# Measurement of Productivity in English

**Key Words:** Measurement, Productivity and English

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# Abstract

In English, the formation of *preterite* and past participle forms of verbs by means of *ablaut* (for example, *sing–sang–sung*) is no longer considered productive. Newly coined verbs in English overwhelmingly use the 'weak' (regular) ending *-ed* for the past tense and past participle (for example, *spammed*, *e-mailed*). Similarly, the only clearly productive plural ending is *-(e)s*; it is found on the vast majority of English *count nouns* and is used to form the plurals of neologisms, such as *FAQs* and *Muggles*. The ending *-en*, on the other hand, is no longer productive, found only in *oxen*, *children*, and the now-rare *brethren*. Because these old forms can sound incorrect to modern ears, *regularization* can wear away at them until they are no longer used: *brethren* has now been replaced with the more regular-sounding *brothers* except when talking about religious orders.

The significance of productivity in practice and theory, for many, is the degree to which native speakers use a particular grammatical process *for the formation of novel structures*. A productive grammatical process defines an **open class**, one that admits new words or forms. Non-productive grammatical processes may be seen as operative within **closed classes**: they remain within the language and may include very common words, but are not added to and may be lost in time or through regularization converting them into what now seems to be a correct form.

This research is about 'productivity of word – formation.' It is divided into three sections. The first section is a general introduction about the meaning of productivity and its relation with other terms. The second one is about some constraints in forming words. The last section is concerning the ways one can measure the morphological rules. There are four ways to measure the productivity of word–formation: the number of actual word, the number of possible words, the ratio of actual words to possible words, and the number of neologisms attested over a certain period.

# قيـــاس الإنتاجيـــة في اللغـــة الإنكليزيـــة

**الكلمات المفتاحية:** قيـــاس، الإنتاجيـــة، و اللغـــة الإنجليزيـــة.

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# الخلاصـــة

إن تشكيل أشكال الأفعال في اللغة الإنجليزية في الماضي البسيط والماضي التام عن طريق تغيير حرف العلة في الكلمات أو الأشكال ذات الصلة (على سبيل المثال، يغني ـ غنى ـ غنى) لم تعد تعتبر منتجة. الأفعال التي تم صياغتها حديثا في اللغة الإنجليزية تستخدم بأغلبية ساحقة "الضعيفة" (العادية) التي تنتهي ب ed- في نهاية الماضـــي و الماضـــي التام (مثلآ، spammed أرســـل بريدآ مزعجآ، e-mailed أرسـل بريدآ ألكترونيآ). وبالمثل، فإن نهاية الجمع الوحيد المنتجة بشـــكل واضـــح هي s(e)-؛ فإنه يتم العثور على الغالبية العظمى من إحصـاء الأسمـاء الإنجليزية ويستخدم لتكوين صيغ من الكلمات الجديدة، مثل FAQs أسئلة وأجوبة و Muggles الأشـخاص الذين ليسـوا على دراية بنشـاط أو مهارة معينة. النهاية en-، من ناحية أخرى، لم تعد منتجة، وجدت فقط في oxen الثيران، children الأطفال، now-rare brethren الأخوة الآن نادرة. لأن هذه الأشـكال القديمة يمكن أن تبدو غير صـحيحة للآذان الحديثة، ويمكن للتنظيم ينهج طريقآ بعيدآ عنهم حتى لم تعد تسـتخدم: وقد تم الآن استبدال brethren مع الأكثر انتظاما brothers إلا عندما نتحدث عن الأوامر الدينية.

إن أهمية الإنتاجية في الممارسة والنظرية، بالنسبة للكثيرين، هي درجة استخدام الناطقين الأصليين لعملية نحوية معينة لتشـــكيل هياكل جديدة. وتحدد العملية النحوية الإنتاجية فئة مفتوحة، تعترف بالكلمات أو الأشـكال الجديدة. ويمكن النظر إلى العمليات النحوية غير المنتجة على أنها منطوقة داخل الطبقات المغلقة: فهي تظل داخل اللغة، ويمكن أن تشـمل كلمات شـائعة جدا، ولكن لا تضـاف إلى ويمكن أن تضـيع في الوقت أو من خلال تنظيم تحويلها إلى ما يبدو الآن شكلآ صحيحآ.

هذا البحث هو حول "إنتاجية تشكيل - الكلمة". وهو مقسم إلى ثلاثة أقسـام. القسـم الأول هو مقدمة عامة عن معنى الإنتاجية وعلاقتها مع المصـطلحات الأخرى. والثاني هو حول بعض القيود في تشـكيل الكلمات. القسـم الأخير يتعلق بالطرق التي يمكن من خلالها قياس القواعد الصرفية.

# Introduction

Many studies on linguistics, and particularly on word structure, usually introduce at an early stage a distinction between 'productive' and 'unproductive' word formation processes. 'Productivity' is used to mean a variety of different things, and it seems best to avoid the term entirely until any potential confusions could be resolved – a task for this research. This risk of confusion does not mean that the notion of productivity is unhelpful. On the contrary, once the various senses are teased apart, the outcome turns out to shed light on the relationship between word formation and lexical listing, and to highlight an important respect in which word-structure differs from sentence-structure.

Carstairs-McCarthy (2002: 85) indicates that productivity is closely tied to regularity, but regularity in shape has to be distinguished from regularity in meaning. One aspect of vocabulary in English and perhaps in all languages is a dislike of exact synonyms. The implications of this for word formation is discussed altogether with dealing with some semantic implications of the freedom with which compound nouns are formed in English.

By Productivity as a morphological phenomenon, people can understand the possibility of language users to coin, unintentionally, a number of formations, which are in principle uncountable. The productivity of an affix is "the degree to which speakers can use it to unintentionally coin new words," (Hay, 2003: 122).

Carr (2008: 136-7), explains that productivity is regarded as the extent to which a given phonological, morphological or syntactic pattern can apply to create new forms. In contemporary English, the suffix *-ee* is currently exhibiting a certain degree of productivity speakers are uttering new forms such as *kissee* and *teachee*, in which the new forms denote the person undergoing the experience. It is claimed particularly in usage-based phonology, that the productivity of a given pattern is largely determined by the type frequency of the pattern.

# Section One

## 1. Productivity

### 1.1 What is Productivity?

Plag (2002: 64) defines *productivity* as "the possibility of creating a new word, it should in principle be possible to estimate or quantify the probability of the occurrence of newly created words of a given morphological category."

To give a specific meaning of the term, Crystal (2008: 389-90), claims that productivity in word-formation is a general term; it is used, in linguistics, to refer to the creative capacity of language users to create and understand an indefinitely large number of sentences. It contrasts mainly with the **unproductive** communication systems of animals, and in this context is seen by some linguists as one of the design features of human language. The term is also used in a more restricted sense with reference to the use made by a language of a specific feature or pattern. A pattern is **productive** if it is repeatedly used in language to produce further instances of the same type (e.g. the past-tense affix *-ed* in English is productive, in that any new verb will be automatically assigned this past-tense form). **Non-productive** (or **unproductive**) patterns require any such potential; e.g. the change from *louse* to *lice* is not a productive plural formation – new nouns would not adopt it, but would use instead the productive *s*-ending pattern.

Fromkin et al. (2014: 65), states that some morphological rules are productive, meaning that they can be used freely to form the list of free and bound morphemes. Trask and Stockwell (2007: 233), state that productivity is the degree of freedom with which a particular grammatical pattern can be extended to new cases. Linguists most often speak of productivity in connection with patterns of word-formation. The noun-forming suffix *-ness* is highly productive: happi*ness*, prepared*ness*, salacious*ness*, friendli*ness*. The same is true of the verbal prefix re-:

*re*write, *re*consider, *re*appoint, *re*negotiate.

Popescu (2009: 196), by his side, describes productivity as "the number of derivatives, compounds, reduplications that can be built with the word." Yule (2010:13), in his turn, illustrates humans are continually creating new expressions and novel utterances by manipulating their linguistic resources to describe new objects and situations. This property is described as productivity (or "creativity" or "open-endedness") and essentially means that the potential number of utterances in any human language is infinite.

Furthermore, Katamba (1993:67), points out two key points requiring explanation about the meaning of productivity; by saying that;

1. Productivity is a matter of degree. It is not a dichotomy, with some word-formation processes being productive and others being a productive. Probably no process is so general that it affects, without exception, all the bases to which it could potentially apply. The reality is that some processes are relatively more general than others.

2. Productivity is subject to the dimension of time. A process which is very general during one historical period may become less so at subsequent period. Conversely, anew process entering a language may initially affect a tiny fraction of eligible inputs before eventually applying more widely.

It can be seen that the noun-forming suffix -th is totally unproductive: people have existing cases like warmth and depth, but they cannot form any new ones: happyth, bigth, sexyth (the asterisk indicates forms that are unacceptable). The noun-forming suffix *-dom* is weakly productive: to established cases like kingdom and martyrdom, new ones like gangsterdom, tigerdom and stardom, occasionally added. However, this cannot be done freely: policedom, universitydom, childdom, (ibid).

The adverb-forming suffix -wise was formerly unproductive and confined to a few cases like clockwise and otherwise, but today people freely coin new formations like *healthwise*, *moneywise*, *clotheswise* and *fitnesswise*. The noun-prefix *mini-* did

not even exist before 1960, but today it is prodigiously productive: *miniskirt*, *minicomputer*, *mini-microphone*, *minibus*, and *mini-war*, (ibid).

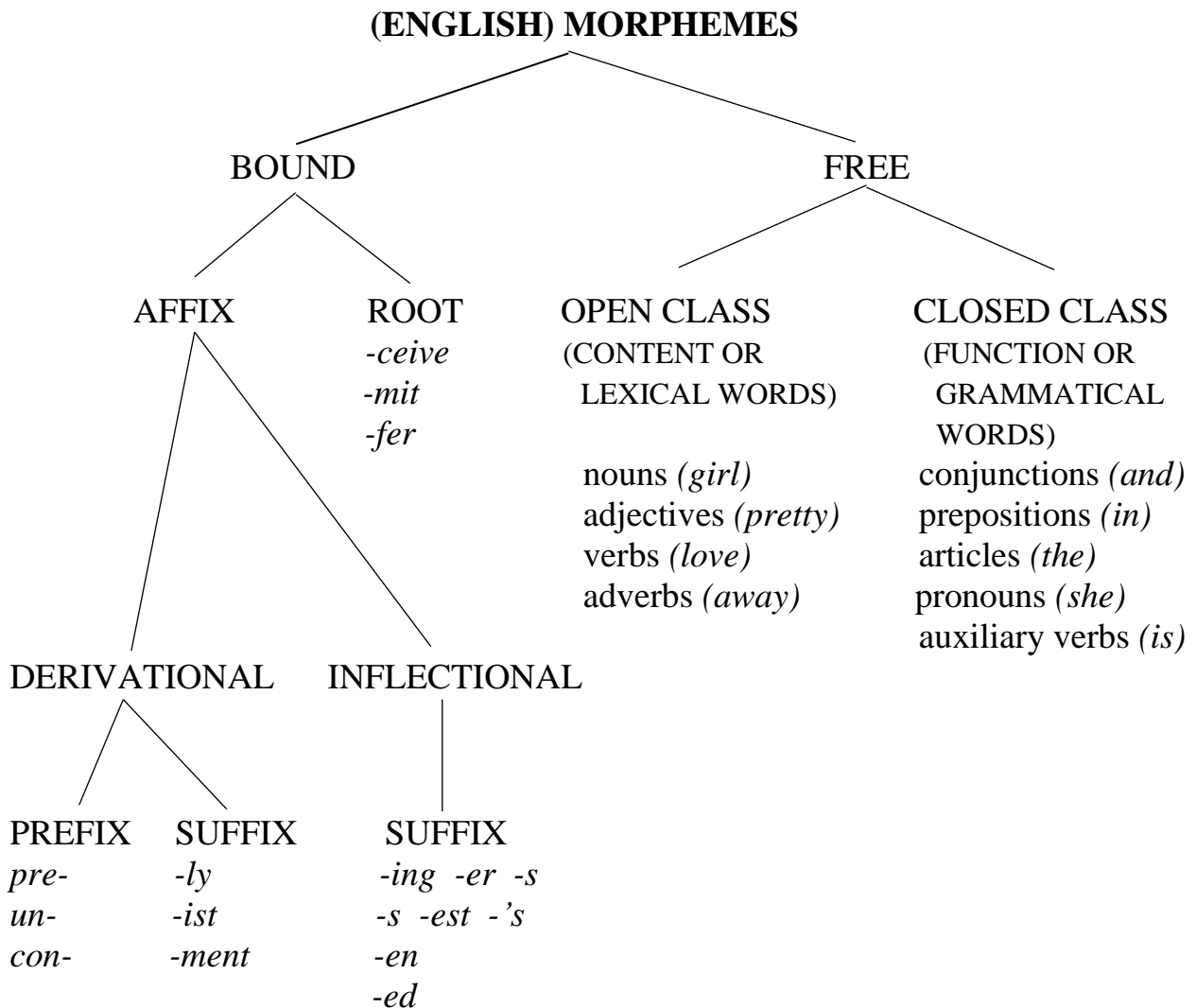English morphemes can be classified according to Fromkin et al. (2014: 49), as shown in the figure below:

**(ENGLISH) MORPHEMES**

| BOUND | | FREE | |
|---|---|---|---|
| AFFIX | ROOT | OPEN CLASS | CLOSED CLASS |
| | *-ceive* | (CONTENT OR | (FUNCTION OR |
| | *-mit* | LEXICAL WORDS) | GRAMMATICAL |
| | *-fer* | | WORDS) |
| | | nouns *(girl)* | conjunctions *(and)* |
| | | adjectives *(pretty)* | prepositions *(in)* |
| | | verbs *(love)* | articles *(the)* |
| | | adverbs *(away)* | pronouns *(she)* |
| | | | auxiliary verbs *(is)* |
| DERIVATIONAL | INFLECTIONAL | | |
| PREFIX    SUFFIX | SUFFIX | | |
| *pre-*      *-ly* | *-ing  -er  -s* | | |
| *un-*       *-ist* | *-s  -est  -'s* | | |
| *con-*     *-ment* | *-en* | | |
| | *-ed* | | |

**Figure (1.1): Classification of English morphemes.**

To take some examples from Fromkin et al. (ibid.: 52), the suffix – *able* is a morpheme which conjoined any verb to form an adjective with meaning of the verb which is like "able to be" such as *acceptable*, *passable*, *changeable*, *breathable*, and so on. The productivity of this rule is illustrated by the fact that the suffix- able affixed to new verb such, downloadable and faxable. In addition, the suffix –re which means

"one who performs an action" can be added to any verb in English to produce a nun, appears to be every productive morphological rule as *analyzer*, *lover*, *hunter*, and so on.

More examples are taken from Katamba (1993:67-9), the suffix –ist which is a morpheme that may be added to noun to form other noun with meaning of "advocate of" as in; anarchist, communist …etc., and with meaning of 'practitioner of' as in; pianist, violinist …etc. Also, it can be added to a noun base to form adjective as in racist, sexist …etc.

By suffix *–ist* people can form a very large number of nouns with the meaning of "advocate of, follower of, supporter of or practitioner of". But there are unexplainable gaps, for example, a follower of Prophet Mohammed is not *Mohammedist*, and a piano is played by a pianist, but the drum is played by a drummer not *drummist*. As it seen earlier that the unproductive process lack, to the potentials that exist in the productive process, (ibid).

With this process, Haspelmath (2002:40) believes that "the notion of unproductive rule is widely accepted among morphologists, both for word- formation and for inflection. Unproductive rules are a remarkable property of morphology, because there is no direct analogue to them in syntax."

The English suffix *-al* which form action nouns as in *refusal*, *revival*, *upheaval* and so on, but not *ignoral*, *amusal*, *repairal* and so on, are unacceptable forms which mean that there are many verbs to which this suffix cannot be applied. Some English plural formation as in *oxen*, *men*, *feet*, and others, are unproductive but they are so idiosyncratic which mean that they can be easily dismissed as "irregular" (ibid.).

The morpheme *-id* is at the unproductive end of English morphology. It is, no longer used actively to produce new words, and the words containing it could be simply being listed in the lexicon. Furthermore, the suffix *-id* is added to bound adjectival bases with the meaning of "having the quality of specified by the verb",

which it is a Latin origin used to drive attributive from verb in Latin, for example ", (ibid.):

timere +  id     ⟶     timidus(Latin ) ⟶      timid(English )

tepere +  id     ⟶     tepidus(Latin ) ⟶      tepid(English )

## 1.2 Semi-Productivity

There was a brief discussion about the meaning of semi-productivity in Crystal's definition of productivity (2008: 390), in which, **semi-productive** forms are those where there is a restricted or occasional creativity, as when a prefix such as *un-* is sometimes, but not universally, applied to words to form their opposites, e.g. *happy* ⇒ *unhappy*, but not *sad* ⇒ *unsad*.

Some linguists like Mathews (1991: 52), recognize, a special category, which they called semi-productivity to cover idiosyncratic, affixes which inexplicable fail to attach to apparently eligible forms. Furthermore, where such affixes are used, the meaning of resulting word maybe un-predictable.

Katamba (1993:71) gives the following data to show that the suffix –*ant* is capricious in the respect of the bases it attach and the resulting meaning:

A – Communic*ant* , defend*ant* , applic*ant* , entr*ant*, serv*ant*,

         supplic*ant*, depend*ant*, inhabit*ant*, consult*ant*

B – Writ(e)*ant* , build*ant* ,shout*ant*.

The suffix – *ant* turns a verbal base into an agentive nominal. It accepts the bases in [A], but not those in [B]. The reason for this attachment is the historical reason. It is descended from the Latin present participle ending- *antem/entem*. Hence, it attaches to Latinate bases only. Germanic bases like *write*, *build*, *shout* are ineligible. Semantically – *ant* has unpredictable effects. The meaning of words created by suffixing – *ant* as in *consistant*. For instance, a *defendant* has the narrow interpretation of a person sued in a law court not just any one who defends oneself; an accountant is

not merely anyone who renders an account or calculation but professional who makes up business account, (ibid.).

## 1.3 Productivity and Creativity

Wherever there are alternate processes for expressing the same categories in a language, there are differences in the degree of productivity of the processes. For example, in English past tense formation, suffixation of an alveolar stop is fully productive, the use of the *strung* schema is productive within a restricted domain, and most other vowel change methods are unproductive, (Bybee, 1985: 132).

Productivity can be distinguished from creativity, although it is hard to draw a consistent line between the two. It may be the case that productivity can be seen as rule-governed, and creativity seen as rule-changing and equated with the use of analogy, but this is not settled. In sum, the productivity of a morphological process is its potential for repetitive non-creative morphological coining, (Bauer, 2004: 98).

Following Lyons (1977: 549), a distinction will be drawn between productivity and creativity. Productivity is one of the defining feature of human Language, and is that property of language which allows a native speaker to produce an infinitely large number of sentences, many (or most, of which have never been produced before. It is assumed that productivity is to be accounted for by the rules of generative grammar-creativity, on the other hand, is the native spankers ability to extend the language system in motivated, but unpredictable way.

Haspelmath (2002: 100) adds that a productive rule allows speakers to form new words unconsciously and unintentionally, whereas creative neologisms are always intentional formation that follow an unproductive pattern. An example of a creative neologism would be the word mentalese (the mental language of thoughts), because new words with the suffix – *ese* (such as *motherese*, *computerese*, *translationese*) are probably always coined intentionally, and they immediately strike hearers and readers as new and unusual.

Bussmann (1996: 949) describes 'productivity' as the "ability of word-forming elements to be used to form new linguistic expressions." He (ibid.) adds that productivity is a gradient concept that is broken down into unproductive elements (e.g. *be-,* cf. *behead*), occasionally productive (or 'active') elements (e.g. *-ify* and *-ese,* cf. *beautify* and *motherese*), and highly productive elements (e.g. *re-* and *-er,* cf. *retry, player*). The explanation and description of productivity is controversial: on the one hand, **neologisms** and their immediate comprehensibility parallel syntactic 'creativity,' but on the other hand, even as highly productive processes, they are, as a rule, not free of lexical gaps and exceptions (e.g. *\*topwards* vs *sidewards, \*teen-something* vs *twenty-something, writable* vs *readable*).

In addition, Bauer (1983: 63); gives an example to show the relation between productivity and creativity. He discusses the invention of the word *headhunter* to designate a number of a tribe which keeps and preserves the heads of its human victims are a case of productivity; the form is produced according to fixed rules which, in this particular case, could be syntactically specified. The metaphorical extension of the term *headhunter* to mean "one who recruits executives for a large corporation", on the other hand, is a case of creativity. In retrospect, it may be clear that the two kind of *headhunters* have a lot in common, but, given that head does not have the meaning "executive". There is nothing in the form *headhunter* to show it could be used with this second meaning, and nor could it be predicted that precisely this form would be extended of with this Kind of meaning. However, the distinction between productivity and creativity has a methodological and empirical problem.

According to Haspelmath (2002: 101), the methodological problem is that "it describes productive application as unintentional" and the empirical problem is that "there is many rules that yield neologisms that are neither totally unremarkable nor immediately noticed."

About the methodologist, it is hard to know the speakers intentions and state of consciousness when they form a new word. For example, the word *mentalese*, which is coined by the philosopher, is a single – word expression for a highly abstract concept that would make that concept more popular in view of the philosophers' intention, on the other hand, which concerns the empirical problem. It would be very odd to say that the English verb – deriving suffix – *ize*, often forms new words, is unproductive, but it may will be that quite a few of these new words are conscious creation (e.g. technical, scientific terms such as *pronominalize*, *tranasistorize*, *multimerize*). It seems that it is more realistic to arrange on a continuous scale of productivity", (ibid.).

## 1.4 Analogy

According to Chalker and Weiner (1994: 23), a general definition is drawn as "imitation of the infection, derivatives, and constructions of existing words in forming inflections, derivatives, and constructions of other words. Analogy normally governs the patterns of word–formation. In recent years, numerous new verbs have been seen with the prefixes *de* – (e.g. *deselect*) and *dis* – (e.g. *disinvest*) and nouns beginning with *Euro* – (e.g. *Eurocart*, *Eurofare*, *Eurospeak*). Other new nouns have been formed with such well–established suffixes as – *ism* (e.g. *endism*, *handicapism*). New verbs almost always inflect regularly (e.g. *faxing*, *faxes*, *faxed*) by analogy with regular verbs).

More interesting than the distinction between productivity and creativity is the distinction between creation by rule and creation by analogy. An analogical formation will provide the impetus for a series of formations; this presumably what happened in the case of formations in – *scape*, based on *landscape*, then an analogical formation seascape giving eventually a productive series including not only *cloudscape*, *skyscape* and *waterscape*, (ibid).

What's more, Haspelmath (2002:102) mentions a new analogical proportion which is Known as local analogy. This formula seems to be a general feature of human cognition that is applied in all kinds of non-linguistic situations (e.g. in problem solving, when people finds analogous solutions to analogous problem, analogous solutions to analogous problem, based on judgement of similarity). For instance, *trialogue*, which is "conversation of three", is formed from the model word *dialogue*, which is "conversation of two". There is no general rule can be invoked to explain the creation of this neologisms. The main difference between local analogy and more traditional rules is that the former is quite unproductive and cannot in general give rise to many neologisms.

# Section Two

## 2. Constraints on Productivity

### 2.1 Blocking

The term blocking is the name given by Aronoff (1976:43), to the phenomenon of non-occurrence of complex form because of the existence of another form. The form cause the blocking may be complex or simple.

To give an example shows the meaning of blocking, Bolinger (1975:109), points out that, despite the productivity of *–er* suffixation in English, there is no word *stealer*, because of the existence of the word thief which carries the appropriate meaning to the to the existence of forms like *bad* and *small* blocks the formation of *ungood* and *unbig*. The prior existence of enlist prevents the use of *enlist* prevents the use of *list* as a verb with that meaning.

Also, Aronoff (1976:44), goes on to point out that there is an existing noun derived from an adjective base ending in *–ous*, it is not possible to create a new noun by adding *–ity*. However, the existence of an established noun does not stop the more productive suffix *–ness*:

**Table [2.1] Blocking of Productivity**

| X+ous (adjective) | Pre-existing (noun) | Noun (-ty) | Noun (-ness) |
|---|---|---|---|
| acrimonious | Acrimony | acrimoniosity | acrimoniousness |
| glorious | Glory | gloriosity | gloriousness |
| fallacious | Fallacy | fallacity | fallaciousness |
| spacious | Space | spaciousity | spaciousness |
| furious | Fury | furiosity | furiousness |

## 2.2 Blocking Factors

## 2.2.1 Phonological Factors

According to Katamba (1993: 74), to form a verb with inchoative meaning (the type of aspectual relationship in which the beginning of the action specified) can be formed from adjective by suffixing – *en* to an adjective base which must be phonetically:

1) Monosyllabic
2) Stop, fricative or affricative (obstruent), which may optionally preceded by a nasal consonant (sonorant) or an approximant like /l/ or /r/;

   black-en   /blæk-ən/,   whit-en /wɑɪt-ən/

   damp-en  /dæmp-ən/,  hard-en /hɑ:d-ən/

   tough-en  /t^f-ən/,     length-en /lenⱯ-ən/

But the following words are not allowed these phonological constraints; dray-en /draɪ-ən/, lax-en /læks-ən/, green-en /gri:n-ən/. However, obviously the phonetic restriction on /-ən/ following sonorant is not general, but peculiar to inchoative verbs. For example /lɑɪən/ lion, /^njən/ onion.

Still, Katamba (1993:74) notes that the suffix *–ly* is a Hached to adjective to form adverb as in *kindly*, *elegantly* and so on. Nevertheless, *sillily* or *friendlily* show that the segmental phonology of the base can determine whether a form can undergo *–ly* suffixation. The *-ly* suffix tends to be avoided where an adjective ends in *–ly* /lɪ/. Suffixing *–ly* would result in a non-preferred /lɪlɪ/ sequence in the derived adverb.

## 2.2.2 Morphological Factors

The application of morphological rules of abase may be prevented by its properties. Thus, Katamba (1993:76); argues that some suffixes are typically added either to native bases (morphemes) or to bases of foreign origin.

For instance, the suffix *-ant* is suffixed to bases of French origin. Similarly, the rule of velar softening which changes /k/ to [s] before a suffix commencing with a non-low vowel:

cynic, cynical ⟶ cynicism

critic, critical ⟶ criticism

fanatic ⟶ fanaticism

sceptic ⟶ scepticism

Moreover, Aronoff (1976:51), points out that there are some suffixes which can only be added to bases which are [+Latinate], and others which can only be added to bases which are [-Latinate]. As an example of the first group, the suffix *–ity*, and of the second group the suffix *–hood*.

He (ibid.) further indicates that such features are not purely etymological, since words etymologically derived from Latin can be accepted as native, as it is shown by the existence of *priesthood*, *statehood*, and *personhood*. Exactly what factors influence this diachronic shift in status is not clear, but it also occurs in other places; the set of adjectives which can be used the first element of *adjective + noun* (compounds) is restricted set consisting largely of (monosyllabic) adjectives of Germanic origin, as in *blackboard*, *busybody*, *bigboard*, *hothouse*, *longstop*, *quickstep*, *redhead stronghold*, and so on. However, this group also contains a number of adjectives which etymology *–cally* are rarely Romance loans, but which are treated for these purposes as being of Germanic origin, as in *doubtetalk*, *grandfather*, *nobleman tenderloin*, and so on.

About the requirement of It [+Latinate] feature, Aronoff (1976: 52-4), goes on to argue that since *readability* is attested, the Latinate feature must be also attached to *–able*, and that it must be the feature marking of the last morpheme which is important, rather that the feature marking of the root.

Aronoff (ibid.) also, shows that the make–up of the base can play a role. He gives the example of adjectival form in *–al* derived from noun in *–ment*. If the *–ment* is an affix added to the verbal root, then there is no *–al* adjective. If the *–ment* is a part of the root, then there is an *–al* adjective:

| *orna* | ornament | ornamental |
| *employ* | employment | employmental |

Besides, suffixation can be sensitive to specific suffixes already present in the base in other ways, for this Bauer (1983: 92), points out that in German it is not possible to form a diminutive from a base which contains the feminine derivational marker *–in*; that is, *lehrer.chen* "little teacher" would be possible in an emotive sense, but not *Lehrer.in.chen*. A similar example is that in English no suffix can be added to a base that already ends in the same suffix; that is, form such as *juy.ful.ful*, *helpless.ness.ness*, *duke.dom.dom* are impossible. It is not the fact of previous suffixation which blocks these forms, as the existence *helpless.ness.ness* proves, but the identity of the two suffixes. Note that this is not a restriction on the function of the suffixes, sine two nominalization suffixes can be conjoined as in *provisionment*, but not *environmentmet* it is not possible.

## 2.2.3 Semantic Factors

According to Katamba (1993: 78), semantic considerations, may impinge on the application of word formation process of forming compounds from adjective plus past participle as in:

short-sleeved (shirt )

green–roofed (house)

blue–eyed (boy)

one–armed (bandit)

three–legged (stool)

red–nosed (reindeer)

By the claim that the base in question must be inalienably possessed by the head noun that the adjective modifies, the given examples (compound worck) are permissible because someone's eyes are an integral of their body. Similarly, *the legs of the stool*, *the sleeves of a shirt*, and *the roof of a building* are an obligatorily possessed part of some piece of *furniture*, *garment* or *building*. However, a *two–carred* man, and *black–shoed* lady; are impossible since, cars and shoes are possessed alterably, (ibid.).

Katamba (ibid.) also illustrates how semantics may restrict the application of morphological rules, by saying that if there are two adjectives with opposite meanings, one of which has a more positive meaning than the other. Normally the negative prefix un-attaches to the positive adjective as in; *unwell*, *unloved*, *unhappy*, *unwise*. Yet, if *un-* is attached to the negative member of a pair as in; *unill*, *unhated*, *unsad*, *unfoolish*; resulting word is usually ill-formed.

## 2.2.4 Synonymy blocking

According to Haspelmath (2002: 103), the reason behind the prevention of new words formatting, is the synonymy blocking, because the derivational rule is pre-empted by an existing word that has the meaning of the potential neologism.

The rule is blocked, if there is a word that have the meaning of the word, which is formed according to a specific morphological rule, that is to say, the word *thief* is a prop ore word used instead of the word *stealer*, which has no agent noun.

Apparently, languages prefer not to have several words that have exactly the same meaning. Therefore, this is another kind of semantic restriction on productivity. More examples are listed in table [2.2].

**Table [2.2] Semantic Restriction on Productivity (Synonymy Blocking)**

| Base | Blocked Word | Blocking Word | Related Pair |
|------|--------------|---------------|--------------|
| broom | to broom | to sweep | to/hummer |
| to type | Typer | typist | to/writ(er) |
| good | Goodly | well | bad/badly |

Therefore, the existence of a synonymous word often blocks the application of a derivational rule, which is not always the case. The puzzling fact about blocking is that it has many exceptions. For instance, English has a synonymous pair like *piety/piousness*, *curiosity/curiousness*, *accuracy/accurateness*, etc.

Also, Haspelmath (2002: 109, 244), claims about the frequency of the blocking words that; "the more frequent the blocking word is, the greater is its blocking strength."

Additionally, as it seen earlier that the derivational rule is more important than the inflection one, and it is invoked by blocking. But, the inflectional morphology also invoked by blocking. For example, the past–tense form *goed* is blocked by *went*, and the comparative form *badder* is blocked by *worse*.

# Section Three

## 3. Measuring Productivity

For measuring **productivity**, morphologists state many types concerning that, among them Bauer (2003: 86-7), who indicates two types of measure; ones based on dictionary listings and others on textual attestation. **The first type** depends on a suitable list of attested words being available. Where English is concerned, the list in *The Oxford English Dictionary* is usually used. But most probably, such measures would not be possible in a language which does not have an excellent historical lexicography. Anyhow, measures built on word-lists of this type have to be careful to distinguish between what is productive and what is generalised. **The second type** of measure is based on the analysis of large collections of text called **corpora**. It has to be assumed that any enough corpus will reflect a typical distribution of words formed by any given morphological process.

Robinson and Ellis (2008: 184), argue that one central issue is how to measure productivity. This is usually done by counting the number of inflections that appear on a given form and the number of different forms that occur with a different inflection. But choosing the criterion for these numbers is, of course, arbitrary and it is still possible, when dealing with naturalistic corpora, that they hide a considerable amount of rote learning, particularly if the numbers of forms and inflections in the child's corpus are rather small. On the other hand, it is important to compare the child's morphological use with that of adults. If the adult's productivity is no greater than the child's is, there is clearly no development to explain.

While Haspelmath (2002:109-10), puts four ways to measure the productivity of word–formation:

1. **The number of actual word (generalization).** This concept is easy to measure by examine a comprehensive dictionary. According to this measure, the English suffix –*ment* has a high type frequency, but it is not productive, only four

neologisms with –*ment* are attested in the Oxford English Dictionary for the twentieth century. Conversely, there are not many usual words with the suffix –*ese*, as in *journalese*, but this can used freely to coin new words denoting a special language or jargon.

2. **The number of possible words**. This concept is much more difficult to measure, because it need identification of all the restrictions on the pattern. The set of possible words equals the likelihood that a unproductive rules that do not seem to be restricted in any general way. For example, *em*/*en* prefixation in English should be possible with any noun that denotes a container–like object (e.g. entomb, ensnare, embody), but the rule is simply not productive; that is to say the word *embox* 'put into a box' is impossible.

3. **The ratio of actual words to possible words (degree of exhaustion)**. This concept requires the ability to count the number of possible words, so it is not very practical. The set of possible word which its bases include complex words which formed productively, becomes open-ended, and computing the ratio of actual to possible words is not really meaningful. For example, English N+N compounds (e.g. lipstick) can be formed freely without restriction. Thus, the possible N+N and its degree of exhaustion compounds are staggeringly large (in principle, infinite) and necessarily quite low (even though there are plenty of actual N+N compounds, and the pattern is highly productive).

4. **The number of neologisms attested over a certain period of time (diachronic productivity)**. The measure can be determined if a good historical dictionary is available, but again the extent that the dictionary reliable. Lexicographers over look new words with the very productive pattern, and the use of large text corpora are another available technique. By looking at a newspaper corpus of the last three decades of the twentieth century, it should be possible, case in point, to observe how the English suffix –*gate* gained (and perhaps lost) productivity over the years.

# Conclusion

The basic way, in which an affix is said to be productive, if it can appear in new words. These words may never develop beyond being nonce formations. Alternatively, they may in the course of time, become established.

A non–productive affix, 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. So–called semi–productivity may be one of two things. Usually it is non-productivity, with lexicalized forms being used as a corpus over which generalization are sought. The other is productivity with very heavy restriction on it.

Morphological patterns can be arranged on scale from totally unproductive to highly unproductive to highly productive. A rigid dichotomy between creativity and productivity, between analogy and productivity, does not seen to be very useful, because there are always intermediate cases.

The productivity of a word–formation pattern may be limited in various ways: phonologically, semantically, morphologically, and with synonymy blocking. Various quantitative measures of productivity have been proposed.

In summary, a morphological rule can be said to be more or less productive according to the new words, which it is used to form. It is natural to ask why productivity crops up as an issue so insistently with word formation but not with sentence formation. Are there no syntactic constructions that are less productive than others? Such constructions do indeed seem to exist. For example, there is no obvious reason why the construction illustrated at (1), in which a verb has two objects, should be acceptable in those examples but unacceptable (or less readily acceptable) in the examples at (2):

(1) a. They gave us a present.

    b. They faxed us the answer.

    c. They allocated us two seats.

    d. They baked us a cake.

(2) a. *They donated us some pictures.

    b. *They yelled us the instructions.

    c. *They planned us a holiday.

    d. *They spoiled us the evening.

Apparently, the lexical entries for at least some of these verbs must specify whether or not they tolerate the double-object construction. The reason why this sort of syntactic restriction is less usual than the kind of morphological restriction discussed is not immediately obvious. It may simply be that the propensity for words (i.e. lexemes) to become lexical items, and thus to acquire idiosyncrasies, inevitably compromises the generality of the processes whereby complex words are formed (that is, processes of derivational morphology and compounding); on the other hand, the propensity for phrases to become lexical items is relatively weak. However, why should this difference in propensity for lexical listing exist, given that *wordhood* is neither a necessary nor a sufficient condition for lexical-item status? A plausible answer is that shorter items are more likely to be lexically listed than longer items are, and words (even complex words) are generally shorter than phrases.

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