

SET REFERENCE RELATIONSHIPS AND THE PHRASAL SYNTAX OF QUANTIFIERS IN ENGLISH

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Despite considerable interest, the semantical and syntactical analysis of quantifiers has been one of the most notorious moot points in modern linguistics ever since the subject matter of quantifiers was first touched upon by Jespersen as a purely linguistic issue in his theory of rank. In recent linguistic studies, however, following the suggestion put forward in the work of Carden (1967) and Lakoff (1970) that the linguistic treatment of quantifiers should not be wholly unlike their treatment in modern symbolic logic, the main focus of attention was generally shifted off from purely linguistic aspects.

Much of the subsequent research in the area took a distinctively logical flavour as further chances of attaining full understanding of the nature of quantifiers in ordinary language were generally linked with an anticipated success of a linguistic institutionalization of the logical treatment of quantifiers along the lines of Frege, who "clearly depicted polyadic predication, negation, the conditional, and the quantifier as the bases of logic" (Goldfarb 1979: 351). Nothing of the sort has ever happened, however. Moreover, these developments have led to no significant contribution to our understanding of quantification in natural language, and any prospects of their ultimate success still remain far from being clear (years of intensive investigation notwithstanding), for the plain reason that "Not all items off of the logical shelf lead to profitable, long-term interactions with linguistic evidence" (Thomason 1987: 125).

In a most profound way, this applies to the analysis of English phrasal quantifier constructions, where the received categories of the logical syntax of quantifiers simply cannot be matched with linguistic evidence, even in principle. This is prevented by the necessarily predicative status of quantifiers in the convention of logical syntax, which has no empirical relevance with respect to any kind of actual syntactic relations in the surface structure of the quantified noun phrases in English. On the other hand, for the talk about whatever interaction of the theoretical

inventory of the Frege-Russellian conception of quantifiers with linguistic evidence to have any sense at all, the discussion must be necessarily confined to the sphere of phenomena, where only instances of the so-called multiple quantification are involved¹, otherwise the analysis remains purely speculative and any talk about its empirical relevance turns up merely pointless. Thus, the phrasal syntax of quantifiers inevitably falls out of the descriptive and explanatory purview of the logical analysis of quantifiers as variable-binding operators for the same reason for which it necessarily falls out of the specific domain of polyadic predication and multiple quantifiers.

On the face of it, there seems to be an urgent need to review and explore more fully some of the possibilities rendered by the analysis of English phrasal constructions with quantifiers in the pre-logical tradition of quantificational studies. The aim of the present paper is, thus, to preserve enough of the previous "normal" research that has accumulated over the years so that continuity is maintained, and valuable work is not wasted.

1. Introduction

In his classification of English noun phrases (NPs), Thrane (1980: 126) employs a simple criterion which relies entirely on observational data. It has to do with the way in which the elements of NP are connected, or, in Thrane's terms, serialized. Thus, in the following examples:

- (1) a. *the best friends*
b. *the best of friends*

(1a) is an instance of what he calls juxtapositive serialization, whereas (1b) is an instance of delimitative serialization. In general, a NP which overtly displays a preposition (most often *of*, but frequently also locative prepositions like *at*, *in*, *on*, etc., less frequently 'directional' prepositions like *for*, *towards*, *against*, etc.) is considered as an instance of delimitative serialization, whereas NPs without a preposition in their internal structure are regarded as instances of juxtapositive serialization (Thrane 1980: 126).

The distinction between juxtapositive and delimitative serialization-types of English NPs bears directly on the issue of English quantifiers, and it does so for at least two reasons. Firstly, it provides a necessary generalization of the basic distinction between the diagnostic environments of English quantifiers, as in the following examples:

¹Although even in these cases empirical evidence, which reduces exclusively to the relative order of quantifiers (quantifier scope) in the sentence's surface structure, may be relevant only insofar the so-called intended readings are concerned. However, relevance of quantifier scope (or, generally, quantifier dependence) even with respect to this restricted range of phenomena in natural language appears to be highly suspect (cf. Hornstein 1984: 20), especially in the light of recent results in game-theoretic semantics.

- (2) a. *some men*
b. *some of the men*

These two environments, taken as a whole, provide a diagnostic frame which is presented schematically in (3):

- (3) a. x Noun
b. x of $\left. \begin{array}{l} \text{these} \\ \text{this} \\ \emptyset \end{array} \right\}$ Noun

According to Thrane (1980: 127), x in (3a) is a position which is accessible to determiners, whereas x in (3b) is a position accessible to the so-called 'E-classifiers', in Bresnan's terms, 'quantity classifiers' (cf. Hintikka 1983: 463), like *pair*, *group*, *herd*, etc. The diagnostic frame in (3) also provides the basis for the structural definition of quantifiers which are defined as items "that may occur in place of x in both (3a) and (3b)" (Thrane 1980: 127).

Secondly, the distinction between the two serialization types provides an important heuristic principle for the theory of quantifiers. Accepting the view that prepositions are – or at least may be considered to be – superficial realizations of underlying case-relations, it turns out that the presence of a preposition in the surface structure of a NP is an indication of recursive syntactic derivation of that NP. What is no less important, especially for the purposes of our analysis, is that the reverse inference does not hold, however. Thus, in Thrane's terms, "We cannot conclude from the fact that a given surface NP displays juxtapositive serialization that it derives from a non-recursive structure" (Thrane 1980: 127). This, in turn, will lead us to further suggestions as to the proper analysis of the syntactic form of quantifier constructions in English, quite in the spirit of one of Wittgenstein's insights, namely that "it does not suffice to specify a syntactic form, one must have a semantic theory which interprets the form" (Grandy 1974: 163).

2. Early proposals for quantifiers

As is seen from the diagnostic frame in (3), quantifiers present themselves as a class of linguistic objects that can be singled out by making use of an objective criterion, and not on the basis of our intuition only, which means that we can do without cross-disciplinary definitions, as much misleading as they are popular, like "Quantifiers are locutions from symbolic logic" (Parsons 1980: 6), as well as without any circular definitions like Jespersen's, who defined quantifiers as "words denoting quantity" (Jespersen 1949: 580). As was mentioned earlier, the criterion in question has to do with their ability to enter the structural position of x in both (3a) and (3b), as opposed to determiners that may occur in place of x in (3a) but not in (3b), and E-classifiers that may occur in place of x in (3b) but not

(3a). What the term 'diagnostic' by itself implies is that among all other possible distributional environments of quantifiers the frame in (3) deals with a set of such distributional environments that are characteristic of the class of quantifiers only. In this way, it is only the diagnostic frame in (3) that may be said to provide the necessary empirical evidence directly concerning the essential inherent properties of quantifiers as a class. Of course, this would not lead us to any instant solutions as to the nature of quantifiers in English, since to know the positions in which quantifiers display their essential properties does not automatically mean that we already know what these essential properties are. Nevertheless, providing such a distinction would mean that we are moving in the right direction at least, since it will prevent us from wasting effort on the discussions that are apt to be missing points essential to the description of quantifiers as such and, thus, spare us useless effort on painstaking analysis that would lead us nowhere.

The most salient feature of the treatment of quantifiers in traditional grammar was a good deal of confusion as to their status in terms of traditional parts of speech, confusion that persists in lexicographical practice even today. Traditionally, quantifiers were often classed either with adjectives or with (indefinite) pronouns, according to their occurrence in (3a) or (3b). The problem with this approach is that the same quantifier should be treated in terms of two different parts of speech, depending on its occurrence in either (3a) or (3b). In this case, the quantifier *many* (adj) that occurs in the position of x in (3a), as in *many men*, should be regarded as a distinct lexical item, different from that of *many* (prn) in the position of x in (3b), as in *many of the men*, which is an evidently counterintuitive solution. To avoid this cumbersome situation, the usual practice was to refer to certain quantifiers, like *some*, as indefinite pronouns, while other quantifiers, like *many*, were regarded as adjectives. Nevertheless, this solution was not satisfactory either, as is seen by Jespersen's comment in *The Philosophy of Grammar* upon the so-called indefinite pronouns:

With regard to this ... class, the boundaries between a few of them such as *some* and such adjectives as *many* are rather vague; consequently grammarians disagree as to what words they should include in this subclass. This, however, is not essentially different from what we find in any other grammatical classification: there will always be some borderline cases.

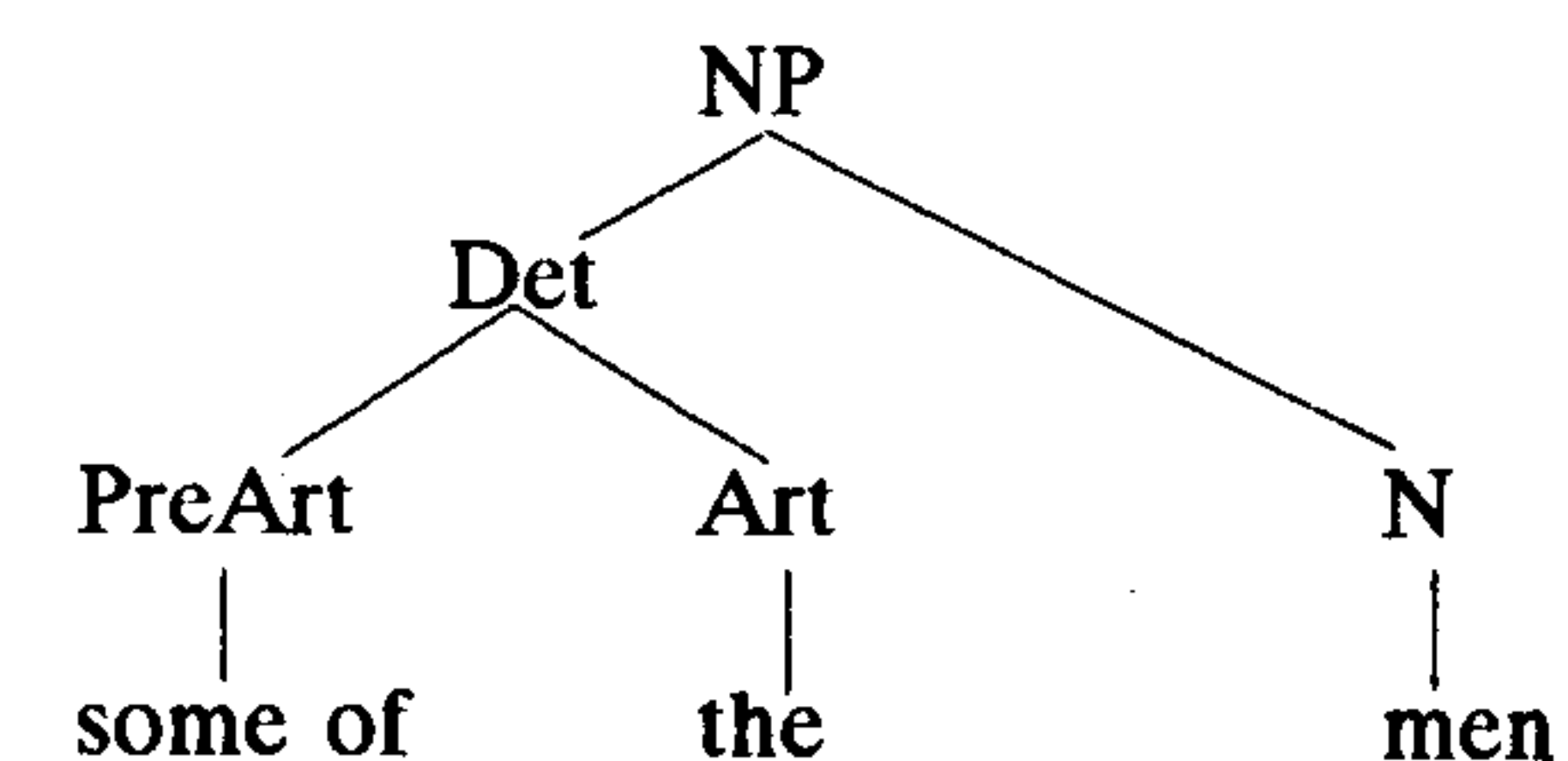
(Jespersen 1924: 83)

In the American structuralist tradition after Fries, the classification into 'parts of speech' was replaced by the classification into 'word classes', and all quantifiers were classified as a subclass of noun determiners (quantitative determiners). As determiners, they were characterized by their ability to occupy the structural position of an article. In addition, as members of the so-called determiner sequences, quantifiers also received further subcategorization according to the fact of their

optional occurrence in a pre- or postposition to the article. Thus, *both* in *both the men* was analysed as a determiner in the pre-article position; hence, predeterminer.

In the earliest transformational approach to quantifiers, developed by Chomsky and elaborated by Barbara Hall (1962), quantifiers were analysed as part of the determiner sequence followed by a head noun, so the syntactical analysis of the distributional pattern in (3b) looked as shown in (4).

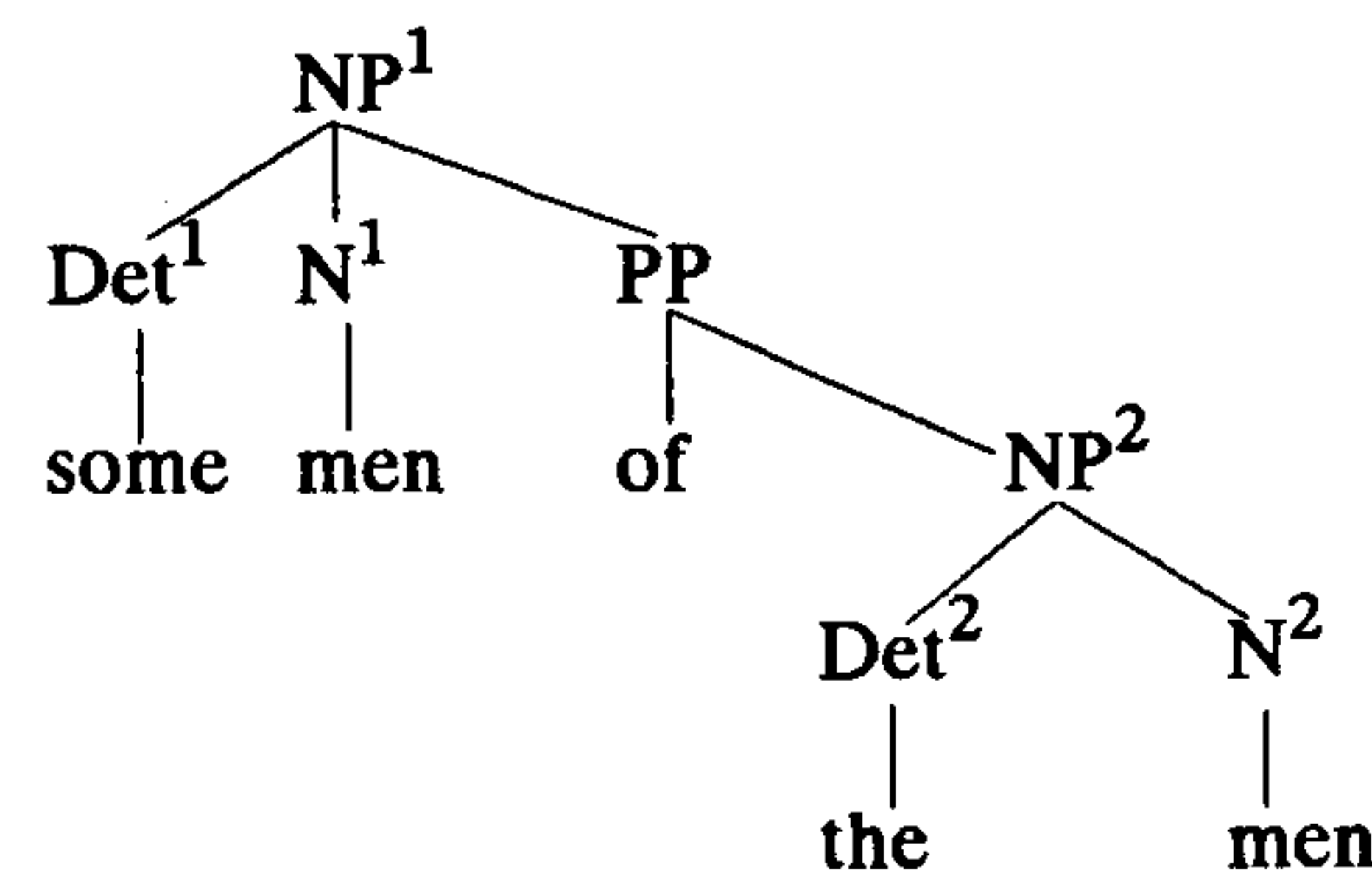
(4) *some of the men*



This was a considerable step towards obtaining significant generalizations about quantifiers as a whole as it abandoned the counterintuitive analysis of quantifiers in terms of various parts of speech. On the other hand, however, Hall's analysis had very serious drawbacks. First, the analysis was inconsistent with the received treatment of quantifiers as a subclass of determiners, since in the determiner sequence before the head noun it obligatorily put all quantifiers in the position of a predeterminer (Jackendoff 1968: 430), which went contrary to the established classification of quantifiers into predeterminers, central determiners and postdeterminers. Thus, in (4), *some* had to be treated as a predeterminer, though in the structuralist classification it belonged to the subclass of central determiners, of which no member could occur to the left of the article by definition (see e.g., Leech and Svartvik, 1975, section 550). Besides, the idea of analysing *some of the* in (4) as a determiner sequence ran contrary to facts of noun-verb number agreement, since they clearly indicated that the word that followed what was assumed as a determiner sequence was by no means the head word of the group (this presented a major problem also with Jespersen's analysis of quantifiers, though he did not speak of determiner). Moreover, the proposal of analyzing *some of the* and *men* as the immediate constituents in *some of the men* was inconsistent with linguistic evidence that indicated the possibility of preposing the whole of the prepositional phrase to the quantifier. However, the requirement on Hall's proposal was that *of the men* need not be a constituent, "thus immediately losing the generalization that it is a plain ordinary prepositional phrase" (Jackendoff 1968: 430).

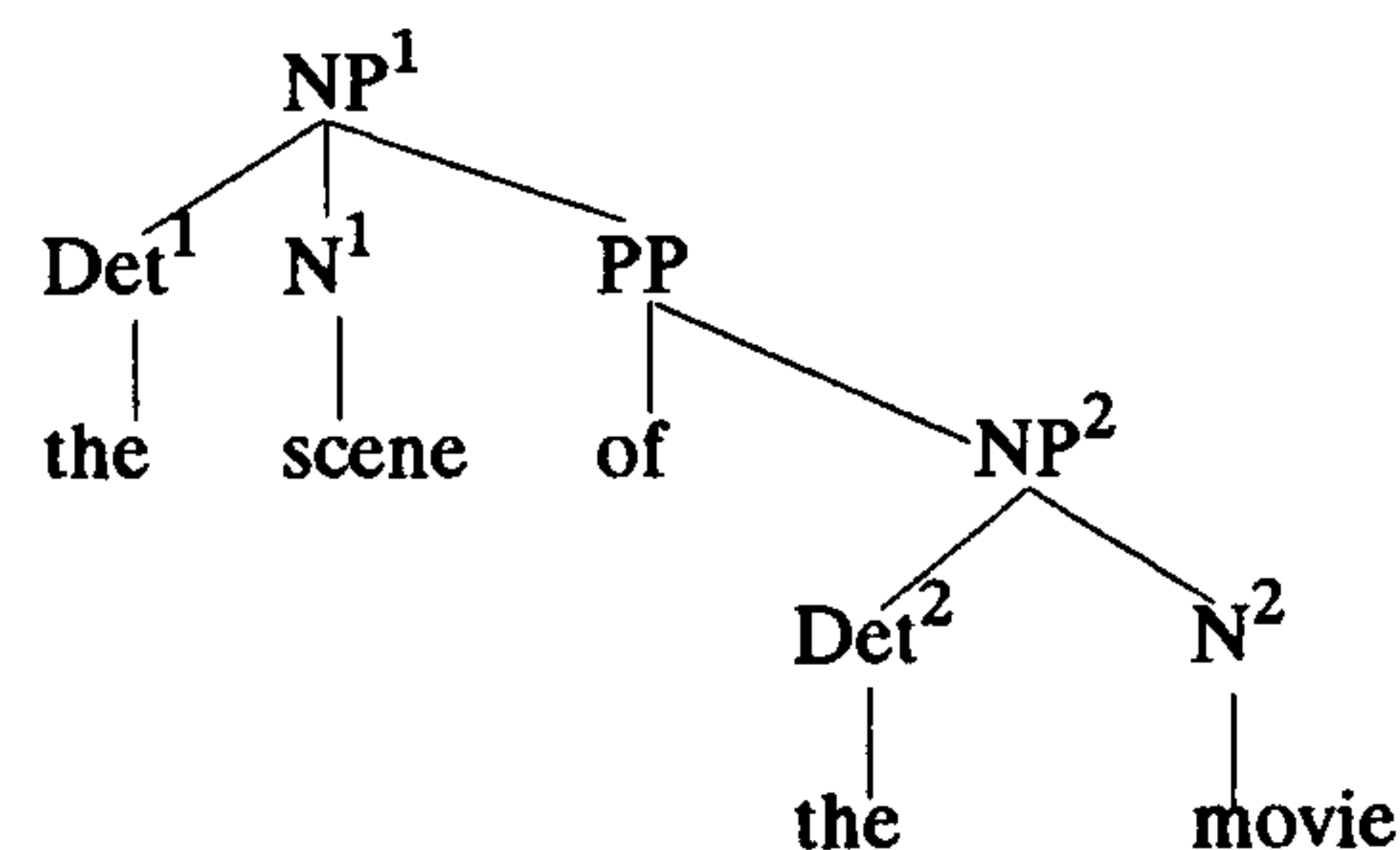
Another popular analysis for quantifiers was the one proposed by Janet Dean (1966). In this analysis, the structure in (5) was proposed.

(5) *some of the men*



Then, by a transformation, N¹ was deleted, provided it was identical with N²; otherwise, the derivation blocked. The advantage of this analysis over Hall's was that it did recognize that *of the men* is a prepositional phrase, which allowed to provide the analysis of the prepositional phrases with quantifiers on a par with the analysis of the ordinary prepositional phrases where quantifiers were not involved. Thus, the analysis of the quantifier strings such as *some of the men* was not entirely different from the analysis of other prepositional phrases, like the one in (6):

(6) *the scene of the movie*



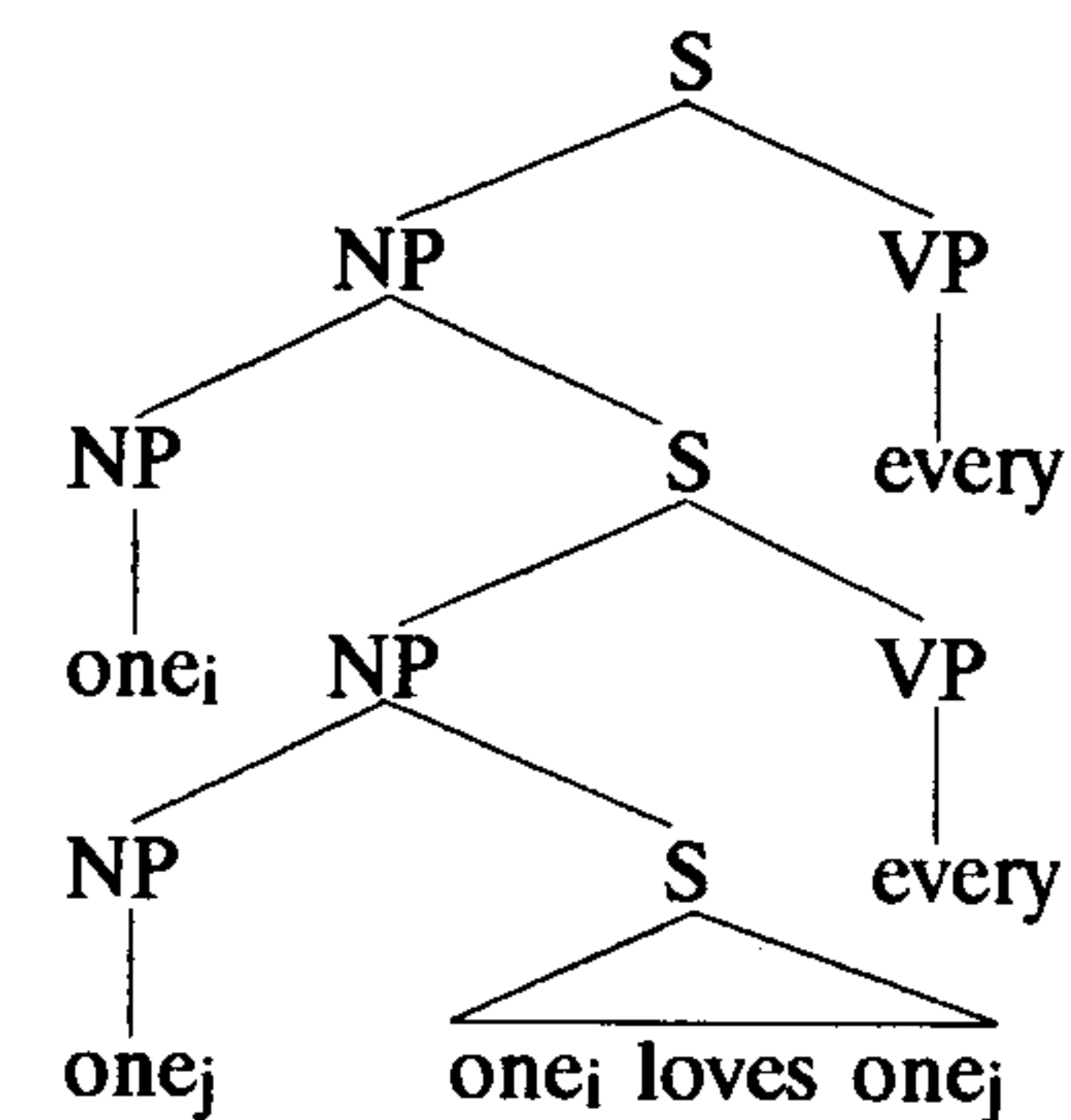
An alternative approach to the analysis of quantifiers involved putting the quantifier in the position of a predicate of an additional underlying sentence (Lakoff 1965; Carden 1967). Among other things, this analysis was aimed at providing an explanation for the meaning differences between structurally related quantifier sentences such as in the following examples:

- (7) *Everyone loves everyone.*
 (8) *Everyone loves himself.*

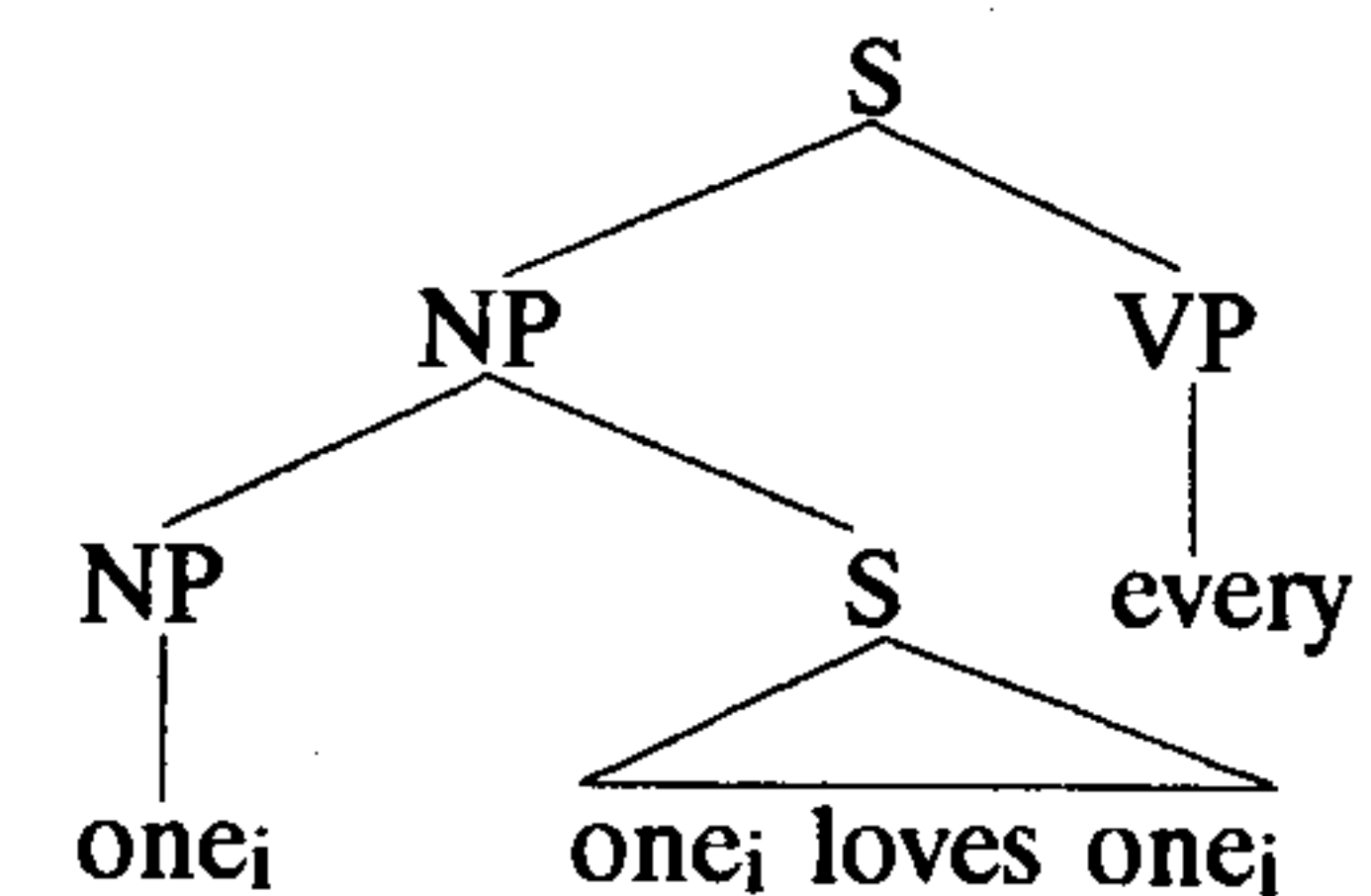
These differences could not be accounted for with the conventional machinery of referential indices, as could, for example, *John saw John* and *John saw himself*, since *everyone* always denotes the same set. Carden argued that the differences might be explained by the presence of different numbers of higher sentences, so

that, for example, (7) and (8) have the underlying forms as given in (9) and (10) respectively:

(9)



(10)



Notice, however, that the same semantic contrasts exist for indefinite plurals under similar circumstances:

- (11) *Senators from New England admire senators from New England.*
 (12) *Senators from New England admire themselves.*
 (13) *Men who earn \$50,000 a year expect men who earn \$50,000 a year to be treated with respect.*
 (14) *Men who earn \$50,000 a year expect to be treated with respect.*

In examples (11)-(12), the parallel with (7)-(8) is pretty obvious, since in (12), even though the plural *themselves* is used, each individual is understood to admire only himself. According to Jackendoff,

The fact that these phenomena appear in ordinary plurals shows that the problem has nothing to do with quantifiers, but is in fact a more general problem of reference of sets. To claim that plurals, like quantifiers, are higher sentences merely begs the question, and such a solution borders on the absurd. What is needed rather is a more comprehensive study of coreferen-

tiality in all kinds of noun phrases that denote more than a single individual. (Jackendoff 1968: 434)

Besides, as was mentioned above, the logical approach to quantifiers, as on the Lakoff-Carden analysis, turns out to be totally divorced from the specific issues of the syntax of phrasal quantifier constructions. Thus, as Carden points out,

The phenomena I have considered do not force me to distinguish between partitive and non-partitive use of quantifiers ("many men" vs "many of the men"); I regard the correct solution for this problem as an open question. (Carden 1967: 1)

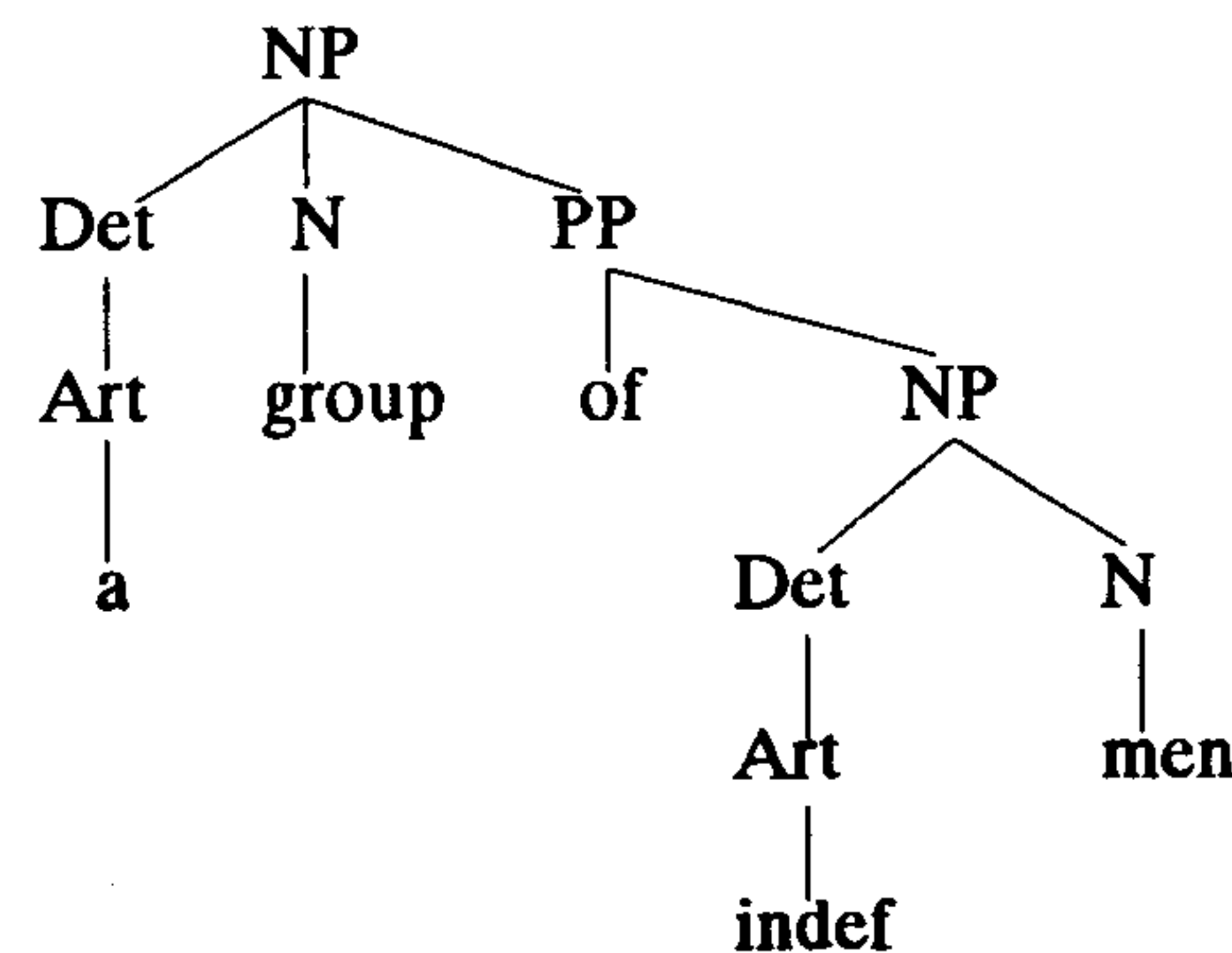
3. Jackendoff's analysis of quantifiers

As a basis of his own (Jackendoff 1968) analysis of quantifier constructions in English, Jackendoff applies a distinction between the three kinds of quantitative expressions:

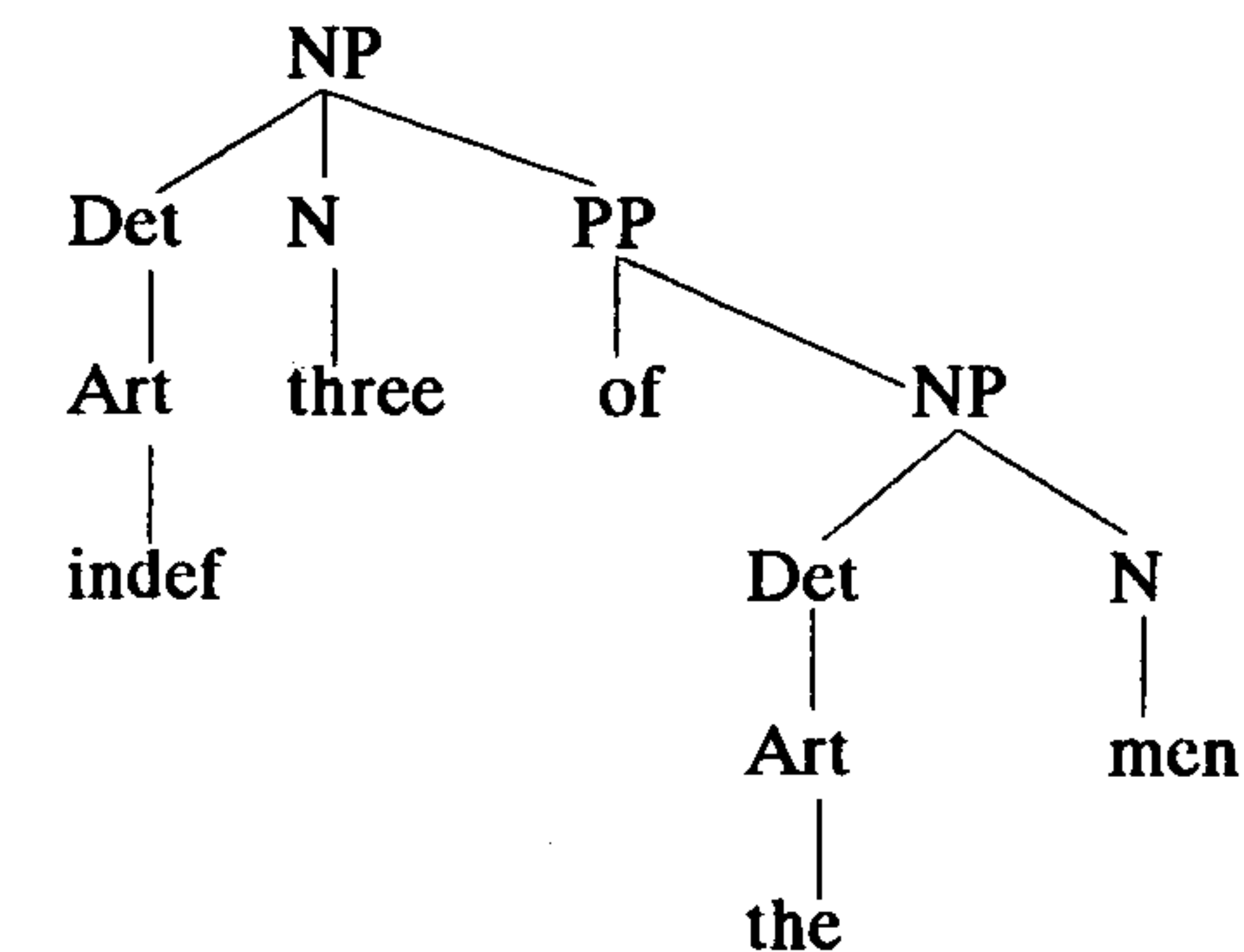
- Group I: *a group, a herd, a wagonload, a score, a pound, etc.;*
- Group II: *some, each, few, which, all, both;*
- Group III: *a few, many, one, three.*

After stating certain restrictions on the syntactic complements of Group I, Group II and Group III words, he concludes that the same pattern of syntactical analysis should be applied to both Group I and Group III constructions, as in (15) and (16) below:

(15) *a group of men*

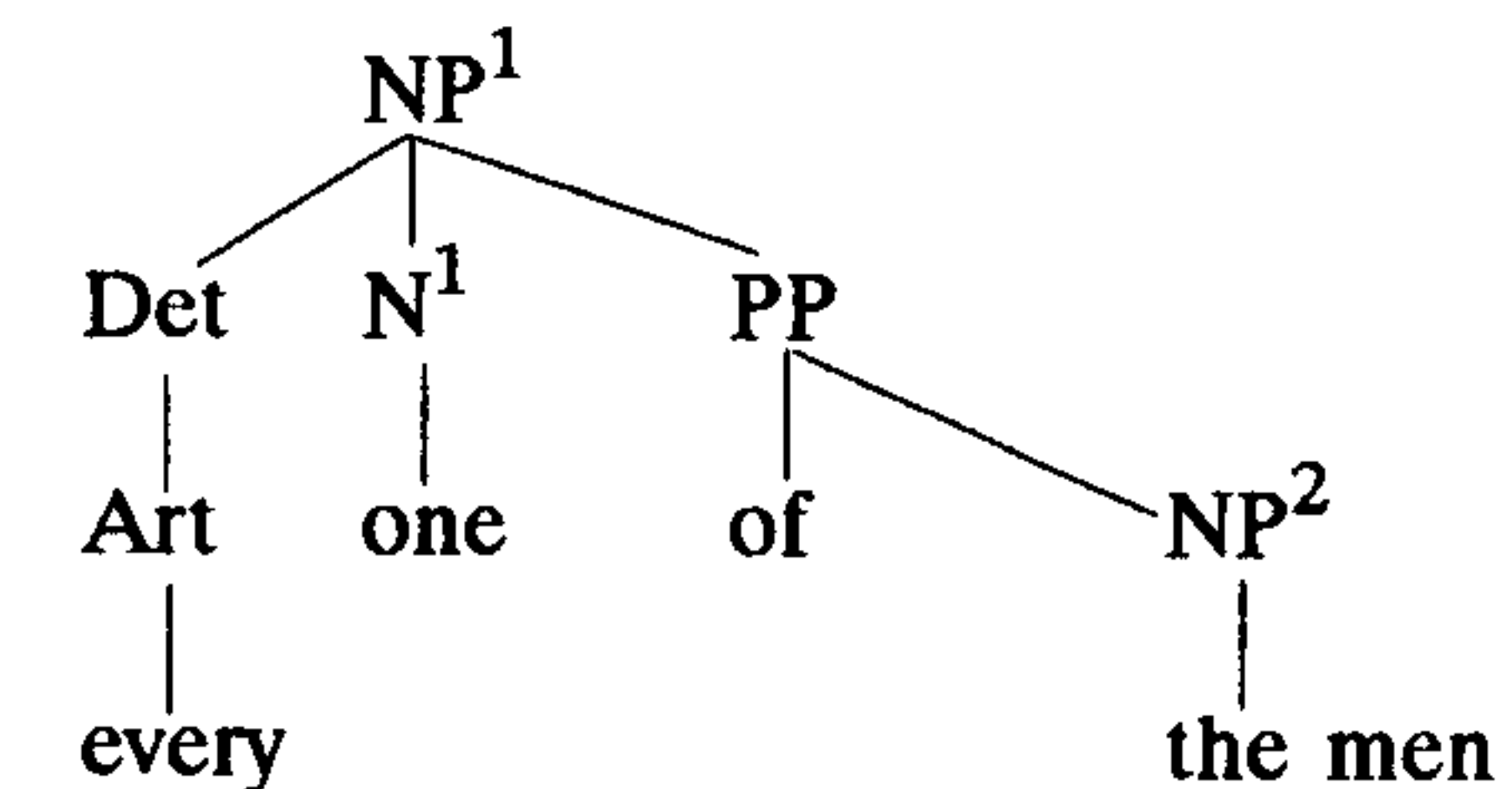


(16) *three of the men*



In (16), the quantifier is regarded as sharing the same structural position with nouns. This generalization cannot be easily extended to Group II words, however, since they never occur with a preceding article. What Jackendoff proposes instead is to treat Group II words as articles, so that *every one of the men* is represented as (17):

(17) *every one of the men*



With other quantifiers, *one* in (17) is then deleted either obligatorily (as with *all, both*) or optionally, as in the following paradigm:

(18)

each	}	{	man
either			
neither			
any			
which			
			(one) of the men

As is easy to notice, this analysis is basically similar to the one proposed by Dean, except for the way N^1 is treated lexically: on Dean's approach it is a full noun, whereas on Jackendoff's proposal it is a pronominal form. The main problem with Jackendoff's analysis is, however, that in the case of mass pronominalization this pronominal form should be represented by a totally abstract lexical item, non-existent in English.

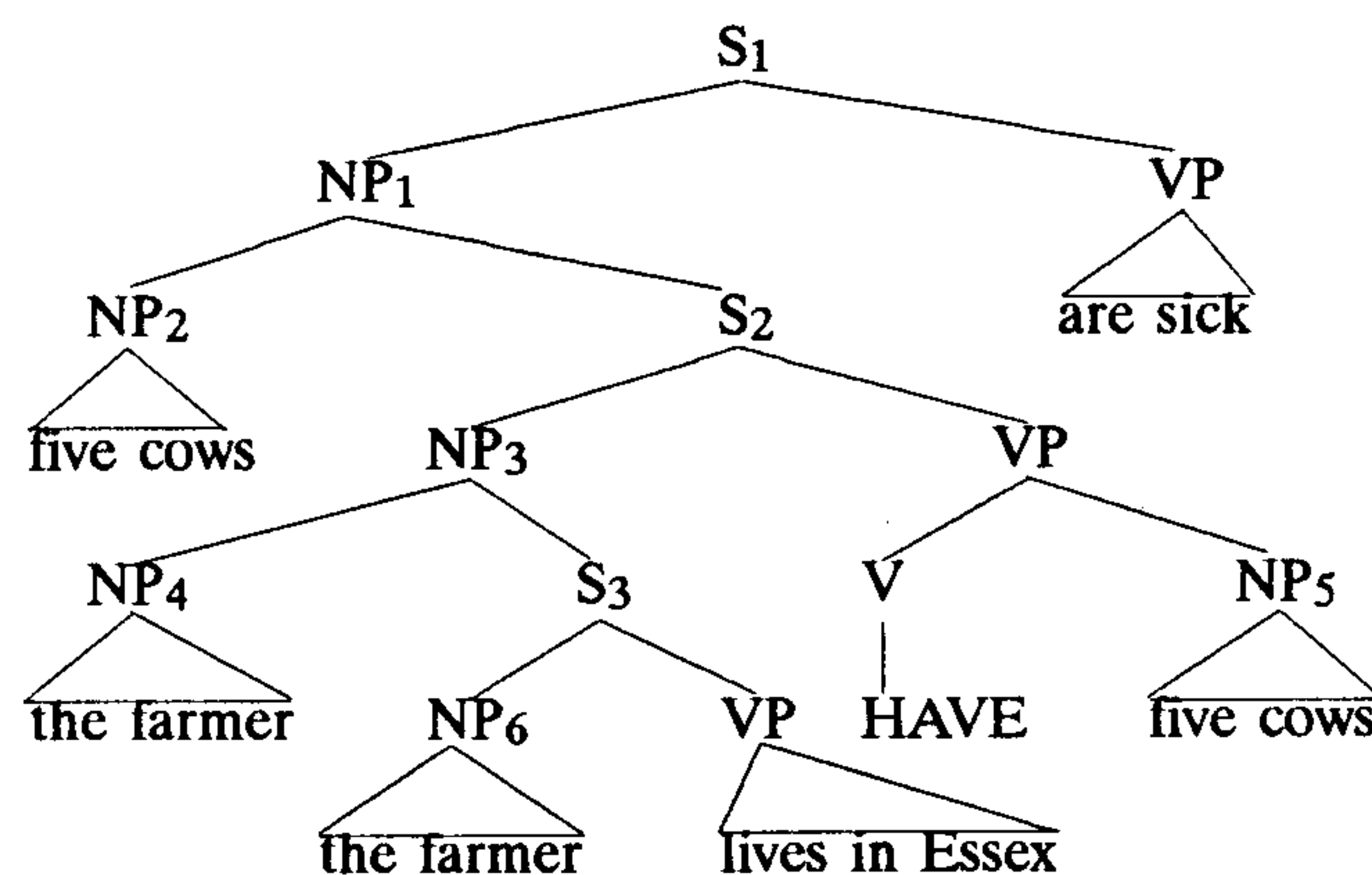
4. Lee's approach to 'set' relationships in the grammar

The problem of reference of sets, which Jackendoff only touches upon very briefly, comes up as bearing directly on the grammar of quantifiers in the work of Lee (1971), relating to the construction *quantifier + of*. The main point of his argument is to establish a relationship between the possessive *of* and the *of* following a quantifier. For the purposes of exposition, he assumes that the possessive *of* derives from an underlying sentence in which the verb is *have*. On the basis of this assumption, Lee suggests that the following sentences:

- (19) *Five cows of the farmer who lives in Essex are sick.*
 (20) *Many of the boys who live in Essex are sick.*

are related, in that they are both derived from an underlying structure of the form:

(21)



An OF-HAVE transformation operates on the phrase marker to produce the surface structure representation of (19), and for (20) the intermediate structure corresponding to:

- (22) *Many boys of the boys who live in Essex are sick.*

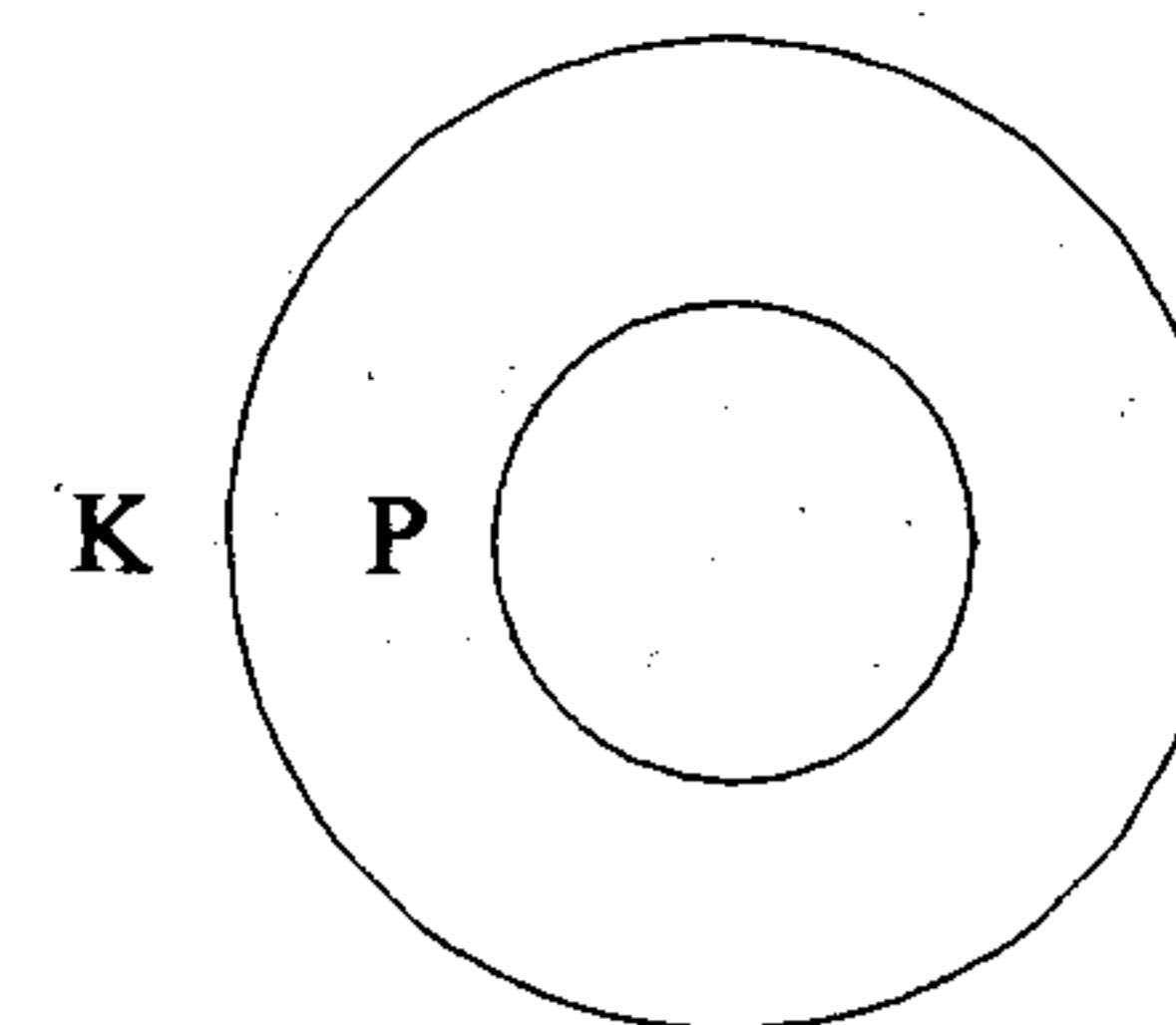
As in Dean's analysis, the occurrence of *boys* associated with *many* in (22) is then deleted under the condition of identity.

In Lee's analysis, however, the condition of identity is not understood merely in terms of the lexical identity between the nouns to the left and to the right of the preposition. According to Lee, the condition of identity is met if the verb HAVE in the underlying structure does not express the idea of 'possession' in the normal sense but, instead, indicates a certain type of relationship between NPs interpreted in terms of 'set inclusion' and 'set identity'. Thus, an instance of set inclusion is illustrated by the following pair of sentences:

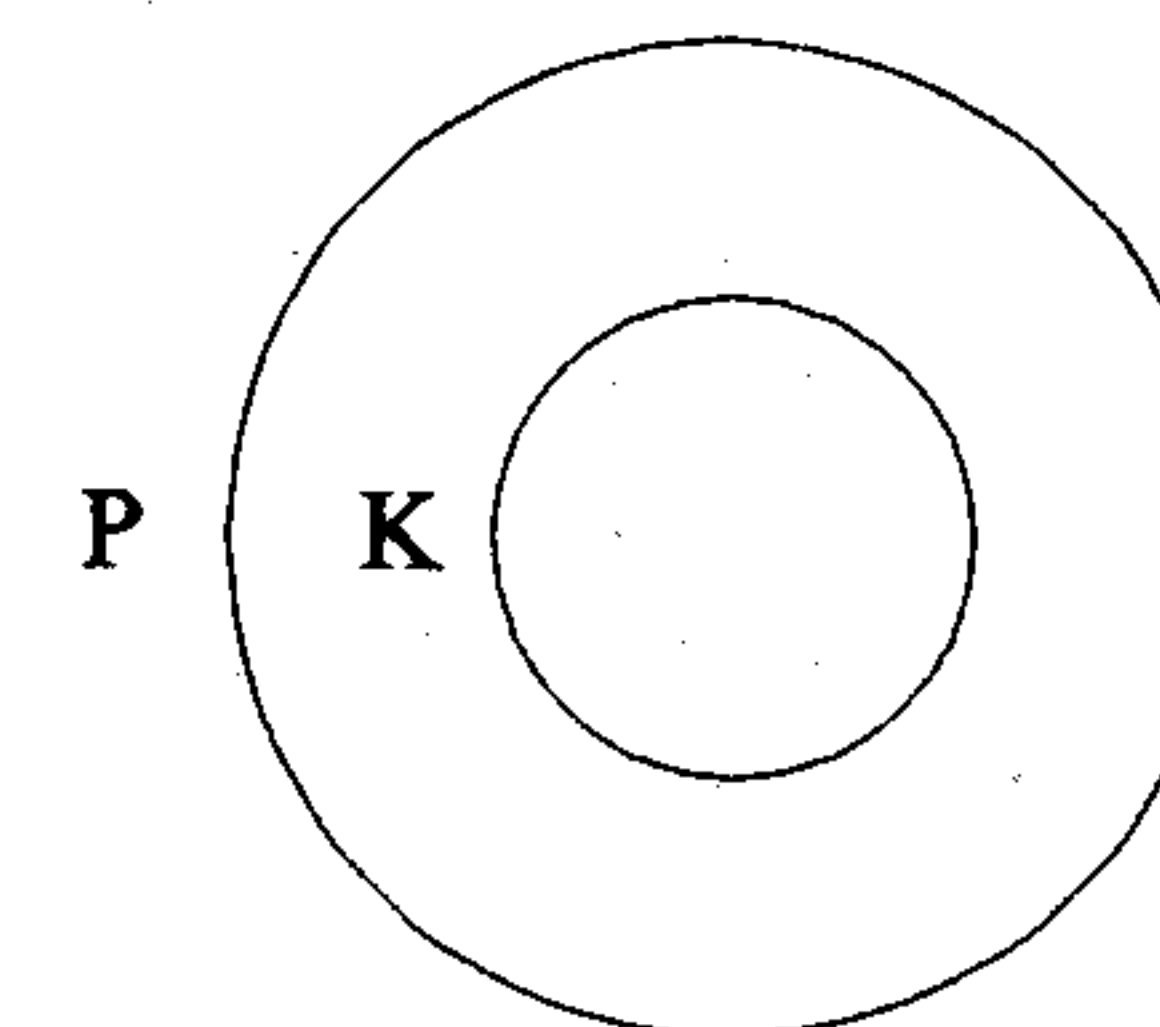
- (23) *Many girls I know came to the party.*
 (24) *I know many of the girls who came to the party.*

In Lee's exposition, the set relationships here are somewhat as follows:

(23)¹



(24)¹



where K is the set of girls I know and P is the set who came to the party (Lee 1971: 11). The semantic difference between (23) and (24) is then explained in terms of different relationships between K (= the girls I know) and P (= the girls who came to the party): in (23), P is a subset of K, whereas in (24) it is *vice versa*, namely it is K that is a subset of P. The point at issue is then that in the underlying structure of the form NP_x *have* NP_y we have different configurations involving NP_x and NP_y , in which the NPs preceding and following *have* present themselves as set and its subset respectively.

Another instance of set relationships is that of 'set identity', which Lee considers as a special case of set inclusion. Lee notes as one of the possibilities in set theory that when set X is a subset of set Y, then set X may equal set Y. It may also be said that in such cases every set is a subset of itself. Thus, in the following example:

- (25) *All of the boys who left school early arrived home late.*

where the set of boys who left school is co-referential with the set who arrived home late, Lee assigns to the sentence on the basis of the presence of the quantifier *all* the reading that not only is NP_y a subset of NP_x but also $NP_y = NP_x$ (Lee 1971: 15). Moreover, as Lee argues, it is precisely when the quantifier is *all* that the notion of set inclusion is secondary to the idea of set identity. As a corollary, this makes it possible to delete the item which derives from the deep structure

element expressing set inclusion and, thus, to represent (25) as the source for (26):

(26) *All the boys who left school early arrived home late.*

The same explanation also applies to other cases of set identity, as in the following examples:

(27) *Both of the boys who left school early arrived home late.*

(28) *Both the boys who left school early arrived home late.*

The derivation of (28) from (27), too, is explained by the fact that the set relationship is that of set identity, since in both (27) and (28) “the two boys who left school early (and there were only two) are co-referential with the two who arrived home late” (Lee 1971: 17).

The *of*-deletion transformation cannot be applied, however, in the presence of other quantifiers, when the relationship of set inclusion is not that of set identity. Thus although (26) and (28), in both of which set relationships between NP_y and NP_x can be described in terms of set identity, are grammatical, the examples in (29) are all ungrammatical:

(29)

*Many	}	the boys who left early arrived home late.
A few		
Some		
Few		
None		

As may be seen from Lee’s analysis adumbrated above, the implementation of the notion of set relationships is part of a serious attempt not only to describe facts concerning quantifiers, but also to explain why these facts are as they are. In this perspective, the notion of set relationships is one that is more central to Lee’s analysis of quantifiers than the proposed mechanism of deriving the *of* following the quantifier from the underlying structures involving the verb *have*. Indeed, as Lee himself notes, “the main point of the argument is to establish a relationship between the possessive *of* and the *of* following a quantifier – *irrespective of the problem of derivation*” (Lee 1971: 2), and it is for the purposes of exposition only that he assumes that the possessive *of* derives from an underlying sentence in which the verb is *have*. Thus, Lee is perfectly aware that the correct solution to this problem is far from being clear, and what he really aims at is just “a more

revealing source in the sense that the appropriate semantic relationships are more clearly expressed” (Lee 1971: 18).

However, as the subsequent discussion has shown, Lee’s account of set reference relationships, which he applies in the case of *Quant of the N* and *Quant the N* structures, cannot be extended to the analysis of simple quantifier plus noun combinations, “since he would appear to claim that *Quant N* structures are developed from a quite different source, cf. Lee (1971: 16 and note), thus very possibly losing any chance of expressing significant generalizations about quantifiers as a whole” (Hogg 1972: 230).

Indeed, as Lee himself remarks in his *Reply to ‘Quantifiers and Possessives’*:

The question which I avoided in my original article was that concerning the internal structure of the NP consisting of a quantifier plus a noun. This was a deliberate decision on my part – though perhaps a wrong one – which I made to avoid one controversial problem (the source of *many boys*) so that I might concentrate on another (the source of *many of the boys*). (Lee 1972: 239)

However, in the light of this remark no chance of expressing significant generalizations about quantifiers as a whole can yet be regained, since Lee still continues to maintain that the source of *many boys* is indeed quite different from the source of *many of the boys*. Nor does it seem likely that he can do otherwise, since in the transformationalist framework that he adopts the requirement is that for the source of *Quant N* and *Quant of the N* structures to be identical, the meaning of the sentences in which they occur should be identical, too; whereas, as Lee notes:

... if we consider:

(30) *I met many students who enjoyed the lecture.*

(31) *I met many of the students who enjoyed the lecture.*

the two sentences do not appear to be synonymous... Thus, to say that I met a large number of students and they enjoyed the lecture, as in (30), is not equivalent to saying that I met a large subset of the whole set of students who enjoyed the lecture — (31) (Lee 1971: 16).

In other words, Lee’s argument runs as follows: a) sentences (30) and (31) are structurally identical except for the structural difference between *Quant N* and *Quant of the N* structures; b) sentences (30) and (31) have different meanings; therefore, c) their difference in meaning should be attributed to the structural difference between *Quant N* and *Quant of the N* structures. Thus, these structures cannot be described in terms of one and the same underlying structure, since otherwise (30) and (31) would not be different in meaning.

What Lee does not take into consideration – though it is notably to this effect

that the second part of his remark quoted above conspicuously testifies – is that this difference in meaning could also be attributed to the presence of the relative clause in both of these sentences with different syntactic roles in either of them. Thus, if we assume for the moment that the quantifier structure in (30) is also derived from the same underlying structure as in (31), i.e., in Lee's terms, from something like *the boys HAVE many boys* or, more generally, $NP_x \text{ HAVE } NP_y$, then the difference in meaning can be easily attributed to the fact, already noted by Jackendoff (1968: 425-6), that the relative clause is associated with different elements of the same quantificational structure. In (30), following Lee's terms of analysis, the element in question would be NP_x interpreted as a *containing* set (I met a large number of students and they enjoyed the lecture), whereas in (31) the element associated with the relative clause would be NP_y which, unlike the one in (30), is interpreted as a *contained* set (I met a large subset of the whole set of students who enjoyed the lecture). Thus, contrary to what just might have been expected along the line of reasoning in Lee's own argument, the superficial difference between *Quant N* and *Quant of the N* structures presents itself rather as a kind of disambiguation device in what would be seen as a typical case of "constructional homonymity" of the otherwise identical yet syntactically ambiguous structures involving the relative clause – a device which in fact has nothing to do with the real source of the non-synonymy of Lee's examples in (30) and (31). In this light, Lee's argument that *Quant N* structures are developed from a quite different source is simply untenable, thus leaving the issue of set relationships in the grammar of quantifiers as a whole generally unresolved.

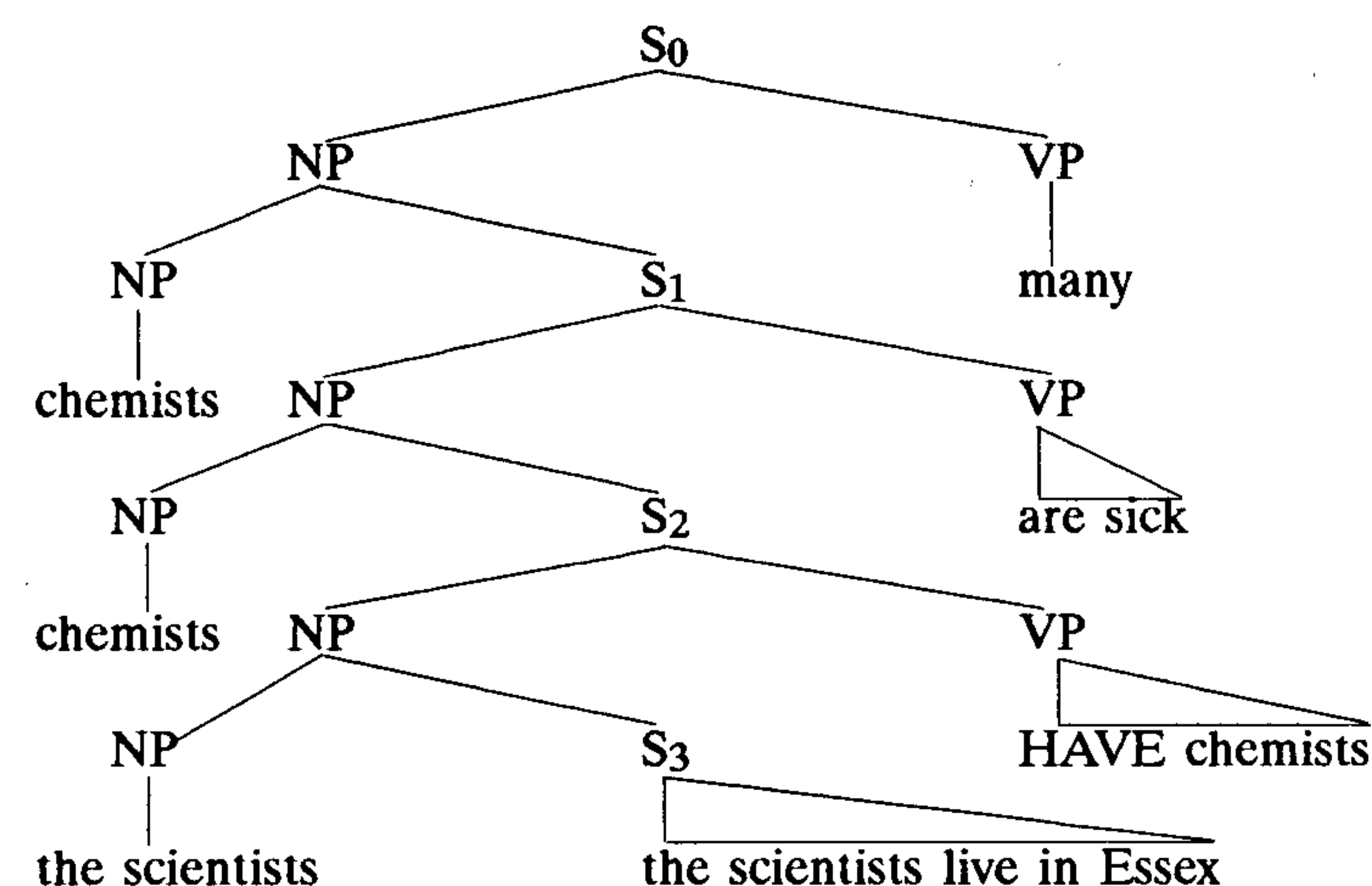
5. Semantic set relationships and the grammar of quantifier complementation

As Lee himself appears to admit in his reply to Hogg's criticism, there is yet another point of controversy in Lee's analysis that bears significantly on the task of arriving at general solutions concerning quantifiers as a whole. In Lee's own analysis, it presents itself *prima facie* as a moot point in the derivation of *Quant of the N* structures themselves. The point at issue arises from the fact that in Lee's original exposition *Quant of the N* constructions are derived from the underlying structures which themselves contain a quantifier as part of the *Quant N* structure of one of the NPs standing in the relationship of set inclusion (*many boys* in *the boys HAVE many boys*). Since, however, *Quant N* structures are assumed to be developed from a quite different yet not identified "dummy" source, the full cycle of derivation of *Quant of the N* constructions themselves appears as ultimately unresolved. Moreover, what at first sight appears only as a "dummy" point of an underlying $NP_1 \text{ HAVE } NP_2$ structure in the full cycle of derivation, turns up to present a source of serious controversy at yet another level of derivation, when the underlying $NP_1 \text{ HAVE } NP_2$ structure (*the boys have many boys*) after the application of an OF-HAVE transformation takes the form of an intermediate *Quant N₁ of the N₂* structure (*many boys of the boys*). What Lee very possibly regards here as the main obstacle to his arriving at significant generalizations about quantifiers as a whole is that in this structure the quantifier appears as part of the

prepositionless phrase as well as part of the phrase with the *of* following the quantifier with different roles played in either of these phrases. Thus, the lack of significant generalizations concerning quantifiers as such would be seen in the fact that in Lee's exposition the same quantifier item happens to be developed from two quite different sources simultaneously.

The necessary step to be done so as to avoid this apparent source of controversy, in Lee's own view, is "to remove the quantifier from the sentence expressing set inclusion," which, as he believes, "goes a long way to answering Hogg's points" (Lee 1972: 239). Thus, as a possible way of doing this, which he illustrates by the following example:

(32)



Lee adopts Lakoff's position – i.e., he takes the view that quantifiers are derived from higher predicates. The immediate effect of this turns up, however, to be quite opposite to the one that was ultimately intended: despite the fact that the removal of the quantifier from the sentence expressing set inclusion appears to eliminate the source of apparent controversy that blocks in principle any uniform treatment of quantifier derivation, the view that quantifiers are derived from higher predicates in both *Quant N* and *Quant of the N* structures leaves no place for any explanation of quantifier derivation in terms of set relationships in either of these cases, thus essentially missing the point of Hogg's criticism.

In order to ascertain that Lee was, nevertheless, basically correct at least insofar as his proposal to remove the quantifier from the sentence expressing set inclusion might be concerned, consider just another option that we already touched upon in our previous discussion, namely that *Quant N* structures, too, should be derived from an underlying sentence expressing set inclusion – i.e., e.g., *many boys*, along with *many of the boys*, should also be derived from an underlying $NP_x \text{ HAVE } NP_y$ structure (*the boys HAVE many boys*). It will be immediately evident, however,

that the underlying *Quant N* structure of NP_y being identical with the surface structure of the same form will itself require yet another stage of derivation from a subsequent NP_x *HAVE* NP_y structure expressing set inclusion, and the same cycle will then have to be repeated *ad infinitum* with respect to the NP of each consecutive NP_x *HAVE* NP_y structure, thus leading to infinite regress. The quantifier item will itself have to be multiply repeated in an endless cycle of derivation, unless the quantifier is indeed removed from the underlying structure expressing set inclusion.

In order to avoid this apparent source of controversy, all we need is to set up a sharp distinction between the quantifier itself and the rest of the quantifier phrase that plays the role of the quantifier matrix so as to produce the full-fledged structure of the quantified NP. What this necessarily implies, however, is that in this layout the quantifier can no longer be syntactically dominated by any element of the quantifier matrix. Rather, it is the quantifier itself that should be regarded as the head word, or nucleus, of the whole quantifier phrase as such. In this case, the quantifier matrix presents itself as a syntactic complement of the quantifier, and the basic structure of all nominative constructions containing quantifiers takes the form:

(33) Quant + Complement

As a basic structure, (33) provides a necessary generalization concerning both diagnostic environments of English quantifiers, since the juxtapositive and delimitative serialization-types of English quantified NPs now appear as members of the same syntactic paradigm, as in (34):

$$(34) \quad \text{Quant} + \left\{ \begin{array}{l} \text{N} \\ \text{of} + \text{Det} + \text{N} \end{array} \right\}$$

Thus, the diagnostic environments in both (3a) and (3b) can be represented as realizations of the same syntactic pattern consisting of a quantifier plus its complement, as in (35):

- (35) a. Quant + NCOMP
b. Quant + (of + Det + N)COMP

Owing to the sameness of the basic QUANT-COMP structure in both (35a) and (35b), the nature of the distinction between the two serialization-types of English quantified NPs can now be considered in a somewhat different light, with the main accent being put on the difference in the structural type of quantifier complementation. Keeping in mind that the structure of the two serialization-types is now regarded as basically identical except for the structural type of quantifier complementation alone, we may observe that in the case of (35a) the quantifier complement is always represented by a single lexical item belonging to the category

of common nouns; hence, it may be defined as syntactically primitive. An essential point to be noted here is that this type of quantifier complementation does not admit personal pronouns and proper nouns as items with specific reference in place of common nouns. This is not, however, the case with (35b), where the surface structure of the quantifier complement never consists of a single, syntactically unanalyzable item, not even when the preposition *of* is occasionally deleted.

As we already know from Lee's analysis, such deletion is possible when the underlying set relationship is that of set identity, as in *both of the boys*, where the deletion of the preposition *of* results in the contracted form in *both the boys* (cf. Lee 1971: 16-17). Notice, however, that *of* cannot be deleted, the case of set identity notwithstanding, if the remaining structure of the quantifier complement should contain a single, syntactically unanalyzable element. This is clearly the case when, e.g., the pronoun *them* is substituted for *the boys* in *both of the boys*: in the resulting structure, *both of them*, *of* cannot be deleted despite the fact that the set relationship is that of set identity.

The nature of the distinction between the two serialization-types of English quantified NPs can therefore be seen as a deeper syntactic fact not necessarily conditioned by, or connected with, the superficial appearance of the preposition *of* following the quantifier; rather, what really makes difference here is the fact that, from the point of view of sentence morphology (Trnka 1928 [1982]), in (35a) we have a synthetic form of quantifier complementation, as opposed to an analytical form of quantifier complementation in (35b). Since, as we assumed earlier, (35a) and (35b) are also identical in their structural meaning (cases of relativization notwithstanding), the only difference between the two diagnostic environments is that in (35b) the complement position is always occupied by an analytical construction, whereas in (35a) it is a synonymous synthetical construction that enters the structural position of the quantifier complement. The relevant generalization concerning quantifiers as a whole can now be achieved by stating that in (35a) and (35b) we have respectively the synthetical and analytical means of expression of the same notion of semantic set relationships.

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