

## The Hierarchy of Linguistic Disciplines

A similar model of arranging series of subsiences and supersciences is found applicable also to the inner layout of linguistic disciplines. Its apparatus pursues how phonemes compose into morphemes, immediate constituents and higher syntactic units. Language structures yield a more consistent arrangement since they are linked by means of homogeneous concatenative chaining. Their hierarchy partly overlaps with poetic fields of study whose graded levels are described in Table 47.

Strings are usually generated by the alphabet of letters considered as the set of the most elementary elements. Where mathematicians generally speak of strings, linguists and literary theoreticians prefer to specify them as acoustic features, phonemes, syllables, morphemes, words, sentences and texts. Such units are investigated by different fields of linguistic and poetic studies. The terms of alphabet and string literally comply only with written texts and look suitable only for textology and linguistic graphemics. Phoneticians assume that the most elementary parts of spoken utterance are acoustic features that compose into three types of phonemes, consonants, vowels and diphthongs. The theoretical field of **phonology** may be assigned as an algebraic system

$$\mathbf{P} = [F, *],$$

consisting of the set  $F$  acoustic features and an operation  $*$  that combines them into phonemes. It defines phonology as an apparatus determining how acoustic features fuse into sounds. In further considerations we will use additive notation and interpret  $*$  as the additive plus sign  $+$ .

Another convenient example of self-contained systems is provided by **morphology**. We may informally say that it deals with combining morphemes into words. By a morpheme we mean the smallest part of a word that carries an independent semantic meaning. The whole system is defined by the mathematical formula  $\mathbf{W} = [M, +]$ , where  $M$  is the set of all morphemes in a given language and  $+$  denotes the additive operation of their concatenation. Morphemes appended to the root in the word-final position are called endings. In *she lives* we append the ending *-s*, in the phrase structure *I live* we add just a null morpheme. Indo-European languages exhibit inflectional properties, i.e. their nominal declension adds case endings and their verbal conjugation appends personal endings. There is only one unbreakable precondition: after joining an arbitrary morpheme to the root, their string remains the same word and the same part of speech.

On the other hand, **lexicology** deals with word formation that creates new units called lexemes that do not have to preserve the same part-of-speech characteristics. Its purpose is to compose roots, stems, prefixes and suffixes in

order to create new lexical units of different part-of-speech standing. If an ending is appended to the word root, we speak about inflection. If a lexical suffix is joined to the root, it creates a new word and linguists consider this transformation as derivation. Adding two word roots is termed word compounding, appending a suffix to the end of a root is called suffixation, positioning a morpheme before a root is referred to as prefixation.

Let  $M$  be the set of all lexemes including all word roots and various affixes. Then we treat joining morphemes to words in terms of simple arithmetic, no matter whether we mean derivation (affixing) or composition (compounding). Concatenation is conceived as an analogy of arithmetic addition and decatenation is described as a type of subtraction:

$$\begin{array}{ll} \textit{waiter} = \textit{wait} + \textit{-er} & c = a + b \quad (\text{lexical addition}), \\ \textit{waiter} - \textit{-er} = \textit{wait} & c - b = a \quad (\text{lexical subtraction}). \end{array}$$

The principal difference from common arithmetic lies in the fact that lexical operations do not obey the commutative law. This property implies that

$$\textit{wait} + \textit{-er} \neq \textit{-er} + \textit{wait}.$$

The sign  $+$  is applied to denote concatenation but it operates at different levels where it acquires special meanings. It is used also for linking higher units such as sentences, clauses, strophes, paragraphs, poems and utterances.

<b>Phonetics</b>	$F = [A, +]$ composes acoustic features into a set $F$ of phonemes.
<b>Syllabics</b>	$Y = [F, +]$ composes phonemes into a set $Y$ of syllables.
<b>Morphemetics</b>	$R = [Y, +]$ composes syllables into a set $R$ of roots/morphemes.
<b>Lexicology</b>	$W = [R, +]$ composes roots into a set of words/lexemes.
<b>Morphology</b>	$M = [W, +]$ composes words/lexemes into syntactic constituents.
<b>Syntagmatics</b>	$G = [M, +]$ composes syntactic constituents into syntagmata.
<b>Syntax</b>	$C = [G, +]$ composes syntagmata into a set $C$ of clauses.
<b>Syntactics</b>	$S = [C, +]$ composes clauses into a set $S$ of complex sentences.
<b>Stylistics</b>	$T = [S, +]$ composes complex sentences into paragraphs/texts.

Table 1. *The hierarchy of linguistic levels*

Table 25 proposes a hierarchical partitioning of levels of linguistic analysis. Let  $A$  denote a set of acoustic features,  $F$  a set of phonemes (vowels, consonants, diphthongs),  $Y$  a set of syllables,  $R$  a set of roots (morphemes),  $W$  a set of words (lexemes),  $M$  a set of syntactic constituents made up from words and their morphological endings,  $G$  a set of syntagmata composed from syntactic constituents,  $C$  a set of clauses constructed from syntagmata,  $S$  a set of (complex) sentences and  $T$  a set of paragraphs and texts. For specific needs of formalisation Table 25 enters simple definitions of linguistic disciplines so that every field of linguistic study may be reduced to procedures of generating

output elements from the elements of the input set. In contradistinction to traditional notation the formula  $W = [R, +]$  conveys that the operation  $+$  on the generating subset  $R$  of morphemes will produce all members of the set  $W$  of words. In order to avoid ambiguity, it is preferable to write  $[R, +] \rightarrow W$ . If a linguistic algebra  $A_j$  is an output of  $A_i$ ,  $A_j$  is an **extension** of  $A_i$  and a  $A_i$  is a **reduction** of  $A_j$ .

The series of linguistic disciplines in Table 25 finds it indispensable to clearly distinguish several levels of syntax. The lowest level is called **syntagmatics** because it deals with syntagmata consisting of syntactic pairs of two immediate constituents. In our usage the wide field of syntax is reduced only to bare sentences without subordinate clauses. So as to eschew ambiguity, it is recommendable to introduce new coinage here, let us say, 'clausematics' as a study devoted to analysing 'clausemes', linguistic units consisting of only one clause or a bare sentence. In the Merriam-Webster dictionary the field of syntactics is defined as 'a branch of semiotics that deals with the formal relations between signs or expressions in abstraction from their signification and their interpreters as independent algebraic structures'. Notwithstanding this does not contradict the chance to redress it as a special branch of syntax devoted to complex and compound sentences. Another uncommon step is introducing the difference between morphology and morphematics denoted by many linguists as morphonology. The formal ordering of all linguistic levels is tentatively depicted on Table 26 as follows:

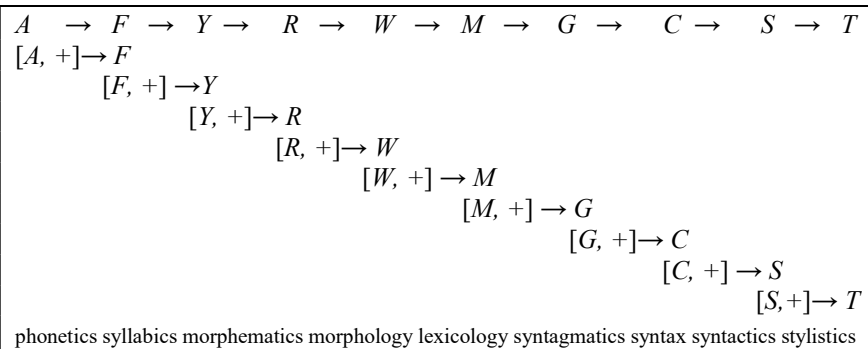


Table 2. *The classification and ordering of linguistic disciplines*

A similar system may be proposed also for classifying music, poetics (Table 47), stylistics, rhetoric (Table 60) and other literary sciences. Some poetic units overlap with linguistic terms because poetry is a superstructure over common speech. Such terms of versology as foot, metre, stich or strophe

require a strict formal account of underlying linguistic theories, and this is why their linguistic substructure deserves utmost care in our theoretical cogitations.

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