Gergana Popova

15 Derivational networks in English

15.1 General notes

This chapter covers the investigation of English derivational networks. Detailed descriptions of English derivation can be found in the work of, amongst others, Marchand (1969), Bauer (1983), Adams (2001), and Plag (2003). The preparation of the data sample was based on searches in the British National Corpus (BNC), the *Oxford English Dictionary* (OED), and the internet. Words marked as rare, obsolete or regional (e.g. *nameling*, *adname*, *foretooth*, *cutty*) in the OED were not included. On the advice of the project team, some unproductive patterns (*forgive*, *knowledge*) were left out too. Working with corpora and dictionaries meant that some derivatives, such as ones based on very productive patterns (e.g. prefixation with *un-* or suffixation with *-ness*), could go under the radar. Every attempt was made to test productive patterns against the words in the sample. This brought to the surface the issue of attested vs. possible words. For example, many of the verbs in the sample give rise to sequences like *pull* > *pullable* > *unpullable* > *unpullability*. But in some cases, it was difficult to find attestations, e.g. searches on Google returned no results, and so forms like *ungiveability* or *unsewability* were not included.

Another methodological issue centred around distinctions like affix, affixoid, and combining form. The guidance was to include only affixes and follow the categorization of an authoritative grammatical description. Accordingly, the chapter relies on the *Oxford Reference Guide to English Morphology* (Bauer et al. 2013), which in turn refers to theoretical principles laid down by Dalton-Puffer and Plag (2000). Words like *stoneware* or *waterscape* were excluded since *-ware* and *-scape* are classified as splinters, while others like *eyelike* and *firelike* were left out because *-like* is considered a compound form. Some forms (e.g. *multi-*, *super-*) were excluded despite being classified as prefixes by Bauer et al. (2013), either because they were on the list of combining forms recommended by the project, or in the interest of bringing the English data set into line with the work done on other languages.

https://doi.org/10.1515/9783110686630-015

15.2 Maximum derivational networks

English derivational networks are sparse and relatively shallow (see Tables 15.1 and 15.6 below). The highest depth, achieved for verbs and adjectives, is the 3rd order of derivation (for adjectives, only one derivative for one word was found in this order).

Table 15.1: Maximum derivational networks per order of derivation for all three word-classes.

	1st order	2nd order	3rd order	Σ
Nouns	22	11	0	33
Verbs	17	14	6	37
Adjectives	20	10	1	31
TOTAL	60	35	7	102

15.3 Saturation values

The derivational networks of the words in the sample can be discussed in terms of their saturation values (for all categories, see Table 15.5; for individual word-classes, see Tables 15.2–15.4 below). A network is fully saturated if all words have derivatives for the same semantic categories in all orders (and have precisely the same number of derivatives per semantic category in all cases). As the data below show, the saturation values for English are relatively low, so these conditions largely don't obtain. As discussed in section 15.6 below, some semantic categories are realized for all members of a word-class. However, some words can have more than one instantiation for a given category; for example, for *bone*, in addition to the PRIVATIVE *boneless*, we find also *debone* and *unbone*. Some words – for example the noun *dog*, which is linked to unique derivatives like *doggery*, *doggerel*, *doggess*, *dogship*, and *underdog* – have unusually rich derivational networks and so create unfilled cells for the other nouns in the sample. Thus *dog*, with 66.67%, has a higher saturation value than most of the other nouns. Saturation values for all nouns are shown in Table 15.2.

Similar points can be made for verbs. Some verbs give rise to less typical derivatives (e.g. *unhold*, *behold* and *withhold* from *hold*) for which others have no counterparts. Where such 'extra' forms give rise to further derivations (e.g. *upholder*,

Table 15.2: Saturation values per order of derivation, nouns.

Nouns	Saturation value (%)	1st order (%)	2nd order (%)
bone	35.48	30	45.45
eye	35.48	40	27.27
tooth	41.94	40	45.45
day	19.35	20	18.18
dog	67.74	68.18	63.64
louse	25.81	9.09	36.36
fire	12.9	13.64	18.18
stone	12.9	9.09	18.18
water	22.58	18.18	18.18
name	22.58	22.73	18.18

Table 15.3: Saturation values per order of derivation, verbs.

Verbs	Saturation value (%)	1st order (%)	2nd order (%)	3rd order (%)
cut	32.43	52.94	14.29	16.67
dig	32.43	35.29	35.71	16.67
pull	18.92	23.53	14.29	16.67
throw	18.92	23.53	14.29	16.67
give	10.81	17.65	7.14	0
hold	59.46	41.18	78.57	66.67
sew	27.03	29.41	35.71	0
burn	16.22	17.65	14.29	16.67
drink	35.14	35.29	28.57	50
know	24.32	23.53	28.57	16.67

upholding, *upholdable*, *upholdability*), gaps are created in more than one order of derivation. Sometimes, a fairly productive pattern like the ITERATIVES with *re-* is instantiated only for some verbs, e.g. *resew*, *redig*, but does not seem to be

Table 15.4: Saturation values per order of derivation, adjectives.

	Saturation value (%)	1st order (%)	2nd order (%)	3rd order (%)
narrow	16.13	20	10	0
old	32.26	40	20	0
straight	19.35	30	0	0
new	35.48	25	50	100
long	45.16	55	30	0
warm	25.81	35	10	0
thick	32.26	40	20	0
bad	16.13	20	10	0
thin	16.13	20	10	0
black	38.71	45	30	0

well-attested with others like *rethrow*, *repull*, though they do appear to be possible words.[1] The saturation values for verbs are given in Table 15.3.

For adjectives, too, some semantic categories are typical of all lexemes in the sample. Other categories are less saturated. For instance, only three adjectives have an attested morphological PRIVATIVE (*unstraight*, *unwarm*, *non-black*). Even though *un-* is generally characterized as a productive prefix in English, it is difficult to find attestations of forms like *unbad* or *unwarm*. This could be related to restrictions on *un-* prefixation like those discussed in Zimmer (1964: 41–45), e.g. restrictions on applying the prefix to evaluatively negative adjectives or monomorphemic adjectives which have monomorphemic antonyms. There is also another interesting source of gaps in the network. Like other adjectives in the sample, *black* forms a SIMILATIVE with *-ish*: *blackish*. However, unlike other adjectives, it has two other forms in this category: *off-black* and *blacky* (this latter is attested in the OED with the meaning 'somewhat black, blackish').[2] Adjectives also provide an interesting example of concealed regularity. Some have RESULTATIVES/CAUSATIVES, for example *blacken* or *straighten*. Others here have

1 *Repull* is marked as obsolete and rare in the OED. Searches on Google suggest that the words may have some use, though mostly in technical registers. Given the emphasis in the project on productivity and general use, these words were therefore not included in the data set.

2 It could be worth noting that in discussions of inflectional paradigms, analogous phenomena might be accommodated under the notion of overabundance (Thornton 2011).

genuine gaps: there is no morphological derivative like **newen* or **warmen* to render 'become/make new' or 'become/make warm' (though the latter meaning can be expressed by a conversion to the verb *warm*). Sometimes, however, there is only the appearance of a gap. For *long*, the relevant meaning is expressed by *lengthen* from *length*. Thus, the RESULTATIVE/CAUSATIVE for *long* appears in the 2nd order and so leaves a gap in the 1st order and, conversely, creates gaps for the other adjectives in the 2nd order. The saturation values for adjectives are shown in Table 15.4.

Table 15.5: Average saturation values per order of derivation for all three word-classes.

	1st order	2nd order	3rd order
Nouns	29	30.907	0
Verbs	30	27.143	21.669
Adjectives	33	16	10

The average saturation values per order of derivation for all word-classes are shown in Table 15.5.

15.4 Orders of derivation

As mentioned already, the networks are shallow. For nouns, the maximum number of orders of derivation is two and all nouns have derivatives in the 2nd order. Verbs and adjectives reach three orders of derivation, but whereas for verbs this is well represented (eight verbs have 3rd order derivatives), only one adjective (*new*) has one derivative in the 3rd order (*renewability*).

Table 15.6: Maximum and average number of orders of derivation for all three word-classes.

	Maximum	Average
Nouns	2	2
Verbs	3	2.6
Adjectives	3	2.1

15.5 Derivational capacity

One consequence of the outliers mentioned above are the differences between the maximum and the average derivational capacities for a certain word-class. The values for all three word-classes are shown in Table 15.7.

Table 15.7: Maximum and average derivational capacity for all three word-classes.

	Maximum	Average
Nouns	14	5.8
Verbs	9	5.1
Adjectives	11	6.6

The average number of derivatives therefore gives a fairer idea of derivational capacity. The values for all orders are given in Table 15.8 (there are no 3rd order derivatives for nouns, hence no value).

Table 15.8: Average number of derivatives per order of derivation for all three word-classes.

	1st order	2nd order	3rd order
Nouns	5.8	3.4	0
Verbs	5.1	3.7	1.3
Adjectives	6.6	1.9	0.1

15.6 Correlation between semantic categories and orders of derivation

Some of the general issues around assigning semantic categories to derivatives are discussed in the General Introduction to the volume and will not be reiterated here. As mentioned in the Introduction, where two labels were potentially applicable (e.g. both QUALITY and PRIVATIVE to a word like *nameless* or both ABILITY and PRIVATIVE to *unburnability*), an attempt was made, as far as was possible, to reflect the meaning that was most prominent at the last derivational step. There are

some exceptions to this, however: since the project notes included both *readable* and *readability* as examples of ABILITY, the same logic was applied to the respective English derivatives and so both *pullable* and *pullability*, for instance, were coded as ABILITY. *Unpullability*, derived from the PRIVATIVE *unpullable*, was also coded as ABILITY.

All English nouns have realizations of the categories PRIVATIVE and QUALITY in the 1st order. The PRIVATIVE is most typically an adjective, expressing the quality of being characterized by the lack of the noun, e.g. *toothless*, *dayless*, *dogless*. All nouns have at least one other more general realization of the category QUALITY. For example, for *tooth*, there is *toothful*, *toothed*, *toothy*, and *toothsome*; for *fire*, however, there is only *fiery*. In the 2nd order of derivation, STATE is a typical category for all nouns, generally derived with *-ness*, e.g. *toothlessness*, *toothiness*.

For verbs, ABILITY (*diggable, drinkable*), ACTION (*digging, drinking*) and AGENT (*digger, drinker*) are represented for all words in the 1st order of derivation. In the 2nd order, the categories ABILITY (*diggability*) and PRIVATIVE (*undiggable*) are realized for 9 words. In the 3rd order of derivation for verbs, we find mostly derivatives of the ABILITY category, e.g. *uncuttability* (realized for 8 words).

For adjectives, three semantic categories are realized for all words in the 1st order: STATE, MANNER and SIMILATIVE, which are most often derived via suffixation with *-ness*, *-ly* and *-ish*, respectively. As this suggests, adverbs were included here as a derivational category, rather than as an inflectional one, though see for example Bauer et al. (2013: 322) on the relevant debate. No category is systematically represented in any other order.

15.7 Semantic categories with blocking effects

Given how shallow the networks are, it is difficult to comment on blocking effects.

15.8 Typical combinations of semantic categories

For all 10 nouns, STATE in the 2nd order combines with QUALITY in the 1st order (e.g. *bony* > *boniness*) and with PRIVATIVE in the 1st order (e.g. *boneless* > *bonelessness*). Typical for verbs are combinations of ABILITY in the 1st order with ABILITY and PRIVATIVE in the 2nd order (*cuttable* > *cuttability*, *cuttable* > *uncuttable*). These patterns hold for 9 and 10 words, respectively. PRIVATIVE in the 2nd order combines with ABILITY in the 3rd order (*uncuttable* > *uncuttability*). This is obtained for 8 words.

15.9 Multiple occurrence of semantic categories

For verbs, there are repetitions of ABILITY across the three orders, e.g. *cuttable*, *cuttability*, *uncuttability*.

15.10 Reversibility of semantic categories

For verbs, ABILITY and PRIVATIVE can occur in both orders, e.g. *cuttable* > *uncuttable* vs *uncuttable* > *uncuttability*.

15.11 Reasons for structurally poor derivational networks

Most striking for English is the relative paucity of networks, as defined by the specifications of the project. One explanation is the prominence in English of conversion and compounding (for more details on these, see Valera 2014 and Bauer 2017), both of which were specifically excluded under the brief. A further contributing factor stems from the fact that the selected sample words, all from the Swadesh list, are predominantly words of Anglo-Saxon origin. English, as pointed out for example by Marchand (1969), has morphological formatives of both native and foreign origin, with many foreign affixes not attaching themselves to native bases. The number of native affixes, especially prefixes, is relatively small (Marchand 1969: 129). Borrowing, points out Marchand (1969), displaced some native affixed words, and also in some cases led to the replacement of or restrictions on native affixes. Thus, this chapter relates primarily to English native bases and native affixes (with some exceptions, of course, such as the affixes *-able, re-* and, occasionally, *-al*). Inflection is not covered by the project and a decision was taken to exclude participles from the data sample, so there are no (present or past) participial adjectives.

15.12 Conclusions

English is a language with shallow and relatively sparsely populated derivational networks. As indicated above, this is partly due to the presence in English of both native and borrowed morphology and partly to the popularity

of conversion and compounding. However, the derivational networks of English also show a stable kernel of paradigmaticity, with a good number of semantic categories being realized for all words in the sample. Such productive semantic categories can be found not only in the 1st, but also in the 2nd and (for verbs) even in the 3rd order of derivation. They are often co-extensive with the more familiar notion of productive word-formation patterns, but the adoption of a meaning-based approach allows us to gain a different perspective on the phenomena concerned and provides a suitable basis for comparisons with other languages.

Acknowledgements: I would like to thank the leaders of the MONIKA project, the participants in the workshop that took place in Košice in June 2018 under the auspices of the project, as well as my colleagues working on other Germanic languages (especially Jack Hoeksema, Martin Neef, and Maria Rosenberg) for their useful discussions and for spotting gaps and inaccuracies. Any remaining errors remain the sole responsibility of the author.

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