THE DERIVATIONAL MAP OF OLD ENGLISH AND THE LIMITS OF GRADUAL DERIVATION[1]

Miguel Lacalle Palacios
Universidad de La Rioja

Abstract: *This journal article deals with Old English word-formation as represented by a derivational map. In a derivational map, lexical derivation applies gradually, so that a process only occurs at a time and affixes are attached one by one. This theoretical and methodological stance holds good for most derivations but there is also evidence of non-gradual formations with the prefixes ǣ-, ge-, or-, twi-, ðri-, and un-. After discussing the relevant derivatives with each of the aforementioned affixes, the conclusions are reached that non-gradual formations arise in frequent word-formation patterns; they constitute, with few exceptions, an adjectival phenomenon; and they are mainly associated with secondary derivational functions. Regarding the derivational map of Old English, the conclusion is drawn that non-gradual formations have to be represented by means of reconstructed forms so that each node represents one lexeme and each edge marks one morphological process.*

Key words: *Derivational map, Old English, gradual derivation, graph theory.*

1. INTRODUCTION. THE DERIVATIONAL MAP OF OLD ENGLISH

While the study of the derivational morphology of Old English has been focused on the typological changes relating to the rise of word-formation from stem-formation (Kastovsky 2006) and the growing importance of analytic tendencies (Haselow 2011), Martín Arista (2008, 2009, 2010a, 2011a, 2011b, 2011c, 2012a, 2012b, 2013) has put forward a model of derivational morphology based on the structural-functional theory of language called *Role and Reference Grammar* (Van Valin and LaPolla 1997; Van Valin 2005) and applied it to Old English. Among other results of this research programme, the lexical derivation of Old English has been described in terms of variation, so that different lexical layers comprising various word-formation processes coexist and interact (Martín Arista 2011b). An exhaustive description has also been proposed of the derivational processes of zero derivation, affixation and compounding of Old English that relies on the information provided by the lexical database of Old English *Nerthus* (www.nerthusproject.com), which is in turn based on the data provided by the dictionaries of Bosworth-Toller, Clark Hall and Sweet. The lexical database *Nerthus* offers not only an extensive description of the lexicon but also a principled explanation for this linguistic component based on hierarchy (prime vs. non-prime) and inheritance (exponent of paradigm vs. non-exponent of paradigm). For instance, in the derivational paradigm of the strong verb (class IIIb) *ābelgan* 'to make angry', this verb is the lexical prime, to which all the members (non-primes) of the lexical paradigm are directly or indirectly related, both for semantic and morphological reasons. That is, a relationship of semantic and morphological inheritance holds between the verb *ābelgan* on the one hand and the nouns *ābylg* 'anger', *ābylgnes* 'offence' and *ābylgð* 'anger', on the other. Moreover, the noun *ābylg* is the base of derivation of the suffixed nouns *ābylgnes* and *ābylgð*. Given the information available from *Nerthus*, Martín Arista (2012b) defines a derivational map as "a visual representation of the relations of inheritance holding among lexical items [...] with two main characteristics: exhaustivity and gradualness". The geometry of a derivational map is based on graph theory, as can be seen in Figure 1:
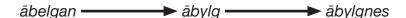
$$\bar{a}belgan \longrightarrow \bar{a}bylg \longrightarrow \bar{a}bylgnes$$

Figure 1. Gradual word-formation in graph theory.

As can be seen in Figure 1, a graph is a set of nodes connected by edges. In a representation like the one in Figure 1, nodes represent each lexical item whereas edges code semantic and morphological inheritance. The edges indicate that more derived terms inherit semantic and morphological features from less derived terms. That is, the edges are directed towards the derivative. In Figure 1, the node *ābelgan* is the initial vertex, while the node *ābylgnes* is the terminal vertex. The derivation of a complex word, therefore, consists of a sequence of consecutive edges in such a way that the more edges are necessary to represent a derivation, the more recursive

the derivation in question is. Throughout the derivation, processes apply gradually and morphemes are attached one after another, so that the maximum of edges leading to a vertex is one.

Although most derivatives in Old English result from gradual derivation, this is not always the case. For this reason, the remainder of this journal article engages in non-gradual derivation and discusses derivatives with the prefixes *ǽ-*, *ge-*, *or-*, *twi-*, *ðri-* and *un-* that can hardly be considered the result of stepwise lexical derivation. The data of analysis have been drawn from *Nerthus*.

2. NON-GRADUAL AFFIXATION IN OLD ENGLISH

This section discusses the derivatives of the prefixes *ǽ-*, *ge-*, *or-*, *twi-*, *ðri-* and *un-* that cannot be attributed to gradual lexical derivation. After the analysis of the prefixes for which more evidence can be gathered, section 2.5 examines some derivations whose lack of graduality probably results from data gaps. Section 3 proposes an explanation for the phenomena under discussion and section 4 summarizes the conclusions.

2.1. The prefix *ge-*

In type analysis, the prefix *ge-* is the most frequent in Old English. It can be attached to most lexical classes, although it is sometimes distinctive and some other times non-distinctive in terms of meaning, as can be seen, respectively, in (1a) and (1b):

(1)

a. *gebedbigen* 'payment for prayers', *gehlystful* 'attentive', *gesēdan* 'to satisfy', *gemimorlīce* 'by heart', *gehwilc* 'which'

b. *stencnes/gestencnes* 'odour', *limpful/gelimpful* 'fitting', *dēadian/gedēadian* 'to die', *rūmlīce/gerūmlīce* 'at large', *ilca/geilca* 'the same'

The prefix *ge-* appears in combination with other morphological processes, such as zero derivation, as, for instance, in *gecorōnian* 'to crown' (*corōna* 'crown'), and affixation, as, for example, in *gecnēorenes* 'generation' (*cnēorisn* 'generation'). This prefix can be attached to both underived and derived bases, as is shown, respectively, by (2a) and (2b):

(2)

a. *gehlid* 'roof' (*hlid* 'covering'), *gebiddan* 'to beg' (*biddan* 'to ask for'), *gelang* 'dependent on' (*lang* 'long')

b. *gelustful* 'desirable' (*lustful* 'desirous'), *gelangian* 'to send for' (*langian* 'to summon'), *gefriðsum* 'safe' (*friðsum* 'peaceful')

The prefix *ge-* does not change the lexical class of the base of derivation, thus *gefǽmne* 'woman' (*fǽmne* 'maid'), *gecȳðig* 'aware of' (*cȳðig* 'known'), *gegryndan* 'to found' (*gryndan* 'to set, sink (of the sun)'), *gehwǽðere* 'nevertheless' (*hwǽðere* 'nevertheless'), etc; and it is usually final in recursive affixation, but, as it is remarked by Martín Arista (2010b: 51), significant groups of exceptions in this respect are provided by the prefixes *fore-* (in the formation of verbs such as *foregesettan* 'to prefer'), *forð-* (in the formation of verbs like *forðgeferan* 'to die'), *mis-* (in the formation of nouns such as *misgelimp* 'misfortune'), *ofer-* (in the formation of verbs of the sort *ofergetrimbran* 'to erect'), *on-* (in the formation of verbs such as *ongeniman* 'to take away'), *tō-* (in the formation of verbs of the type *tōgēotan* 'to spill'), and *un-* (in the formation of adjectives like *ungeriht* 'uncorrected'), as well as the suffixes *-nes* (in the formation of nouns such as *ungemetnes* 'extravagance') and *-līce* (in the formation of adverbs of the type *ungelimplīce* 'unseasonably').

Regarding the function of *ge-*, the lexical database *Nerthus* provides pairs like the ones following in (3), which constitute evidence in favour of *ge-* as a transitivizer, although this prefix is very lexicalized (Martín Arista, 2012a):

(3)

a. *rīnan* 'to rain' ~ *gerīnan* 'to wet with rain'

b. *sadian* 'to be sated' ~ *gesadian* 'to satiate'

c. *stincan* 'to emit a smell' ~ *gestincan* 'to smell'

    d.   *ðearfian* 'to be in need' ~ *geðearfian* 'to impose necessity'

    e.   *cēlan* 'to cool' ~ *gecēlan* 'to quench thirst'

    f.   *cuman* 'to come' ~ *gecuman* 'to come together'

    g.   *hrisian* 'to shake' ~ *gehrisian* 'to shake together'

    h.   *biddan* 'to ask' ~ *gebiddan* 'to beg'

    i.   *fricgan* 'to ask' ~ *gefricgan* 'to learn'

    j.   *gryndan* 'to set' ~ *gegryndan* 'to found'

    k.   *slēan* 'to strike' ~ *geslēan* 'to strike down'

In the formation of nouns, the prefix *ge-* marks plurality or collectivity, as in *bān* 'bone' ~ *gebān* 'bones', *mann* 'man' ~ *gemāna* 'community', *sweostor* 'sister' ~ *gesweostor* 'sisters'. When it is forming adjectives, this prefix expresses quality or property of the noun that functions as base of derivation, as in *dēaw* 'dew' ~ *gedēaw* 'dewy' or *swāt* 'sweat' ~ *geswāt* 'sweaty'.

To recapitulate, the frequency and distribution of the prefix *ge-* are remarkable. Such frequency and distribution may explain the existence of non-gradual derivations with this affix in nominal, verbal and adjectival derivatives, as is shown by (4a), (4b) and (4c), respectively:

(4)

    a.   *gemāna* 'community' (*mann* 'person'), *gemǣnes* 'fellowship' (*mann* 'person'), *gemȳðe* 'junction of two streams' (*muð* 'mouth'), *gefyllednes* 'fulfilment' (*full* 'full'), *gewǣcednes* 'weakness' (*wāc* 'weak'), *gegenga* 'companion' (*gangan* 'to go, walk'), *gehygd* 'mind' (*hicgan* 'to think, consider'), *gehlǣg* 'derision' (*hliehhan* 'to laugh at, deride'), *gehwyrftnes* 'return' (*hweorfan* 'to turn; change')

    b.   *geandwlatod* 'shameless' (*andwlita* 'countenance'), *gebeormad* 'leavened' (*beorma* 'leaven'), *gebilod* 'having a bill' (*bill* 'bill'), *gehilmed* 'helmeted' (*helm* 'helmet'), *gelend* 'furnished with land' (*land* 'land'), *gemǣne* 'overpowered' (*mann* 'man'), *gerȳde* 'prepared, ready' (*rǣd* 'advice, counsel'), *getēðed* 'toothed' (*tōð* 'tooth'), *getrīowed* 'shafted' (*trēow* 'tree, wood, timber'), *gelenge* 'belonging to' (lang 'long'), *geclyft* 'cleft' (*clēofan* 'to cleave'), *gedrycned* 'dried up' (*drēgan* 'to dry'), *gehugod* 'minded' (*hicgan* 'to think, consider'), *gelysted* 'desirous of' (*lustian* 'to delight in'), *gesprǣce* 'eloquent' (*sprecan* 'to speak, say, utter'), *gesprǣcelic* 'incapable of being used alone' (*sprecan* 'to speak, say, utter'), *gestence* 'odoriferous' (*stincan* 'to emit a smell, stink')

    c.   *gebirman* 'to leaven' (*beorma* 'leaven'), *gecrymian* 'to crumble' (*cruma* 'crumb, fragment'), *gelendan* 'to endow with land' (*land* 'land'), *gescȳgean* 'to furnish with shoes' (*scōh* 'shoe'), *gestincan* 'to smell' (*stenc* 'odour; scent'), *gestrȳdan* 'to rob' (*strod* 'robbery'), *geārwierðan* 'to honour' (*ārweorð* 'honourable'), *gebaswian* 'to stain red' (*basu* 'scarlet, crimson'), *geblǣcan* 'to whiten' (*blāc* 'pale, pallid'), *geclāsnian* 'to cleanse' (*clǣne* 'clean'), *gecrympan* 'to curl' (*crumb* 'crooked, bent'), *hēhan* 'to raise' (*hēah* 'high'), *geyppan* 'to bring out' (*uppe* 'up, above')

Two types of non-gradual derivation with *ge-* can be identified. In the first, this prefix co-occurs with inflectional suffixes that also perform a derivational function. For instance, *ge-* combines with the inflectional suffix *-u* in the noun *gebǣcu* 'back part', with *-ed* in the adjective *gewīred* 'made of wire', and with *-ian* in the verb *gecorōnian* 'to crown':

(5)

    a.   *gebǣcu* 'back part' (*bǣc* 'back'), *getrūwung* 'confidence' (*trūwa* 'confidence')

    b.   *gewīred* 'made of wire' (*wīr* 'wire'), *gewyrmsed* 'purulent' (*wyrmsan* 'to fester')

    c.   *geambihtan* 'to minister' (*ambiht* 'office, service'), *gecōcnian* 'to season food' (*cōc* 'cook'), *gecorōnian* 'to crown' (*corōna* 'crown'), *gefyxan* 'to trick' (*fyxe* 'she-fox, vixen'), *geglēdan* 'to make hot' (*glēd* 'fire, flame'), *geglengan* 'to set in order' (*gleng* 'ornament, honour, splendour'), *gehīwian* 'to transform' (*hīw* 'appearance'), *gemidlian* 'to divide' (*midlen* 'middle'), *gewǣdian* 'to clothe' (*wǣd* 'clothing'), *gewandian* 'to hesitate' (*wand* 'mole (animal)'), *gewanhālian* 'to make weak' (*wanhāl* 'weak'), *geweddian* 'to engage' (*wedd* 'pledge, agreement, covenant'), *wiglian* 'to take auspices' (*wigle* 'divination'), *gewlencan* 'to enrich' (*wlenc* 'riches, wealth'), *gewynsummian* 'to rejoice' (*wynsum* 'pleasant, delightful, joyful')

In the complex words in (6), the prefix *ge-* combines with a purely derivational suffix. The instances of non-gradual derivation are grouped by suffix: nominal, including *-nes* in (6a) and *-end* in (6b), and adjectival, including *-ed/-od/-ede* in (6c), *-lic* in (6d), *-en* in (6e), *-ende* in (6f), *-sum* in (6g), and *-e* in (6h):

(6)

a. *gebīgednes* 'declension' (*bīgeng* 'practice, exercise'), *gebregdnes* 'quick movement' (*bregdan* 'to move quickly'), *gebrȳsednes* 'bruising' (*brēsan* 'to bruise'), *gebundennes* 'obligation' (*bund* 'bundle'), *gecnēorenes* 'generation' (*cnēorisn* 'generation'), *gegripennes* 'seizing' (*gripe* 'seizure'), *gehieldnes* 'observance' (*hield* 'observance'), *gestyrenes* 'tribulation' (*styrenes* 'movement')

b. *geedlēanend* 'rewarder' (*edlēan* 'reward'), *gefrēogend* 'liberator' (*frēo* 'free'), *gehālgigend* 'sanctifier' (*hālig* 'holy, sacred'), *gestaðoliend* 'founder' (*staðolian* 'to found')

c. *gebearded* 'bearded' (*beard* 'beard'), *gecosped* 'fettered' (*cosp* 'fetter'), *gecroged* 'saffron-hued' (*crog* 'saffron'), *gedǣrsted* 'leavened' (*dǣrst* 'leaven'), *geenged* 'troubled' (*enge* 'troubled'), *gefēred* 'associated' (*fēre* 'able to go, fit for (military) service'), *geglōfed* 'gloved' (*glōf* 'glove'), *gehefed* 'weighed down' (*hefe* 'weight, burden'), *gehoferod* 'humpbacked' (*hofer* 'hump'), *gehūsed* 'furnished with a house' (*hūs* 'house'), *gehylced* 'bent' (*hylc* 'bend'), *gelēfed* 'weak' (*lēf* 'weak'), *gelegered* 'confined to bed' (*leger* 'bed'), *gepīled* 'spiked' (*pīl* 'spike'), *geslēfed* 'furnished with sleeves' (*slēfan* 'to slip (clothes) on'), *gestrenged* 'formed' (*strenge* 'severe'), *getarged* 'furnished with a shield' (*targa* 'small shield'), *geweallod* 'walled' (*weall* 'wall'), *gewintred* 'aged' (*winter* 'winter'), *gewīred* 'made of wire' (*wīr* 'wire'), *gewyrmsed* 'purulent' (*wyrmsan* 'to fester')

d. *gebīgendlic* 'inflectional' (*bīgeng* 'practice, exercise'), *gehieldelic* 'safe' (*hield* 'guard, protection'), *genīededlic* 'compulsory' (*nīedan* 'to compel'), *gewrixlic* 'alternating' (*wrixl* 'change')

e. *gefǣderen* 'born of the same father' (*fǣder* 'father'), *gehammen* 'patched' (*hamm* 'piece of pasture-land, enclosure'), *geliðen* 'having travelled much' (*liðan* 'to travel')

f. *gecospende* 'fettered' (*cosp* 'fetter')

g. *gehealdsum* 'provident' (*heald* 'keeping')

h. *gecynde* 'natural' (*cynd* 'nature'), *gefeaxe* 'furnished with hair' (*feax* 'hair'), *gehǣrede* 'hairy' (*hǣre* 'sackcloth of hair'), *gehende* 'near' (*hand* 'hand'), *gehȳðe* 'appropriate' (*hȳð* 'gain, advantage'), *gerǣwe* 'arranged in rows' (*rǣw* 'row'), *geðēawe* 'customary' (*ðēaw* 'custom')

It turns out from the instances given in (5) and (6) that the combination of two derivational affixes is restricted to nouns and adjectives, whereas the combination of the prefix *ge-* and an inflectional suffix also occurs in verbs. The data also show that more combinations arise in the formation of adjectival derivatives of this kind than in the formation of verbal ones.

2.2. The prefix *un-*

As Martín Arista (2010a) points out, the Old English prefix *un-* serves the function of lexical negation with the reversative meaning, as in *unbindan* 'unbind' (*bindan* 'to bind'), the pejorative meaning, as in *ungewiss* 'uncertain' (*gewiss* 'certain'), and the privative meaning, as in *untǣle* 'blameless' (*tǣl* 'blame'). The prefix *un-* is second only to *ge-* in type frequency. Its distribution across lexical classes, as it is the case with *ge-*, is widespread. From the point of view of the input to *un-* derivation, the prefix *un-* is attached recursively more often than not. For example, in the formation of nouns, *un-* is attached to the prefix *ā-* in *unāblinn* 'irrepressible state', *be-* in *unbelimp* 'mishap', and *ge-* in *ungeðeaht* 'evil counsel'; and the suffixes *-dōm* in *unwīsdōm* 'unwisdom', *-en* in *unrǣden* 'ill-considered act', *-end* in *unwemmend* 'innocent man', *-ere* in *unwrītere* 'incorrect copyist', *-ing* in *unwemming* 'incorruptibility' (*wemming* 'defilement'), *-nes* in *unscamfulnes* 'shamelessness', *-scipe* in *unarodscipe* 'cowardice' (*arodscipe* 'energy, dexterity'), *-ð* in *ungetrēowð* 'unfaithfulness', and *-ung* in *unwītnung* 'impunity' (*wītnung* 'punishment'). From the perspective of the outputs of *un-* derivation, this prefix tends to be terminal in its derivation. Thus, for instance *untōdǣlednes* 'undividedness' (*tōdǣlednes* 'division') and *unāscyrigendlic* 'inseparable' (*āscirigendlic* 'disjunctive'). The only prefix that can occur after *un-* is *ge-*, as in (7). The base category is the noun in instances like *geunārian* 'to dishonour' and the adjective in cases such as *geunfǣstnian* 'to unfasten'. In (7a) the prefix *ge-* is contrastive, while in the verbs in (7b) *ge-* is non-contrastive:

(7)

a. *geunārian* 'to dishonour' (*unār* 'dishonour'), *geunfǣstnian* 'to unfasten' (*unfǣst* 'unfast'), *geunhǣlan* 'to weaken' (*unhāl* 'weak'), *geunlustian* 'to loathe' (*unlust* 'evil desire, lust'), *geunmihtan* 'to deprive of strength' (*unmiht* 'weakness'), *geunsōðian* 'to falsify' (*unsōð* 'false'), *geunstillan* 'to disturb' (*unstille* 'restless, inquiet, uneasy')

b. *(ge)unclǣnsian* 'to soil' (*unclǣne* 'unclean'), *(ge)ungewlitigian* 'to disfigure' (*ungewlitig* 'not bright, dull'), *(ge) unrētan* 'to make sad' (*unrētu* 'sadness'), *(ge)unrōtsian* 'to be or become sad' (*unrōt* 'sad'), *(ge)unweorðian* 'to dishonour' (*unweorð* 'unworthy'), *(ge)unwlitegian* 'to become disfigured' (*unwlitig* 'disfigured')

Leaving aside the recursive prefixation of *un*-derivatives, *un-* derived nouns, adjectives, and verbs have nominal, verbal, and adjectival bases, while *un-* derived adverbs also contain adverbial bases. This is illustrated by (8), which displays, respectively, nominal, adjectival, verbal, and adverbial *un-* derivatives:

(8)

a. *unaga* 'one who owns nothing' (*aga* 'proprietor, owner'), *ungemet* 'excess' (*gemet* 'fit, proper'), *unāblinn* 'irrepressible state' (*āblinnan* 'to cease, leave off, desist')

b. *untǣle* 'blameless' (*tǣl* 'blame'), *unðǣslic* 'inappropriate' (*ðǣslic* 'proper'), *onspornend* 'not stumbling' (*spurnan* 'to stumble')

c. *unmihtan* 'deprive of strength' (*miht* 'might'), *unrōtian* 'to become sad' (*rōt* 'glad, cheerful'), *unwindan* 'to unwind' (*windan* 'to twist, wave')

d. *ungewyrhtum* 'without a cause' (*gewyrht* 'work, deed, service'), *ungescēad* 'exceedingly' (*gescēad* 'reasonable'), *unbeðōhte* 'unthinkingly' (*ðencan* 'to think'), *unbeorhte* 'not brightly' (*beorhte* 'brightly')

The patterns of categorization that arise from the instances in (8) include intracategorial derivation as in *ungewiss* 'uncertain' (*gewiss* 'certain'), as well as intercategorial derivation, as is shown by (9).

(9)

a.	noun > adjective	*unǣðele* 'of low birth' (*ǣðele* 'noble, aristocratic')
b.	noun > verb	*unmihtan* 'to deprive of strength' (*miht* 'might')
c.	noun > adverb	*unnīedig* 'willingly' (*nied* 'compulsion, duty')
d.	adjective > noun	*unclǣno* 'uncleanness' (*clǣne* 'clean')
e.	adjective > verb	*unrōtian* 'to make or become sad' (*rōt* 'glad, cheerful')
f.	adjective > adverb	*ungewisses* 'unconsciously' (*gewiss* 'certainty, surety')
g.	verb > noun	*ungelīefend* 'unbeliever' (*gelīefan* 'to be dear to')
h.	verb > adjective	*unǣtspornen* 'not hindered' (*oðspornan* 'to stumble')
i.	verb > adverb	*unbeðōhte* 'unthinkingly' (*ðencan* 'to think')

Negative prefixes are exceptional in changing the category of some bases of derivation, recategorization being a function typically performed by suffixes. Thus, *ǣ-* derives adjectives from nouns, as in *ǣfelle* 'without skin, peeled' (*fell* 'skin'); *mis-* derives adjectives from verbs, as in *mishworfen* 'perverted' (*hweorfan* 'to turn'); and *or-* produces adjectives from nouns, as in *orweg* 'trackless' (*weg* 'way, direction'), and adjectives from verbs, as in *ortȳdre* 'barren' (*tydran* 'to bring forth'). All in all, the recategorization patterns given in (9) show that, in terms of distribution, *un-* is the universal negative prefix. The categorial distribution of the other negative prefixes is more restricted, probably because the type frequency of these prefixes is much lower than the one of *un-*. The same reasoning is applicable to non-gradual derivation. As has been proposed regarding *ge-*, the line taken is that this type of derivation turns up with affixes that are attached in a generalized way, both quantitatively (type frequency) and qualitatively (distribution).

Non-gradual formations with *un-* often belong to the lexical class adjective and include the suffix *-lic*. There are around one hundred *un-/-lic* deverbal adjectives in *Nerthus*, including *unāblinnendlic* 'unceasing' (*āblinnan* 'to cease'), *unābrecendlic* 'inextricable' (*brecan* 'to break'), *unācnycendlic* 'that cannot be untied' (*gecnyccan* 'to tie'), *unācwencedlic* 'unquenchable' (*ācwencan* 'to quench') and *unymbwendedlic* 'unalterable' (*ymbwendan* 'to turn round'). Other non-gradual formations belonging to the category adjective are of the type *un-/-e*, *un-/-en*, *un-/-ful*, and *un-/-ig*, as illustrated by (10a)–(10d), respectively. Notice that the bases belong to the categories of noun as in *ungebierde* 'beardless' (*beard* 'beard'), adjective, as in *ungetingful* 'not eloquent' (*getinge* 'eloquent'), and verb, both strong, as in *unāhladen* 'unexhausted' (*āhladan* 'to draw out'), and weak, as in *unoferfēre* 'impassable' (*oferfēran* 'to cross, pass along'):

(10)

a. *ungebierde* 'beardless' (*beard* 'beard'), *unoferfēre* 'impassable' (*oferfēran* 'to cross, pass along'), *unsamwrǣde* 'contrary' (*samwrǣdness* 'union')

b. *unbefliten* 'undisputed' (*geflit* 'a fan to clean corn'), *unāhladen* 'unexhausted' (*āhladan* 'to draw out'), *unforspornen* 'not hindered' (*gespurnan* 'to spurn, reject'), *unforburnen* 'unburnt' (*forbeornan* 'to burn'), *unwunden* 'not wound' (*wundian* 'to wound')

c. *ungetingful* 'not eloquent' (*getinge* 'eloquent'), *ungewitful* 'unwise' (*gewitt* 'intellect, sense'), *unstydful* 'inconstant' (*standan* 'to stand firm, remain'), *unsefful* 'senseless' (*sefa* 'mind')

d. *unforrotiendig* 'incorruptible' (*forrotian* 'to decay, putrefy'), *unscǣððig* 'innocent' (*sceaðan* 'to injure, hurt'), *unscamig* 'unashamed' (*scamu* 'shame'), *untēorig* 'untiring' (*tēorian* 'to tire'), *untrymig* 'infirm' (*trum* 'firm'), *unslǣpig* 'sleepless' (*slǣp* 'sleep')

The formations with *un-* in (10) are exclusively adjectival. This is an important difference with respect to *ge-*, which appears in non-gradual formations of the lexical classes of noun, adjective, and verb. Moreover, *ge-* and *un-* show different constructional distribution, given that *un-* does not combine with inflectional suffixes that also perform a derivational function, as *ge-* does. Another difference between these affixes in non-gradual formations has to do with the number of different suffixes with which they combine. In this respect, *ge-* combines far more freely than *un-*. The distribution of *ge-* includes the combinations *ge-/-a*, *ge-/-ad*, *ge-/-an*, *ge-/-d*, *ge-/-e*, *ge-/-ed*, *ge-/-en*, *ge-/-end*, *ge-/-g*, *ge-/-ian*, *ge-/-lic*, *ge-/-nes*, *ge-/-od*, *ge-/-t*, *ge-/-u*, *ge-/-ung*, and *ge-/-sum*; whereas the distribution of *un-* is restricted to the pairs *un-/-e*, *un-/-en*, *un-/-ful*, *un-/-ig*, and *un-/-lic.* The inventory of suffixes combining with both *ge-* and *un-* comprises three adjectival suffixes: *-e* (*ge-/-e* and *un-/-e*), *-en* (*ge-/-en* and *un-/-en*), and *-lic* (*ge-/-lic* and *un-/-lic*).

2.3. The prefixes *twi-* and *ðri-*

The evidence provided so far has related non-gradual word-formation in Old English to the two most type-frequent prefixes, *ge-* and *un-*. Non-gradual word-formation, however, is not restricted to prefixes that can attach to several lexical classes, change the category of the base, and combine with derived bases, as is the case with *ge-* and *un-*. The prefixal quantifiers *twi-* and *ðri-* take part in non-gradual formations in (11):

(11)

a. *twibēte* 'subject to double compensation' (*bētnes* 'reparation, atonement'), *twibille* 'double-edged' (*bill* 'chopper, battle-axe'), *twidēagod* 'twice-dyed' (*dēagan* 'to dye'), *twiecge* 'two-edged' (*ecg* 'edge'), *twifēte* 'two-footed' (*fōt* 'foot'), *twigǣrede* 'cloven' (*gār* 'spear'), *twigilde* 'liable for a double fine' (*gield* 'tax, tribute'), *twihēafdede* 'double-headed' (*hēafod* 'head'), *twihlidede* 'having two openings' (*hlid* 'opening'), *twilafte* 'two-edged' (*lǣfer* 'rush, reed, iris'), *twimylte* 'twice-melted' (*miltan* 'to melt'), *twirǣde* 'uncertain'(*rǣd* 'resolution, deliberation'), *twisceatte* 'to the extent of a double payment' (*sceatt* 'payment')

b. *ðrifēte* 'three-footed' (*fōt* 'foot'), *ðrifingre* 'three fingers broad or thick' (*finger* 'finger'), *ðrifȳrede* 'three-furrowed' (*furh* 'furrow'), *ðrigēare* 'three years old' (*gēar* 'year'), *ðrihēafdede* 'three-headed' (*hēafod* 'head'), *ðrihīwede* 'having three forms' (*hīw* 'form'), *ðrihlidede* 'having three openings' (*hlid* 'opening'), *ðrihyrne* 'three-cornered' (*horn* 'horn'), *ðrilēfe* 'three-leaved' (*lēf* 'weak'), *ðrilīðe* 'a year with an extra month' (*līða* 'name of months June and July'), *ðrirēðre* 'with three rows of oars' (*rēðru* 'oars'), *ðristrenge* 'three-stringed' (*streng* 'string'), *ðriscȳte* 'triangular' (*scēat* 'angle'), *ðrislite* 'three-forked' (*slite* 'slit, tear, bite'), *ðriwintre* 'three years old' (*winter* 'winter')

As can be seen in (11), *twi-* and *ðri-* partake in the non-gradual formation of adjectives. In this line, it is remarkable that the formation of *twi-* and *ðri-* adjectives is never gradual when it comprises the suffix *-e*. The only adjectival formations with a suffix different from *-e* include three instances in which the prefix *twi-* combines with the suffix *-en* corresponding to the past participle of the strong verb: *twibrowen* 'twice-brewed (*brēowan* 'to brew'), *twispunnen* 'twice-spun' (*spinnan* 'to spin'), and *twiðrāwen* 'twice thrown' (*ðrāwan* 'to turn, twist, curl'); and the instance in which the prefix *ðri-* combines with the suffix *-ed* characteristic of the past participle of weak verbs: *ðrihǣmed* 'one who marries three times' (*hǣman* 'to marry'). Only exceptionally can *twi-* and *ðri-* apply gradually. The prefix *twi-* is attached in a stepwise manner in derived nominals of the type *twidǣl* 'two-thirds' (*dǣl* 'portion, part'), verbal derivatives like *twiferlǣcan* 'to dissociate' (*ferlǣcan* 'to join with'), and adjectival formations such as *twidǣglic* 'lasting two days' (*dǣglic* 'of day, daily'), and *twiscyldig* 'liable to a double penalty' (*scyldig* 'guilty, liable'). Regarding the prefix *ðri-*, it appears in the gradual derivation of the noun *ðriðing* 'third part of a country' (*ðing* 'property') and the adjectives *ðridǣglic* 'lasting three days' (*dǣglic* 'of day, daily') and *ðrisumer* 'three years old' (*sumor* 'summer').

To close this section, consider the instances in (12):

(12)

a. *twidǣglic* 'lasting two days'/*ðridǣglic* 'lasting three days'
b. *twifēte* 'two-footed'/*ðrifēte* 'three-footed'
c. *twifealdan* 'to double'/*ðrifyldan* 'to triplicate'
d. *twifingre* 'two fingers thick'/*ðrifingre* 'three fingers broad or thick'
e. *twigilde* 'liable to a double fine'/*ðrigylde* 'subject to three-fold compensation'
f. *twihǣmed* 'one who marries twice'/*ðrihǣmed* 'one who marries thrice'
g. *twihēafdede* 'double-headed'/*ðrihēafdede* 'three-headed'
h. *twihīwe* 'of two colours or shapes'/*ðrihīwede* 'having three forms'
i. *twihlidede* 'having two openings'/*ðrihlidede* 'having three openings'
j. *twisliht* 'forked, branched'/*ðrislite* 'tripod, three-forked'
k. *twiwintre* 'two years old'/*ðriwintre* 'three years old'

Regarding the derivations in (12), it must be noted that the number of bases that combine with *twi-* and *ðri-* reinforces the analogical character of non-gradual formations and stresses the paradigmatic dimension of word-formation phenomena:

2.4. The prefixes *ǣ-* and *or-*

Other prefixes that appear in non-gradual formations include the privatives *ǣ-* and *or-*, illustrated, respectively, by (13a) and (13b):

(13)

a. *ǣblǣce* 'lustreless' (*blǣco* 'pallor'), *ǣcnōsle* 'not noble' (*cnōsl* 'progeny, kin, family'), *ǣfelle* 'without skin'(*fell* 'skin'), *ǣgilde* 'receiving no wergild as compensation' (*gield* 'compensation'), *ǣnote* 'useless' (*notu* 'use'), *ǣwēne* 'doubtful, uncertain' (*wēn* 'belief, hope')
b. *orblēde* 'bloodless' (*blōd* 'blood'), *ordǣle* 'not participating' (*dǣl* 'portion, part'), *orfeorme* 'empty' (*feorm* 'goods, possessions'), *orgilde* 'not having discharged a payment' (*gield* 'money-payment'), *orleahtre* 'blameless' (*leahtor* 'offence, crime, fault'), *orhlȳte* 'without lot or share in' (*hlīet* 'lot'), *orsāwle* 'lifeless' (*sāwol* 'life'), *ortrīewe* 'treacherous' (*trēow* 'trust'), *orwearde* 'unguarded' (*weard* 'guard'), *orwēne* 'hopeless' (*wēn* 'hope'), *orwīge* 'not fighting' (*wīg* 'war, battle')

As can be seen in (13), these prefixes combine in non-gradual formations with inflectional endings exclusively. An important difference arises with respect to other prefixes discussed in this section. Apart from the instances given in (13), the prefix *ǣ-* is attached gradually in the formation of nouns like *ǣfyrmð* 'rubbish' (*fyrmð* 'cleansing, washing'), *ǣgift* 'restitution, repayment' (*gift* 'gift (by the bridegroom), dowry'), *ǣhīw* 'pallor' (*hīw* 'colour'), *ǣmynd* 'jealousy' (*mynd* 'memorial'), *ǣmūða* 'cæcum intestinum' (*mūða* 'mouth (of a river)'), and *ǣsceap* 'remnant, patch' (*sceap* 'shape, form'). In the formation of adjectives this prefix is attached gradually only in *ǣmōd* 'dismayed, disheartened' (*mōd* 'courage'). The case with *or-* is less strong. Although it also appears in combination with an inflectional suffix, it applies gradually in verb formation, as in *ortrūwian* 'to despair, doubt' (*trūwian* 'to trust'), and in noun formation, as in *orleahter* 'lack of vice' (*leahtor* 'vice'), *orðanc* 'mechanical art' (*ðanc* 'thought, mind'), *orwurð* 'ignominy' (*weorð* 'honourable'), and *orwyrð* 'shame' (*weorð* 'honourable'); but also in adjective formation, as is the case with the adjectives *orweg* 'difficult of access' (*weg* 'way, direction'), *orsorg* 'unconcerned' (*sorg* 'trouble, care'), *orcēas* 'inviolable' (*cēosan* 'to accept, approve'), and *ormōd* 'hopeless' (*mōd* 'courage'). The only adverb that takes *or-*, *orcēape* 'without cause' (*cēap* 'goods, possessions'), is not a gradual formation. It turns out, therefore, that the prefixes *ǣ-* and *or-* are very consistent in forming denominal adjectives ending with the suffix *-e*, as is also the case with *twi-* and *ðri-*. This means that when non-gradual formations involve prefixes that are not as type-frequent as *ge-* and *un-*, such formations are restricted in three ways. In the first place, recategorization is compulsory in parasynthetic formations with *twi-*, *ðri-*, *ǣ-*, and *or-*. In the second place, and related to the question of recategorization, these formations always require a nominal input and turn out an adjectival output. Thirdly, the suffix that combines with *twi-*, *ðri-*, *ǣ-*, and *or-* is the inflectional ending *-e*.

2.5. Doubtful cases

Whereas enough evidence has been provided for noun-gradual word-formation with the prefixes discussed so far, there is a group of prefixes that very occasionally appear in non-gradual formations. They are listed and illustrated by (14):

(14)

a.	*ā-*	*āseonod* 'relaxed' (*seono* 'relaxed')
b.	*ǣf-*	*ǣfgrynde* 'abyss' (*grund* 'abyss')
c.	*ǣl-*	*ǣlfremed* 'strange, foreign' (*from* 'from')
d.	*ǣt-*	*ǣtealdod* 'too old' (*eald* 'old')
e.	*an-*	*anhende* 'on hand' (*hand* 'hand')
f.	*and-*	*andsǣte* 'hateful' (*sǣtian* 'to plot against')
g.	*be-*	*berindran* 'to strip off bark, peel' (*rind* 'rind')
h.	*bī-*	*bīwyrde* 'byword, proverb' (*word* 'word')
i.	*for-*	*forrǣpe* 'assart' (*rāp* 'rope')
j.	*fram-*	*framlēce* 'turned from' (*lēc* 'look, regard')
k.	*full-*	*fullmannod* 'fully peopled' (*mann* 'person')
l.	*healf-*	*healfslǣpende* 'half-asleep' (*slǣpan* 'to be inactive')
m.	*in-*	*inmēde* 'close to one's heart' (*mōd* 'courage')
n.	*ō-*	*ōmihte* 'inflammatory' (*miht* 'might')
o.	*of-*	*ofhende* 'out of one's hand' (*hand* 'hand')
p.	*ofer-*	*ofertǣle* 'superstitious' (*tǣlan* 'to tell a tale')
q.	*on-*	*ongeflogen* 'attacked by disease' (*geflog* 'infectious disease')
r.	*sām-*	*sāmswǣled* 'half-burned' (*swǣlan* 'to burn')
s.	*tō-*	*tōgife* 'freely, gratis' (*gif* 'gift')
t.	*ðurh-*	*ðurhsȳne* 'transparent' (*sīene* 'sight, vision')
u.	*wan-*	*wanhlȳte* 'having no share in' (*hlīet* 'share')

The derivatives *ǣfgrynde* 'abyss' and *ōmihte* 'inflammatory' display variants of the prefixes *ǣ-* and *or-*, respectively, thus belonging to the inventories of non-gradual formations given in example (13). As for the rest of the derivatives in (14), most of them belong to the class of the adjective, although there also arise instances of nouns, such as *bīwyrde* 'byword, proverb', verbs like *berindran* 'to strip off bark, peel', and adverbs of the type *tōgife* 'freely, gratis'. Another significant coincidence is that the majority of the adjectival derivatives listed in this example take the suffix *-e*. Apart from these point of convergence, when the derivatives in (14) are considered in the paradigmatic dimension, it is beyond a doubt that that they are exceptional because the affixes involved attach gradually elsewhere. For instance, *wanhlȳte* 'having no share in' is the only parasynthetic formation with *wan-*, as can be seen in (15):

(15)

wanǣht 'want, poverty' (*ǣht* 'possessions, goods'), *wanfāh* 'dark-hued' (*fāg* 'dyed'), *wanfeax* 'dark-haired' (*feax* 'hair'), *wanfȳr* 'lurid flame' (*fȳr* 'fire'), *wanhāl* 'ill' (*hal* 'healthy'), *wanhǣw* 'bluish' (*hǣwen* 'blue'), *wanhafa* 'poor man' (*habban* 'to possess, own'), *wanhlȳte* 'having no share in' (*hlīet* 'share'), *wanhoga* 'thoughtless one, fool' (*hoga* 'careful, prudent'), *wanhygd* 'carelessness, recklessness' (*hygd* 'mind, thought'), *wansǣlig* 'unhappy' (*sǣlig* 'happy'), *wansceaft* 'misery, misfortune' (*sceaft* 'condition, nature'), *wanscrȳd* 'poorly clad' (*scrūd* 'clothing, dress'), *wansēoc* 'melancholic' (*sēoc* 'sick, ill'), *wanspēd* 'poverty, want' (*spēd* 'luck, success'), *wanwegende* 'waning' (*wegan* 'to weigh, measure')

Given the derivational paradigm in (15), *wan-* is not included within the inventory of prefixes that can take part in non-gradual word-formation. The same reasoning is applicable to the other affixes in (14).

3. EXPLANATION

The previous sections have provided evidence of non-gradual word-formation in Old English with the prefixes *ge-*, *un-*, *twi-*, *ðri-*, *æ-*, and *or-*. The main argument in the discussion of the prefixes *ge-* and *un-* has been that the type frequency and distribution of these affixes justify the existence of non-gradual patterns, which operate on the basis of analogy with well-established processes involving the same affixes. Regarding less frequent and generalized affixes, a requirement has been proposed for accepting the existence of a non-gradual pattern: if the prefix under scrutiny can also be attached gradually there has to be a significant number of formations involving the same combination of prefix and suffix, the same input and output category, and the same meaning, as is the case with the prefixes *twi-*, *ðri-*, *æ-*, and *or-*.

In a derivational map, the representation on the grounds of graph theory requires reconstructed forms that guarantee gradual derivation in such a way that each edge can represent an only morphological process. More research is needed in this question because the reconstruction of the hypothetical forms that function as bases of derivation of the non-gradual formations discussed in this article raises the issue of directionality. That is to say, it has to be determined which process has taken place first, prefixation or suffixation.

It remains to explain why non-gradual formations are possible with certain derivational functions and affixes, but not with others. It must be borne in mind that the affixes *un-*, *æ-*, *or-*, *twi-*, and *ðri-* perform secondary word-formation functions because, according to Pounder (2000: 109), they "modify word-formation meaning rather than constituting word-formation meaning on their own". In a similar vein, Beard and Volpe (2005: 204) consider as secondary the lexical function of privation, performed by *æ-* and *or-* in Old English. On the side of meaning, these affixes convey a predictable meaning, which is the case with *un-*, or a simplified meaning, as is the case with *ge-*. In short, secondary derivational functions are performed by recursive formations with the prefixes *ge-* and *un-*. As for the other affixes, they are very regular in relating a given lexical class to another one, as *twi-* and *ðri-* as well as the privative affixes *æ-* and *or-* do. Moreover, the semantic weight is not carried by these bound forms, but by the prefixes that co-occur with them in parasynthetic constructions. As it turns out, either the suffix lies at the boundary between inflection and derivation, as is the case with *-a*, *-ad*, *-d*, *-ed*, *-en*, *-end*, *-ian*, *-od*, and *-u*; or its function is restricted to recategorization, as in the formation of adjectives by means of *-e* and *-ig* and the formation of adverbs through *-an*. As an additional argument in favour of this reasoning, the only privative suffix cannot apply recursively, thus, for instance *gāstlēas* 'lifeless' (*gāst* 'life'), *hrēðlēas* 'inglorious' (*hrēð* 'victory, glory'), etc.

4. SUMMARY AND CONCLUSION

To conclude, five conclusions can be drawn from the analysis carried out in this study. Firstly, whereas the prefixes *ge-*, *un-*, *twi-*, *ðri-*, *æ-*, and *or-* are good candidates for being described as taking part in non-gradual word-formation, the ones given in (14) are probably the result of data gaps. Secondly, non-gradual derivation is associated with frequent word-formation patterns whose motivation can be explained in terms of analogy with well-established patterns involving the same affixes; or with combinations of prefix and suffix that always relate the same input and output lexical class and convey the same meaning. Thirdly, with few exceptions, non-gradual derivation is an adjectival phenomenon. Fourthly, non-gradual derivation is mainly associated with negative (pejorative, reversative, and privative) meanings conveyed by secondary derivational functions. Finally, the representation based on graph theory requires reconstructed forms that guarantee gradual derivation because each edge represents an only morphological process.

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