

**THE OLD ENGLISH  
ADJECTIVAL SUFFIXES  
-CUND AND -ISC:  
TEXTUAL  
OCCURRENCES AND  
PRODUCTIVITY**

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*Abstract*

The aim of this journal article is to assess the productivity of the Old English adjectival suffixes *-cund* and *-isc* by analysing the textual occurrences of these affixes in *The Dictionary of Old English Corpus*. The result of the measure of productivity, which is based on Baayen's framework (1992, 1993), is that *-isc* is more productive than *-cund*. Along with this conclusion, some relevant points arise from the analysis, including the restricted competition between *-isc* and *-cund*, the absence from dictionaries of the nominal bases of derivation of *-isc* adjectives and the semantically predictable formations. On the methodological side, the analysis that has been carried out demonstrates that lexicographical sources, dictionaries and databases in isolation cannot give an accurate picture of productivity, whereas an analysis that combines the use of textual and lexicographical sources allows for a suitable assessment of the productivity of morphological processes in a historical language.

*Resumen*

Este artículo tiene como objetivo principal el cálculo de la productividad de los sufijos adjetivales del inglés antiguo *-cund* e *-isc* por medio del análisis de las ocurrencias textuales de los mismos encontradas en *The Dictionary of Old English Corpus*. La medida de la productividad de los afijos está basada en los índices propuestos por Baayen (1992, 1993) e indica que el sufijo *-isc* es más productivo que *-cund*. Del análisis llevado a cabo surgen otras cuestiones destacables como la competencia semántica entre los sufijos *-cund* e *-isc* a la hora de formar derivados adjetivales, la ausencia en los diccionarios de las bases de derivación de los adjetivos en *-isc* y la existencia de algunas formaciones predecibles semánticamente. Desde el punto de vista metodológico se demuestra que el uso único de las fuentes lexicográficas no puede proporcionar resultados adecuados, mientras que un análisis combinado de fuentes lexicográficas y textuales permite un cálculo más exacto de la productividad de los procesos morfológicos de una lengua histórica.

*Keywords:* Old English, word-formation, corpus analysis, productivity

*Palabras clave:* inglés antiguo, formación de palabras, análisis de corpus, productividad.

## 1. INTRODUCTION

According to Bauer (2004:87), productivity deals with the extent to which new words may be coined by any particular morphological process. This is a relatively new topic of discussion in the area of morphology, but it is drawing increasing attention, thus the studies by Bauer (1993, 2005), Baayen (1992, 1993), Kastovsky (1986), Plag (1999, 2003) and Rainer (2005), among others. Whereas some of these authors have been involved in the measure of productivity of some Present-day English and German affixes, there are no previous studies in the productivity of Old English word-formation processes.

In the specific area of Old English word-formation, previous research has concentrated on the relationship between inflectional and derivational morphology (Kastovsky 2006), the word-formation processes of affixation, compounding and zero derivation (González Torres 2010, *fc.-a*, *fc.-b*; Kastovsky 1992; Martín Arista 2008, 2009, 2010, 2011a, 2011b, 2011c, *fc.-a*, *fc.-b*, *fc.-c*, *fc.-d*) and the interaction of morphological processes (Torre Alonso 2009, 2010, *fc.*). Given that the language is no longer spoken and only some written records survive, the measure of the productivity of Old English morphological processes may pose the problems pointed out by Kastovsky (1992:358) and Lass (1994). Such problems are related to the written status of Old English and the diachronic variation of this language. Beginning with the latter question, while the synchronic continuity of Old English is undoubtedly a convention, the study of a remote stage of the language allows for a historical perspective that cannot be adopted in modern languages, in which, for instance, we can determine the decay of an affix, but cannot foresee its disappearance. Thus, the study of productivity must be seen under a synchronic point of view. Regarding the former question, the study of a historical language is dependable on surviving texts and, in order to reduce at a minimum the written record bias, it seems necessary to analyse as many linguistic data as possible, if not all surviving records. So there is a need to establish from the beginning the period of time we are going to cover in our analysis and gather together all the texts belonging to that precise moment in time. In this line, Lass (1994:193) remarks that it is not easy to distinguish whether a given derived form represents an institutionalised lexical item or it is a new formation. Lass (1994:193) goes on to say that given the fragmentary lexicon of Old English that has survived, neologisms

are hard to recognize and taking hapax legomena (words occurring once in a corpus) as new formations will not always be an adequate assumption.

For these reasons, all the available texts must be analysed, while the indexes for productivity must be seen as estimate measures of probability. The question remains, however, of what exactly productivity is in a historical language. It is necessary, in order to answer this question, to break down the complex notion of productivity into less complex notions. Productivity, as put forward by Bauer (2004:87), can be divided into availability and profitability. Availability makes reference to whether a given process can be used for producing new words, while profitability takes issue with the frequency of use of a given morphological process. In assessing the productivity of the processes of a historical language, in which there can be no new coinages, the assessment of productivity must focus on profitability, that is, how much a process is used. The approach is strictly synchronic even though the object of analysis is a historical language, although the diachronic evolution of the suffixes under analysis is used to check the results of the measure on productivity.

After these preliminary remarks, the aim of this journal article is to carry out an analysis of productivity that tries to determine the extent of use of one of the most important morphological processes during the Old English period, namely affixation. More specifically, this study focuses its attention on the Old English adjectival suffixes *-cund* and *-isc*, whose productivity will be calculated by mean of the indexes proposed by Baayen (1992, 1993). This article also aims at offering new perspectives on the combination of textual and lexicographical sources for measuring productivity. Last but not least, this research requires wide array of software and electronic texts, including concorders, search engines, specific query programmes, lexical databases and online corpora and dictionaries.

Given the aim of calculating the different indexes of productivity of the Old English adjectival suffixes *-isc* and *-cund*, the remainder of this article is organised as follows. Section 2 concentrates on the different approaches to the calculation of productivity as well as on the methodological decisions adopted throughout the research. Section 3 provides a brief analysis on the meaning of these suffixes during the Old English period and describes in detail the different steps followed to collect the relevant linguistic data, as well as the development of the different measures on productivity. Finally, section 4 presents the main conclusions drawn from this research.

## 2. MEASURES OF PRODUCTIVITY

This section deals with corpus-based vs. dictionary-based measures of productivity, the role of type and token analysis, the concept of hapax legomenon and the measure of narrow and global productivity. These questions are discussed in turn.

In Aronoff and Anshen's (2001:242) words, morphological productivity is "*the extent to which a particular affix is likely to be used in the production of new words in the language*". The phenomenon of morphological productivity can be studied qualitatively and quantitatively. Qualitative approaches to productivity decide whether a morphological process can be said to be productive or not, while quantitative approaches determine productivity along the scale. This means that productivity is not an absolute notion but rather a scalar phenomenon in which intermediate cases are much more frequent than those in the polar categories (Aronoff and Anshen 2001:243) and that quantitative and qualitative approaches to productivity are largely convergent. As Plag (1999:22) points out on the question, "*if something can happen (ruled by qualitative approaches), it should be possible to quantify the probability of its occurrence (ruled by quantitative approaches)*" [emphasis as in original-RMM]. All in all, quantitative approaches throw data based as well as falsifiable conclusions and, as such, have been used more widely in the literature.

On the other hand, the debate over the methods that should be used in order to quantify productivity in the most accurate way is open. Previous studies in productivity have discussed the advantages and disadvantages of corpora and dictionaries when it comes to measure this phenomenon. Whereas some authors, such as Baayen (1992, 1993) are in favour of a text-based analysis of productivity rather than a dictionary-based one, other authors argue that dictionaries are the best existing tool to carry out an analysis of productivity, thus Plag (1999). In the same vein, Baayen and Renouf (1996, in Plag 1999) deal with the disadvantages of using a dictionary with the purpose of measuring productivity and criticise Cannon's (1987, in Plag 1999) dictionary-based account for its lack of accuracy, as compared with a corpus-based account. The main argument against the dictionary-based approach is that dictionaries are written with commercial aims and do not try to list every single word in a language, but the most frequent and idiosyncratic ones. The reason is that users can predict the meaning of some complex words, especially of those constructed under productive patterns, and thus, these words are omitted, as well as the inflected forms (Plag 1999:98). Another factor that may affect the study of productivity in dictionaries is that this phenomenon has to be measured in synchronic terms, whereas dictionaries often include some archaic complex forms

that are no longer productive. In spite of these weak points, dictionary-based measures of productivity can be more accurate than corpus-based ones in some respects. Plag (1999:99) points out that lexicographers examine larger quantities of data than those found in an electronic corpus and that the addition or deletion of a type in a dictionary does not change the index of productivity at all, whereas in a corpus such addition or deletion modifies the number of tokens and, in consequence, productivity changes. Moreover, in contrast to corpus-based accounts, dictionary-based accounts allow to determine the productivity of converted items, that is, those that change their categorial label without changing their form. For these reasons, this study combines lexicographical and textual sources. The lexicographical sources include the lexical database of Old English *Nerthus* ([www.nerthusproject.com](http://www.nerthusproject.com)) and Bosworth and Toller's *An Anglo-Saxon Dictionary* (1973). The textual source is *The Dictionary of Old English Corpus* developed by the *Dictionary of Old English* project at the University of Toronto.

Turning to the question of the role of type and token analysis, Baayen (1992, 1993) proposes different measures of productivity based on a quantitative approach to the question, to which the concepts of type and token are central. Bauer (2005:328) points out that frequency and productivity are different terms since frequency makes reference to the number of existing derivatives of a certain word-formation process, whereas productivity refers to the index of possible new coinages. Nevertheless, Aronoff and Anshen (2001) suggest that there is a strong relation between token frequency and productivity, which stresses the need for a text-based account because the analysis of token frequency requires corpus evidence, in contradistinction to type frequency, which calls for lexicographical analysis only. It follows that a type and token analysis is a strict requirement for any quantitative measure of productivity. Once the types (V) and tokens (N) of the required affixes have been measured, two different procedures can be adopted. One possibility is to measure the index of possible words, as proposed by authors such as Aronoff (1976, in Baayen 1993). The index results from the formula 'I = S/V,' where S stands for the possible forms and V for the actual forms. However, this is not a relevant measure for the analysis of morphological productivity, since, as Baayen states (in Plag 1999:24), the number of possible words with a truly productive affix should be uncountable for being infinite. For this reason, Baayen (1992, 1993) resorts to the term *hapax legomenon*, which makes reference to those forms occurring only once in the corpus and, ultimately, has become crucial for the assessment of the index of productivity of derivational processes. Indeed, hapax legomena are used as a kind of measure of the likelihood of neologisms to appear in the language, although they cannot be equated with neologisms, as Lass (1994:193) remarks. The measure P is the quotient of the number of hapaxes with that given morphological process ( $n_1$ ) and the tokens, or in other words, the total number of

words in the corpus with the affix (N), thus  $P = n_1/N$ . What P really expresses is the probability of new types with that morphological process to appear in the corpus if its extension grows, and, consequently, the probability of creating new words with that process in a given language. However, Van Marle (in Plag 1999:30) applies this productivity measure P to the suffix *-er* which expresses the neuter gender in Dutch and its productivity is 3.5 times higher than its feminine counterpart *-ster*, which seems counterintuitive. These results match up with the criticism made in this respect by other authors such as Plag (1999) and Bauer (2001). They insist on the importance of the number of types (V) in order to get an accurate measure of productivity since V represent the number of potential bases where a given morphological process can take place. In addition, this criticism is reinforced by Lass (1994) theory about the weakness of hapax legomena as representatives of neologisms.

In order to deal with these counterintuitive results, Baayen (1992, 1993) devises another measure of productivity called *global productivity* (P\*). This is a bi-dimensional measure that shows graphically the extent of productivity of the affixes. The horizontal axis stands for P, the degree of productivity previously calculated; whereas the vertical axis shows the extent of use of the affix in the corpus, namely V. This measure does not provide a simple scale, in accordance with the gradual nature of the phenomenon of productivity, which has to be measured with respect to more than one parameter.

### 3. ASSESSING THE PRODUCTIVITY OF *-CUND* AND *-ISC*

To recapitulate, in the field of Old English studies, both Kastovsky (1992) and Lass (1994) have raised the question of the productivity of word-formation processes and have underlined the difficulty of assessing productivity in a historical language. While I agree with these authors, I take the line that corpus analysis can be a useful research tool for measuring the productivity of certain processes. Against this background, the aim of this analysis is to measure the productivity of the Old English adjectival suffixes *-cund* and *-isc* by analysing the textual occurrences of these affixes in *The Dictionary of Old English Corpus*. In order to assess the productivity of the adjectival suffixes *-cund* and *-isc* it is necessary, first of all, to identify the meaning of the suffixes and, secondly, to collect the relevant linguistic data.

As several authors have remarked (Quirk and Wrenn 1994; Mitchell 1964; Kastovsky 1992), the suffix *-cund* turns out adjectives with the meaning ‘of the nature of’ and has usually religious connotation, as in the instances in (1a). There is also agreement in the field on the recategorization pattern and meaning of the suffix *-isc*. This suffix mainly creates adjectives of place and origin, like the ones in (1b), although it also produces less predictable qualifying adjectives such as those in (1c) and (2)

(1)

- a. *godcund* ‘religious, sacred, divine, spiritual, heaven-sent,’ *upcund* ‘from above, heavenly,’ *heofoncund* ‘celestial, heavenly,’ *woruldscund* ‘wordly, secular,’ *hellcund* ‘of hell’
- b. *bryttisc* ‘British,’ *crecisc* ‘Greek,’ *denisc* ‘Danish,’ *egiptisc* ‘Egyptian,’ *englisc* ‘English,’ *frencisc* ‘French’
- c. *militisc* ‘military,’ *utlendisc* ‘strange, foreign,’ *wielisc* ‘foreign, not free, servile’

An important aspect of the methodology adopted is that two (or more) word-formation processes of a given kind are needed in order to conduct a comparative analysis in which different points along the gradual scale of productivity can be considered. Therefore, I have chosen these two affixes because both produce denominal adjectives and, moreover, compete for meaning expression, as can be seen in (2):

(2) *eorlisc*/*eorlcund* ‘noble,’ *heofonisc*/*heofoncund* ‘heavenly’

However, as Bauer (Bauer 1993: 82) remarks, *it seems that it is not the case that either affix can be added freely to any base, since speakers show marked preferences for one or the other in particular case*. Indeed, for the expression of location, the affixes compete in a much less direct way because they attach to different, though related bases, as is shown by (3).

(3)

- a. *incund* ‘internal,’ *innancund* ‘inner,’ *innecund* ‘inward,’ *ūpcund* ‘from above, heavenly,’ *ūtancund* ‘external,’ *ufancund* ‘from above’
- b. *inlendisc* ‘native,’ *ūplendisc* ‘from the country,’ *ūtlendisc* ‘foreign’

For instance, the base of affixation of *u:plendisc* ‘from the country’ is *u:pland* ‘country,’ whereas the base of *upcund* ‘from above’ is *u:p* ‘above.’ In general, as in the examples in (3), *-isc* derivatives convey the meaning of origin with nominal or adjectival bases and *-cund* derivatives have adverbial bases that express place or location.



With this background, the analysis carried out in the remainder of this research comprises the following steps: (i) the identification of the inflectional endings that follow the adjectival affixes *-isc* and *-cund*, in order to find all the occurrences of the affixed words within the corpus; and (ii) the quantification of the tokens, types and hapaxes of both suffixes needed to measure the different productivity indexes. Ultimately, these steps are a consequence of the methodology pursued in this research, which combines lexicographical and textual sources. Whereas lexicographical sources provide lemmas, textual sources display unlemmatized occurrences, which have to be related to lemmas in order to quantify types and hapaxes. To begin with, it has been necessary to gather all the texts provided by the *The Dictionary of Old English Corpus* in a single file that contains approximately 3 million words. The resulting file has been indexed by means of ConcGram, a concorder-indexer that has turned out a list of tokens with the number of occurrences of each token.

Given the index to *The Dictionary of Old English Corpus*, the next step has been to identify the sequences of derivational morpheme plus inflectional morpheme that have to be searched for. With this purpose, different sources have been consulted, including Campbell (1987), Quirk and Wrenn (1994) and Mitchell and Robinson (1995). *The Dictionary of Old English* (Healey 2008) has also been useful for this analysis, as the entry for each word provides the attested inflected forms (although *The Dictionary of Old English* has only reached the letter G so far). Finally, the last source has been *The Dictionary of Old English Corpus*, where fragmentary searches can be launched. The different sequences of derivational plus inflectional morpheme for the two suffixes under scrutiny are shown by figure 1:

<b>-isc</b>	<i>-isc, -isca, -iscan, -iscena, -isce, -isces, -iscne, -iscra, -iscre, -iscum, -iscea, -iscean, -iscere, -iscon, -isca, -sca, -sce, -scra, -scum, -esc, -scana, -scen, -scena, -sci, -sceon, -sceum, -iscman, -sco, -scvm, -sne, -scon, -scre, -scu, -scus.</i>
<b>-cund</b>	<i>-cund, -cunda, -cundan, -cunde, -cundes, -cundne, -cundra, -cundre, -cundum, -cundæ, -cundæn, -cundde, -cundon, -cundun, -cundvm, -cundnes, -cunden, -cvnd, -cvnde, -cundran, -cvndes, -cvndvm.</i>

Figure 1: The inflectional endings of *-isc* and *-cund*.

The sequences that appear in figure 1 have been used as query strings that have been passed to B.R.Searcher, a textual searcher that allows for exact and fragmentary searches. The output of B.R.Searcher has required some desambiguation, given that some words ending with the suffixes under analysis are not complex but simplex. For example, if we take the hits found for the inflected form *-iscan* we have to differentiate simplex words, such as *discan* ‘dishes’, and exclude them from our final count, from complex words such as *Indiscan* ‘Indian’



which represents a prototypical derivative of *-isc*. Distinguishing simplex words from complex ones is not always a straightforward task. Problematic cases include *Etheisc*, *Numantisc* or *Sarmondisc*. The three of them are proper nouns although they could be mistaken for place names. To solve this kind of problems it is necessary to check the context of use of the words in the *Dictionary of Old English Corpus*. Consider, as illustration, the following string:

(4) Or 1 B9.2.2

[0005 (1.8.23)] Europe hio onginð, swa ic ær cwæþ, of Danai þære ie, seo is irnende of norþdæle, of Riffeng þæm beorgum, þa sindon neh þæm garsege þe mon hateð **Sarmondisc** & seo ea Danai irnð þonan suðryhte on westhealfe Alexandres herga;

In the sentence *þe mon hateð Sarmondisc* ‘the man was called Sarmondisc,’ *Sarmondisc* belongs to the nominal category instead of the adjectival one. The same is the case with *Numentisc* and *Etheisc*, which also constitute proper names:

(5)

a. Or 5 B9.2.6

[0063 (3.117.16)] Þa Scipia hiene hamweard wende of þæm lande, þa com him to an eald mon, se wæs *Numentisc*.

b. Gen B8.1.4.1

[0530 (25.9)] & Isaac & Ismahel hys suna hi bebyrigdon on þam twy fealdum scræfe ðe stynt on Effrones lande, Soares suna *Etheiscean*, ongean Mambre.

[0546 (26.34)] ÐA Esau wæs *xl* wintre, þa nam he twa wif, Iudith, Berithes dohtor ðæs *Etheiscean*, & Basemat, Helones dohtor on ðære ylcan stowe.

[1081 (49.29)] & cwæþ to him: Bebyriaþ me mid minum fæderum on þam twifealdan scræfe þe is on Ephrones lande, þæs *Etheiscan*.

The next step of the analysis entails the lemmatization of the unlemmatized forms resulting from textual analysis. This stage requires a lexicographical source. I have chosen the lexical database of Old English *Nerthus* in order to check the words turned out by textual analysis, including the question of whether they appear under the canonical form or represent a non-canonical form resulting from phonological change or spelling modification. Phonological changes have been tested out with the list provided by Clark Hall (1996), while Baker (2003) has been used for dealing with spelling modifications. The words that have not been listed in *Nerthus* have been double-checked with the Bosworth-Toller Dictionary. However, these lexicographical sources do not provide information on a significant number of words, whose meaning can be defined by comparison with other derivatives of the same productive process. At the same time, dictionaries tend to omit some words that are in use in the language. This is the case for words such as *BABYLONISC* (21 occurrences) *CHALDEISC* (29 occurrences), *ISRAHELITSC* (27

occurrences), etc. All in all, 59 forms do not appear either in dictionaries or databases, while the total number of occurrences in the corpus is of nearly four hundred and seventy tokens. In the same way, this research has evidenced that even for those *-isc* derivatives that can be found in lexicographical sources, there is not an entry for their base of derivation. This is the case for words such as *arabisc*, *bulgarisc*, *cananisc*, *nazarenisc* and a total of eighty-nine derivatives out of one hundred and eighteen.

After deleting undesired results and gathering all relevant data, the next step in the analysis is to count the number of occurrences of each selected form with the given suffix by using the frequency list provided by the concorder. All these data can be summarized as follows in table 1, which presents the different inflectional endings found in the corpus and the number of tokens each ending displays:

<b>-isc</b>	<i>-isc</i> (1070), <i>-isca</i> (174), <i>-iscan</i> (795), <i>-iscena</i> (8), <i>-isce</i> (572), <i>-isces</i> (115), <i>-iscene</i> (61), <i>-iscra</i> (170), <i>-iscree</i> (198), <i>-iscum</i> (535), <i>-iscea</i> (8), <i>-iscean</i> (73), <i>-iscere</i> (26), <i>-iscon</i> (2), <i>-iscæ</i> (5), <i>-sca</i> (27), <i>-sce</i> (25), <i>-scra</i> (1), <i>-scum</i> (14), <i>-esc</i> (13), <i>-scana</i> (2), <i>-scen</i> (10), <i>-scena</i> (7), <i>-sci</i> (6), <i>-sceon</i> (2), <i>-sceum</i> (9), <i>-iscman</i> (1), <i>-sco</i> (19), <i>-scvm</i> (6), <i>-scne</i> (1), <i>-scon</i> (2), <i>-scre</i> (2), <i>-scu</i> (3), <i>-scus</i> (9).
<b>-cund</b>	<i>-cund</i> (51), <i>-cunda</i> (22), <i>-cundan</i> (382), <i>-cunde</i> (185), <i>-cundes</i> (26), <i>-cundne</i> (19), <i>-cundra</i> (49), <i>-cundre</i> (137), <i>-cundum</i> (110), <i>-cundæ</i> (1), <i>-cundæn</i> (3), <i>-cundde</i> (1), <i>-cundon</i> (1), <i>-cundun</i> (1), <i>-cundvm</i> (1), <i>-cundnes</i> (15), <i>-cunden</i> (6), <i>-cvnd</i> (4), <i>-cvnde</i> (2), <i>-cundran</i> (1), <i>-cvndes</i> (2), <i>-cvndvm</i> (2).

Table 1: Tokens by suffix and inflectional ending.

At this point, we have fulfilled the first step in our analysis regarding the identification of morphemes, as well as the number of tokens found for each one. For calculating the indexes, it has been necessary to quantify the number of different types and the number of hapaxes with *-isc* and *-cund* in the corpus. The total figures for each measure are shown in the table below:

Affix	Tokens (N)	Types (V)	Hapaxes (n <sub>1</sub> )
<i>-isc</i>	3971	129	256
<i>-cund</i>	1021	16	41

Table 2: Tokens, types and hapaxes per affix.

Beginning with the measure of the different indexes for productivity proposed by Baayen (1992, 1993), the index of the degree of exhaustion or the number of possible words formed with a certain affix is impossible to calculate since the

number of possible forms is infinite. Turning to the second measure, productivity in the narrow sense (P), we apply the equation formulated by Baayen ( $P = n_1/N$ ) in order to assess the productivity (P) of each affix. This is done by dividing the number of hapaxes by the number of tokens of the words derived by means of a given morphological process. The more approximate the result will be to 1, the more productive the affix in question will be, since the number of hapaxes resembles the number of neologisms of that category. Nevertheless, depending on the size of the corpus, some hapax legomena stand for well-known words of the language, although among the hapaxes we will also find the new formations we are really looking for. Table 3 shows the results for productivity in the narrow sense:

Affix	N	$n_1$	P
- <i>isc</i>	3971	256	0,064
- <i>cund</i>	1021	41	0,04
$P = n_1 / N$	-	-	1,00000

Table 3: Productivity in the narrow sense.

The interpretation of these data indicates that the index of productivity of *-isc* is higher than that of *-cund*. Moreover, the results partly satisfy Plag's (2003) requirements regarding the relation between the number of hapaxes and the index of productivity. Plag (2003:67) claims that for productive processes, we should expect a large number of low frequency words and a small number of high frequency words. This boils down to the fact that the affix with a higher rate of tokens (N) is the more productive one. Nevertheless, if we focus on the results for productivity (P), both affixes seem to be quite close despite the differences in their number of tokens (N) and hapaxes ( $n_1$ ). So, it will be necessary to have a look at the results together with the rest of measures before drawing the final conclusions.

A more accurate measure for productivity that satisfies the requirements on which I have just commented can be provided the graphic representation of global productivity (P\*) proposed by Baayen (1992, 1993). First of all, we must set the measures involved in this bi-dimensional measure. The horizontal axis of the figure represents the degree of productivity (P) shown by figure 2, while the vertical is filled with the number of different types with the given affix in the corpus, that is, what I have labelled *V* above.

Affix	P	V
-isc	0,064	129
-cund	0,04	16

Table 4: Measures for global productivity.

Taking these figures into account, their translation into a graphic similar to the one proposed by Baayen (1992) would be as follows in figure 2:

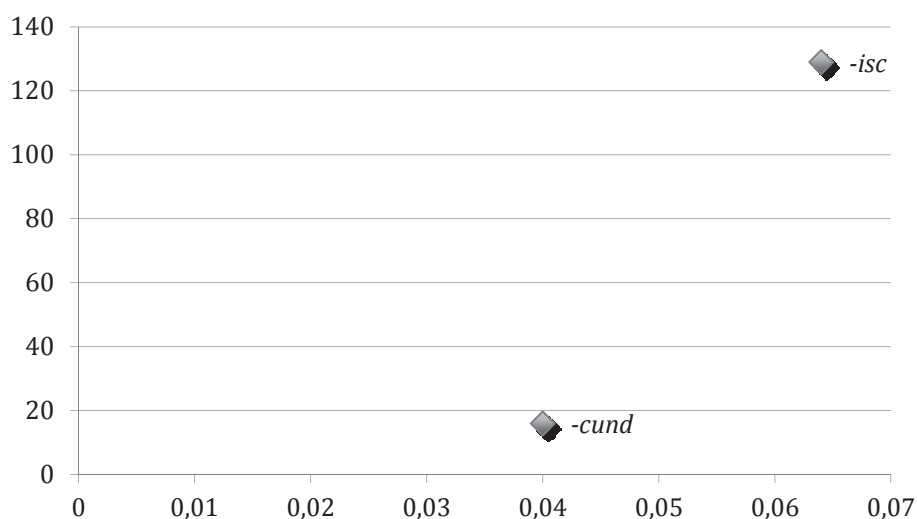
Figure 2: Graphical representation of the Global productivity of *-isc* and *-cund*.

Figure 2 shows that the degree of global productivity is higher for *-isc* derivatives than for *-cund* ones, since *-isc* derivatives are often used (verified by V) and have a higher probability to be encountered in new formations (established by P). Turning to the issue discussed above of the similar results for productivity, it is at this point where we can see the real differences between them. In spite of the similar value for P, “a large P in combination with a large V implies that more new types may be expected than when a large P co-occurs with a small V” (Baayen 1993:190). This means that, as Van Marle (1992), Plag (1999) and Bauer (2001) stated before, it is V that determines the results of the global productivity of an affix. As mentioned above, this measure has the disadvantage of not providing us

with accurate numerical results, although it is beyond a doubt that *-isc* is more productive than *-cund*.

These results are consistent with diachronic evolution. Diachronically, the suffix *-cund* is found for the last time in Early Middle English (Kurath 1998), although only three forms are kept during this period, namely *godcund*, *incunda* and *innacund* (Ciszek 2010), against the sixteen different types found in *The Dictionary of Old English Corpus*. On the other hand, the suffix *-isc* is still productive in English and, as such, this suffix is included in the descriptions of the affixal system by authors like Marchand (1969), Lieber (2005) and Stein (2007). In effect, *-ish* continues to be used for indicating geographical origin, (6a) and for describing a quality, as in (6b). Apart from these uses already found in Old English, the affix has developed new meanings, including the derogatory and mitigating meaning (6c) and the expression of tendency to do something, attached to verbs (6d).

(6)

- a. *English, Scottish, Welsh, Irish, Danish, Swedish, Polish, Finnish, Spanish, etc.*
- b. *aguish* ‘febrile, associated with malaria,’ *baboonish* ‘related to Asian monkeys’
- c. *bleakish, cheapish, coldish, dampish, dilettantish*
- d. *snappish, peckish, ticklish*

Where *-ish* seems to combine more freely is with numbers or numerical expressions with the meaning of ‘approximately.’ The examples in (7) have been retrieved from *The British National Corpus* (searched on September 24, 2010):

(7)

CKH376 This has yet to receive a name and will depart from Waterloo again about lighting up time, 18.00 *ish*, heading for Southampton but via Andover, the Laverstock avoiding line and Romsey so that the locomotive is facing the right direction for the homeward journey.

F8A167 And, we can have a main for seven pound fifty- *ish*.

J1F435 They can still be playing to their full ability at 34 *ish*.

J3U55 is, he was on a Christmas bash last night, he did, he has told me he’d be late, he’ll be here oh about ten o’clock- *ish*.

KE65604 I mean he er he used to as regular as clock work but I say, and I have had those times when he comes four o’clock- *ish* even in the afternoon.

And also, as Stein (2007:88) stresses, this suffix has the ability to be attached to phrases, as can be seen in (8):

(8) school-boyish, public-schoolish, at-homeish (Stein 2007:88).

The evidence gathered in these examples, insists on the productivity of the suffix *-ish* in English, which goes in the line of the assessment of productivity of the Old English counterpart.

#### 4. CONCLUSION

This research has dealt with the Old English adjectival suffixes *-isc* and *-cund* in order to measure their productivity. After the analysis of types, tokens and hapaxes, the main conclusion that can be drawn is that the suffix *-isc* is more productive than *-cund*, both in terms of productivity in the narrow sense (0,064 for *-isc* and 0,04 for *-cund*) and global productivity (as shown in figure 2). From the methodological point of view, this research has proved that, despite the different approaches proposed by the literature, a combined analysis of both lexicographical and textual sources satisfies the problems found both in corpus or dictionary-based accounts. Although in some cases the formula of narrow productivity proposed by Baayen (1992) provides counterintuitive results, global productivity shows all the measures involved in the analysis - tokens and hapaxes together reflected by P\* and the number of types (V) - and provides us with a general overview of the productivity of the affixes.

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