Linguistica Silesiana 27, 2006
ISSN 0208-4228

ALEKSANDRA KALAGA
College of Foreign Languages, Częstochowa

MORPHOLOGICAL PRODUCTIVITY. A REVIEW OF THE PROBLEM

The article aims at investigating the concept of morphological productivity, which, although frequently applied in the discussion of various word-formational analyses, has not, as it seems, received attention sufficient for its disambiguation. In order to clarify this issue, the article inquires into the complex interrelations of such notions as productivity, transparency, frequency, and potentiality. Moreover, the view of productivity as a cline is also inspected, and, consequently, the linguistic and extralinguistic constraints on productivity are scrutinised and commented on.

> We are aware that we have approached the problem of productivity like blind men approaching an elephant.
> (Anshen, F., Aronoff, M. 1989: 202)

Considering the abundance of viewpoints which will be presented in this article, it seems that productivity in current word-formation theories is an elephantine problem indeed, and the blind village from the famous Indian story represents the current state of linguistic studies concerning morphological productivity. Similarly as the allegorical blind men presented different reports of the elephant because they approached the beast from different directions, scholars reach different conclusions as to what productivity is, just because they study the problem from different perspectives. Thus there is hardly a single picture of productivity, and there are nearly as many definitions of productivity as there are linguists who attempt to grasp its core essence. The article aims at presenting and discussing the various, often conflicting, attitudes to productivity, and it is hoped that such a review will facilitate deeper understanding of the concept.

It is an inherent feature of morphological component of grammar that novel items are constantly being introduced into the language system. Thus, speakers continually expand the vocabulary of their language, and it becomes clear that the mechanisms,

reasons, and possible purposes of this activity have to be accounted for if the description of word-formation is to be complete. This emergence of new words is believed to be the evidence that a given pattern (rule, process, or affix) is productive, i. e. it can be used synchronically to derive new lexemes. So, it is generally accepted that productivity is manifested in new coinages, but the problem is much bigger than that.

Among the questions which are often asked are the following:

1. What is it that is productive?
2. Does frequency of application of a given affix imply its productivity?
3. Is productivity a matter of degree?
4. How can productivity be measured?
5. What makes a particular process more productive than others?
6. Is productivity a matter of language system or a matter of language use?
7. How is productivity different from creativity?

The answers to the above queries depend to a large extent upon the theoretical framework of a given scholar, or, in other words, upon his set of beliefs and convictions as to how word-formation processes operate. In some cases the differences are only apparent, as they are merely a matter of terminology. Sometimes, however, one can observe two opposing camps whose standpoints have almost no common ground. Let us start our discussion of productivity with a brief historical sketch, which will demonstrate how the notion of productivity has evolved over the last sixty years.

It turns out that the very term "productivity" is much more recent than the phenomenon it denotes. As Bauer (2001: 11, after Schultnik 1992a: 188) puts it: "the whole notion of grammar implicit in the work of the Sanskrit grammarians assumes the idea of productivity". One of the first contemporary linguists who mentions productivity is Otto Jespersen (1942: 4), who talks of "living" structures, i.e. those which can yield new formations.

However, one of the first attempts at a systematic application of the concept of productivity has been made by Marchand (1969). He writes: "Productivity of a derivative type ... cannot be overlooked in a correct description of a linguistic system, and the linguist who neglects this particular factor will be counting "dead souls" as live people" (1969: 5). Marchand was the first scholar who postulated delimiting the scope of word-formation study, in such a way that only composites which can be analysed both formally and semantically have place in it. Thus, only morphologically complex words can belong to the domain of word-formation study, because they are motivated, and in this way form a part of a larger pattern. This ability of a pattern to give rise to new coinages is what Marchand understands as productivity. Therefore, he sees productivity as the general capability of a pattern to produce new words. His judgements about productivity of a given pattern were made on the basis of actual words, and the high number of attested words coined on a given pattern indicated its productivity. So for Marchand frequency of a pattern was the decisive element.

The emergence of the theory of transformational grammar changed the views on word-formation mechanisms. The transformational grammar, simultaneously with the introduction of the concept of rule-governedness, has made it possible to operationalise the notion of a potential word. The existence of rules presupposes the

predictability of language change, and with this predictability the interest of scholars shifted from actual words to potential words.

"Productivity is all about potential", writes Bauer (2001: 41). He further concludes that "a process is productive if it has the potential to lead to new coinages" (Bauer 2001: 41). However, not all scholars believe in rule-governed approach to word-formation, which creates our first dichotomy in understanding productivity: productivity as frequency and productivity as potential. Both stances have their own methodological and theoretical shortcomings.

Let us first have a careful look at the frequency sense of productivity. Here, one can encounter two different estimates of productivity. One is based on the number of attested different words with a given affix at a specific point in time. This is called type frequency or lexical frequency. The other measure focuses on the number of times a particular item occurs in a text. This is called token-frequency or text frequency (Bauer 2001: 47). Both represent the so-called qualitative approach to productivity, which mainly concentrates on the availability of a given process with respect to a particular base. The type frequency measure has received a lot of criticism, because it is the method which most directly relates frequency to productivity. Such a relation, however, can easily be proved false, as there are instances of affixes which are very common, but which are not used synchronically to produce new words (e.g. *-ment*). On the other hand, there are processes which seem to be productive, in the sense that new words are being derived by means of them, but the derivatives are not very numerous (e.g. the prefix *a-*).

Many scholars (e.g. Aronoff 1983, Bauer 2001, Górska 1982) also point to the fact that the number of derivatives depends on the number of available bases. As Bauer (2001: 48) puts it: "if there is a small input class of bases, there can never be many new words". What is more, it has been proved that less productive affixes are attached to more frequent bases, so the frequency of a derivative is a resultant of the frequency of its base and the frequency of its affix (Anshen and Aronoff 1989: 199). Therefore, it is often suggested that type frequency is indicative rather of past productivity of a process under consideration, and it can hardly be used to make valid statements about the present potential of the process.

Measures based directly on token frequency also have to be treated with caution. Here, the productivity of a given process is believed to be inversely proportional to the frequency of that process. Aronoff (1983: 168) drew attention to the fact that lexicalised words have higher token frequency than non-lexicalised words, and this view seems to be supported by psycholinguistic evidence concerning lexical storage and retrieval. Lexicalised words are those which have become part of the language norm, and thus are familiar to a large number of speakers. Lexicalisation is characterised by semantic or phonological specialisation, thus items which are lexicalised are usually non-compositional or idiosyncratic, and as such they have to be stored in the mental lexicon. The outputs of synchronically productive processes, on the other hand, need not be stored, as they can be immediately analysed on the basis of rules. It follows, then, that productive processes typically have low token frequency and high degree of semantic coherence. Therefore, the token frequency measure is perhaps best seen as an indica-

tion of unproductivity of a given process rather than a method of establishing productivity.

Both measures mentioned above, i.e. type frequency and token frequency, have one more drawback which is inevitable if one tries to establish productivity on the basis of actual words. The problem is that both methods are based on the data collected from a dictionary or a computer corpus, and neither can be viewed as a complete record of lexical inventory of a language at a given point in time (although it has to be noted that some computer corpora can be very large; the well-known British National Corpus, for example, consists of approximately 100 million word tokens of contemporary British English). Furthermore, a synchronic frequency of a process does not tell us much about the potential of that process to coin new words in future. For this reason linguists who incline towards rule-governedness of word-formation postulate that frequency should rather be taken as one of the prerequisites of productivity, and not as directly equating with productivity (i.e. Bauer 2001, Plag 2003).

A potential (or a possible) word is a word whose semantic, morphological, or phonological structure is in accordance with the rules of the language. Because a possible word is not listed, it cannot be idiosyncratic – its meaning must be predictable from its structure. Aronoff and Schvaneveldt (1978), whose main interest has been located in possible but non-occurring words, look upon productivity in terms of probability of occurrence. They write: "if a given word-formation rule (i.e. affix) is more productive than another such rule, then words formed by the former are more likely to enter the language than those formed by the latter" (1978: 108). This view is also maintained in Aronoff (1980).

Investigating potential words requires a special methodology, which is not provided by traditional descriptive analysis, as descriptive grammar can only deal with actually occurring words. Thus scholars have borrowed an experimental technique from cognitive psychology, which can be used to make predictions about possible but non-occurring words. This experiment is known as Lexical Decision Task. In this technique, native speakers are presented with various structures, and they are asked to decide whether a given structure is an English word or not. In some experiments, the yes/no answer is in itself the object of interest, in others also the time taken to make the decision is calculated . The results of the Lexical Decision Task are believed to provide an insight into how language structures are organised in the mental lexicon, and how the psycholinguistic processes of parsing and retrieval function.

This technique has also been employed to investigate the problem of productivity. One such example is the research conducted by Anshen and Aronoff (1981), in which the scholars presented the subjects with three types of constructions: *possible words*, *words*, and *non-words*, and asked them to judge whether a given construction is an English word or not. Possible words were non-existent derivatives formed on actual English bases, words were attested derivatives, and non-words were derivatives formed on non-existing bases. The affixes chosen for the analysis were *-ness* and *-ity*, because they are rival forms which attach to bases of the same syntactic category. The experiment has shown that the subjects, when presented with two types of structures: Xibleness and Xibility, consistently preferred the Xibility form, and it proved that the

greater acceptability of the Xibility form correlates with greater morphological productivity of the suffix *-ity* with bases in *-ible*. In their article, Anshen and Aronoff write: "By studying subjects' responses ... we are able to test various hypotheses about morphological patterns without having to deal with most of the problems caused by differences among actually occurring words" (1981: 63). This should not be taken to mean, however, that dealing with possible words is without problems. The most acute conflict within this theory lies between the potential and the actualisation of this potential, or, in other words, between systemic and extra-systemic forces. A possible (potential) word is defined in terms of linguistic system, but the sheer fact that a word is derived in accordance with the language rules does not guarantee that it will be used by real speakers, and that it will become a part of language norm. The concept of a possible word cannot account for pragmatic factors which play a very important role in word-formation, and, what follows, also should not be overlooked in the discussion of productivity. Some scholars (e.g. DiScullio and Williams 1987: 2, Langacker 1987: 71–72, cited in Bauer 2001: 15) go as far as to exclude productivity from the domain of grammar, seeing it rather as the result of using the grammar by real speakers. Because of this failure of the notion of a possible word to comply with pragmatic factors, some linguists consider it profitable to introduce the term "probable word" to refer to those potential words which are likely to occur. Bauer (2001) even opts for keeping apart the actualisation of a given process (its probability of occurrence) and the productivity of that process.

The next question which is frequently asked about productivity is what is it that is productive? Here, the answer mainly depends upon the view of a given scholar on how word-formation works in general. Perhaps the most inclusive view attributes productivity to the language system as a whole. Another position, suggested by Bauer (1983: 65–74) links productivity with a complete module of the grammar (i.e. word-formation). Aronoff (1983), with his strong anchoring in generative approach towards word-formation, ascribes productivity to rules. In analogy-oriented theories these are patterns which are productive.

A more restrictive viewpoint is that productivity is a feature of individual affixes, but the problem with such an approach is that it cannot account for techniques which are not affixal, but nevertheless are employed to form new words (e.g. reduplication, as in *chitchat, ticktock, mishmash*). Still a different opinion has been expressed by Kastovsky (1986: 597), who has argued for attributing productivity to various morphological-semantic types, like, for example, agent nouns, instrumental nouns, or locative nouns in *-er*. Other linguists (e.g. Bauer, 2001) hold a view that productivity is a matter of an individual process (for example, *-er* affixation), or a group of processes. Although multifarious, the terminology, however, does not seem to affect the underlying principles of how productivity works or how it is manifested.

The problem which to a greater extent affects the understanding of the concept of productivity concerns the degrees of productivity. There are linguists who argue that a morphological process is either productive or not (Booij 1977: 5, cited in Bauer 2001: 15). However, such an absolute vision of productivity is seldom encountered, and most scholars support the view that productivity is a gradual phenomenon, with

unproductive processes and fully productive processes at opposing ends of the scale, and some intermediate stages in between. Some scholars take it that the number of the intermediate stages is infinite, while others argue that there are a few in-between steps. Thus, Matthews (1974: 52) lists three stages of productivity: fully productive, semi-productive, and unproductive, where the term "semi-productive" includes most lexical formations.

The notion of semi-productivity is often seen as the inability of an affix to attach to a seemingly appropriate base (e.g. both *-ness* and *-ity* can be added to adjectival bases in *-able*, but the application is not unconstrained, thus, according to Marchand (1969: 55) *serviceableness* is an attested derivative, but **serviceability* is unacceptable). An unproductive process is usually one whose outputs can be listed, and the process does not yield new derivatives. Full productivity is assigned to those processes which operate on an open class of bases, and whose all possible outputs are acceptable to the speakers. It has to be stressed, though, that the status of full productivity can hardly be assigned to any process, since, as will be shown later, every process is more or less restricted by interrelations of linguistic and pragmatic factors. Most often, the degrees of productivity are characterised by more or less vague approximations, thus many scholars use such modifiers as "very", "more", "marginally", "immensely", or "hardly" when they describe the degree of productivity of a given process.

Whatever the case, it remains a fact that some processes are more successful in coining new words than others, or that speakers prefer to exploit some processes over others. Thus, some scholars see productivity in a profitability perspective, and for them the productivity of a process is inversely proportional to the amount of competence restrictions imposed on that process (e.g. Booij 1977: 5, cited in Górska 1982: 92). In general, the restrictions (or constraints, as they are sometimes called) can be divided into linguistic and extra-linguistic. By linguistic restrictions I mean those constraints which are associated with language structure. In other words, a process cannot operate on a given base because of certain structural properties of that base. Those properties may be of phonological, morphological, semantic, or syntactic nature.

Phonological constraints are connected not only with the qualities of individual segments, but also with prosodic properties. For example, the suffix *-en* only attaches to bases which end in obstruents. The suffix *-al*, on the other hand, is sensitive to stress pattern, and it only attaches to verbs that end in a stressed syllable. Other affixes can be selective in terms of syllable-structure: the suffix *-en* can only operate on monosyllabic bases.

Morphological make-up of the base can also delimit the number of possible affixes that can be attached to it. It is known, for instance, that Latinate bases behave differently from non-Latinate ones, and there are affixes which specialise in [+latinate] bases (e.g. *-ity*), while other formatives only attach to [-latinate] bases (e.g. *-hood*) (Aronoff 1976: 51–52).

The meaning of the base can also play a role in word-formation. The examples of derivatives which are unacceptable because of the semantic properties of the input

elements are words **unill*, **unsad*, **unsorrowful*, **unpessimistic*. Such formations are believed to be ill-formed because the prefix *un-* (and negative prefixes in general) cannot be used with adjectives whose meaning is negative. Their "positive" (or unmarked, as Bauer (1983: 94) prefers to call them) antonyms, however, constitute legitimate bases for *un-* derivation, and, correspondingly, *unwell*, *unhappy*, *uncheerful*, *unoptimistic* are all attested words (Bauer 1983: 94).

The syntactic restrictions are to do with the fact that word-formation rules are constrained to members of a certain syntactic category. For example, the prefix *de-* can only be tucked on to verbs (the possible exceptions are derivatives from nominal bases, such as *debus*, *detrain*, *deplane*, which have the meaning "(cause to) descend from, leave ...", which are quoted in Marchand 1969: 104).

Apart from what language structure disallows, there is also what language use disallows, or, in other words, the extra-linguistic constraints. A derivative may be possible on structural grounds, and still not be actualised, because it has been ruled out by pragmatic factors. The basic pragmatic restriction, which we can call a global restriction, is that a word will not be coined unless there is a need for it. Also, lexemes must denote something which is nameable.

The restriction which is often treated as a special type of constraint, because it is not rule-specific, is blocking. Blocking is the term introduced by Aronoff (1976: 43) to cover the cases where a word is non-existent because of the simple existence of another, synonymous (or, in some cases, homonymous) form. Thus, an actual word (usually a simplex) blocks the derivation of another word with the same meaning. It seems to me, though, that blocking can be seen as a subtype of pragmatic restrictions; the words which have been excluded by means of blocking mechanism are in a sense unnecessary, because there already exist lexemes which carry the same meanings.

Pragmatic factors also reduce the productivity of what Kastovsky (1983: 410) calls labelling function of word-formation. Labels are lexical items whose task is to designate segments of extralinguistic reality. If designation is not required, labelling function will not be activated. On the contrary, syntactic recategorisation, which is the second function of word-formation recognised by Kastovsky (1983: 411), is characterised by a considerably greater degree of productivity. Kastovsky (1983: 411) illustrates this function with the following examples:

a. He made *fists*..... He *defisted* to gesture.

b. If that's not *civil*, *civilise* it and tell me.

c. Solarians did not bud, they *birthed*; and the female was always the *birther*. She remained female for life, no matter how many times she *birthed*.

Kastovsky argues that in case of syntactic recategorisation neologisms are more readily accepted, as their use is to some extent motivated by context and triggered by grammar. Syntactic recategorisations help maintain text cohesion and stylistic variation. Thus, the pragmatic factors are of lesser importance here.

Both formal (linguistic) and extrasystemic constraints hinder the derivation of new formations, and in this way reduce the number of new types in a language. Thus, restrictions affect type frequency of derivatives. How exactly restrictions function proves hard to determine. Theoretically, it is difficult to state whether the non-exist-

ence of a given word is due to competence restrictions or performance restrictions. A possible solution, suggested by Plag (2003: 61), is that pragmatic restrictions should be seen as operating only on those derivatives which are formally possible. So, there are two filters through which potential words are passed. The first-level sieve is a formal one: words which do not conform to current rules of the language are rejected. The words which are in accordance with the rules proceed to the next stage, which is the pragmatic filter.

It is also unclear to what extent the restrictions actually reduce type-frequency. As Bauer (2001: 143) notices, type frequency can be low irrespectively of constraints. Therefore, he puts forward the distinction between the two sources of low type frequency, which he calls constraint-restricted type frequency and usage-restricted type frequency. A similar line of reasoning can be traced in Kastovsky (1986), who writes: "we should ... consistently distinguish between the scope of a given rule and its actual application rate mirrored by the number of formations listed in dictionaries or occurring in texts" (1986: 594). By rule-scope Kastovsky means the number and type of constraints imposed on the rule, while the application rate is the frequency of the application of the rule in performance. We can thus equate the application rate with type frequency. Although couched in different terminology, both views reach the same conclusion, and they confirm the separation of quantitative and qualitative factors in productivity.

Acknowledging the operations performed by restrictions presupposes the concept of productivity as a gradual rather than binary phenomenon. Heavily constrained processes will be less productive than those where only few restrictions are operative. This, in turn, implies that productivity is open to measurement.

We have already seen that estimates of productivity based on frequency of a given process is not in line with the current view on productivity as a potential to form new words. Grzegorczykowa and Puzynina (1979) measure the rate of additions of some Polish affixes by calculating the ratio of words recorded in the most recent dictionary to words recorded in an earlier dictionary. Such a method is sometimes called "index of productivity", and it is burdened with the same inaccuracies as the type frequency method – it tells us nothing about the potential of a process to coin new formations. Also, any research based on dictionaries cannot be seen as reliable because every dictionary contains fewer words than are known in the language community.

A slightly modified version of the index of productivity has been suggested by Aronoff (1976: 36). His measure is centred on potential words, and here the index of productivity is the ratio of actual words produced by a word-formation rule to potential words produced by that rule. Aronoff has formulated an exact instruction as to how such a ratio can be computed:

> We count up the number of words which we feel could occur as the output of a given word-formation rule (which we can do by counting the number of possible bases for the rule), count up the number of actually occurring words formed by that rule, take the ratio of the two and compare this with the same ratio for another word-formation rule (Aronoff 1976: 36).

There are several problems with Aronoff's measure. Firstly, as has already been noted, calculating an exact number of actual words is hardly feasible, since dictionaries and corpora are necessarily deficient, partly because a full record of the words used in society is impossible, and partly because the outputs of the most productive processes are never listed. Secondly, the complex interrelations of various constraints on the potential bases make it difficult to estimate the number of consequent derivatives.

A different approach to measuring productivity concentrates on token frequency. Baayen (1989, cited in Bauer 2001: 147) has suggested a new method of computing productivity, which is sometimes referred to as "productivity in the strict sense" or "productivity in the narrow sense". Thus, productivity in the strict sense is the quotient of hapax legomena (n^1) formed by a given process to the total number of tokens (N) of all words formed by that process in a given corpus. It has to be remembered that a productive process is characterised by low token frequency, so the higher the number of tokens N in the denominator, the lower the productivity of the process in question.

Hapax legomena (or hapaxes) are words which appear only once in a corpus. Their significance in evaluating the degree of productivity stems from the assumption that the number of possible words derived by a very productive process is very large. Thus, it is unlikely to observe all of such types in a single corpus, and some of the types are likely to occur only once. It is expected, therefore, that most hapax legomena will be neologisms (although they could as well be simply rare words). Baayen's formula is thus considered to measure a probability of encountering a neologism formed by an appropriate process, and it is frequently used in corpus-based analyses of productivity (e.g. Plag et al. 1999). It has to be borne in mind, however, that "productivity in the strict sense" is defined with respect to a given corpus, and its reliability depends on the size of the corpus – the larger the corpus, the more accurate the results are. Besides, the status of hapaxes as a measure of productivity is questionable, as some scholars do not believe in the relationship between the possibility of a given rule to create new words and the resultant frequency of this word. It has also been proved that too often hapaxes are not in fact neologisms, even if the corpus in which they are sampled is large.

The aforementioned measures by no means exhaust the list of methods which are used in estimating the degree of productivity. However, each method that I am familiar with exploits the ideas of type-frequency, token-frequency, or hapaxes, so the criticism presented above will also be relevant to other formulas based on the concepts. There is not a single procedure in estimating productivity which would be acknowledged by all scholars, and which could be taken as a reliable technique measuring the right thing. We can conclude from this that productivity is an intuitive notion which is difficult to account for in exact statistical terms. This seems to strengthen the position of those linguists who argue that one should not talk about productivity of a process or an affix in general terms, but rather about productivity of the process or the affix under systematically defined circumstances.

What makes matters even more complicated is that the degree of productivity of a given affix is susceptible to register type. Plag et al. (1999) have conducted a research based on data extracted from the British National Corpus, in which they have analysed the productivity of fifteen English derivational suffixes across three types of discourse: written language, context-governed spoken language, and every-day conversation. They have estimated the probability of encountering a neologism with a given affix (which they call productivity) by employing Baayen's "productivity in the strict sense" formula. The results obtained have made it possible to reach a conclusion that a given suffix may display noticeable differences in productivity across the three registers. The suffixes *-type*, *-like*, and *-free* have been reported to be very frequent in written corpus (with the suffix *-like* being the most productive), but very infrequent in spoken registers. The suffix *-ish* has been found more often used in every-day conversations than in context-governed speech. The suffix *-wise*, on the other hand, does not show considerable differences in productivity across registers. In general, Plag et al. (1999: 224) conclude that: "the suffixes yield more types in the written than in the spoken registers", which takes us back to the significance of pragmatic factors in morphology and Kastovsky's (1986) claim of the typically higher degrees of productivity of *syntactic recategorisations* if compared to *labels*.

We have touched upon the problem of neologisms in investigating productivity. It is generally agreed that productivity presupposes innovation – a process is productive if it gives rise to new words. But does each new formation of a given process indicate that the process is productive? To answer this question we have to draw a distinction between productivity and creativity.

Both terms are used to account for the ability of native speakers to produce novel words. Thus Bauer (2001: 64) suggests that creativity and productivity should be viewed upon as hyponyms of innovation. The main distinguishing factor between the two is, according to Bauer, rule-governedness. Therefore, creativity is not rule-governed, and as such it is characterised by irregularity and unpredictability. Creative coinages change the rules of the language system. Most scholars follow Aronoff's view (1976: 20) that creativity covers such word-formation techniques as blending, acronymisation, clipping, and backderivation. Also, the manufacturing of simplex words is often seen as creative.

Productivity, on the contrary, is usually seen as applying to complex words only, and is always rule-governed. Thus, a productive process, by exploiting the rules of the language, changes the language norm, but it does not change the rules.

Let us now recapitulate on the ideas which seem to be central for the notorious misconceptions that have accumulated around the notion of productivity. Perhaps the best way is to see productivity as a wide-ranging concept, which includes such properties as frequency, transparency, and potential to form new words.

It has been shown that productivity is not synonymous with frequency, although frequency is taken to be one of the prerequisites of productivity. Another such prerequisite is the ability to coin new formations. Thus, the difference between an unproductive process and a productive one is that the former is no longer used to form new words, while the latter does give rise to new derivatives. Here, we touch upon the

qualitative view on productivity, which investigates the availability of the process in question. It has to be noted, though, that not every new word derived by a given process necessarily indicates that the process is productive. Thus, we have to distinguish between productivity and creativity, i.e. between rule-governed and rule-changing coinages.

What is more, consciously formed words are ignored in the estimates of productivity. So, nonce-formations derived to achieve a special effect on the reader or listener are considered as "marked" and not counted as productive. Also, to be considered productive an innovation must be repetitive. A single actualisation of a process does not prove productivity, and is rather seen as a matter of analogy and not rule-governedness. The third property of productivity is transparency, by which I mean both semantic coherence and phonological regularity. A speaker, on encountering a novel formation which is not yet stored in his mental lexicon, must be able to understand it. The only way in which he can do it is by inferring the meaning of the whole word on the basis of the meaning of constituent elements.

Productivity can also be understood as the profitability of a process (Bauer 2001), which is sometimes referred to as the quantitative approach. Scholars who subscribe to this view see productivity as a cline, and the degree of productivity of a given process depends on the number and quality of formal and pragmatic restrictions. Thus once again the notion of productivity as a complex phenomenon is confirmed.

References

Anshen, F., Aronoff, M. (1981). Morphological productivity and phonological transparency. *The Canadian Journal of Linguistics* 26, 63–72.

Anshen, F., Aronoff, M. (1989). Morphological productivity, word frequency, and the Oxford English Dictionary. In: R.W. Fasold (ed.). *Language Change and Variation*. Amsterdam Studies in the Theory and History of the Linguistic Science, 4, Current Issues in Linguistic Theory. 52. Amsterdam: Benjamins, 197–202.

Aronoff, M. (1976). *Word Formation in Generative Grammar*. Cambridge Mass.: MIT Press.

Aronoff, M. (1980). The relevance of productivity in a synchronic description of word formation. In: J. Fisiak (ed.). *Historical Morphology. Trends in Linguistics: Studies and Monographs* 17. The Hague: Mouton, 71–82.

Aronoff, M. (1983) Potential words, actual words, productivity and frequency. *Proceedings of the 13th International Congress of Linguistics*, 163–171.

Aronoff, M., Schvaneveldt R. (1978). Testing morphological productivity. *Annals of the New York Academy of Science* 318, 106–114.

Bauer, L. (1983). *English Word-formation*. Cambridge: CUP.

Bauer, L. (2001). *Morphological Productivity*. Cambridge: CUP.

Górska, E. (1982). Formal and functional restrictions on the productivity of Word Formation Rules. *Nordic Journal of Linguistics* 5, 77–89.

Grzegorczykowa, R., Puzynina, J. (1979). *Słowotwórstwo współczesnego języka polskiego*. Warszawa: PWN.

Jespersen, O. (1942). *A Modern English Grammar on Historical Principles. Part VI: Morphology*. London: George Allen and Unwin.

Kastovsky, D. (1983). Diachronic word-formation in a functional perspective. *Linguistics across Historical and Geographical Boundaries I: Linguistic Theory and Historical Linguistics*, 409–421.

Kastovsky, D. (1986). The problem of productivity in word-formation. *Linguistics* 24, 585–600.

Marchand, H. (1969). *The Categories and Types of Present-Day English Word-Formation. A Synchronic-Diachronic Approach*. Alabama: University of Alabama Press.

Matthews, P.H. (1974). *Morphology*. Cambridge: CUP.

Plag, I. (2003). *Word-Formation in English*. Cambridge: CUP.

Plag, I., Dalton-Puffer, C., Baayen, H. (1999). Morphological productivity across speech and writing. *English Language and Linguistics* 3, 209–228.