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UNDER THE WORD SYNTAX ANALYSIS**

The late 1970s and the 1980s witnessed the rise of the theories according to which word formation was not merely a matter of concatenating elements in a linear order. Scholars started seeking correspondence between derivation and the rules of phrase formation as a requirement of any satisfactory explanation of morphological phenomena. The category of compounds and the process of compound formation seem to have attracted special attention of the advocates of syntactic influences in word formation. Some linguists observed that at least for certain categories of compounds it was possible to postulate that they include an internal structure reflecting that of the Verb Phrase (though restricted exclusively to the combination of the head verb and its internal argument). This observation justified their search for rules and methods of describing compounds in a way parallel to syntactic. The data that served as the basis for such stipulations included first and foremost a group of compounds usually referred to as synthetic compounds. The words such as, e.g. *thirst quencher*, *truck driver* or *elevator repair* seemed to the proponents of syntactic approach to compounding best explained by means of reference to the theory of phrase structure (or actually, its specially devised variant). *Thirst quencher*, for example, was derived from the phrase *quencher of thirst*. In consequence, such an approach evoked the necessity of the use of transformations, such that would be able to relate the X' level (phrase structure) with the X^0 (word structure).

This paper is an attempt to shed more light on the so-called theories of word-syntax in relation to the phenomenon of synthetic compounding. The subject of our analysis will be a selection of Polish compounds, which we believe may help us better understand the advantages and drawbacks of the word-syntax approach to morphology. We will first try to set the scene for our discussion by presenting a short survey of two theories that attempt to explain the phenomenon of compound formation as closely related to phrase formation.

The second step will be to test these theories against the data, and to suggest possible modifications to the theories in question so that they are capable of accounting for a large set of compounds. Finally, we will try to conclude on our findings and their possible consequences.

For the purposes of our discussion we have chosen two theories of word structure, namely Selkirk (1982), Lieber (1992), out of the vast spectrum of approaches, including, among others, Roeper and Siegel (1978), Toman (1983), Fabb (1984), etc. Our choice is determined by the fact that both approaches provide a comprehensive coverage of the wide area of word formation rules: both theories constitute attempts at ‘reconstructing’ the whole domain of word formation. An additional argument is that compounding is of vital import to both theories, since, as noticed above, they tend to recognise the internal structure of certain compounds as at least to some extent influenced by the rules of phrase composition.

The major similarity between the two word-syntax approaches under discussion is that they both strive to introduce a greater degree of unification to the grammar. Selkirk and Lieber agree that both words and phrases should be dealt with by means of the X-bar theory¹ and they both accept the notions of the head and feature percolation² in their morphological use. However, the very fact of resorting to similar syntactic instruments in the explanation of compounding does not imply that the theories are identical. On the contrary, there seems to be a cardinal difference between the two approaches, which lies in the way in which they strive to answer the following question: to what extent is word formation syntax-like?

In her proposal, Selkirk³ argues in favour of the *Lexicalist Hypothesis*, that is, in brief, a statement that word formation and syntax are two independent grammatical strata: word formation rules may not be considered a mere extension of the syntactic component. The major reason behind her point of view is as follows (Selkirk (1982:11)):

One characteristic feature that distinguishes morphology from syntax, to be sure, is the fact that many of the entities defined as well formed by the rules of morphology are fixed expressions. Most words we speak and understand we have heard before, while sentences are for the most part novel to us. More precisely, what distinguishes words from sentences is that most words are in the dictionary.

Under Selkirk’s solution compound formation rules are word formation rules (modified slightly). Her argumentation as regards the explanation of the phenomenon of synthetic compounding is semantic: there is no structural

¹ Of course, under certain conditions. For details see, e.g. Selkirk (1982:6ff), Lieber (1992:33ff).

² See Selkirk (1982:19ff) and Lieber (1992:77ff).

³ See Selkirk (1982:10ff).

difference between a root compound (i.e. one where the elements are concatenated in linear order, and there is no syntactic relation between them) and a synthetic compound, there may only be talk of different semantic reading. Selkirk (1982:29ff) illustrates her point with the compound *tree eater*: [...] on one interpretation, a 'tree eater' is an 'eater of trees'; on the other, it might denote a 'creature which habitually eats in trees' [...]. Thus, according to her, there are no grounds to postulate a transformation that would derive the form of *tree eater* from e.g. *to eat trees*.⁴ But Selkirk's attempt to advocate the validity of the *Lexicalist Hypothesis* in synthetic compounding has more profound grounds. Firstly, it follows from the grammatical model she adopts (the *Lexical Functional Grammar* (LFG)), developed by Bresnan, Grimshaw and Kaplan, among others.⁵ Actually, Selkirk modifies the theory, so as to make it suit the needs of the grammar of synthetic compounding (see Selkirk (1982:32ff)); secondly, it draws on her criticism of a transformational solution to the problem of synthetic compounding proposed by Roeper and Siegel (1978). Unfortunately, we have no place or time to discuss these two important approaches in detail here. Instead, we will confine ourselves to providing a very simplified picture of Selkirk's theory of synthetic compounding.

The grammatical model of LFG presupposes that each lexical entry stores a complex information matrix, in which one may distinguish two levels: a) the *predicate argument structure*, (e.g. the verb *to hand* is specified lexically as taking three arguments, each of which has its Θ -role specified as in (1)):

- (1) *hand*: (Agent, Theme, Goal)

Apart from that there is what we decided to call level b), where the *grammatical functions* related to the particular thematic roles are specified.

- (2)
- | | | | |
|---------------|---------|--------|----------|
| | (SUBJ) | (OBJ) | (TO OBJ) |
| | | | |
| <i>hand</i> : | (Agent, | Theme, | Goal) |

The notion of grammatical functions is crucial to the system, as it realises the function of a link between the morphological and syntactic expressions and rules (Selkirk 1982:31): *Grammatical functions are assigned to surface phrase structure position by syntactic rules [...] and to arguments of predicate argument structure by lexical rules*. This assumption leads Selkirk to abandon the transformational link between word formation and syntax, and makes her save

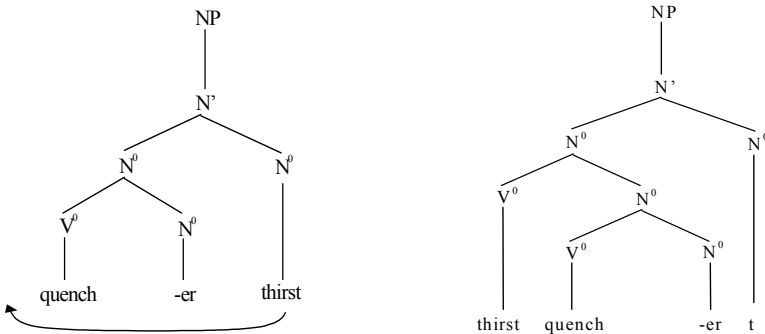
⁴ One may observe that Selkirk's argument is rather weak, because *tree eater* in its non-synthetic reading is only a possible form, rather than an attested lexical item. The same type of argumentation will surely not hold for *truck driver*, *thirst quencher* or *elevator repair*. This simple fact has very serious consequences to Selkirk's theory, but they fall beyond the scope of this paper.

⁵ See Bresnan (1982).

the Lexicalist viewpoint. This is also how she gets rid of transformations in her grammar of synthetic compounding: (Selkirk 1982:39) [...] *an appeal to argument structure makes possible a theory of the relation between verbal compounds and phrasal configuration that does not involve relating these structures transformationally*. The similarity between a synthetic compound and a phrase is due to the fact that they both mirror similar structural patterns, though represented on two different grammatical levels. In compounds (Selkirk 1982:32, 2.25 *Grammatical Functions in Compounds*) [...] *a nonhead noun/adjective may be assigned any of the grammatical functions assigned to nominal constituents in syntactic structure [...]*.⁶ It becomes clear, therefore, that Selkirk's LFG distinguishes between the argument structure of a verb phrase, e.g. *hand a toy to a baby* (verb + argument1 + argument2), and the lexical form (i.e. lexical representation) of the verb *hand* (verb + argument1 + argument2), although the predicate structures look identical in both cases.

Lieber⁷ upholds a different view, where morphology is (Lieber 1992:21) [...] *done as a part of the theory of syntax*. This viewpoint is motivated by the following assumption: (Ibid.) *In order for phrasal categories to be input to processes of derivation and compounding, at least some construction of words must be done in syntax*. Thus, Lieber (1992) denounces expressly the *Lexicalist Hypothesis*, and postulates that both morphology and syntax be governed by the identical set of principles. In this way, she opens the possibility of direct syntactic influences on word structure, such as transformational derivation of lexical items. In her account of element ordering in synthetic compounds, she relies on the mechanism of Head Movement⁸, which ensures the grammaticality of structures such as *thirst quencher*:

(3)



⁶ For the sake of brevity we have modified slightly the definition of 2.25.

⁷ See Lieber (1992:11 ff).

⁸ See Lieber (1992:59 ff), and the positions quoted there.

The length of this study does not allow us to go into more detail on Lieber's proposals. All we hoped to show were some basic points of similarity and discrepancy between the two word-syntax approaches to synthetic compounding. All in all, we may end this theoretical survey with two conclusions:

1. Depending on a theory, either a) synthetic compounds seem to be a category that reflects the argument structure of the VP from which it is derived (transformationally); or b) synthetic compounds seem to be a category that reflects the predicate argument structure (= complex lexical representation) of the head verb.

2. There are two conditions on being a synthetic compound: a) each synthetic compound must possess the deverbal head element (rightmost element in English compounds); b) the head complement is the internal argument of the verb base realised in the head, and the relation between the head and its complement must be that of THEME.

It may be observed that a) and b) in conclusion 2 are very closely related, or even that they just state the same truth in a different way. Although the claim in 2b is discussed only by Selkirk (1982:29ff), it seems that the same criterion holds good for Lieber (1992). Our mentioning of conclusion 2 is purposeful. In what follows we will strive to show that in practice this criterion on synthetic compoundhood is too strong.

The aim of this paper is not to either find support for or criticise on theoretical grounds any of the two approaches that we have sketched. Instead, we propose a closer look at how the two theories may be used to account for a selection of linguistic data. As specified above, our discussion will draw on a selection of Polish compounds, which we now wish to present to the reader. First consider the examples of (4):

(4) Polish synthetic nominal compounds

<i>autonaprawa</i>	[‘car repair’: garage]
<i>językoznawstwo</i>	[‘language knowledge’: linguistics]
<i>słowotwórstwo</i>	[word formation]
<i>bratobójstwo</i>	[fratricide]
<i>drzeworytnictwo</i>	[wood-engraving]

The list in (4) above includes Polish compounds corresponding to the category represented by e.g. *truck-driver* or *thirst-quencher* in English. The distinctive feature of that category, but also of all other Polish examples under discussion in this paper, is the linking element *-o-* that is put between the two bases that make the compound up. Apart from that, the Polish and English patterns of synthetic compounding seem virtually identical: the non-head element precedes the head and stays in the relation of THEME to the head; the head is a deverbal noun and it takes precisely one argument. However, we believe the Polish language also possesses other patterns, which pose a challenge to the definition of synthetic compounding expressed in conclusion 2 above:

(5a) Adjectival compounds

<i>językoznawczy</i>	[linguistic]
<i>słowotwórczy</i>	[derivational]
<i>bratobójczy</i>	[fratricidal]

(5b)

<i>drewnopochodny</i>	[wood-derived]
<i>czokoladopodobny</i>	[chocolate-like]
<i>wodoodporny</i>	[water-resistant]
<i>światłoczuły</i>	[photosensitive]

The examples in (5a) are adjectives related to the previously presented nominal compounds (see 4 above), whereas with the other four forms in (5b) it will be difficult to trace the deverbal origin of the head adjective even though it may be postulated for *drewnopochodny* [wood-derived], one can hardly accept a direct link between such adjectives as *podobny* [similar], *odporny* [resistant] or *czuły* [sensitive] with any related verbs. The solution that the author considers most feasible in this case is to accept the pattern of (5b) as representing synthetic compounding as well. However, this solution has its serious consequences to the conditions on synthetic compoundhood, as expressed in conclusion 2 above, since for us the head-argument relation does not necessarily have to obtain between the head verb and its argument, but may also concern the head adjective and its argument. In our view the criterion of synthetic compoundhood could be formulated as follows:

(6)

A compound may be named synthetic once it is possible to relate it to any grammatically possible syntactic phrase, in the sense that such a compound reveals in some way the internal structure of such a phrase, and conveys the same meaning.

This definition is, of course, very sketchy, and it may well be the case that some limitations on it should be added. One has to bear in mind that it only serves the goal of enlarging the domain of synthetic compounds, against the assumptions stated by Selkirk (1982).

As for the theoretical approaches to synthetic compounding, we think that our definition may freely be accommodated within Lieber's view on word formation, since her derivational system easily supports transformation of various types of phrases into compounds. Being aware of the criticism of the transformational treatment of the issue at hand, our approval of this method would necessitate detailed analyses of all aspects of the use of transformations in compound derivation. Unfortunately, this undoubtedly intriguing problem reaches far beyond the scope of this paper. All in all, we may state that the transformational approach seems justified (in the sense that it recognises direct

syntactic influence on morphological structures) in the case of the above-presented Polish compound adjectives, provided that we accept the very use of transformations as a correct tool in word formation.

To be able to handle the data of (5b), Selkirk's theory should account for the lexical form (LFG term for the lexical representation) of the head adjectives in the compounds such as *czekoladopodobny* [chocolate-like] or *wodoodporny* [water-proof]. Alike the case of the verbal compounds, some semantic matrix for adjectives (a kind of subcategorisation frame) should be postulated, along with grammatical functions that relate the lexical and the syntactic structure. One characteristic feature of the adjectives that occur in compounds such as the ones of (5b) is that they must be able to take a PP complement once they occur in a phrase:

(7)

<i>odporny na wodę</i>	[resistant to water]
<i>podobny do czekolady</i>	[similar to chocolate]
<i>pochodny od drewna</i>	[derived from wood]
* <i>piękny do podziwiania</i>	[beautiful to admire ⁹]
* <i>długi do zrobienia</i>	[long to do]
* <i>ciekawyy do obejrzenia</i>	[interesting to watch]

As illustrated by (7), Polish adjectives such as *piękny*, *długi* and *ciekawyy* may not take a PP argument, whereas adjectives such as *odporny*, *podobny* and *pochodny* must contain the information of (8) within their lexical argument structures:

(8) Adj [___ PP]

In this way, compounds such as *wodoodporny* could be explained by the existence of the above-mentioned specification of the lexical form of the adjective *odporny*, in a fashion parallel to the one employed by Selkirk, e.g. *tree eater*. Under this solution the existence of the phrase *odporny na wodę* and the compound *wodoodporny* is only possible because of the lexical features of the adjective *odporny*, and not because of its being motivated by the phrase *odporny na wodę*. What is striking, however, is that such an approach means simultaneous storage in both syntax and the lexicon of the identical bits of information. This is so because in Selkirk's hypothesis there may be no case of direct mapping of the lexical features from the X^0 level to the X' . In other words, the grammar should store the information of (8) in two places: in the lexicon and in syntax. This redundancy seems to us a weakness of the solution. What is more, the solution ignores the similarities between the conditions on structure building that operate on the level of syntax and morphology.

⁹ In the Polish examples deverbal nouns, not verbs are used.

At first glance, it may seem that the last group of examples to be discussed in this paper has no role to play in a study on synthetic compounding, since nowhere in the literature of the subject have dvandva compounds been regarded as having anything to do with syntax. The examples in (9) only seem to prove that point:

(9) Dvandva adjectival compounds [ingredient compounds]

<i>owocowo-warzywny</i>	[(made) of fruit and vegetables]
<i>szalwiowo-pokrzywowy</i>	[of sage and nettle]
<i>pszenno-żytni</i>	[of wheat and rye]
<i>granitowo-marmurowy</i>	[of granite and marble]
<i>metalowo-drewniany</i>	[of metal and wood]

We will try to show that there are reasons to believe some dvandva compounds may rightly be named synthetic compounds, on condition that we accept the broader sense of the term, as introduced above (see (6)). The pattern that the examples of (9) reveal seems to allow a practically unlimited number of combinations of adjectives or nouns, since the possible restrictions on the internal structure of such compounds seem non-existent. The examples of (10) are to show this is not necessarily true:

(10)

sok owocowo-warzywny	??sok owocowy i warzywny	sok z owoców i warzyw
[fruit-and-vegetable juice]	[fruit and vegetable juice]	[juice made of fruit and vegetables]
chleb pszenno-żytni	??chleb pszenny i żytni	chleb z pszenicy i żyta
[wheat-and-rye bread]	[wheat and rye bread]	[bread made of wheat and rye]
konstrukcja	??konstrukcja	konstrukcja z drewna i metalu
metalowo-drewniana	metalowa i drewniana	
[metal-and-wood	[metal and wood	[construction made
construction]	construction(?s)]	of wood and metal]
dom *otwarto-dostępny	dom otwarty i dostępny	?
[open and accessible house]	[open and accessible house]	
koc *grubo-ciepły	koc gruby i ciepły	?
[thick and warm blanket]	[thick and warm blanket]	
noc *pogodno-ciepła	noc pogodna i ciepła	?
[fine and warm night]	[fine and warm night]	

The leftmost column of (10) comprises dvandva compounds, both grammatical and ungrammatical. The central column lists possible phrasal interpretations of the compounds by means of coordinated structures, while the rightmost column lists possible interpretations of the compounds by means of Prepositional Phrases (in the examples the head preposition is *z* [of]). One may notice that in semantic terms the correct dvandva compounds do not match

precisely their interpretations with coordinated structures. They seem to match their PP counterparts better. On the other hand, the ungrammatical formations seem to correspond directly to the coordinated phrases. The most straightforward conclusion to draw is that the type of dvandva compounding exemplified above cannot be conceived as an unrestricted concatenation of coordinated adjectival structures.

There are at least two possible ways of accounting for the facts presented in (10). Firstly, one may point out that, semantically speaking, all the above compounds correspond to the pattern: MADE OF [[X] and [Y]], where X and Y are the ingredients of the ‘output substance’ (this is why the author refers to these compounds as ‘ingredient dvandva compounds’).¹⁰ This fact may be concluded upon by means of a semantic restriction on ingredient dvandva compounding in Polish, that would allow the exclusive combination of denominal adjectives, derived from nouns denoting substances or other objects that may serve as ingredients of more complex substances. However, the author is not satisfied with this solution, firstly because the scope of this semantic restriction seems very broad, secondly it ignores the facts of structural complexity of the above-mentioned compounds.

Hence, we propose an alternative stance, in which we will also seek formal constraints on the process of ingredient dvandva compounding in Polish. Drawing on the previous observation that the PP counterparts in (9c) seem to relate to the ingredient compounds in (10a) better than the APs involving mere coordination of adjectives, we will venture the following restriction on ingredient dvandva compounding in Polish:

(11)

The words that are the constituent elements of the ingredient dvandva compound must be able to occur in the PP that bears the thematic role of SOURCE (in a larger syntactic structure). The words in question must occur in a co-ordinated structure, being itself the complement of the head preposition.

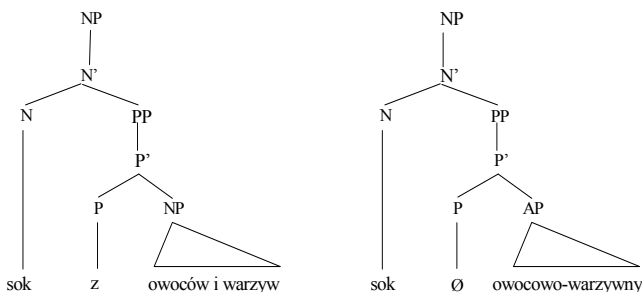
Our restriction rightly connects the formal and semantic facts we have observed so far. Again, the restriction as it stands may need some further improvements, but we assume that the form we have given to it in (11) suffices for the needs of the present study.

We have to bear in mind the consequences that the above restriction may have on the two theories of word structure which we have previously made reference to. Alike previous discussion, Lieber’s ‘all-syntax’ approach seems a

¹⁰ Other (non-ingredient) dvandva patterns are possible in Polish: *ruch robotniczo-chłopski* [association of workers and farmers], *zespół pałacowo-zamkowy* [castle-palace complex], *samolot szkolno-bojowy* [trainer-fighter plane], *ośrodek rekreacyjno-sportowy* [sports and recreation centre], *sos słodko-kwaśny* [sweet and sour sauce], etc.

straightforward solution to the problem at hand. The postulated transformation would change the internal structure of the PP as exemplified in (12) below:

(12)



The stages of the process could be explained as follows: the nouns in the coordinated phrase are turned into adjectives (they both have adjectival endings); the head P is deleted; the coordinated structure becomes a compound adjective; the first constituent is marked for ‘zero case’;¹¹ case is assigned by the head noun *sok*. One has to bear in mind that all the above makes sense once we accept transformation as a right tool in deriving complex lexical structures.

As for Selkirk’s hypothesis we are not certain whether it is at all able to account for our findings, at least under the interpretation we have provided. Following the assumptions of LFG, we should probably look for some details in the lexical representation of the nouns (or adjectives?) that make up the ingredient compounds that would make them suitable for the occurrence in the SOURCE-type PP. Whatever solution to take, it seems impossible to ignore that the structure of the output ingredient compound is only explainable through a reference to the structure of a syntactic component (phrase), which it seems to mirror. Additionally, Polish ingredient dvandva compounds seem to be subject to a semantic restriction that also pertains to phrases, which seems not only against Selkirk’s theory, but also against the *Lexicalist Hypothesis*.

If the interpretation of the facts we have presented above is correct, its consequences force us to reconsider some very basic questions of word formation. The scope of this presentation will only allow us to remark that, on the whole, the approach to word formation as developed by Lieber (1992) seems less restricted in the light of the Polish data discussed in this paper than the other theory we have put to test, that is Selkirk’s (1982).

¹¹ The assumption of ‘zero-case’ marking follows the author’s conviction that the function of the -o- linking element is the protection against case marking of the first compound component by the noun *sok*. Thus -o- vowel should constitute an inherent part of the postulated transformation.

Does the above mean that the author is completely satisfied with the transformational solution to the process of synthetic compounding? The answer is negative: we have to bear in mind the vast criticism this approach has met with throughout the last decades. We have also shown that this solution's weak point is its complexity: it requires a complex sequence of operations such as head P deletion, zero-case marker insertion, etc. Thus, all we want to say is that Lieber's approach seems more feasible than Selkirk's, and this is mainly due to our assumption that despite all doubts concerning the use of transformations in the derivation of compounding, the direct access to syntactic information in that type of derivation seems a matter of fact.

However, the final conclusion we want to make is that one should appreciate the attempts of the theories of word-syntax at providing a more satisfactory way of handling the structural complexity of the pattern of synthetic compounding, but at the same time, one should ask whether the problem in question should only be studied as a case of formal combination of elements. In other words, it is the author's opinion that fuller understanding of the phenomenon of compounding of any type will become available to us through an approach in which formal aspects will be seen from the perspective of language function and use.

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