

A study of differentiation and modification positions in the structure of English free and terminological word combinations with substantive bases (nuclei)

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Abstract. *The present paper considers the syntagmatic status of the differentiation and modification positions in the structure of English free and terminological word combinations on the basis of a "slot-based" approach and in the frame of their structural rigidity and recurrence. Such structural aspects of word combinations as the ranking of differentiating and modifying components, as well as the direction and mode of their linear integration are analysed in the paper. The results of the given study are tentative and require further validating.*

Keywords: *free word combination; compound technical term; basis; nucleus; slot; differentiation; modification; rank position; ranking; structural rigidity; compositional recurrence; simulatedness; linear integration.*

Исследование позиций дифференцирования и модифицирования в структуре английских свободных и терминологических словосочетаний с субстантивными базисами (ядрами)

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Аннотация. *В данной статье рассматривается синтагматический статус позиций дифференцирования и модифицирования в структуре английских свободных и терминологических словосочетаний на основе "слотового" подхода и в контексте их структурной ригидности и рекуррентности. В работе анализируются такие структурные аспекты словосочетаний как ранжирование дифференцирующих и модифицирующих компонентов, а также направление и модус их линейной интеграции. Результаты данного исследования являются предварительными и требуют дальнейшего обоснования.*

Ключевые слова: *свободное словосочетание; составной технический термин; базис; ядро; слот; дифференциация; модификация; ранговая позиция; ранжирование; структурная ригидность; рекуррентность структуры; моделируемость; линейная интеграция.*

Introduction

The purpose of this paper consists in analysing the structure of free and terminological word combinations with substantive bases (nuclei) on the ground of a hypothetical concept of their slot-like structure. In our opinion, a "slot-based" approach proposed herein enables one to investigate various aspects of word combinations from the standpoint of their structural rigidity and recurrence (*simulatedness*). A number of questions arise relating to the structure of English free and terminological word combinations with substantive onomasiological bases, or nuclei, in particular: 1. what is the lexical and grammatical distinction between components of free and terminological word combinations? 2. what does the difference in the modes of their linear integration consist in? 3. what types of syntagmatic relations exist between differentiating and modifying components in their structure?

The subject of the present investigation is suggested by some ideas of the "surface-and-deep structure" approach to the study of syntactic constructions and by achievements of modern cognitive science, for instance [1]. A cognitive approach using *frames* to represent knowledge was first proposed by the American cognitive scientist Marvin Lee Minsky (*Minsky*) [2]. A

number of examples of word combinations were randomly chosen from various sources, including lexicographical editions. In this paper, we build our propositions basically upon a hypothesis of the structural rigidity of word combinations and their recurrence. Recurrence is primarily associated with some typical structural models of word combinations, especially terminological ones.

Methods and results

The main methods used in this study include the induction, deduction and hypothetic simulation methods. Our concept of the "slot-based" composition of the structure of free and terminological word combinations is based on two assumptions:

1. The structure of English free and terminological word combinations with substantive bases (nuclei) is intrinsically *rigid*, since it contains definite rank positions, or "slots", occupied by differentiators and modifiers;

2. Along with the "surface" structure, both free phrases and terminological word-groups also possess the "deep" structure which has its own characteristics. Below are given three tentative types of slot-based structures of free and terminological word combinations in a tabular form.

Table 1. A "slot-based" composition of the structure of free phrases with substantival bases (nuclei)

Differentiation slots	
Nos of names of slots	Names of differentiation slots
1	Predeterminers
2	Determiners
3	Quantifiers
4	Descriptive attributes
5	Attributes of dimensionality
6	Attributes of condition
7	Attributes of trade marks and brands
8	Attributes of geometric forms or spatial vectors
9	Dynamic attributes
10	Attributes of chromacity or illuminance
11	Attributes of national-geographic provenance/origin
12	Attributes of authorship
13	Attributes of reference
14	Attributes of material provenance
15	Attributes of similarity of colour, form and function
16	Attributes of componentiality

Note 1: 1) differentiators in free word phrases with substantive bases (nuclei) have associative relations with one other; 2) no slot name of the basis is given in Table 1 because this slot position can be "filled in" by any arbitrary substantive.

The given arrangement of the slots in the above Table 1 is but tentative and needs verifying, as it is practically impossible to find such chains/catenas of free word combinations in English, in which all potential slots could be filled in simultaneously, all at once. Here, we attempt to define an exemplary rank order of differentiating components based on their inherent relative ranking with respect to one another. Slots 1 ч 16 represent different rank positions and are "filled in" by various attributes (positioned *from left to right* with respect to the onomasiological basis/nucleus) describing parameters and properties of individual objects: slot 1, pre-determiners - **all, both, half**; slot 2, determinants - **a/the, this/that, his, her, father's**; slot 3, quantifiers - **first, one, a dozen, several, many**; slot 4, descriptive attributes - **excellent, good, nice, top, precision (precision tool), quality (quality goods), choice (choice car)**; slot 5, attributes of dimensionality - **small, long, wide, large, baby (baby car, baby plane); elephant (elephant oil-field), high, short**; slot 6, attrib-

utes of condition: **new, old, warm, antiquity (antiquity estate), vintage (vintage house, vintage car), period (period (stylish) furniture)**; slot 7, attributes of trade-marks or brands - **Crosby (Crosby shoes), Winston Classic, Underwood, Wedgewood (Wedgewood porcelain)**; slot 8, attributes of geometric forms or vectors - **square, round, oval, conical, inclined, vertical, horizontal**; slot 9, attributes of chromacity or illuminacy - **green, red, purple, bluish, dark**; slot 10, dynamic attributes (active and passive) - **walking, rotating, rotating, folding, cool, electrified**; slot 11, attributes of national-geographical origin/provenance - **British, French, southern**; slot 12, attributes of authorship - **Newtonian, Darwinian, Pythagorean**; slot 13, attributes of reference - **high-grade (high-grade products), low-grade, top-class**; slot 14, attributes of material provenance or origin - **silk, silky, stone, brick, masonry, steel, glass, wood**; slot 15, attributes denoting similarity in colour, form and function - **coral (coral bag); emerald (emerald dress); alligator (alligator clamp, crocodile clip, alligator grab), mole (mole plough), butterfly (butterfly valve)**; slot 16, attributes of componentiality - **wheel/wheeled (four-wheeled car), finned, ribbed, flat-roof(ed), lined, striped, spotted (spotted shirt)**.

Table 2

Modification slots (associative type of intercomponential relations)	
Nos of names of slots	Names of modification slots (associative links)
1	Direct-type objectal actants in the S-V-O chain
2	Indirect-type objectal actants in the S-V-O chain
3	Parametric modifiers expressing subject-to-object actantial relations in the S-V-O chain

Note 2: Slots 1 ч 3 (positioned *from right to left* with respect to the onomasiological basis (nucleus) and represent three types of positionally arranged modifiers (according to the order of their ranking) describing various actantial relations in the S-V-O chain. No slot name of the basis (nucleus) is indicated in Table 2 because its slot position may be filled in by any arbitrary substantive.

An example of an English compound technical term based on associative inter-component relations in its structure is adduced here: **reversible farm soil tool (an agricultural tool rotating around its transverse axis and designed for raking the soil)**.

Slot 1. The modifier **soil** indicates direct-type objectal modifying actant **O** in the S-V-O chain: **soil tool** (→ a tool **RAKES** the soil) and occupies slot 1 as per

Table 2. The basis *tool* denotes active subjectival actant *S*. Such a word combination as *soil tool* may be considered as a kind of *frame*, or *scenario* (*A TOOL RAKES THE SOIL*).

Slot 2. The modifier *farm* indicates indirect-type objectival modifying actant *O* in the S-V-O chain: *farm tool* (→ a tool *IS USED ON* a farm) and occu-

pies slot 2 as per Table 2. The basis *tool* refers to passive subjectival actant *S*.

Slot 3. The parametric modifier *reversible* indicates predicative actant *V* in the S-V-O chain through the medium of a deverbative adjective *reversible reversible tool* (→ a tool *CAN BE REVERSED*) and occupies slot 3 as per Table 2. The basis *tool* refers to active subjectival actant *S*.

Table 3

Modification slots (concatenative type of relations)	
Nos of names of slots	Names of modification slots (concatenative links)
1	Binary modifiers with actantial links in S-V-O chain-1
2	Binary modifiers with actantial links in S-V-O chain-2
3	Binary modifiers with actantial links in S-V-O chain-3

Note 3: As is obvious from Table 3, the modifying positions, i.e. slots 1 и 3 (arranged *from right to left* with respect to the onomasiological basis (nucleus)) are filled in by concatenated binary modifiers and characterised by actant relations in the subject-predicate-object chains S-V-O, differing in the order of their positioning and their semantics. No slot name of the basis (nucleus) is indicated in Table 3 because its position may be filled in by any arbitrary substantive.

An analysis of the structure of the English compound technical term *surface tillage tool tine assembly* is given below. The structure of this term is a continuous chain of subject-object actants: → an assembly (*subject*) which *INCORPORATES* a tine (*object/subject*) which *BELONGS TO* a tool (*object/subject*) which *PERFORMS* tillage (*object/subject*) which *LOOSENS* the surface (*object*). Binary modifiers (i. e. <tine assembly>, <tool tine>, <tillage tool>, <surface tillage>) are reciprocally concatenated with each other.

Slot 1. Binary modifier 1 (*tool tine*) expresses simultaneously objectival actantiality in one S-V-O chain and subjectival actantiality in another: *tool tine* + *tine assembly*: 1) → an assembly *INCORPORATES* a tine (assembly: subjectival actantiality; tine: objectival actantiality) and 2) → a tine *BELONGS TO* a tool (tine: subjectival actantiality; tool: objectival actantiality).

Slot 2. Binary modifier 2 (*tillage tool*) expresses simultaneously objectival actantiality in one S-V-O chain and subjectival actantiality in another: *tillage tool* + *tool tine* 1) → a tine *BELONGS TO* a tool (tine: subjectival actantiality; tool: objectival actantiality) and 2) → a tillage tool *PERFORMS* (tool: subjectival actantiality).

Slot 3. Binary modifier 3 (*surface tillage*) expresses both objectival actantiality in one S-V-O chain and subjectival actancy in another: *surface tillage* + *tillage tool* 1) → a tool *PERFORMS* tillage (tool: subjectival actantiality; tillage: objectival actantiality) and 2) → tillage *LOOSENS* the surface (of the soil) (tillage: subjectival actantiality; surface: objectival actantiality).

The chain of the actantial components in the structure of this term, including its onomasiological basis (nucleus), can be represented in the following schemes:

1) *surface tillage* (3) *tillage tool* (2) *tool tine* (1) *assembly* (basis)

2) *surface* (O) ← *tillage S/tillage* (O) ← *tool S/tool* O ← *tine S/tine* O ← S

For the purpose of analysing some immanent differing parameters of free and terminological collocations, we adduce an example of a combined quasi mega-collocation artificially coined by ourselves and not marked in English: **a nice small old square brown folding French wooden standard school writing desk***. It consists of three parts: [1. *nice small old square brown folding French wooden standard* (differentiators in a free-phrase)] + [2. *school writing* (modifiers in a compound term) + [3. *desk* (a joint onomasiological basis)]. In the second part of this mega-phrase, the modifier *school* denotes an indirect objectival actant (→ a desk *IS USED IN* a school); the modifier *writing* signifies an indirect objectival actant (→ a desk *IS USED FOR* writing). Thus, they form a joint modifying cluster of two modifiers belonging to one and the same rank and sharing the same rank position, or slot (No. 2 as per Table 2).

When comparing two types of word combinations with substantive bases (nuclei) we analyse a number of structural and semantic factors of their formation, namely the ranking of components; the structural rigidity of free and terminological word combinations; and the direction and mode of the linear integration of components.

1) **the ranking of differentiating and modifying components**

In free word combinations, such as the one above, the ranking status of differentiators is usually maintained, except for some stylistic or pragmatic reasons. But the structure of free word combinations may be altered, and some rank positions may interchanged, for example, a shorter determinant commonly precedes a longer one despite a higher rank: *a new* (rank 6) *effective* (rank 4) *device*.

In the structure of compound terms, positions of modification cannot be deleted, broken or interchanged without alternating their nominative and semantic properties, say, *school standard desk* (→ 1. a desk *CONFORMS TO* a school standard; 2. a standard-type desk *STATIONED IN* a school) *versus* *standard school desk* (→ 1. a standard desk *STATIONED IN* a school; 2. a desk *STATIONED IN* a standard school).

2) **the structural rigidity of free and terminological word combinations**

On the basis of the above analysis, there appear some grounds to assume the existence of the "solidity" of modifying components, that is, a greater degree of structural rigidity and recurrence of English terminological word combinations with substantive bases (nuclei) in contrast to free word combinations. In addition, structurally free and terminological word combinations are characterised by the different lexical and grammatical status of their components.

If the free combination *standard^d desk^d* (as a household or school item of furniture) and the term *standard^e desk^e* (as a specialised item of furniture production) are compared to each other, it may be found that the lexical and grammatical status of the differentiator *standard^d* and the basis *desk^d* are quite different from that of the modifier *standard^e* and the basis *desk^e*. It is not possible either to delete or arbitrarily substitute the differentiator *standard^d* for another arbitrary differentiator (e.g. *traditional*). The basis *desk^d* can be used without any differentiator at all, which the basis *desk^e* is not capable of doing. The modifier *standard^e* is semantically "fused" with the base *desk^e*, they are both lexicalised and when taken together, i. e. associated, express integrated reference. In addition, if the compound terms *standard^e desk^e* is further associated with any differentiator, say, such as *improved*, the latter does not define the basis *desk^e* separately but actually the whole word combination *standard^e desk^e* as an analytical unity: improved <standard^e desk^e>. Otherwise, it would be semantically included as a modifier in the given structure (<improved standard^e desk^e>).

3) two directions of the linear integration of components

We note here that the direction of component sequencing in both above-mentioned types of word combinations is different: 1) fine → old → square → brown → folding → wooden | table (the direction of the linear integration of the differentiators *from left to right* demonstrates the narrowing of their semantic extension from the biggest to the smallest); 2) standard ← school ← writing | desk (the direction of the linear integration of the modifiers *from right to left* also exhibits the narrowing of their semantic extension from the biggest to the smallest).

4) two ways of the linear integration of components

We believe that the complication of the structure of English free phrases proceeds in the form of successive associative agglutination (*stringing/ beading/ threading*) of various differentiating components with their onomasiological bases (e.g.: gorgeous (rank 4) iconic (rank 4) old (rank 6) porcelain ← gorgeous + iconic + old | porcelain). Unlike free word combinations, the linear expansion of the structure of terminological word combinations is carried out either by superimposing (*telescoping*) identical bases on one other (*reversible farm soil tool*

← soil tool¹ + farm tool² + reversing tool³) (Type I) or by "overlying" identical adjacent components (*surface tillage tool tine assembly* ← surface <tillage + tillage> <tool + tool> <line + tine> assembly) (Type II).

It should be noted that the basis of our study is formed by an approach to the structure of free and terminological word combinations as a "deep" structure. The fact is that traditional research methods used by many modern linguists are limited, as it were, to two types of study - part-of-speech analysis and quantitative analysis, which relate to the "surface" structure of free and terminological word combinations with substantive bases (nuclei) and which are often applied jointly. We emphasise a need to apply in-depth research methods along with "surface" methods of study. For instance, conventional types of analysis fail to explain the status difference between the free word combination *round^d table^d* (a household furniture item), the compound technical term *round^e table^e* (an item of the manufacture of furniture) and the compound word *round^e table^e* (a format of a conversation or meeting) as in the collocation 'extended round table'. These word combinations are completely identical in their part-of-speech composition and the quantity of components, but differ from each other semantically.

Sometimes, English compound technical terms may be identical from the point of view of their semantics, though different in their quantitative and part-of-speech composition. For instance, the terms *knife coulter* and *knife-like coulter* possess different componential and quantitative compositions.

Further, such compound technical terms as *high-pressure low-volume gas* and *low-pressure high-volume gas* appear to consist of three parts at the "surface" level of their analysis, but the paired modifiers *high-pressure low-volume* and *low-pressure high-volume* actually denote unitary physical concepts meaning 'compressed' and 'uncompressed', respectively. Thus, the "deep" structure of the above terms shows a two-part pattern.

Conclusions

1. A comparative analysis of the rank positions in the structure of free word combinations and compound technical terms suggests an idea of their "slot-like" composition.

2. English free word combinations and compound technical terms with substantive onomasiological bases (nuclei) are essentially different units of nomination. Compound technical terms are clearly analytical in their syntagmatics.

3. The propositions presented in this paper are disputable but they may contribute to the expansion of the scholarly apparatus and methodology relating to word combinations. They should be theoretically validated through further studies.

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