

## THE FEATURE "COUNT" AND SEMANTIC INFORMATION

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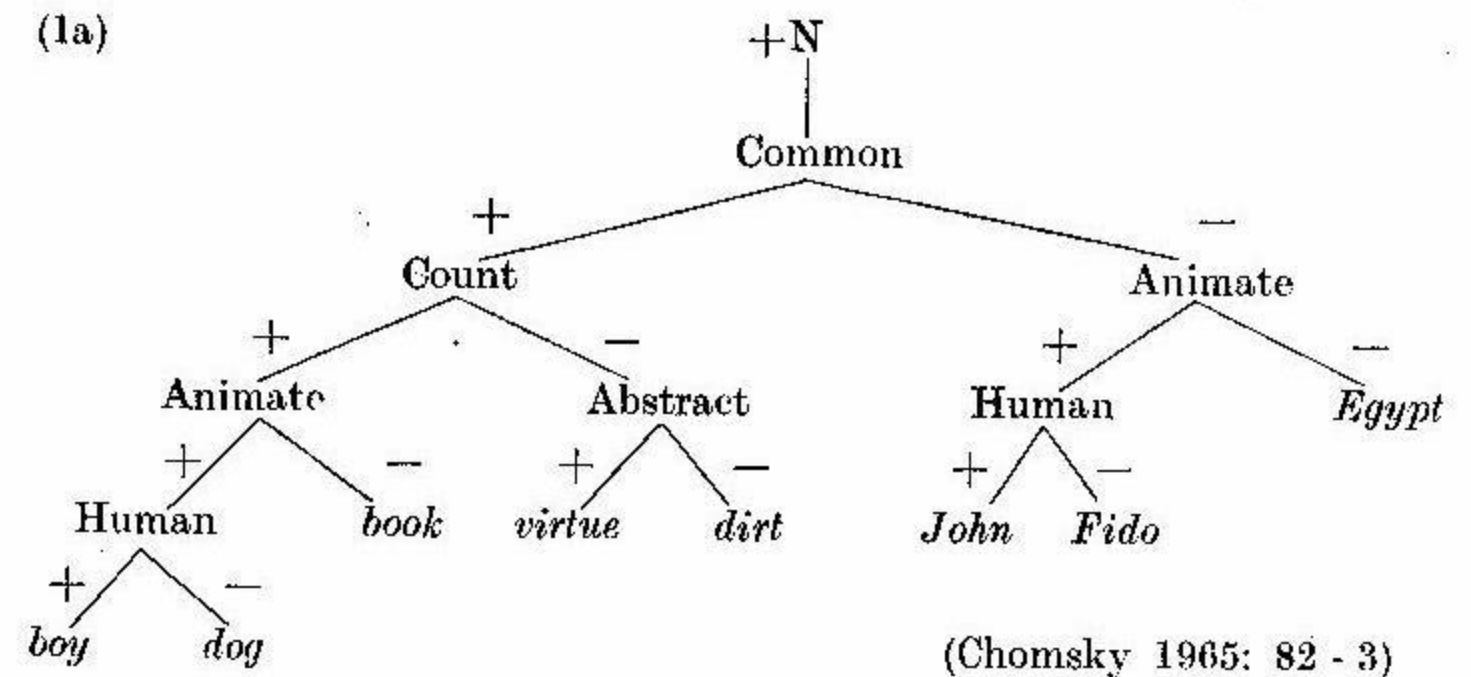
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It is assumed that the inherent features of the noun should combine both syntactic and semantic information in a systematic manner. This requirement is not fulfilled by the feature "Count" as positioned in Chomsky's (1965: ch 2) scheme for the subcategorization of the noun. Alterations in the scheme are therefore proposed and a detailed justification for the proposal is provided.

Syntactic features<sup>1</sup> have been introduced into the *Aspects* model of grammar (Chomsky 1965) to improve upon the earlier technique of subcategorization which split classes into successively smaller single primitive concepts, without ever allowing for the fact of cross-classification. To secure appropriate co-occurrence relations — the ultimate goal of all subcategorization — the Noun symbol is first developed by context-free subcategorization rules:

- (1) (i)  $N \rightarrow [+N, \pm\text{Common}]$  (iv)  $[-\text{Common}] \rightarrow [\pm\text{Animate}]$   
(ii)  $[+\text{Common}] \rightarrow [\pm\text{Count}]$  (v)  $[+\text{Animate}] \rightarrow [\pm\text{Human}]$   
(iii)  $[+\text{Count}] \rightarrow [\pm\text{Animate}]$  (vi)  $[-\text{Count}] \rightarrow [\pm\text{Abstract}]$

These rules are representable by the following binary branching tree:

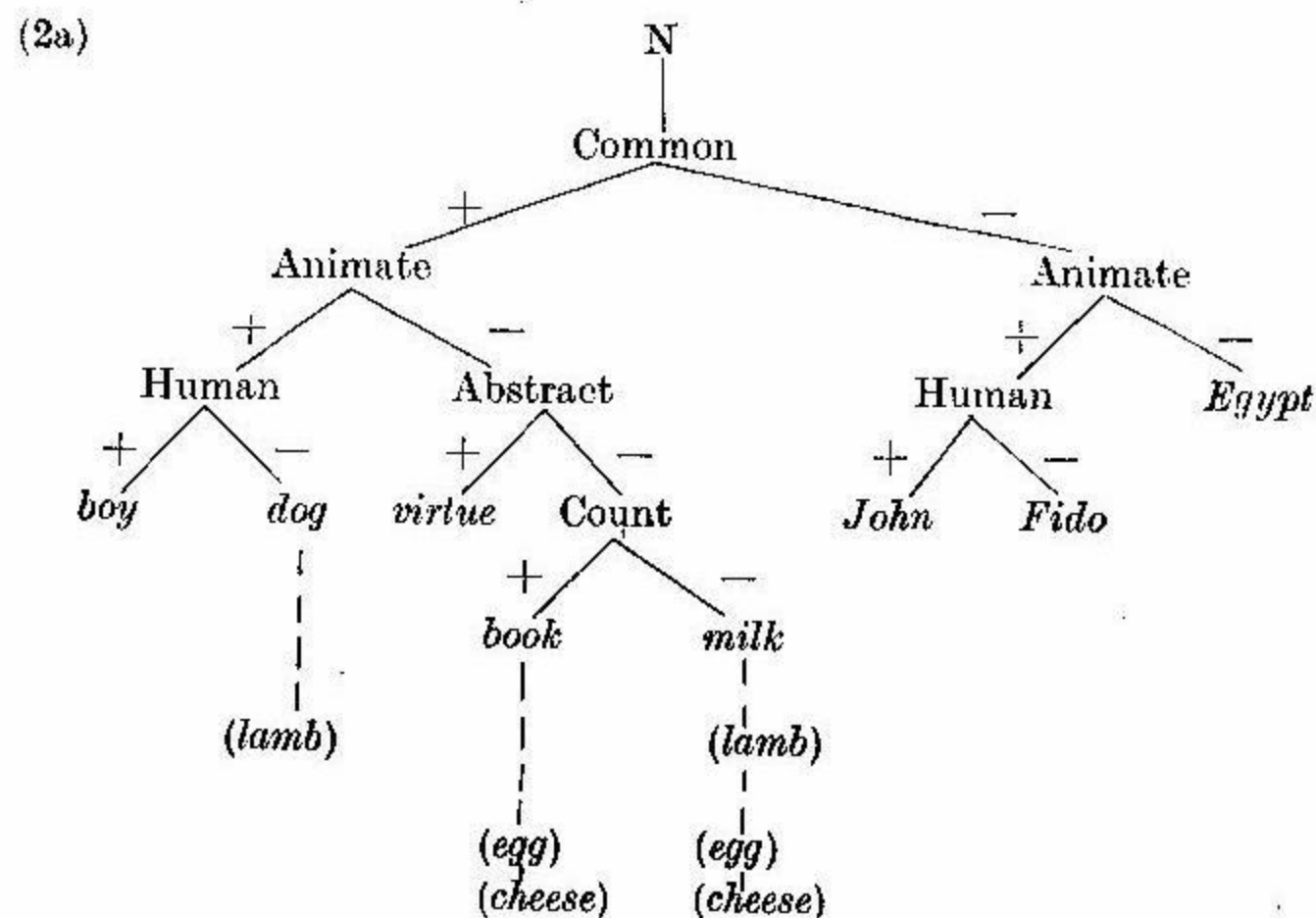


<sup>1</sup> Before Chomsky popularized the concept, proposals to use syntactic features were made by Matthews in 1957 (see Chomsky 1965: 79, and note 13 to chapter 2), Schachter in 1962 (as reported in Matthews 1967: 127), and Stockwell (as reported in Weinreich 1966: 401, note 12a).

Then, the Verb symbol is developed by acquiring contextual features: first, an image of the entire VP dominating the Verb in question ("strict subcategorization"); second, an image of the Complex Symbol representing the subject (and object, if any) with which the Verb is to be concatenated ("selectional restrictions"). Thus the Verb is selected in terms of the subject (and object) whose features it must match.

The feature approach to subcategorization has in turn met with various criticisms (see e.g. Matthews 1967: 127 - 32), notably those concerning the inelegant duplication of the information contained in Noun features, and those concerning the preservation of the "directional" character of feature assignment. But so far as I know, the context-free rules developing the inherent syntactic features of the Noun have not been questioned. I should like now to present a slightly revised version of these rules, along with the justification for the proposal. The rules and the corresponding tree are:

- (2)
- (i)  $N \rightarrow [+N, \pm\text{Common}]$
  - (ii)  $[\pm\text{Common}] \rightarrow [\pm\text{Animate}]$
  - (iii)  $[+\text{Animate}] \rightarrow [\pm\text{Human}]$
  - (iv)  $[-\text{Animate}] \rightarrow [\pm\text{Abstract}]$
  - (v)  $[-\text{Abstract}] \rightarrow [\pm\text{Count}]$



The innovation consists merely in lowering the feature "Count" and thereby restricting its range to  $[-\text{Animate}, -\text{Abstract}]$ , i.e. to Concrete Nouns only. Technically then, it is a problem of the relative ordering of features. The issues

involved, however, are far-reaching. Indeed so much so that before attempting the justification proper, we must touch upon a point as important as the role of semantic considerations in the construction of a grammar.

The *Aspects* model considered semantics as purely interpretive, the semantic projection rules working on the output generated by deep syntax. The boundary between syntax and semantics, however, remained elusive since, as Chomsky was the first to admit, no satisfactory theoretical grounds were found for setting a priori the question of how much linguistic fact was to be rendered by syntax and how much by semantics, respectively (cf. Chomsky 1965: ch. 4, § 1, and especially p. 159). So, soon after the appearance of *Aspects*, the separability of syntax from semantics became a major issue of dispute. As early as 1966, Weinreich (1966: 468) argued for what he called "interpenetration" of deep syntax and semantics. Then gradually there arose a new semantic-oriented approach, expounded, e.g., in McCawley (1968), Lakoff (1971), and Postal (1971). It has assumed the name of "generative semantics" to stress the claim that it is the semantic representation—of a nature much more abstract than the "classical" deep structure—that is truly generative, while the task of syntax (referred to as "grammar") is that of the "mapping of semantic representations into phonetics" (Postal 1971: 251). Formal logic is given an important role in shaping such semantic representations. In this connection, it is significant that a case for the logico-semantic construction of deep structure has also been made outside the "generative semantics" school, for instance by Hutchins (1971) and Bellert (1972).

In the discussion that follows my attitude is not so radical: I merely wish to *arrange* deep structure syntactic information in such a way that it may naturally correlate with some well-defined semantic information. Of various deep structure elements, I understand the syntactic inherent features of Noun to be perfectly able to meet this requirement, indeed an attempt at matching syntactic with semantic information in the domain of noun subcategorization was made by Bloomfield himself (1933: 204 - 5). On the other hand, I do not wish to claim that *all* deep structure syntactic information must necessarily have semantic significance (cf. Weinreich 1966: 469).

Now, after this brief but important explanation, let us return to the matter in hand. Chomsky does not say what considerations—beyond the need to formalize multiple class membership (cross-classification, Chomsky 1965: 79 - 80)—have gone into the ordering of the features he has proposed. (In fact, he leaves unanswered the question "whether or to what extent semantic considerations are relevant in determining such subcategorizations", though he admits that the justification of the answer will involve the grammatical status of such expressions as *the boy may frighten sincerity* (Chomsky 1965: 75). Thus Chomsky touches upon the nature of these features but not upon their sequential ordering, and one may only conjecture that if semantic considera-



tions are thought relevant to the former, then they will also be relevant to the latter). A little experimenting with other possible (=not counter-intuitive) orderings shows that Chomsky's scheme is certainly the simplest in the sense of "most economical", the inelegant doubling of symbols necessary to represent the fact of cross-classification being reduced to the unavoidable minimum<sup>2</sup>. The deeper underlying principles of arrangement seem to be concerned with what may be called "range coverage". Thus every noun must be either [+Common] or [-Common] (=Proper), therefore this feature ranks highest, whereas features such as "Human" or "Abstract" are, respectively, found only in some nouns and are totally irrelevant in others: consequently, they rank lower. It is significant that the feature "Count" does not suggest itself as a good illustration in this argument; evidently its position is not so intuitively obvious as were the others. Observe now that the concept of "range coverage" may be formalized with the help of the notion of *implication*, which is in principle semantic. Originating from the sentential calculus of the science of logic, this notion has been adapted by Lyons (1968: 445) for purposes of establishing relations between sentences in natural languages, and, by analogy, for establishing the sense relations between lexical items occurring in deep structures that are identical except for the lexical items under investigation (cf. Lyons 1968: ch. 10, and especially p. 458). So in effect, the features which have been distinguished on syntactic grounds are finally arranged in hierarchical sequences on the strength of semantic considerations, the purely syntactic matter contributing only in the sense that the number of syntactic rules relevant to a node will gradually accumulate as we go down each path.

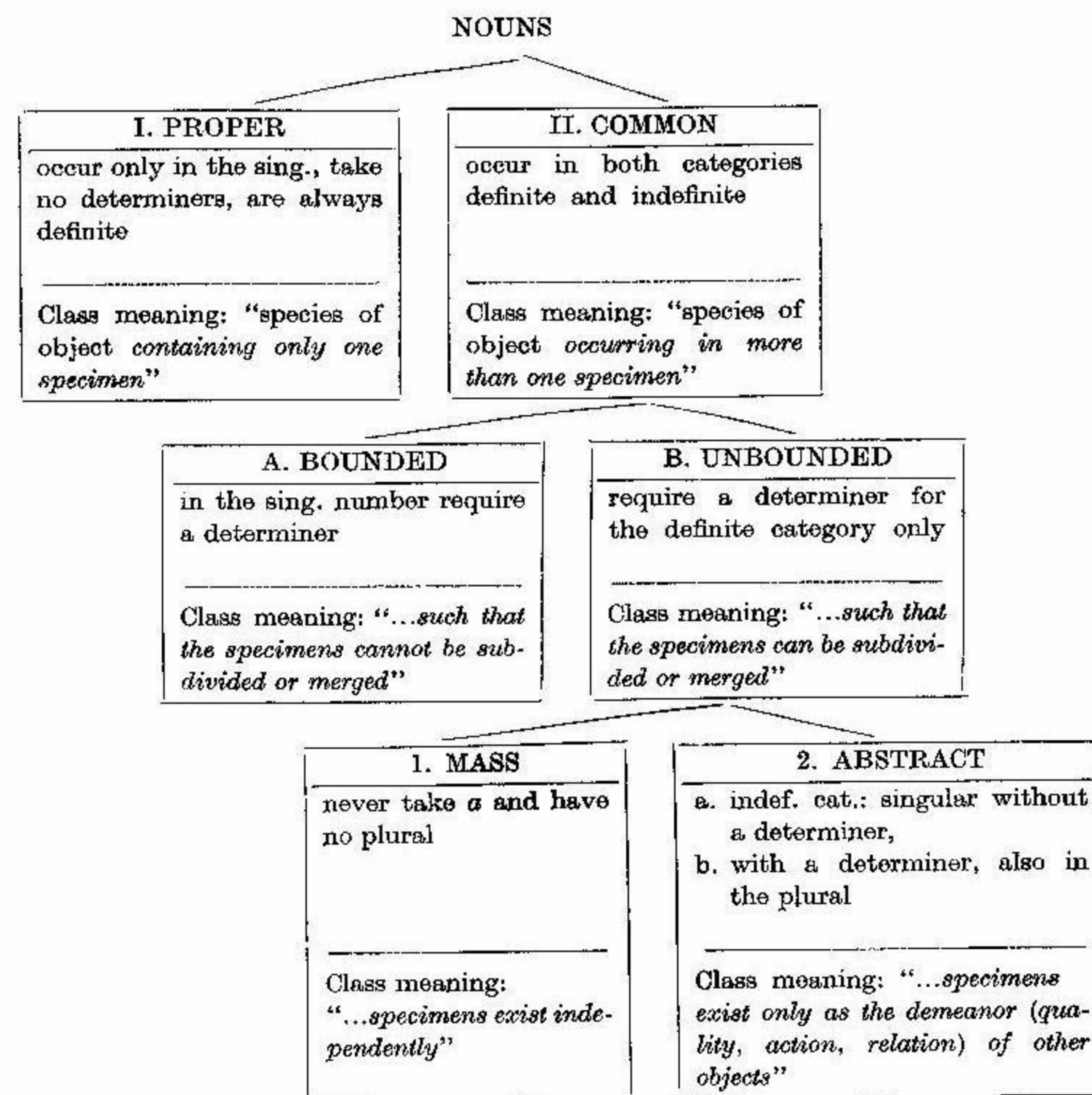
<sup>2</sup> Consider, for instance, that it would not be counter-intuitive to finish off each of the paths originating in [+Common] by adding the [ $\pm$ Count] choice. Such a solution would enable us to distinguish between the following subcategories (Polish equivalents have been supplied whenever they make an interesting contribution):

[+Human]	[+Count]	<i>All these men will survive</i>	"mężczyźni, ludzie"
	[-Count]	<i>Man will survive</i>	"rodzaj ludzki, człowiek"
[-Human]	[+Count]	<i>These are lambs</i>	"owieczki"
	[-Count]	<i>This is lamb</i>	"mięso jagnięce"
[-Animate]	[+Count]	<i>Books are expensive</i>	
	[-Count]	<i>Furniture is expensive</i>	
[+Abstract]	[+Count]	<i>Virtues are rare</i>	
	[-Count]	<i>Information is rare</i>	
[-Abstract]	[+Count]	<i>There are twelve sugars in this compound</i>	
	[-Count]	<i>Sugar is sweet</i>	

In such a system the [ $\pm$ Count] choice would have to appear five times in the rules, instead of Chomsky's once. This is why it has to be rejected. All the same, the very possibility of multiple application of "Count" suggests a certain amount of confusion in our understanding of the property of "Countability".

To get a reasonably clear picture of the information involved, Table (3) below specifies the syntactic and the semantic contributions as far as they can be read with some certainty from Chomsky's scheme. Bloomfield (1933: 204-5) is of considerable help here, as Chomsky seems to have drawn on his scheme of subcategorization of noun, even though Bloomfield's system was based solely on the criterion of "the use and non-use of determiners"<sup>3</sup> while

<sup>3</sup> To refresh the reader's memory, here is Bloomfield's (1933: 204 - 5) noun subcategorization, presented in the new form of a binary tree.



It is interesting to notice that the tree I have constructed out of Bloomfield's material is to be read in exactly the same way as Chomsky's in so far as the information cumulates as we go down each branch, so that in order to define a lower level, everything from the relevant higher levels must be included.



Chomsky's may be understood to be concerned also with substitution and morphological forms. In the Table, the information traceable explicitly to Chomsky is marked as such, the source being given in parentheses.

(3) Table

FEATURE	INFORMATION	
	SYNTACTIC	SEMANTIC
	expressed by syntactic rules involved (including morphological rules)	expressed by semantic features marked < >, each feature determining a set of all and only lexical items possessing that feature
(a) [+Common] vs. [-Common]	rules involving Determiners (Chomsky 1965: 79)	<+Common> vs. <-Common> (=<-Unique> vs. <+Unique>) additional contrast between these sem. features is given by the fact that the <+Unique> set consists only of one-element subsets, unlike other feature-determined sets
	relevance vs. irrelevance of features "Count" and "Abstract" (Chomsky 1965: 82 - 3)	
(b) [+Count] vs. [-Count]	?	?
(c) [+Animate] vs. [-Animate]	rules involving choice of gender in pronominal substitution forms (personal and possessive)	<+Animate> vs. <-Animate>
(d) [+Human] vs. [-Human]	same as under (c); rules involving choice of relative pronoun (Chomsky 1965: 79)	<+Human> vs. <-Human>
(e) [+Abstract] vs. [-Abstract]	relevance vs. irrelevance of morphological rules involving the formation of complex forms such as <i>goodness</i> , <i>boyhood</i> ; idiosyncratically applying rules involving number, e.g. <i>virtues</i> , * <i>goodnesses</i> [+Abstract] <i>waters</i> , * <i>dirts</i> [-Abstract]	<+Abstract> vs. <-Abstract>

Syntactic information in the Table is self-explanatory in so far as it summarizes some generally acknowledged facts. The relations between the syntactic features and the rules they trigger are understood to be unilateral, e.g., a *proper*

*noun does not take an article* is not equivalent with a *noun that does not take an article is a proper noun*. As for semantic information, on the other hand, some explanations are in order as there is hardly anything here that would come under the comforting description of "generally acknowledged". In the Table, the pitfalls of referential semantics have been avoided by the simple expedient of using the notion of semantic features, each of which determines a set of all and only lexical items containing this feature. It is beyond the scope of this short paper to go into the problem of how the features have been distinguished and how they are interpreted by a linguistic theory. It is necessary, however, to explain that they are not technical terms automatically transferred from the syntactic to the semantic component. They rather originate from ordinary lexical items which serve here as metalinguistic symbols representing certain contrasts in meaning ("sense-relations")<sup>4</sup>.

Now coming back to the Table, observe that no naturally fitting interpretation has been found for the feature "Count" as it is placed in Chomsky's scheme. We must then test the concepts that suggest themselves as candidates for the position of "Count" and find out, through elimination, which is best (=most economical). We start by equating the [+Count] vs. [-Count] opposition with Bloomfield's Bounded vs. Unbounded nouns (see note 3). They have clearly defined syntactic and semantic properties. Bounded nouns require a determiner when in the singular and have "class meaning" of objects that "cannot be subdivided or merged", while Unbounded nouns "require a determiner for the definite category only", their "class meaning" denoting objects that "can be subdivided or merged" (cf. Bloomfield 1933: 204-5). However, this interpretation of "Count" has to be rejected because it disturbs the scheme of implicational relations that we have established as the governing principle for the ordering of inherent noun features of deep syntax. This is so because it is counter-intuitive for the semantic information "cannot vs. can be subdivided or merged" to precede the information carried by <Animate>. The disturbance stems precisely from Chomsky's introduction of "Animate" as a syntactic feature while basing his subcategorization scheme on Bloomfield's classification, in which there is no room for distinctions such as "Animate" (or "Human", for that matter), since the only criterion Bloomfield employs is the "use and non-use of determiners", inapplicable to "Animate" or "Human" in any interesting fashion. (Bloomfield's semantic information, which he calls "class meaning", is added as an afterthought and does not constitute a criterion contributing to the obtaining of the classification.) An additional argument against the acceptance of Bloomfield's Bounded

<sup>4</sup> There are indications in Weinreich (1966) that language possesses semantic properties which make such a solution possible. The problem is given full consideration in my *English feature-grammar and its application to deviant sentences* (1974).



vs. Unbounded dichotomy for our [ $\pm$ Count] is concerned with the nature of syntactic information contained in Bloomfield's proposal. He characterizes Unbounded nouns as requiring a determiner "for the definite category only". Now "Definiteness" may be understood as inherent in [ $-$ Common] nouns, but in [ $+$ Common] nouns it clearly belongs to the phrase marker rather than to the lexical item, since it depends on the "intention" of the speaker and on the hitherto little-known rules of beyond-the-sentence grammar. It is thus best represented by a segment structure rule of the kind of (4) and not by an inherent feature.

$$(4) \quad \begin{bmatrix} +N \\ +\text{Common} \\ \alpha F \end{bmatrix} \rightarrow [\pm \text{definite}]$$

The next candidate to consider for the position of "Count" as placed in Chomsky's scheme is the notion of the ability of plural formation, together with restrictions in the occurrence of the indefinite article. Such characteristics have been traditionally connected with the Countable: Uncountable opposition, accompanied supposedly by the corresponding semantic information. However, there is a sense in which the semantic information remains vague if "Count" is understood in this way. This is connected with the plausibility of the inherentness (to the lexical item) of the properties under consideration. It is a fact that [ $\pm$ sing] understood as an inherent feature of the noun is often purely idiosyncratic syntactically and has nothing to do with meaning, cf. Bloomfield's (1933: 190) well-known example: "wheat grows" but "oats grow", and also a number of such abstract nouns as *advice* (\**advices*), *information* (\**informations*) characterized by their inability to form the plural, as contrasted with abstract nouns such as *idea* (*ideas*), *thought* (*thoughts*). (Observe, too, that the two last-named nouns representing a statistically numerous subgroup do not, properly speaking, belong anywhere in Chomsky's scheme. True, they have been defined as [ $-$ Count,  $+$ Abstract], but it is difficult to imagine how [ $-$ Count] is to be understood in nouns which are notoriously used in expressions like *I had three great ideas, a penny for your thoughts*, etc.). The idiosyncratic character of such phenomena is confirmed by the fact that they belong exclusively to individual languages, cf. for instance, Polish "porady", plural of "porada" *advice*<sup>5</sup>. It seems that the only safe interconnection between number and "Count" is that number has no relevance for certain nouns, which have only one form, and that these nouns may be provisionally described as [ $-$ Count] (information about all other idiosyncrasies, such as

<sup>5</sup> On the other hand, when the plural form is needed to support the semantic information, as in *glasses, scissors, trousers*, then the corresponding nouns behave similarly in a number of languages; cf. Polish *szkła* (*okulary*), *nożyczki*, *spodnie*, all of which are also plural in form.

pluralia tantum, to be stored in the Lexicon). To all the remaining nouns, the property [ $\pm$ sing] is freely attributed (except for agreement requirements, etc.) when they enter the phrase marker. In other words, similarly to definiteness, number is introduced by segment structure rules and belongs to the phrase marker rather than to the individual noun. And again as has been the case with definiteness, number depends on the "intention" of the speaker and on some rules of grammar (agreement, beyond-the-sentence grammar). It is introduced by a segment structure rule of the form:

$$(5) \quad \begin{bmatrix} +N \\ \alpha F \end{bmatrix} \rightarrow [\pm \text{sing}]$$

to which a convention may be attached saying that the presence of [ $-$ Count] in the first segment blocks the possibility of that segment acquiring the [ $-$ sing] feature.

We have thus considered the interpretation of Chomsky's [ $\pm$ Count] as either (A) Bounded: Unbounded (Bloomfield), or (B) Countable: Uncountable (traditional grammar) oppositions, and found each of them unsatisfactory when taken as a whole but true in many details. So the only strategy that remains to us is to cross some elements of (A) with some of (B). Of various combinations possible we choose that combining the syntactic part of (B) with the semantic part of (A). To make this new combination useful, we must lower the position of "Count", so that it refers only to a relatively small subset of Common nouns delimited by the features [ $-$ Animate,  $-$ Abstract]. In consequence, Table (6) shows "Count" occupying the lowest position as contrasted with the second position in Table (3).

(6)

Table

	INFORMATION	
	SYNTACTIC	SEMANTIC
[ $\pm$ Common] [ $\pm$ Animate] [ $\pm$ Human] [ $\pm$ Abstract]	same as in Table (3)	
[ $+$ Count] vs. [ $-$ Count]	relevance vs. irrelevance of a) rules involving the formation of plural, b) special rules involving restrictions in the occurrence of the indefinite article	< $-$ Ability of being subdivided or merged>  < $+$ Ability of being subdivided or merged>

So placed, "Count" correlates the syntactic and semantic information that regularly delimits this subclass of nouns. The new approach allows us to differentiate between nouns such as e.g.: [ $+$ Count]: *a chair, the chair, chairs*, but \**chair*; and [ $-$ Count]: *milk, the milk*, but \**a milk, \*milks*.



In particular, it allows us to account for the distinction of nouns such as *lamb* as a living animal, and *lamb* as food in a more natural way than does the Chomsky scheme, because the main difference now stems from [+Animate] vs. [-Animate] (cf. Polish *baran* vs. *baranina*, *jagnię* vs. *mięso jagnięce*), while in Chomsky it is accounted for by the [+Count]:[-Count] opposition. Moreover, this strategy has brought nearer, i.e., under the domination of the same node "Count", such Concrete nouns as *egg*, *cheese* which may occur as either plus- or minus-Count but do not seem to differ in any other way. Now in Chomsky such nouns descend quite different paths, being separated by three intervening nodes. The new scheme also gains support from the fact that there exist many nouns of similar phonological shape serving as either plus- or minus-Count, one form being neutral or "unmarked" while its counterpart is intuitively felt to be "marked". Thus *egg* is primarily [+Count] but may occur as marked in the role of [-Count] ("you have egg on your blouse"), while *cheese*, *sugar*, *water* are primarily [-Count] but may occur as marked [+Count] (*three cheeses, there are twelve sugars in this compound, which one of the (table) waters do you take?*).

It follows from the foregoing argument that the new scheme can be adopted only with the concurrent acceptance of the solution according to which "Count" (in both semantic and syntactic sense) is irrelevant in all nouns except those which are [-Animate, -Abstract]. In other words, the ability or lack of ability of "being merged or subdivided" (and the corresponding syntax) does not refer to words such as *boy*, *dog*—which is intuitively obvious—and not only to words such as *John*, *Fido* and *Egypt*, as in Chomsky. At the same time, the main syntactic function of "Count" that may be attributed to Chomsky's scheme, i.e., the ability of plural formation, must be taken over by a segment structure rule which says that any noun may appear in either singular or plural form, the only exception on the syntactic level being the [-Count] nouns. (Other exceptions, of idiosyncractic character, belong properly to the lexicon and characterize individual lexical items, e.g. *the news is, the crew is/are*, etc.).

This concludes the justification of a proposal in which noun subcategories systematically combine the syntactic with the semantic information. The solution may eventually help in describing the selectional restrictions that hold between the noun and its predicator.

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