure of Sentence (1) can be explained as follows:



In the same way, the underlying deep structure of Sentence (2) will be as follows:



The derivation of Sentence (1) from (3) or Sentence (2) from (4) requires the operation. Lakoff calls this operation Quantifier-lowering, which inserts quantifiers into a lower sentence. Considering the underlying deep structure (3) and (4), negatives as well as quantifiers seem to have an operation of lowering. Therefore, it may be said that we can permit the transformation Negative-lowering, which inserts negatives into a lower sentence. On the contrary, according to the analysis of the interpretive semanticians such as Jackendoff and Partee, the interrelation between quantifiers and negatives can be explained in terms of semantic interpretation rules. Particularly, Jackendoff tries to explain these phenomena by considering the surface order of negatives and quantifiers to give the semantic interpretation of a sentence in which they occur. According to the semantic interpretation rules, Sentence (1) can be paraphrased as follows:

(5) It is *not* so that *many* arrows hit the target.

But, Sentence (2) cannot be paraphrased like this. The semantic difference between Sentence (1) and Sentence (2) can be considered to depend upon the surface order of the negative *not* and the quantifier *many*; namely, in Sentence (1), the negative *not* precedes the quantifier *many*. On the contrary, in Sentence (2), the quantifier *many* precedes the negative *not*.

Chapter III Some Problems to be Discussed

Even though the interrelations between quantifiers and negatives are shown clearly by the severe controversies between the generative semanticians and the interpretive semanticians, both attitudes seem to have severe problems unsolved.

If we apply the generative semantics, the Quantifier-lowering suggested by Lakoff must have lots of problems unsolved. Concerning the Quantifier-lowering operation, Chomsky criticizes that Quantifier-lowering violates the presumably universal constraint that no rule may introduce an item into a phrase of an embedded sentence from outside of that sentence as follows:

The rule of quantifier-lowering deletes the antecedent noun and moves the predicate of the matrix sentence into the embedded sentence. Thus applying to (books

(men read books) many), it deletes *books* in the matrix structure and inserts *many* into the embedded "relative." Neither of these operations has an analogue within the syntactically motivated sections of the grammar. In particular, although there are a number of rules which extract items from an embedded sentence and move them into higher sentences, there is, to my knowledge, none that introduce an item into a phrase of an embedded sentence from outside of this sentence. In fact, it has been proposed that there is a universal condition blocking such rules. This was suggested as a possible way of explaining the familiar observation that reflexivization and "inherent coherence" is impermissible in the case of embedded sentences, as in *John expected Mary to hurt himself*, *John expected Mary to lose his mind*.... the same general condition would explain the fact that from (86) we can form (87), but from (88) we cannot form (89):

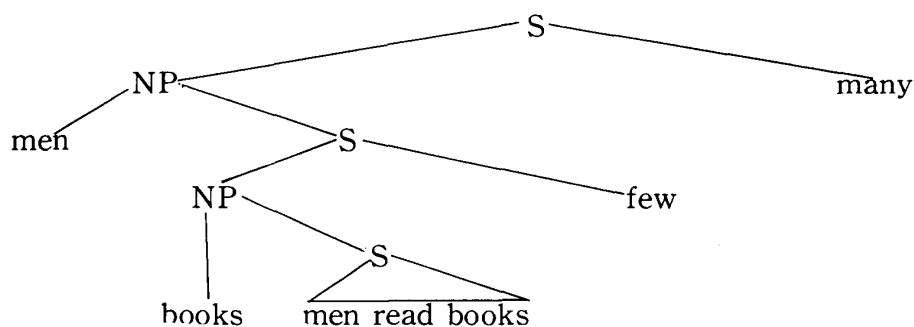
- (86) each of the men saw the others
- (87) i. the men saw the others
ii. the men saw each other
- (88) each of the men expected the police to catch the others
- (89) the men expected the police to catch each other⁽⁶⁾

The analysis of the generative semanticists, in which negatives and quantifiers occur as verbs of higher sentences, doesn't seem to be well-motivated. This analysis seems to be *ad hoc*. Concerning this point, Chomsky claims as follows by explaining the following sentence:

- (6) Many men read few books.

The underlying deep structure of Sentence (6) will be as the following in terms of the analysis of generative semanticists.

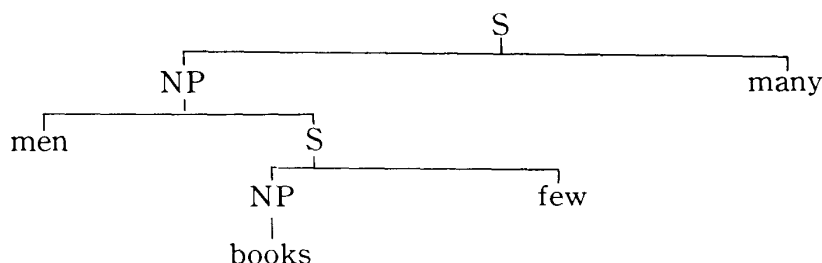
(7)



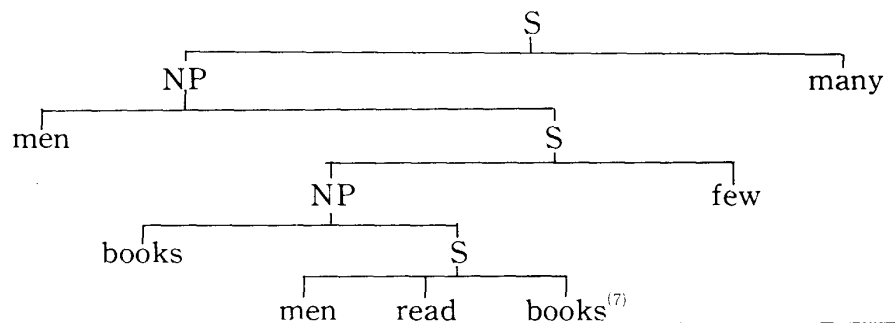
(6) Noam Chomsky, "Some Empirical Issues in the Theory of Transformational Grammar," *Studies on Semantics in Generative Grammar*, The Hague: Mouton, 1972, pp. 184-5.

Notice first that the structures in which quantifiers appear as predicates have unique properties. For example, the structure (79) is admissible only if the embedded NP *books* has a relative clause attached to it; furthermore, this relative clause must contain both of the NP's that appear in (79). These conditions are without parallel among syntactically motivated structures. Furthermore, although (77) appears to involve a "relative clause," this structure is unique in that its antecedent, *men*, does not appear within the "relative clause" of which it is the immediate antecedent.

(79)



(77)



On the contrary, the analysis proposed by interpretive semanticians seems to have much power than the analysis proposed by generative semanticians if we can reform the meaning-preserving hypothesis.* According to the interpretive semanticians, the interrelations between quantifiers and negatives can be accounted for in the semantic interpretation rules. In particular, Jackendoff claims that the surface orders of quantifiers and negatives determine the meaning of a sentence. If we consider the moving transformations such as Passivization and Topicalization, the meaning-preserving hypothesis seems to be blocked. Consider the following sentences by Jackendoff:

- (1) Not many arrows hit the target.

(7) *Ibid.*, p. 183.

(2) Many arrows did not hit the target.

(8) The target was not hit by many arrows.

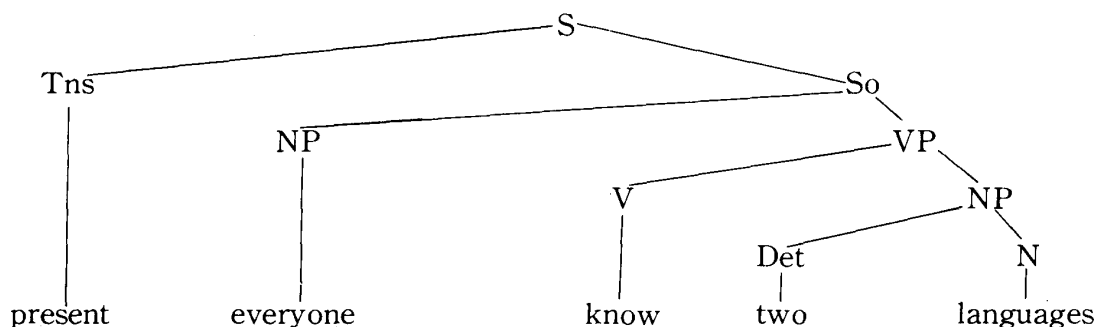
If we apply the passive transformation to Sentence (1), we cannot get Sentence (8). Concerning the operations of the passive transformation, it is clear that the passive form of Sentence (2) must be Sentence (8). However, the meaning of Sentence (2) and (8) are different from each other. The passive form Sentence (8) is synonymous with Sentence (1). It is indeed true that transformations cannot change the meaning of a sentence; it should be meaning-preserving, but in the rare case, transformations change the meaning of a sentence. The following sentences can be considered in the same case as the passive transformation cannot preserve the meaning of the sentence as Chomsky often claims:

(9) Everyone knows two languages.

(10) Two languages are known to everyone.

It is clear that Sentence (10) can be generated by the passive transformation of Sentence (9). The underlying deep structure can be considered as follows:

(11)



The semantic difference between Sentence (9) and Sentence (10) is depending upon the feature of *two*; namely, in Sentence (9), *two* occurs in the object position, while in Sentence (10), *two* occurs in the subject position. The factor that determines the meaning of these sentences seems to be the quantifier *two*. In Sentence (9), *two* has a feature [-specific], so that the content of two languages is not mentioned. When the quantifier occurs in the object position, the number of the languages can be the most important thing to be mentioned. On the contrary, in Sentence (10), *two* occurs in the subject position, so that *two* has a feature [+specific]. Therefore, the content of two languages is mentioned by the speaker, but not mentioned in the sentence itself. The quantifier which occurs in the subject position can be called the speaker-oriented quantifier or something like that.

However, it is doubtful whether such a way of thinking can be applied to all kinds of quantifiers. Consider other quantifiers as follows:

- (9) Everyone knows { two languages.
three
four
several
some
many

- (10) { Two languages are known to everyone.
Three
Four
Several
Some
Many

In Sentence (9), which has the quantifier in the object position, whatever quantifier we may use, the quantifier has no specific reference. The quantifier only plays a role in referring to the number. Therefore, the degree of the quantifier has no relation with its specific reference. However, in Sentence (10), which has the quantifier in the subject position, the degree of the specific reference seems to vary according to the character of the quantifier. The greater the degree becomes, the less the specific reference seems to become. Therefore, the degree of its quantifier may be in inverse ratio to the specific reference. The reason why the specific reference seems to decrease according to the increase of its number may be considered to depend upon the human competence.

Further examples mentioned by Jackendoff are as follows:⁽⁸⁾

- (12) The police did *not* arrest *many* demonstrators.
(13) *Many* demonstrators were *not* arrested by the police.
(14) *Not many* demonstrators were arrested by the police.

Not considering the semantic identity, Sentence (13) seems to be a corresponding sentence to Sentence (12) by applying the passive form. However, semantically the passive form of

(8) Ray Jackendoff, "An Interpretive Theory of Negation," *Foundations of Language*, 5, 1969, pp. 223-5.

Sentence (12) is corresponding to Sentence (14). Also in this case, the passive transformation cannot preserve the meaning of a sentence. Particularly, in this case, Negative-incorporation by the definition of Klima⁽⁹⁾, which incorporates negative *not* into the quantifier *many*, cannot preserve the meaning of a sentence. Considering the non-synonymity of Sentence (13) and Sentence (14), it is clear to show Negative-incorporation is not meaning-preserving transformation. This fact will show the serious defect of the transformational grammar. Though the analysis of interpretive semanticians seems to have much power than the analysis of generative semanticians, the analysis depending only upon the surface order of negatives and quantifiers seems to have counterexamples to be solved. Lakoff points out the following counterexample which cannot explain the surface order of negatives and quantifiers.⁽¹⁰⁾

(15) The arrows that did *not* hit the target were *many*.

According to the interpretation of the interpretive semanticians, in Sentence (15), the negative *not* precedes the quantifier *many*, so that the meaning of Sentence (15) must be synonymous with Sentence (1), but semantically Sentence (15) is synonymous with Sentence (2), G. Lakoff argues that it is indeed true that in Sentence (15) the quantifier *many* follows the negative *not*, but *many* is in a higher sentence than the negative *not*, and this asymmetric command relationship between *not* and *many* makes the difference in scope.

Further counterexamples against the interpretive semanticians are mentioned as follows, which can have an extra heavy stress.

(16) The girls did not read *many* books.

In Sentence (16), the negative *not* precedes the quantifier *many*, but the semantic interpretation of Sentence (16) must be considered that the quantifier *many* includes the negative *not* in its scope. According to this fact, the interpretive semantic analysis based upon the surface order of negatives and quantifiers should be revised to account for these counterexamples. Considering these defects of the generative semantic analysis

(9) Edward S. Klima, "Negation in English," J. A. Fodor and J. J. Katz eds., *Structure of Language; Readings in the Philosophy of Language*, Englewood Cliffs, N. J., Prentice-Hall, 1964, p. 274.

(10) George Lakoff, "On Derivational Constraints," *Papers from the Fifth Regional Meeting Chicago Linguistic Society*, 1969, pp. 117-139.

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and the interpretive semantic analysis, I want to consider these two analyses more in detail in the following paper.

(To be continued in the next number)

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