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A corpus-based approach to morphological productivity

A morfológiai termékenység korpusz alapú vizsgálata

Jelen tanulmányban a morfológiai termékenység fogalmát vizsgálom néhány kritérium alapján és próbálom kimutatni az ige+partikula szerkezetek termékeny természetét egy átfogó szemantikai elemzés keretén belül. Próbálok választ keríteni arra a kérdésre, hogy milyen szabályok alapján dönthető el a szóképzés termékeny vagy sem.

A szóképzés során a nyelvészek azokat a folyamatokat tartják termékenynek, melyek új szavak létrehozásával új „nevet'' is kölcsönöznek a fogalmaknak. Úgy vélem, hogy ez a magyarázat nem meríti ki a morfológiai termékenységet. Egy bizonyos szótipus vagy szóképzési folyamat termékenysége nem csak az új szavak szisztematikus képezhetőségét jelenti, de a konvencionális elfogadottságot is. A fogalom tisztázásánál szeretném kiemelni a képzés automatikus voltát, amely azt jelenti, hogy az új szavak képzése nem szándékosan történik.

A kritériumok mellett bemutatok néhány termékenységi tesztet, melyek segítségével bizonyíthatom, hogy az angol direkcionális out- prefixumként egyáltalán nem termékeny, de mint verbális partikula 'nagyon termékeny' vagy 'közepesen termékeny' mintát képvisel. Az irodalomban található morfológiai produktivitásra vonatkozó korábbi kutatások alapján egy sajátos feltételt fogok javasolni, amellyel bizonyítható, hogy milyen szemantikailag meghatározott osztályoknál mutatható ki a magas fokú termékenység. Ennek a feltételnek megfelelően azokat a 'prefixum+ige' illetve 'ige+partikula' osztályokat tekintem termékenynek, melyek morfotaktikailag termékenyek és morfoszemantikailag transzparensek.

I. Introduction

In English linguistics the word *productivity* is used to refer to a language pattern accounted for rules which enables to create new concepts and words in a free manner. Within morphology three types of morphological processes are distinguished: inflection, derivation and compounding among which inflection typically demonstrates an essentially unrestrained productivity compared to two other types. Derivation, on one hand is strictly governed by specific conditions, on the other always produces lexical gaps which are rarely found in inflection. Although it is true only in a broad sense as particular words show defective inflectional paradigms as well and these gaps have much less to do with inflection than derivation (BEARD, 1998; STUMP, 1998; KIEFER, 1998; 2000). It has often been claimed that compounding is far more productive than derivation but productivity of compounding resembles that of syntactic constructions: if a given compound type is productive, its productivity is of the kind we meet in syntax, which means that there are virtually no restrictions.

The present study is focussed on the examination of the problem of morphological productivity and tries to find the most plausible definition of the concept

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based on criteria given by derivational morphology. Further research concerning the rules and tests needed to carry out a semantic analysis of verb classes provides further evidence for productivity of verb-particle constructions as opposed to unproductivity of the prefixal verb combinations found in contemporary English.

Morphological productivity has been defined so far by many linguists but for the purpose of the present contribution the following definition will be used: *"one word formation rule is said to be productive if it can create unintentionally an infinite number of semantically transparent new words. This amounts to saying that if a word formation process cannot be extended and a certain derivational rule applies to words belonging to closed word classes, no productivity holds."* (KIEFER-LADÁNYI 2000, 149).

The productivity of a certain word type or word formation process involves not only the systematic well-formedness of new words, but crucially the social and conventional acceptability as well. In short, there is morphological productivity as soon as and as long as the two sets of norms coincide. This implies that it is not correct to investigate productivity without referring to the norms determining the acceptability of new words. This fact is directly reflected in those characterizations of productivity which stress the 'unintentionality' with which new words must be formed (SCHULTINK 1963: 113). That is, the possibility of making new words in itself is not a sufficient characterization of productive processes.

Unproductive word types are then defined as those word types which permit no new formations, unless a speaker intentionally violates the conventional restrictions of the language.

II. Morphological productivity as a "matter of degree"

One of the time-honoured truisms about productive morphological processes is that productivity is a matter of degree. While talking about a degree of productivity numerous linguists tried to determine how *rule scope* (number and type of constraints imposed on the rule) directly affected *application rate* (frequency of actual application of the rule in performance as measured in terms of the number of attested formations) (BOOIJ, 1977). The concept of productivity built around constraints imposed on a rule depends on a general nature of a word formation process. The question that arises is not that of quantity but rather that of quality, that is focuses on semantic features of a domain rather than a number of newly created words (by the domain of a given morphological process is to be understood the set of words constituting potential bases for that process).

Another difficulty that emerges in determination of the degree of productivity is openness or closeness of the underlying class of words subjected to a word formation rule.

Linguists claim that the class serving the potential bases for a word formation process should be open and, consequently, be determined by one or more common morphological properties (RAINER, 1988; 1993). If the domain is not closed, it creates further problems to determine productivity as we cannot iden-

tify the exact number of potential bases. Thus, it follows that the number of derived words can be identified in a relative manner based on a given corpus.

To bridge over the problems of definition some linguists referred to the qantitave analysis measuring morphological productivity statistically (BAAYEN, 1991; 1944; PLAG-DALTON-PUFFER-BAAYEN, 1999). Such a quantitative concept of productivity can be applied successfully to analyses of word corpora. However, in the frames of this approach only the possibility or impossibility of a derived word can be determined but not its probability, because the latter category depends on the norm and performance factors and not those of competence.

Linguists approaching productivity in a natural framework (DRESSLER, 1997; DRESSLER-THORTON, 1996; VAN MARLE, 1991; KIEFER-LADÁNYI, 2000) do not view the BAAYEN concept of productivity to be applicable, because quantitative measuring of productivity with type and token builds around the concept of frequency and the advocates of natural morphology endeavour to determine productivity as a concept independent of frequency – productivity and frequency do not necessarily occur together.

From the above the following picture arises. Natural morphology handles the concept of productivity as such that cannot be explained either via type and token or frequency of the applied rule. Morphological processes that are productive may differ considerably as to the actual ease with which they underlie newly coined words. This phenomenon is often referred to as the gradual nature of morphological productivity. The factors underlying these different degrees of productivity are highly diverse, because they belong to three distinct 'spheres': the morphological system, its conventional aspects and, finally, properties that determine how readily a certain process is handled.

III. The criteria of productive morphological processes

Among the numerous criteria highlighted by linguists I will consider only those which may seem appropriate for the purpose of this study. These are as follows: 1. word formation paradigms and underlying word classes, 2. degrees of derivational productivity. For the lack of space and time, I will examine combinations which allow formations with only one prefix *out-* and the corresponding particle *out* retaining spatial/directional meaning. The most important criteria of productivity will be discussed first.

1. Semantic compositionality in relation to productivity

A productive word formation process requires the meaning of a derived word be deducible from the meaning of its parts – an underlying base and a derivational affix – that is a productive word formation process is semantically compositional (ARONOFF „about semantic coherence", 1976, 38). It does not mean, however, that the new derivative formed via productive word formation process may not have a lexicalized meaning as well. In case the meaning of a derivative becomes obscure due to a large number of lexicalized meanings, that is the se-

mantic coherence ceases, the given word formation process may lose its productivity. The opposite phenomenon may also occur: some lexical item may acquire a specific grammatical value through the process of grammaticalization and thus become productive.

The productivity of a certain word formation process can be best tested on loan words and nonsense words. But the test with nonsense words is not an appropriate tool to examine the compositionality of their meaning. Later I will make an attempt to illustrate this point.

2. A rule scope requirement

Besides semantic compositionality productive word formation processes should account for rules. A productive word formation rule must fix an input syntactic category at the beginning of derivation as well as an output syntactic category, way of word formation (e. g. affixation), rule scope of a word formation process – whether a rule applies to all underlying bases of a specific syntactic category or just those bases that show common phonological, morphological or semantic properties pertaining to that category. The constraints imposed on the rule determine the domain – the class of underlying bases needed for a word formation process.

3. Primary and secondary productivity

One of the most crucial (if not the most) criteria to determine productivity of morphological (inflectional) classes was oulined by WURZEL (WURZEL, 1984). In his theory an inflectional class is defined productive if

a) it can acquire new words, that is, native neologisms as well as borrowings from other languages;
b) it can attract words from other inflectional classes;
c) it does not lose words to other inflectional classes.

Productivity is partly based on class stability. Class transitions take place only among complementary classes, that is, transfers of lexical items from one inflectional class to another are based on common extramorphological properties of the basic form of words. The same properties determine the assignment of neologisms to inflectional classes, and implicitly determine constraints on such assignments. So it is possible to state that there is no absolute productivity. It must also be pointed out that in principle productivity holds if the class is system-congruous, and, obviously, that a class is productive as long as there are words with exactly the morphological properties required for assignment to it.

WURZEL distinguishes between primary and secondary productivity. The former applies to all those cases in which the assignment of lexical items to an inflectional class is automatic, since the extramorphological properties of the words (e. g. semantic properties, phonological structure, grammatical gender, etc.) conform exactly to those which characterise that class. The latter, on the other hand, refers to the integration of words which have to be phonologically,

semantically or syntactically adapted in order to meet the extramorphological properties of the class into which they are accepted.

As I have already mentioned, in the present study I will examine prefixal verb combinations with *out-* as opposed to their verb – particle counterparts and try to examine the productivity of these formations. For the current examination I used corpus data collected from both traditional modern dictionaries: Collins Cobuild English Dictionary (1991), Webster's II New College Dictionary (1995) and Internet dictionaries: http://thesaurus.reference.com, http://szotar.sztaki.hu, http://www.answers.com. It seems that internet sources provide the fullest corpus data as they fix both standard and non-standard usage of word combinations in a variety of contexts and give a hint as to what extent the speaker is comfortable with an already existing combination and neologism.

IV. The prefix *out-* and its interpretation in terms of productivity

Prefixal combinations with *out-* are very restricted in Modern English . According to MARCHAND (1969a: 96) „ with a locative meaning, the particle has never had any verb-forming force. Verbs of the type *outbreak* 'break out' occur only in poetry and are equivalent to prose combinations of the phrasal type *break out*. The original use is very rare or archaic. LIVE (1965:442) mentions that *out-* is still productive and that the prefix is ' semantically consistent and transparent in the newer compounds', while it is 'often metaphorically obscured in the older ones'. Prefixal combinations are few in number and must be considered to be the remains of an older system which have been subjected to lexicalisation to a large extent. FRASER (1965:54) states that in *outburn, outlast, outwear out-* has the effect of doing two things. First, it causes the intransitive verbs *burn, last, wear* become transitive (WURZEL's secondary productivity) . Secondly, it associates the notion of ' comparison ' to the verb (semantic property). He thus derives prefixal verbs such as *outshout, outshine, outspend* from comparative sentences containing *shout louder*, *shine brighter, spend more.* At first glance these combinations seem to be productive as they meet the requirements needed to be integrated in a class. But what about semantic compositionality which assumes that the meaning of a derived word be deducible from the meaning of its parts. Let us see again the above examples of *outshout, outshine and outspend.* The underlying verbs *shout, shine* and *spend* have the same meaning being both input and output verbs. But the prefix *out- (*remember I examine only the spatial meaning of the affix) being attached to verb bases does not carry the directional meaning, so this criterion of productivity is not met by the prefixal combinations and hence these formations cannot be considered productive.

For the present research the corpus containing 1200 prefixal verbs was examined. The results showed that only 176 (14.67%) formations conveyed the original sense of directionaliy. A few examples of examination results are recorded in *Table 1.*

Table 1
The distribution of prefixal verb senses

Prefixal verbs with *out-*	Literal /spatial meaning	Meaning of *'surpass, exceed, do or be better'*	Other meaning
1. outbid 'bid higher than'		✓	
2. outdo 'do more or better'		✓	
3. outperform ' surpass in performance'		✓	
4. outbabble 'utter excessively'		✓	
5. outbake 'bake better than'		✓	
6. outban 'ban more than expected'		✓	
7. outbar 'bar out'	✓		
8. outride 'ride faster than'		✓	
9. outchase 'be quicker than, to deceive with more tricks'		✓	
10. outtax 'levy excessive taxes'		✓	
11. outhatch 'outscheme or outplan someone'		✓	
12. outsell 'surpass in amount sold'		✓	
13. outbalance 'exceed in influence or significance'		✓	
14. outsail 'excel, leave behind in sailing'		✓	
15. outdraw 'draw out'	✓		

As it can be seen from the table, in majority of prefixal verb combinations the original meaning of the prefix *out-* is lost in the process of derivation, instead it brings some figurative value to a base verb. Consequently, it is highly problematic to analyse such non-existing or half-existing combinations as *outliaise, outcarry, outdig, outchoose,* etc. The meaning of prefix in these combinations is not transparent and its usage is very restricted. I will consider the meanings of such combinations to be frozen or lexicalized, semantic transparency in these cases completely ceases.

Taking into consideration criteria needed to determine the productivity of a word -forming affix I want to propose two important conditions used for the present analysis: prefixal verb combinations vs. verb-particle combinations hold morphological productivity if they are both
a) morphotactically productive; and
b) morphosemantically transparent.

Morphotactic productivity requires that any new combination be possible – formal transparency requirement. Morphosemantic transparency requires the meaning of the derived word be deducible from the meaning of its parts- semantic transparency. In case of the examined prefixal verbs morphotactically it is possible to combine any new base with the prefix, but morphosemantically not (not only must a new word denote something which speaker feels to be real, it must denote something which is nameable, can be easily inferred from its parts). Prefixal combinations fail that requirement and, thus, cannot be treated as productive formations.

V. Productivity of the particle out in verbal combinations

The question to be solved is to what extent the spatial (directional) sense of the particle *out* is transparent in verb- particle combinations and which combinations hold either full or partial productivity. To come to grips with this question, I need to analyse possible semantic classes of verbs which allow the particle to be attached forming a semantically transparent unit. To make the present analysis easier I wish to suggest two hypotheses: first, verb+ particle is a morphologically productive combination if the meaning of a given particle is derivable from its original spatial/directional meaning ; second, the meaning of a particle is derivable from its directional meaning if it can be considered to be a metonymical extension of the latter.

The collected corpus made it possible to set up at least the following semantic classes of verbs which allow free attachment of the particle with the retained sense of directionality:

1) verbs of motion
2) action verbs implying motion
3) action verbs with the meaning of action which brings about a bulge or boss
4) action verbs with the meaning of action which brings about a deepening or hole
5) perception verbs expressing the direction of perception
6) action verbs which do not involve movement.

The findings are summarised in *Table 2*. The semantic classes of verbs are shown in decreasing order of their occurrence.

As it is seen from the *Table 2*, the particle *out* can collocate freely with practically any verb of motion – this is the most commonly used semantic verb class which allows verb-particle formations to be unrestricted in their occurence. What we actually receive is the open-ended formation within an open-ended formula which allows the application of a particle in its literal sense. The meaning of the newly coined derivative can be inferred from the meaning of its parts, (the requirement of morphosemantic transparency) thus, these combinations are fully productive.

Table 2
The distribution of verb-particle senses

Meaning of the particle *out*	Semantic verb class	Examples	Frequency of occurrence (%)
direction of movement	1. verbs of motion	run out, walk out, creep out, fly out jump out, move out, bounce out crawl out, tip out, swim out, hop out, ride out, troop out, slip out sally out, jog out, dash out, fling out, stroll out, schuffle out	52
direction of action involving movement	2. action verbs (1)	throw out, cast out, chase out, carry out, blow out, push out, fall out, burst out, break out, tumble out, pitch out, hang out, loll out, flood out, lean out, drag out, pitch out, fling out, yank out	30
the action brings about a bulge or boss	3. action verbs (2)	bulge out, pop out, swell out, stand out, pile out, puff out, stick out, surge out, belly out	9
the action brings about a deepening or hole	4. action verbs (3)	bore out, bite out, cut out, hew out, hollow out, delve out, dole out, pump out, root out, weed out, puck out, dredge out, squeeze out, bale out, whip out, gouge out	6.8
direction of perception	5. perception verbs	look out, peep out, gaze out, sound out, stare out, spy out	2
direction of action which does not involve movement	6. action verbs (4)	blab out, blunder out, call out, blurt out, jerk out, falter out, rap out	0.2

It seems plausible to assume that the direction indicated by the particle *out* 'movement outwards' can be conceptualized in various ways. The directional meaning which is most apparent in the case of verbs of movement can be extended to other action verbs involving movement. A further extension is its use with verbs of perception where no movement is involved. The other uses of the particle represent different extensions of the directional meaning.

It should be made clear though that the details of the conceptualizations of spatial directions are far from being clear-cut and full. I made an attempt to show as many combinations as possible with the particle *out* found in contemporary usage, but completeness is of course impossible to achieve.

VI. Concluding remarks

Having proposed the criteria of morphological productivity and the hypotheses used for the present study, I tried to show the unproductive nature of prefixal derivatives and productivity / transparency of verb-paricle combinations. On the basis of the above criteria I made an attempt to demonstrate that the prefix *out-* is unproductive as the rule scope and morphological properties of the affix do not apply freely to any verb base, the given verb classes are closed.

It can be concluded that the basic way in which a particle shows productivity is that it can appear in new words the class of which is open. These words may never develop beyond being nonse formations, or they may, in the course of time, become established. An unproductive particle, on the other hand, is one whose distribution can be accounted for only in terms of a list of the bases with which it occurs. I have also indicated a high degree of lexicalization in prefixal combinations and noted that a post – verbal particle functions in quite a systematic way in expressing spatial meaning and being conceptualised in the extension of its original meaning.

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