

## Another Look at Old English Zero Derivation and Alternations

JAVIER MARTÍN ARISTA

Universidad de La Rioja

[javier.martin@unirioja.es](mailto:javier.martin@unirioja.es)

This article offers an overview of zero derivation in Old English, a description of the vocalic alternations that hold between zero derived nouns, adjectives and weak verbs and their bases of derivation as well as an account of the significance of alternations in the wider context of the evolution of the lexicon of English. Alternations are quantified and related to i-mutation and word-formation processes by distinguishing direct from reverse alternations and alternations with a strong verb source from alternations with a weak verb target. The conclusions reflect the synchronic-diachronic character of alternations. On the synchronic axis, alternations represent a relatively generalised phenomenon that affects all classes of both strong and weak verbs, while, on the diachronic axis, they allow us to assess the progress of the change from variable to invariable base morphology.

Keywords: alternation; word-formation; zero derivation; morphology; Old English

...

## Nuevas perspectivas en la derivación cero y las alternancias del inglés antiguo

Este artículo ofrece una visión general de la derivación cero en inglés antiguo, una descripción de las alternancias que se establecen entre los nombres, adjetivos y verbos débiles, de una parte, y sus bases de derivación, de otra parte; y una valoración de la importancia de las alternancias para la evolución del léxico inglés. Se cuantifican las alternancias y se relacionan con la mutación de la i y con los procesos de formación de palabras mediante distinciones entre las alternancias directas y las inversas y entre el verbo fuerte como origen de la derivación y el verbo débil como meta de la derivación. Las conclusiones reflejan el carácter sincrónico-diacrónico de las alternancias. En el eje sincrónico, las alternancias representan un

fenómeno relativamente generalizado que afecta a todas las clases de verbos fuertes y débiles; mientras que en el eje diacrónico las alternancias permiten medir el progreso del cambio de la morfología de base variable a la morfología de base invariable.

Palabras clave: alternancia; formación de palabras; derivación cero; morfología; inglés antiguo

## I. AIMS, SCOPE AND PREVIOUS RESEARCH

Word-formation is not only an area where phonology, lexicology and grammar meet but also an aspect of language structure which often resists a purely synchronic analysis. This is particularly the case with Old English because it constitutes a remarkably long period in which the degree of diachronic and diatopic variation present indicates that a number of changes are underway that undermine the synchronic unity of this stage of the English language. An important consequence of assuming the synchronic status of Old English is that the effects of well-attested diachronic changes such as the fronting and raising of back vowels and diphthongs known as *i-mutation* have to be integrated into the synchronic grammar of the language in order to appropriately describe and explain the morphological processes that are witnesses to them.

The two topics of this article, zero derivation and alternations, clearly reflect the situation just described, since the overlapping of synchronic fact and diachronic motivation, on the one hand, and lack of productivity and relatively widespread distribution, on the other, point to an extremely unstable system which is very likely to disappear during its subsequent evolution, but which still calls for explanation in the synchronic grammar of Old English. That said, the general aim of the article is to take a new look at Old English zero derivation and alternations in terms of (i) an overview of zero derivation in Old English, (ii) a description of the vocalic alternations that relate zero derived nouns, adjectives and weak verbs to their bases of derivation and (iii) an account of the significance of alternations in the wider context of the evolution of the lexicon of English. In general, the line taken in this research is that the framework of alternations is valid if it is applied systematically and exhaustively; and, moreover, that it allows the researcher to come to conclusions regarding the structure of the lexicon.

The point of departure of this review is Herbert Pilch's *Altenglische Grammatik* (1970), given its concern with the synchronic explanation for grammatical aspects of Old English in general and word-formation in particular. Pilch finds some parts of the inflectional morphology of Old English that display *i-mutation* (such as the singular second and third persons of the present indicative of strong verbs) and, above all, a noteworthy set of derivational processes in which a relation often holds between an *i*-unmutated base of derivation and an *i*-mutated derivative (1970, 88). Although the formation of deverbal nouns with a dental suffix is identified by Pilch as conveying *i-mutation* (*mægð* "ambition" < *magan* "to be able"), the vast majority of derivational processes presenting *i-mutation* can be included under the general heading of zero derivation (or derivation without derivational morphemes). These include the formation of causative verbs (as in *brengan* "to produce" < *bringan* "to bring"), denominal weak verbs from class 1 (as in *gebylman* "to provide with a helmet" < *helm* "helmet"), deadjectival nouns (like *hæte* "heat" < *hāt* "hot"), deverbal nouns without suffix (such as *gebæc* "baking" < *bacan* "to bake") and deverbal adjectives without suffix (of the type *gescēad* "reasonable" < *gescēadan* "to separate"). Pilch's description does

not include i-mutated denominal adjectives like *strēme* “having a current” (< *strēam* “stream”) and, more importantly, does not constitute a principled systematic account.

Dieter Kastovsky’s *Old English Deverbal Substantives Derived by Means of a Zero Morpheme* (1968) presents a complete framework of recurrent and fairly frequent contrasts or *alternations* between the vocalism of verbs and deverbal nouns. He also draws a distinction between the vocalism of strong verbs due to the functioning of gradation and alternations and remarks:

As to the structural status of these alternations, they are of course not derivative morphemes, as little as is gradation. The alternations originated by purely phonological processes in the course of which former inflexional or derivational morphemes were lost as overt forms and were replaced by zero morphemes (or allomorphs), while the allophones of the stem vocalism or consonantism which had been conditioned by the vowel(s) of the lost morphemes were phonemicised. The ensuing opposition of vowels and/or consonants constitutes a concomitant feature, as far as derivation is concerned. (59)

Kastovsky’s vocalic alternations, presented in table 1, are based on historical considerations. Direct alternations (A1, A2, etc.) are due to i-mutation, while reverse alternations (A1R, A2R, etc.) “describe those cases where the verbal stem or part of the verbal stem underwent i-mutation, while the derived noun did not” (57).

TABLE 1. Vocalic alternations in Kastovsky (1968)

	Alternation	Examples
A1	<a> ~ <æ>	<i>faran</i> “to travel” ~ <i>fær</i> “journey”
A1R	<æ> ~ <a>	<i>stæl</i> ( <i>stelan</i> “to steal”) ~ <i>stalu</i> “stealing”
A2	<a> ~ <e>	<i>acan</i> “to ache” ~ <i>ece</i> “ache”
A2R	<e> ~ <a>	<i>sendan</i> “to send” ~ <i>sand</i> “sending”
A3	<ea> ~ <ie>	<i>feallan</i> “to fall” ~ <i>fiell</i> “fall”
A3R	<ie> ~ <ea>	<i>mierran</i> “to disturb” ~ <i>gemearr</i> “obstruction”
A4a	<e> ~ <i>	<i>gecweden</i> ( <i>gecwēdan</i> “to say”) ~ <i>cwide</i> “saying”
A4b	<eo> ~ <ie>	<i>weorþan</i> “to throw” ~ <i>wierþ</i> “throw”
A4bR	<y> ~ <eo>	<i>wyrcean</i> “to work” ~ <i>weorc</i> “work”
A5	<o> ~ <y>	<i>gebrocen</i> ( <i>brecan</i> “to break”) ~ <i>bryce</i> “breach”
A5R	<y> ~ <o>	<i>spyrian</i> “to make a track” ~ <i>spor</i> “track”

Alternation		Examples
A6	<u> ~ <y>	<i>burston</i> ( <i>berstan</i> “to burst”) ~ <i>byrst</i> “burst”
A6R	<y> ~ <u>	<i>gryndan</i> “to underlie” ~ <i>grund</i> “bottom” <sup>1</sup>
A7	<ā> ~ <æ>	<i>drāf</i> ( <i>drīfan</i> “to drive”) ~ <i>dræf</i> “action of driving”
A7R	<æ> ~ <ā>	<i>læran</i> “to teach” ~ <i>lār</i> “instruction”
A8	<ō> ~ <ē>	<i>lōcian</i> “to look” ~ <i>lēc</i> “look”
A8R	<ē> ~ <ō>	<i>fēdan</i> “to feed” ~ <i>fōda</i> “food”
A9	<ēa> ~ <īe>	<i>blēat</i> ( <i>blēotan</i> “to cast lots”) ~ <i>bliet</i> “lot”
A9R	<īe> ~ <ēa>	<i>īecan</i> “to increase” ~ <i>ēaca</i> “addition”
A10	<ēo> ~ <īe>	<i>fleotan</i> “to float” ~ <i>flīete</i> “curds”
A10R	<īe> ~ <ēo>	<i>stīeran</i> “to steer” ~ <i>stēora</i> “steersman”
A11	<ū> ~ <ȳ>	<i>būan</i> “to inhabit” ~ <i>bȳ</i> “dwelling” <sup>2</sup>

Kastovsky’s framework of alternations constitutes a significant departure from the traditional approach which focused on the vocalic grades of the strong verb and is represented by Carl Palmgren (1904), Eduard Schön (1905), Claus Schuldt (1905), John Jensen (1913) and others. For instance, Palmgren, on the basis of i-mutation, distinguishes eight types of formal relation between nouns and denominal weak verbs (*land* “land” ~ *lendan* “to land,” *lār* “teaching” ~ *læran* “to teach,” *segl* “sail” ~ *siglan* “to sail,” *bold* “house” ~ *byldan* “to build,” *blōd* “blood” ~ *blēdan* “to bleed,” *lust* “pleasure” ~ *lystan* “to please,” *rūm* “room” ~ *rȳman* “to clear up” and *stēan* “steam” ~ *stīeman* “to emit steam”), but relates the derivatives of strong verbs mainly to the ablaut of the verb and only secondarily to other phenomena. However, in spite of the central role attributed by Kastovsky to strong verbs, the scope of his work does not include weak verbs based on strong verbs, and excludes non-verbal derivations, as Pilch also does.

As regards the motivation of alternations, for Kastovsky the opposition of vowels between the two members of the alternation constitutes “a concomitant feature” which “originated by purely phonological processes” (59). Subsequent work by Kastovsky (2006) is more explicit in attributing an unproductive and irregular character to alternations:

<sup>1</sup> The pair *būsc* “insult” ~ *byscan* “to reproach” is asymmetrical because it opposes a long and a short vowel. Kastovsky renders both the verb and the noun with short vowel. In this article the alternants *grund* “bottom” and *gryndan* “to underlie” illustrate A6W (1968, 280).

<sup>2</sup> The same illustration for alternation A11 <ū> ~ <ȳ> as Kastovsky’s is used in this article, that is, *būan* “to inhabit” ~ *bȳ* “dwelling.” Although *bȳ* is a hapax legomenon, other pairs of alternants with A11 <ū> ~ <ȳ>, such as *brūcan* “use” ~ *brȳce* “useful,” are far more frequent in the texts and, moreover, the two variants of the alternation together evince twelve instances.

Towards the end of the Old English period, the language was characterised by large-scale allomorphic variation, with most of these alternations being unpredictable. This eventually led to considerable analogical levelling in the Middle English period with the result of eliminating most of these alternations [...]. Stem-alternation became a characteristic feature of the irregular part of inflection, whereas it disappeared from word-formation on a native basis except some unproductive cases such as *long ~ length*. (171-72; italics in the original)

In this same vein, Luisa García García finds eighteen different sound alternations in Old English *jan*-pairs like *swincan* “toil, labour, work with effort” ~ *swencan* “cause a person to labour, harass, afflict.” According to this author, these alternations are “remnants of phonologically motivated changes produced by a word-formation strategy which was relatively unambiguous in Germanic” (2012, 25). As such, sound alternations do not play a morphological role in the formation of Old English *jan*-causatives. García García goes on to say that “the term ‘lexical alternations’ is more accurate for the alternations in Old English *jan*-causatives, since they are lexically conditioned, thus constituting relic alternations” (26; italics in the original). Carmen Novo Urraca and Laura Pesquera Fernández (2015) follow the same track, although they use the term *morphological* to refer to the fact that, with the extinction of the phonological changes that motivated them, alternations constitute a contrast between bases and derivatives that cannot be repeated productively.

Kastovsky (2006), García García and Novo Urraca and Pesquera Fernández all distinguish between synchronic fact and diachronic motivation and ultimately account for the phenomenon of variation in terms of evolution on the diachronic axis: from phonologically conditioned alternations to lexical contrasts that constitute a closed set of vocalic correspondences and represent a remnant of word-formations resulting from processes that are no longer productive. The data presented in the remainder of the article do not indicate that alternations are systematic in Old English: they are neither generalised nor regular. In this sense, this work does not differ from the authors cited in this paragraph. Nevertheless, a more exhaustive application of the model of alternations than that carried out by these linguists can explain aspects of word-formation, such as the comparatively low importance of verbal suffixation, and more general aspects of lexical organisation, like the spread of the change to invariable base morphology and the beginnings of conversion.

Against this background, this article is organised as follows. Section two defines zero derivation and offers a quantitative overview of this phenomenon. Section three presents the extended model of alternations and compares it to previous approaches. The sections that follow apply the extended model of alternations by type of alternation, lexical category and morphological class: direct alternations based on strong verbs (section four), reverse alternations based on strong verbs (section five), direct alternations resulting in weak verbs (section six) and reverse alternations resulting in weak verbs (section seven). In order to offer an exhaustive account of formal changes

in zero derivation, section eight considers this question with respect to nouns and adjectives. Section nine discusses the results of the analysis and their implications for the organisation and evolution of the lexicon of Old English and, to close this work, section ten summarises the main conclusions.

## 2. THE DEFINITION OF ZERO DERIVATION

In this work, zero derivation is derivation without derivational morphemes. In English, this includes the relationship that holds between the verb *to play* and the noun *play*, in which no formal contrast is involved, as well as between the verb *to sing* and the noun *song*, which differ from each other as to their root vowel. The term *zero derivation*, therefore, is preferred over *recategorisation* or *conversion*, to account for both fossilised formations like *song* and fully productive derivations like the noun *play*, which share the property of lacking explicit derivational morphology. In Old English, this definition comprises four subtypes: (i) zero derivation with inflectional morphemes and without derivational morphemes, as in *rīdan* “to ride” > *riidda* “rider”; (ii) zero derivation without explicit morphemes, either inflectional or derivational, as in *bīdan* “to delay” > *bīd* “delay”; (iii) zero derivation with or without explicit inflection but displaying ablaut, such as, respectively, *cnāwan* “to know” > *cnēowian* “to know carnally” and *drīfan* “to drive” > *drāf* “action of driving”; and (iv) zero derivation with formatives that cannot be considered derivational affixes in synchronic analysis, such as *-m* in *flēon* “to fly” > *flēam* “flight.”

This definition of zero derivation is motivated by the coexistence in the lexicon of relics from earlier stages of the language and the product of fully operative processes of derivation. In a strictly synchronic analysis, the noun *drāf* “action of driving,” for instance, is morphologically related to the preterit of the Class I strong verb *drīfan* “to drive,” while the noun *gedrīf* “tract” holds a morphological relation to the present of *drīfan*. Diachronically, the derivatives with *æ* like *ūdrāf* “decree of expulsion” derive from the Germanic weak verb *\*draibjanan* > Old English *(ge)drāefan* “to drive” (Holthausen 1963, 75; Seebold 1970, 163; Orel 2003, 74), although the weak verb can be traced back to the strong one in Germanic (Hinderling 1967, 37). On the synchronic axis, *drāf* presents a vocalic contrast with the main parts of *drīfan*, which, if described with respect to the first preterit, can be put down as *drāf* ~ *drāef* and related to *i*-mutation. The evidence presented in this article, which concurs with the authors cited below on this question, indicates that ablaut formations like *drāf* are losing ground in Old English to derivatives with the vocalic grade of the infinitive such as *gedrīf*. Nevertheless, relics like *drāf* and productive formations of the type *gedrīf* can be integrated into a unified account of non-affixal derivation comprised of the four types given above.

This approach has two consequences. In the first place, the scope of zero derivation is drastically widened with respect to the zero ablaut grade of Proto-Germanic, which,

in nouns, is restricted to *-a*-stems (*gecor* “decision”), *-ja*-stems, *-to*-stems, *-VCV*-stems, *-(s)T-r/la*-stems (*rifter* “sickle”), *-ō*-stems, *-Cō*-stems, *i*-stems (*bryce* “fraction”), *-ti*-stems (*flyht* “flight”), *-tu*-stems (þurst “thirst”), *-Cu*-stems and *n*-stems (*wiga* “fighter”) (Mailhammer 2008, 286). In the second place, as Kastovksy puts it, this means that “in those instances where the stem-formatives originally acting as derivational exponents were lost or reinterpreted (e.g. *spring*, *cuma*, *bunta*) we have to assume their replacement by a zero morpheme in order to keep up the binary interpretation of word-formation sintagmas” (2005, 44; italics in the original).

Thus defined, zero derivation is less transparent than other derivational processes like affixation. For this reason, a paradigmatic approach to lexical analysis is required if this phenomenon is to be studied accurately and exhaustively. The key concept of paradigmatic morphology is the derivational paradigm, which consists of a primitive of derivation and its derivatives, that is, all the lexical items that can be related to the primitive on the basis of both form and meaning (Martín Arista 2012, 2013). Derivational paradigms are relevant for a synchronic analysis of derivational morphology, although they contain the formations of both productive and unproductive processes. As claimed by Robert Hinderling (1967), Elmar Seebold (1970) and others, the strong verb is the starting point of lexical derivation in this analysis, which excludes the formation of strong verbs from categories different from the strong verb itself. Nouns and adjectives can be either derived from strong verbs (Kastovsky 1992) or primitives (Heidermanns 1993) and, as such, function as the base of derivation of weak verbs (Bammesberger 1965; Hallander 1966; Stark 1982). In other words, while strong verbs are always primitive, weak verbs are the result of derivation from strong verbs, nouns, adjectives and adverbs, such as *ūþ* “up” > *uppian* “to rise up.” In Robert Mailhammer’s words, “strong verbs are primary because they somehow go back to Indo-European verbal roots (e.g. Gmc. *\*kwem-a-* “come” < IE *\*g<sup>m</sup>em-* “come”), or because the original base has been lost, and consequently the explicit derivation would have been obscure to the native speaker (e.g. Gmc. *\*bed-ja-* “demand”)” (2007, 51). Consider, as illustration, the derivational paradigm of the strong verb *þurfan* “to need,” which includes the zero derived noun *þearf* “need” and adjective *þearf* “necessary,” on which the noun *þearfa* “needy person” as well as the weak verb *þearfian* “to be in need” are based. The affixal derivation found in this paradigm comprises, among others, the prefixal strong verb *beþurfan* “to need” and the nouns *oferþearf* “extreme need” and *unþearf* “disadvantage,” together with the suffixed forms *þorffæst* “useful,” *þorflēas* “useless,” *þearflic* “necessary” and *þearflīce* “usefully.”

With these premises, there are approximately 2,900 zero derivatives in Old English, which can be broken down by category as follows: around 1,700 verbs, 1,000 nouns and 200 adjectives. These figures represent over fifty percent of weak verbs (which total around 3,900) and approximately five percent of nouns (out of a total of ca. 18,500) and adjectives (from a total of around 6,300). The number of formations on the ablaut of the verb is 587. Among the formations on the different vocalic grades of the verbal



stem, the infinitive is chosen in almost fifty percent of cases (308). These data have been retrieved from the lexical database of Old English *Nerthus*, which is based on the dictionaries by Henry Sweet (1987), Joseph Bosworth and Thomas N. Toller (1973) and, especially, John R. Clark Hall and Herbert D. Meritt (1996), on which it draws for headword spelling.<sup>3</sup>

### 3. THE EXTENDED MODEL OF ALTERNATIONS

This section deals with the alternations that arise between verbs, nouns and adjectives. At this point, it is necessary to explain the principles that underlie the extended model of alternations, to describe its implementation and to compare it to previous approaches.

The extended model of alternations is based on two principles. Firstly, all the major lexical classes take part in alternations and hence alternations must be analyzed exhaustively as they apply to nouns, adjectives and verbs, both strong and weak. Secondly, alternations can only be identified in a well-defined network of relations of morphological and lexical inheritance such as word-formation.

These two principles are implemented in the definition of alternations in the following way. To begin with, alternations have a graphemic basis and therefore frequent alternative spellings need to be registered. For instance, <ēo> alternates with the variants <īe>, <ī> and <ȳ>. Alternations always relate two vowels or two diphthongs that display the same vocalic length, thus the distinction between <ea> ~ <ie> and <ēa> ~ <īe>. The ablaut of the verb is avoided as alternant although it is not totally excluded: the first candidate for alternant is the infinitive of the strong verb, then the past participle (as in *cweðen*, from *cweðan* “to say”) and then the preterit (as is the case with *barn*, from *biernan* “to burn”); and the infinitive of the weak verb without exception. As regards the direction of zero derivation, strong verbs constitute the base of derivation of weak verbs, nouns and adjectives, while weak verbs are derived from basic nouns and adjectives as well as strong verbs. With respect to pairs of nouns and adjectives that are morphologically unrelated to a strong verb, the direction of derivation may be unclear unless it can be attributed to i-mutation. Alternations in the direction of i-mutation are considered direct, whereas those in the opposite direction are reverse (R). Strong alternations (A), starting in a strong verb, are distinguished from weak alternations (W), which result in a weak verb. With these distinctions, it turns out that full alternations have the strong form, the weak form, the reverse strong and the reverse weak form. For example, the direct strong form A3 presents the variants <ea> ~ <ie>, <ea> ~ <i> and <ea> ~ <y>; the reverse strong form A3R comprises the variants <ie> ~ <ea> and <e> ~ <ea>; the direct weak form shows the variants <ea> ~

<sup>3</sup> As Michael Ellis (1993) shows, the Clark Hall-Meritt dictionary represents a balanced solution between the early spelling preferred by Sweet (1987) and the late orthography adopted by the Dictionary of Old English (Cameron et al. 2018). Moreover, it is fairly consistent in giving the West-Saxon form of headwords. See Fulk (2009) on the alleged consistency of late West-Saxon spelling.

<ie> and <ea> ~ <i>; and the reverse weak form is <e> ~ <ea>. Many alternations are defective because, unlike full alternations, they do not present the four forms, but even those that do have not been found with all the variants of each form that can be seen in the example above. To avoid circularities, a maximum of one of the four principal parts of the strong verb can be an alternant. For instance, the alternation <a> ~ <æ> *barn* (preterit of *biernan* “to burn”) ~ *bærnan* “to cause to burn” is ruled out by <a> ~ <æ> as in *faran* (infinitive) “to travel” ~ *fær* “journey.” Finally, the recurrent character of alternations excludes contrasts with only one instance (including the strong form, the weak form and the reverse strong and weak forms).

In the following sections, a total of thirteen alternations are discussed. In comparison to Kastovsky’s (1968) set of alternations, the extended model is applied to all the major lexical categories, presents four additional alternations, considers frequent alternative spellings and is more systematic as regards the distinction between direct and reverse alternations. This entails the revision of the alternations displayed in table 2, which here are not considered reverse, as they are in Kastovsky (1968), but as weak because they appear in the formation of weak verbs.

TABLE 2. Comparison with Kastovsky (1968)

Alternation		Examples
A3W	(K-A3R)	<ea> ~ <ie> <i>gemearr</i> “obstruction” ~ <i>mierran</i> “to disturb”
A5W	(K-A5R)	<o> ~ <y> <i>spor</i> “track” ~ <i>spyrian</i> “to make a track”
A6W	(K-A6R)	<u> ~ <y> <i>grund</i> “bottom” ~ <i>gryndan</i> “to underlie”
A7W	(K-A7R)	<ā> ~ <æ> <i>lār</i> “teaching” ~ <i>læran</i> “to teach”
A8W	(K-A8R)	<ō> ~ <ē> <i>fōda</i> “food” ~ <i>fēdan</i> “feed”
A9W	(K-A9R)	<ēa> ~ <īe> <i>ēaca</i> “increase” ~ <i>īecan</i> “to increase”
A10W	(K-A10R)	<ēo> ~ <īe> <i>stēor</i> “steer” ~ <i>stīeran</i> “to steer”

The next section of this article applies the alternations presented in this section to the zero derivations in which strong and weak verbs partake.

#### 4. DIRECT ALTERNATIONS BASED ON STRONG VERBS

Beginning with frequent alternations, of which more than twenty instances can be found, the vocalic alternation A1 <a> ~ <æ> presents twenty-three instances, divided between class VI verbs and nominal derivatives (*wascan* “to wash” ~ *wæsc* “washing”), adjectival derivatives (*onsacan* “to deny” ~ *onsæc* “denying”) and verbal derivatives (*wacan* “to wake” ~ *wæccan* “to watch”). There are thirty-four instances of alternation

A2 <a> ~ <e>, involving class VI strong verbs and nouns (*standan* “to stand” ~ *stede* “place”) and verbs (*forspanan* “to seduce” ~ *forspennan* “to entice”), as well as class VII verbs and nouns (*gangan* “to go” ~ *gegenga* “fellow-traveler”), adjectives (*forgangan* “to neglect” ~ *forgenge* “hard to carry out”) and verbs (*foregangan* “to go before” ~ *foregengan* “to go in front”). The three variants of alternation A3 throw a total of twenty-six instances, comprising class VII strong verbs, on the one hand, and nouns (*weallan* “to bubble” ~ *willa* “spring”), adjectives (*oðhealdan* “to withhold” ~ *oðhylde* “contented”) and verbs (*sealtan* “to salt” ~ *syltan* “to season”), on the other. The two variants of alternation A4a present thirty-two instances in total, including class III strong verbs and nouns (*melcan* “to milk” ~ *milc* “milk”), class V strong verbs with nouns (*stecan* “to sting” ~ *sticce* “sting”) and weak verbs (*widercweðan* “to withstand” ~ *widercwiddian* “to murmur”) and class VI strong verbs along with nouns (*āðswerian* “to swear” ~ *āðswyrð* “oath-swearing”). There are twenty-four instances of alternation A5 <o> ~ <y>, all of them displaying a class IV strong verb and a noun (*beran* “to carry” ~ *byrd* “burden”) or an adjective (*brecan* “to break” ~ *bryce* “fragile”). Alternation A7 <ā> ~ <æ> is the most frequent, providing forty-four instances, both from class I strong verbs, which alternate with nouns (*gehnūtan* “to thrust” ~ *gehnæst* “conflict”), adjectives (*fīgan* “to be or become an enemy” ~ *fāge* “fated”) and verbs (*snīðan* “to cut” ~ *snæðan* “to slice”) and with class VII strong verbs, which alternate with nouns (< *ās wāpan* “to sweep off” ~ *æs wāpa* “rubbish”). The four variants of alternation A10 altogether evince twenty-eight instances, corresponding to class II verbs that alternate with nouns (*rēocan* “to emit smoke” ~ *rēc* “smoke”), adjectives (*āgēotan* “to pour out” ~ *āgīta* “prodigal”) and verbs (*āflēogan* “to fly” ~ *āfliegan* “to put to flight”) and to class V verbs and adjectives (*geflēon* “to flee” ~ *geflīeme* “fugitive”).

Focusing on relatively infrequent alternations of the direct type, which each yield between ten and twenty instances, the two variants of alternation A4b yield seventeen instances, all of them comprising a class III verb and a noun (*weorpan* “to throw” ~ *wierp* “throw”) or a verb (*onhwiorfan* “to change” ~ *onhwierfan* “to turn”). Alternation A6 <u> ~ <y> presents a total of seventeen instances, comprising a class III strong verb and an adjective (*scrincan* “to wither” ~ *scrynce* “withered”) or a verb (*spurnan* “to spurn” ~ *spyrnan* “to stumble”). A total of twelve instances of the two variants of alternation A11 are found, consisting of a class II strong verb and an adjective (*brūcan* “to use” ~ *brȳce* “useful”) and a verb (*sūcan* “to suck” ~ *sȳcan* “to suckle”) or a class VII strong verb and an adjective (*būan* “to inhabit” ~ *bȳne* “inhabited”).

Three direct alternations evince less than ten instances and can thus be considered infrequent. The total of instances of alternation A8 is nine, including class VII strong verbs alternating with nouns (*spōwan* “to succeed” ~ *spēd* “success”), adjectives (*swōgan* “to sound” ~ *swēge* “sonorous”) and verbs (*brōpan* “to call” > *brēpan* “to cry out”). The two variants of alternation A9 present eight instances in total, consisting of a class VII strong verb and an alternating noun (*ēacan* “to be increased” ~ *īht* “increase”). Finally, two alternations show one instance only: alternation A12 <æ> ~ <e>, holding between

a class VI strong verb and a noun (*stæppan* “to step” ~ *stepe* “step”); alternation A14 <a> ~ <æ>, involving the class III strong verb *biernan* “to burn” (preterit *barn*) and the weak verb *baernan* “to cause to burn.”

## 5. REVERSE ALTERNATIONS BASED ON STRONG VERBS

The only frequent reverse alternations is A4aR <i> ~ <e>, of which seventy-two instances have been found, including nouns derived from class III verbs like *drincan* “drink” ~ *drenc* “drink,” as well as derivatives from class V verbs of the adjectival class (*yumbsittan* “to set around” ~ *yumbsett* “neighbouring”) and the verb class (*licgan* “to lie” ~ *lecgan* “to lay”). Alternation A2R <e> ~ <a> is relatively infrequent, given that it provides ten instances based on class V verbs (nouns such as *wrecan* “to avenge” ~ *wracu* “revenge” and verbs like *wegan* “to carry” ~ *wagian* “to move”) and on class VI verbs, which alternate only with nouns like *swerian* “to swear” ~ *swara* “swearer.”

Most reverse alternations based on strong verbs are infrequent. There are just nine instances of A1R <æ> ~ <a>, involving class IV verbs and nouns (*cwelan* “kill” ~ *cwalu* “killing”), adjectives (*gestelan* “to steal” ~ *gestala* “accessory in theft”), verbs (*gestelan* “to steal” ~ *stalian* “to go stealthily”) and class VI verbs that alternate with nouns like *stæppan* “to step” ~ *stapela* “post.” The variant <e> ~ <ea> of alternation A3R relates class IV strong verbs to nouns, as in *beran* “to bear” ~ *bearn* “child.” The variant <ie> ~ <ea> of alternation A3R occurs with class IV, V and VI verbs, which alternate exclusively with nouns: *scieran* “to shear” ~ *scear* “ploughshare,” *ofergietan* “to forget” ~ *ofergeatu* “oblivion,” *hliebhan* “to laugh” ~ *bleahfor* “laughter.” All in all, alternation A3R presents fourteen instances. A total of four instances of alternation A4bR <e> ~ <eo> are evinced, where class IV, V and VI verbs are linked to nouns, as in *āðswerian* “to swear” ~ *āðsweord* “swearing.” There is only one instance of alternation A10R <ī> ~ <ēo>, comprising a class I strong verb and a noun, *figan* “to be or become an enemy” ~ *fēond* “foe.” Finally, two instances of A12R <e> ~ <æ> have been found, comprising class III strong verbs and nouns, as in *hebban* “to heave” ~ *hæf* “leaven.”

## 6. DIRECT ALTERNATIONS RESULTING IN WEAK VERBS

Among the frequent alternations resulting in weak verbs we find A2W <a> ~ <e>, comprising both nouns (*sagu* “saying” ~ *segan* “to say”) and adjectives (*strang* “strong” ~ *strengan* “to strengthen”) and presenting twenty-eight instances. The four variants of alternation A3W (<ea> ~ <ie>, <ea> ~ <i>, <ea> ~ <y> and <ea> ~ <e>) together evince a total of thirty instances including pairings of noun and weak verb (*beaðor* “confinement” ~ *gebeðerian* “to shut in”) as well as of adjective and weak verb (*beald* “bold” ~ *gebielðan* “to encourage”). There are twenty-three instances of alternation A5W <o> ~ <y>, which comprise nouns (*hosp* “reproach” ~ *gebyspan* “to reproach”) and adjectives (*scort* “short” ~ *scyrðan* “to shorten”). A total of forty instances have

been found that correspond to alternation A7W <ā> ~ <ǣ>, linking both nouns (*snās* “skewer” ~ *snāesan* “to pierce”) and adjectives (*fāg* “variegated” ~ *fāgan* “to paint”) to weak verbs. There are thirty-two instances of alternation A8W <ō> ~ <ē>, with pairs comprising nouns (*sōm* “agreement” ~ *sēman* “to reconcile”) and adjectives (*cōl* “cool” ~ *cēlan* “to cool”).

The relatively infrequent alternations that result in weak verbs include, to begin with, the two variants of alternation A4bW (<eo> ~ <ie> and <eo> ~ <y>), which provide eleven instances containing both nouns (*smeoru* “ointment” ~ *smierwan* “to smear”) and adjectives (*beorbt* “bright” ~ *gebierhtan* “to brighten”). A total of fourteen instances can be found that correspond to alternation A6W <u> ~ <y> with nouns (*hungor* “hunger” ~ *hyngnan* “to be hungry”) and adjectives (*gesufel* “with a relish” ~ *gesyftan* “to provide with relishes”). All in all, thirteen instances can be identified of the three variants of alternation A9W (<ēa> ~ <īe>, <ēa> ~ <ȳ> and <ēa> ~ <ē>), in which both nouns (*stēam* “steam” ~ *stieman* “to emit steam”) and adjectives (*dēad* “dead” ~ *dȳdan* “to kill”) alternate with weak verbs. There are thirteen instances of the three variants of alternation A10W (<ēo> ~ <ī> and <ēo> ~ <īe> and <ēo> ~ <ȳ>) displaying nouns (*blēor* “cheek” ~ *blȳrian* “to blow out the cheeks”) and adjectives (*lēobt* “light” ~ *litan* “to make light”). Alternation A11W presents twelve instances, with nouns (*scrūd* “dress” ~ *scrȳdan* “to clothe”) as well as adjectives (*cūð* ~ “known” ~ *cȳðan* “to proclaim”).

The infrequent direct alternations that result in weak verbs include alternation A1W, which presents five instances with nouns (*wacn* “wakefulness” ~ *wæcnan* “to awake”) and adjectives (*bær* “bare” ~ *barian* “to lay bare”). There are nine instances of the two variants of alternation A4aW (<e> ~ <i> and <e> ~ <y>), all of which link a noun to a weak verb, as in *helm* “helmet” ~ *gebylman* “to cover.” Alternation A12W evinces five instances, with nouns (*ðæc* “covering” ~ *ðeccan* “to cover”) and adjectives (*hwæt* “sharp” ~ *hwettan* “to sharpen”). One single instance can be found of alternation A13W <ǣ> ~ <ē> with a noun and a weak verb: *dæl* “portion” ~ *dēlan* “to divide.” Finally, alternation A13W <o> ~ <e> has two instances comprising the noun *edroc* “rumination” ~ *edreccan* “to chew.”

## 7. REVERSE ALTERNATIONS RESULTING IN WEAK VERBS

No reverse alternation resulting in a weak verb has more than two instances, while the relatively infrequent alternation A1WR <ǣ> ~ <a> evinces seventeen instances from both nouns (*stæf* ~ *stafian* “to dictate”) and adjectives (*smæl* “thin” ~ *smalian* “to become thin”). Among the infrequent alternations we find firstly 2WR <e> ~ <a>, which presents one instance only, involving an adjective and a weak verb: *enge* “oppressive” ~ *angian* “to be in anguish.” Alternation A3WR <e> ~ <ea> also evinces one instance, linking an adjective to a weak verb: *æmelle* “insipid” ~ *æmeallian* “to become insipid.” A total of three instances can be found of A7WR <ǣ> ~ <ā>. They

involve nouns and weak verbs, as in *wlætta* “loathing” ~ *wlätian* “to cause to loathe.” Alternation A11WR <ȳ> ~ <ū> presents one instance, with an adjective (*dryge* “dry” ~ *drūgian* “to dry up”). Finally, there are two instances of alternation A12WR <e> ~ <æ>, including the pairing of the noun and weak verb *fregen* “question” ~ *frægnian* “to ask” as well as that of the of adjective and weak verb *wērig* “weary” ~ *wārigian* “to weary.”

## 8. NOUNS AND ADJECTIVES

In the previous sections, the alternations that involve verbs were analyzed. Nevertheless, a complete picture of the situation in Old English as far as zero derivation and alternations are concerned cannot leave non-verbal classes aside. This is to say, adjectives and verbs should be accounted for not only as derivatives of strong verbs or bases of weak verbs, but also as belonging in noun-adjective and adjective-noun formations. The direction of derivation involving nouns and adjectives cannot be fully ascertained and, consequently, the model of alternations is not applied to these categories. The analysis that follows pays heed to any formal change of the vocalic type between zero derived nouns and adjectives, except when an affix is attached to the zero derivative, as in *wōd* “mad” > *gewēde* “fury,” and when the zero derivative does not convey a significantly different meaning, as in *bāt* / *hætu* “heat.” The direction of derivation from adjectives is based on Heidermanns (1993) and, when possible, on i-mutation.

A total of 108 nouns derived from adjectives by zero derivation have been found, of which twenty-three show i-mutation: *bieldo* “boldness” (< *beald* “bold”), *bierbtu* “brightness” (< *beorbt* “bright”), *blæce* “irritation of the skin” (< *blāc* “pale”), *blæco* “pallor” (< *blāc* “pale”), *ieldesta* “chief” (< *eald* “old”), *ieldo* “age” (< *eald* “old”), *ieldra* “ancestors” (< *eald* “old”), *frico* “usury” (< *frecc* “greedy”), *fyllo* “fulnes” (< *full* “full”), *gæls* “pride” (< *gāl* “proud”), *grȳto* “greatness” (< *grēat* “great”), *hæru* “hoariness” (< *hār* “hoary”), *hæte* “heat” (< *bāt* “hot”), *bielde* “slope” (< *beald* “sloping”), *hierdenn* “hardening” (< *heard* “hard”), *blȳd* “noise” (< *blūd* “noisy”), *menigu* “multitude” (< *manig* “many”), *nēhsta* “neighbour” (< *nēah* “near”), *prȳto* “pride” (< *prūd* “proud”), *rētu* “joy” (< *rōt* “glad”), *snyttru* “cleverness” (< *snotor* “clever”), *wlæce* “tepidity” (< *wlaco* “tepid”) and *wlenc* “pride” (< *wlanc* “proud”).

Forty-seven adjectives derived from nouns by zero derivation have been found, nine of which show i-mutation: *drȳme* “melodious” (< *drēam* “melody”), *filde* “field-like” (< *feld* “field”), *flēre* “having a floor” (< *flōr* “floor”), *fēðre* “loaded” (< *fōðor* “load”), *fēte* “provided with feet” (< *fōt* “foot”), *geibt* “yoked together” (< *geoc* “yoke”), *strieme* “having a current” (< *strēam* “stream”), *wēse* “moist” (< *wōs* “juice”) and *renc* “pride” (< *ranc* “proud”).

This formation of adjectives and nouns by zero derivation is not a very productive process. Neither does it present much formal change between base and derivative. Moreover, it is clearly less affected by i-mutation than those processes involving verbs,

which might suggest that we are dealing with formations that occurred later than the derivation from strong verbs. It might also be the case that the origin of modern conversion, or recategorisation without formal change, as in *poor-the poor* and *bottle-to bottle*, should be sought in the zero derivation of nouns and adjectives that are morphologically unrelated to verbs, not only because there is little formal change of stems between bases and derivatives, but above all because the declension of nouns and adjectives is remarkably similar in Old English, which must have boosted the derivational process. Eventually, with the simplification of inflections, recategorisation was, as in other lexical categories, even more straightforward. More research is needed in this area.

### 9. RESULTS AND DISCUSSION

In the analytical part of this article the set of unproductive formations represented by alternations was quantified, described by lexical category and morphological class of verb and related to i-mutation and word-formation processes by distinguishing, on the one hand, direct from reverse alternations and, on the other, alternations with a strong verb source from those with a weak verb target. Furthermore, the general impact of alternations was contextualised with respect to ablaut formations and zero derivation in general. At this point, a word needs to be said on the significance of this phenomenon with respect to the types of alternations and the tokens that instantiate these types.

Beginning with the types of alternations, the results of the analysis can be seen in table 3.

TABLE 3. Quantitative results

Alternation	Occurrences	Alternation	Occurrences
A1 <a> ~ <æ>	23	A7 <ā> ~ <ǣ>	44
A1R <æ> ~ <a>	9	A7W <ā> ~ <ǣ>	40
A1W <a> ~ <æ>	4	A7WR <ǣ> ~ <ā>	3
A1WR <æ> ~ <a>	17	<b>A7 total</b>	<b>87</b>
<b>A1 total</b>	<b>53</b>	A8 <ō> ~ <ē>	9
A2 <a> ~ <e>	34	A8W <ō> ~ <ē>	32
A2R <e> ~ <a>	10	<b>A8 total</b>	<b>41</b>
A2W <a> ~ <e>	28	A9 <ēa> ~ <īe>	7
A2WR <e> ~ <a>	1	A9 <ēa> ~ <ī>	1
<b>A2 total</b>	<b>73</b>	A9W <ēa> ~ <īe>	7
A3 <ea> ~ <ie>	9	A9W <ēa> ~ <ȳ>	4

A3 <ea> ~ <i>	4	A9W <ēa> ~ <ē>	2
A3 <ea> ~ <y>	13	<b>A9 total</b>	<b>21</b>
A3R <ie> ~ <ea>	9	A10 <ēo> ~ <īe>	9
A3R <e> ~ <ea>	5	A10 <ēo> ~ <ī>	5
A3W <ea> ~ <ie>	16	A10 <ēo> ~ <ē>	6
A3W <ea> ~ <i>	3	A10 <ēo> ~ <ȳ>	8
A3W <ea> ~ <y>	7	A10R <ī> ~ <ēo>	1
A3W <ea> ~ <e>	3	A10W <ēo> ~ <īe>	5
A3WR <e> ~ <ea>	1	A10W <ēo> ~ <ī>	3
<b>A3 total</b>	<b>70</b>	A10W <ēo> ~ <ȳ>	5
A4a <e> ~ <i>	22	<b>A10 total</b>	<b>42</b>
A4a <e> ~ <y>	10	A11 <ū> ~ <ȳ>	10
A4aR <i> ~ <e>	72	A11 <ū> ~ <ī>	2
A4aW <e> ~ <i>	3	A11W <ū> ~ <ȳ>	12
A4aW <e> ~ <y>	4	A11WR <ȳ> ~ <ū>	1
A4b <eo> ~ <ie>	6	<b>A11 total</b>	<b>25</b>
A4b <eo> ~ <y>	11	A12 <æ> ~ <e>	1
A4bR <e> ~ <eo>	4	A12R <e> ~ <æ>	2
A4bW <eo> ~ <ie>	5	A12W <æ> ~ <e>	4
A4bW <eo> ~ <y>	6	A12WR <e> ~ <æ>	2
<b>A4 total</b>	<b>143</b>	<b>A12 total</b>	<b>9</b>
A5 <o> ~ <y>	24	A13W <o> ~ <e>	2
A5W <o> ~ <y>	23	<b>A13 total</b>	<b>2</b>
<b>A5 total</b>	<b>47</b>		
A6 <u> ~ <y>	17	<b>Strong direct (A) total</b>	<b>275</b>
A6W <u> ~ <y>	14	<b>Strong reverse (R) total</b>	<b>112</b>
<b>A6 total</b>	<b>31</b>	<b>Weak direct (W) total</b>	<b>232</b>
		<b>Weak reverse (WR) total</b>	<b>25</b>
		<b>Grand total</b>	<b>644</b>



As shown in table 3, from a qualitative point of view the weak version is the only one present in all alternations, while the reverse variant shows the lowest distribution. Quantitatively, direct versions outnumber the corresponding inverse version (although the difference is much higher for the weak direct and the weak inverse version). These results are in keeping with the primitive nature of strong verbs and the derived character of weak verbs, on the one hand, and the generalised impact of *i*-mutation, on the other. Indeed, the number of direct alternations, which go along the lines of *i*-mutation, exceeds reverse alternations, opposite to *i*-mutation, by far.

Turning to the tokens of the alternations described in this article, two perspectives can be adopted. From a descriptive perspective, the seven classes of strong verbs and the three classes of weak verbs (mostly class 1) take part in alternations. Hence, in spite of the irregular character of the phenomenon, it certainly deserves attention. Overall, 644 alternating pairs were found, representing nearly twenty-five percent of the total number (2,862) of zero derivatives. By lexical class, the bases of the word-formation process in which the alternations occur include eighty-three adjectives, 171 nouns and 387 verbs (as well as two adverbs), while the derivatives belong to the classes of adjective (39), noun (197) and verb (408). All in all, the relative weight of the verb stands out, both as base and as derivative, considering that the verb is the smallest of the major lexical classes in Old English: there are around 18,500 nouns, 6,300 adjectives and 5,500 verbs in the lexicon. This assessment of the role of the verb in zero derivation must be considered in the context of two facts: the generalised prefixation of verbs (which is largely opaque from the semantic point of view, thus Hiltunen 1983; Ogura 1995; Brinton and Traugott 2005; Martín Arista 2011, 2014) and the narrow scope of verbal suffixation (Kastovsky 1992, 391), which is comprised of few overtly derivational suffixes because they have largely fused with inflectional endings. In other words, the figure of verbal zero derivation compensates for the suffixation of this class because, considering the definition of zero derivation as derivation without derivational morphemes, the formations on the boundary between derivation and inflection count as zero derivatives.

In explanatory terms, it must be underlined that the number of formations on the ablaut of the verb (587) is outnumbered by alternating formations (644). These figures provide a quantitative assessment of what Kastovsky calls “the typological change from stem-formation to word-formation” (1992, 487) and Alexander Haselow considers a “rise of analytic tendencies” (2011, 278). On the one hand, there is evidence for a tendency to select variable bases of morphology, given that there are more alternations than non-alternating formations, and that the number of derivatives based on the preterit and the past participle, which represent variable morphological bases, is practically the same as those based on the infinitive, which stands for an invariable morphological base. On the other hand, in the derivation of nouns and adjectives, out of 885 denominal weak verbs only 168 partake in alternating pairs whilst 83 deadjectival verbs out of 415 alternate with their adjectival bases. This is to say, less than twenty percent of

derivatives alternate with their nominal and adjectival bases of derivation. Whereas in the derivation from strong verbs alternations are more frequent than the derivation based on the verbal ablaut, in the derivation from nouns and adjectives alternating pairs are rather exceptional. All in all, these data indicate that variable bases are still preferred over invariable bases of derivation, but also that the change to invariable base morphology is well underway. This, in turn, points out that the typological change to word-formation and the rise of analytic tendencies might be taking place at a slower pace than suggested by Kastovsky (1992) and Haselow (2011).

## 10. CONCLUSION

The main conclusions of this work have a bearing on the two axes of analysis. On the synchronic axis, the seven classes of strong verbs and the three classes of weak verbs take part in alternating pairs, which may be verb-noun, verb-adjective or verb-verb, and around one fourth of zero derivatives show alternations. Alternations, then, constitute a remarkable synchronic fact, both qualitatively and quantitatively, which the loss of motivation and lack of productivity of these contrasts cannot deny. On the diachronic axis, the main conclusion is that variable base morphology is well entrenched in Old English and, consequently, the change to invariable base morphology is taking place at a slow pace. As this analysis has shown, variable morphological bases as represented by alternations and verbal ablaut based on the preterit and the past participle outnumber invariable bases of morphology.<sup>4</sup>

## WORKS CITED

- BAMMESBERGER, Alfred. 1965. "Deverbative *jan*-Verba des Altenglischen, vergleichend mit den übrigen altgermanischen Sprachen dargestellt." PhD diss., Ludwig-Maximilians Universität.
- BAUER, Laurie and Salvador Varela, eds. 2005. *Approaches to Conversion/Zero Derivation*. Münster: Waxmann.
- BOSWORTH, Joseph and Thomas N. Toller. 1973. *An Anglo-Saxon Dictionary*. Oxford: Oxford UP.
- BRINTON, Laurel J. and Elizabeth C. Traugott. 2005. *Lexicalization and Language Change*. Cambridge: Cambridge UP.
- CAMERON, Angus et al. 2018. *Dictionary of Old English: A to I Online*. Toronto: Dictionary of Old English Project.
- CLARK Hall, John R. and Herbert D. Meritt. 1996. *A Concise Anglo-Saxon Dictionary*. Toronto: U. of Toronto P.

<sup>4</sup> The research underpinning this article was conducted under the auspices of the research project "Old English Lexical Semantics: Verb Classes, Alternations and Constructions," funded by the Spanish Ministry of Economy and Competitiveness (FFI2014-59110).

- ELLIS, Michael. 1993. "Old English Lexicography and the Problem of Headword Spelling." *ANQ: A Quarterly Journal of Short Articles, Notes and Reviews* 6 (1): 3-11.
- FULK, Robert D. 2009. "Morphology and Diachrony in *A Grammar of Old English* and the *Dictionary of Old English*." *Florilegium* 26: 15-35.
- GARCÍA GARCÍA, Luisa. 2012. "Old English *jan*-Causatives: Between Grammar and Lexicon." In Martín Arista et al. 2012, 15-28.
- HALLANDER, Lars G. 1966. *Old English Verbs in -sian: A Semantic and Derivational Study*. Stockholm: Almqvist and Wiksell.
- HASELOW, Alexander. 2011. *Typological Changes in the Lexicon. Analytic Tendencies in English Noun Formation*. Berlin: De Gruyter.
- HEIDERMANNS, Frank. 1993. *Etymologisches Wörterbuch der germanischen Primäradjektive*. Berlin: De Gruyter.
- HILTUNEN, Risto. 1983. *The Decline of the Prefixes and the Beginnings of the English Phrasal Verb*. Turku: Turun Yliopisto.
- HINDERLING, Robert. 1967. *Studien zu den starken Verbalabstrakta des Germanischen*. Berlin: De Gruyter.
- HOGG, Richard, ed. 1992. *The Cambridge History of the English Language I: The Beginnings to 1066*. Cambridge: Cambridge UP.
- HOLTHAUSEN, Ferdinand. 1963. *Altenglisches etymologisches Wörterbuch*. Heidelberg: Carl Winter Universitätsverlag.
- JENSEN, John. 1913. *Die I. und II. Ablautsreihe in der ae. Wortbildung*. Kiel: H. Fiencke.
- KASTOVSKY, Dieter. 1968. *Old English Deverbal Substantives Derived by Means of a Zero Morpheme*. Tübingen: Eberhard-Karls-Universität.
- . 1992. "Semantics and Vocabulary." In Hogg 1992, 290-408.
- . 2005. "Conversion and/or Zero: Word-Formation Theory, Historical Linguistics, and Typology." In Bauer and Varela 2005, 31-50.
- . 2006. "Typological Changes in Derivational Morphology." In Kemenade and Los, 151-77.
- KEMENADE, Ans van and Bettelou Los, eds. 2006. *The Handbook of the History of English*. Oxford: Blackwell.
- MAILHAMMER, Robert. 2007. *The Germanic Strong Verb: Foundations and Development of a New System*. Berlin: De Gruyter.
- . 2008. "Ablaut Variation in the Proto-Germanic Noun: The Long Arm of the Strong Verbs." *Sprachwissenschaft* 33 (3): 279-300.
- MARTÍN ARISTA, Javier. 2011. "Adjective Formation and Lexical Layers in Old English." *English Studies* 92 (3): 323-34.
- . 2012. "The Old English Prefix *ge-*: A Panchronic Reappraisal." *Australian Journal of Linguistics* 32 (4): 411-33.

- . 2013. "Recursivity, Derivational Depth and the Search for Old English Lexical Primes." *Studia Neophilologica* 85 (1): 1-21.
- . 2014. "Noun Layers in Old English. Asymmetry and Mismatches in Lexical Derivation." *Nordic Journal of English Studies* 13 (3): 160-87.
- MARTÍN ARISTA, Javier et al., eds. 2012. *Convergent Approaches to Mediaeval English Language and Literature*. Newcastle: Cambridge Scholars.
- MARTÍN ARISTA, Javier, ed. et al. 2016. *NerthusV3. Online Lexical Database of Old English*. Nerthus Project. Universidad de La Rioja. [Accessed online on July 12, 2017].
- NOVO URRACA, Carmen and Laura Pesquera Fernández. 2015. "Alternation vs. Allomorphic Variation in Old English Word-Formation: Evidence from the Derivational Paradigm of Strong Verbs." *Studia Anglica Posnaniensia* 49: 63-82.
- OGURA, Michiko. 1995. "The Interchangeability of Old English Verbal Prefixes." *Anglo-Saxon England* 24: 67-93.
- OREL, Vladimir. 2003. *A Handbook of Germanic Etymology*. Leiden: Brill.
- PALMGREN, Carl. 1904. *English Gradation-Nouns in their Relation to Strong Verbs*. Uppsala: U. of Uppsala.
- PILCH, Herbert. 1970. *Altenglische Grammatik*. München: Max Hueber Verlag.
- SCHÖN, Eduard. 1905. *Die Bildung des Adjectivs im Altenglischen*. Kiel: Verlag von Robert Cordes.
- SCHULDT, Claus. 1905. *Die Bildung der schwachen Verba im Altenglischen*. Kiel: Verlag von Robert Cordes.
- SEEBOLD, Elmar. 1970. *Vergleichendes und etymologisches Wörterbuch der germanischen starken Verben*. The Hague: Mouton.
- STARK, Detlef. 1982. *The Old English Weak Verbs. A Diachronic and Synchronic Analysis*. Tübingen: Niemeyer.
- SWEET, Henry. 1987. *The Student's Dictionary of Anglo-Saxon*. New York and London: Macmillan.

Received 22 September 2018

Accepted 5 December 2018

Professor Javier Martín Arista teaches Old English and Linguistics at the University of La Rioja. He is the lead researcher of the research project Nerthus, which deals with the linguistic analysis and lexicography of Old English.

Address: Departamento de Filologías Modernas. Facultad de Letras y de la Educación. Edificio de Filología. Universidad de La Rioja. 26004-Logroño, Spain. Tel.: +34 941299425.