

A corpus-based investigation into the negative suffixes (*-less* and *-free*) from a diachronic overview

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Wang, Yalin. 2020. A corpus-based investigation into the negative suffixes (*-less* and *-free*) from a diachronic overview. *SNU Working Papers in English Linguistics and Language* 17, 74-95. With the affixal status of *-free* confirmed by Dixon (2014), the current study carries on a comparative analysis of the negative suffixes *-less* and *-free* by emphasizing the dynamic alternation of the semantic distributional patterns together with the semantic meanings encoded and generalized in a diachronic fashion. The results show the bases pertaining to *conceptual* and *animate* semantic category have more intimate co-occurrence with *-less* throughout history, whereas *-free* has undergone the upheaval in distributions where *chemical* category is currently most prominent. In addition, “preference or permission to the referent’s existence” and “preference to the referent’s nonexistence” were the only semantic meanings that initially differentiated *-less* and *-free*, while the semantic denotation meanings newly derived were granted to *-less* and *-free* respectively in the aftermath. (Seoul National University)

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1. Introduction

Affixal negation is a process of derivational transformation where a new word is constructed from a base, commonly via the attachment of a negative prefix to the beginning or a negative suffix to the end of the root. The grouping and steadily growing number in negative prefixes (e.g. Zimmer, 1964; Kvetko, 2003; March, 2003) have made tremendous contributions to deeply theoretical and empirical insight into the affix studies, while rather less attention has been directed to the investigation of the nature of negative affixes, particularly negative suffixes, from a quantitative perspective.

The fact that *-less* is a derivational affix has been commonly agreed on whereas there was no certainty on the affixal status of the morpheme-

free. Dixon (2014) confirmed it as a derivational affix¹, which accordingly provides us with new orientation and gives us possibility to carry on further investigation into negative affix, particularly the comparison of negative suffixes, via a larger corpus-based study to predict their clear preference patterns.

Admittedly, comparative researches on the negative affixes mostly involve synchronic analysis (e.g. Andreou, 2015) but are rarely investigated diachronically. Dixon's (2014) diachronic discussion on *-less* and *-free*, both of which were demonstrated with the denotation meanings "without" or "not containing", mainly concentrated on their origin and not much analysis with regards to the individual preference could be found in their diachronic comparison. Besides, as most studies of synonymy adhere to the fact that we should "know a word by the company it keeps" (Firth, 1957), synonymous affixes, such as *-less* and *-free* should also be comparatively scrutinized in terms of the distributional patterns, especially from the type of semantics the co-occurring bases contribute in each case (Andreou, 2015; Arndt-Lappe, 2014). Thus, based on the data extracted from the Corpus of Contemporary American English (COCA) and the Corpus of Historical American English (COHA), this study carries on a comparative analysis of the productive synonymous suffixes *-less* and *-free* by emphasizing the dynamic alternation of the distributional patterns of semantics together with the semantic meanings generalized in a diachronic fashion.

2. Literature review

Productivity of suffixes is always a significant topic of the projects on suffixes particularly in corpus-based studies. Affixation in English language as in *gossip* (*gossip* + *-ee*), is a productive process to yield

¹ For detailed explanations, see Dixon (2014).

new words, and many studies proved that different degree of productivity can be found in different suffixes (e.g. Aronoff, 1976; Bauer, 2001). This arose a wide range of in-depth investigations by an increasing number of researchers and several calculation methods were thus presented by Baayen and his co-workers (e.g. Baayen & Lieber, 1991; Baayen, 1993; Baayen & Renouf, 1996). The suffixes *-free* and *-less* simultaneously appeared as the research subjects initially in the study of Plag (1999) for the analysis of the relation between register variation and derivational morphology via a quantitative analysis. Their productivity values were provided together with another set of English derivational suffixes across different discourses².

With the augment in the number of negative prefixes (Zimmer, 1964; Kvetko, 2003; March, 2003), such as *anti-*, *de-*, *dis-*, *il-*, *im-*, etc., Andreou (2015) illustrated the prefixes *in-* and *dis-* with a focus on the types of negation they contribute to the base and found the two prefixes deliver contrary (e.g. *inelastic*, *dishonest*) and contradictory (e.g. *inanimate*, *disengaged*) interpretations on adjectives and privative meanings (e.g. *inexperience*, *disanalogy*) on nouns. Different situations can be found in verbs that the prefix *dis-* instantiates standard negative (e.g. *disagree*), reversative (e.g. *disconnect*), and pejorative (e.g. *dishear*) meanings.

The negative suffix list, where *-less* used to be the only member, was further enlarged as the derivational suffix status of *-free* was confirmed by Dixon (2014). He also pointed out that for some bases of *-less* and *-free*, “the referent of a noun can be regarded as what one should have, in one circumstance, but as something which is undesirable, in another.” (p. 258) For example, *parentless child* and *parent-free evening* can be paraphrased into individual meanings, either as “an orphan whom no one looks after” and “the evening when children can have a party only held by themselves”. Simply speaking, they are

² It mainly refers to three discourse types in the British National Corpus (BNC): written language, context-governed spoken language, and everyday conversations.

individually distributed in a different way in the context environment, like parents are actually needed by the orphan in the first case while parents are not welcomed (by the children) in the second one.

According to Aronoff & Cho (2001), suffixes like *-hood* and *-ship* both originally meant “state or condition”, but *-ship* is now restricted to a “stage level” interpretation, while *-hood* can have a “stage-level” or “individual-level” interpretation. Such combinations of suffix A with word X do not rule out the combination of suffix B with the identical word X when A and B are synonymous. Although this is a possible situation for the words that yield the identical meaning when X can be attached both by A or B, or we say the situation where they are substitutable. It will be totally different for the suffixes *-less* and *-free* since different connotation meanings will be thus produced in the attachment of the negative suffixes to Xs. This further illustrates that two words containing an identical stem may have the discrepant connotation meanings when the stem is attached by different suffixes that have identical denotation meanings.

In addition to the analysis of semantic meanings generated from the context environment, distributional patterns of the suffixes should be likewise considered as Sinclair (1966) claimed that the major task of lexical analysis is to describe “the tendencies of items to collocate with each other”. Since productive suffixes *-less* and *-free* are synonymous, it is possible to draw an analogy to the collocation studies of lexical semantics (e.g. synonymy) by seeing their distributional patterns from the semantic types of the coexisting neighbors in order to instantiate the behavior and preference of the suffixes.

The corpora were chosen for their comprehensiveness, representativeness, and variety of useful user-friendly search functions, providing the current study with the questions addressed as follows:

1. What is the alternation of distributional patterns for the negative suffixes *-free* and *-less*?

2. How are the semantic meanings of the suffixes *-free* and *-less* generalized discrepantly in a diachronic fashion?

3. Methodology

3.1 Corpora

The corpora used in this study are the Corpus of Contemporary American English (COCA) and the Corpus of Historical American English (COHA). COCA is composed of language data from 1990 to 2019, the largest corpora which comes with an amount of corpus with 1 billion words from the electronic stored database of words. This current study, however, mainly analyses the data from 1990 to 2017 to ascertain the data validity and feasibility. In addition to the contemporary and representative data, the corpus is also equipped with a powerful search engine with many user-friendly search functions. This is true of COHA, the largest structured corpus of historical English with data covered in a span of time from 1810 to 2009, allowing the users to access 400 million words of American English texts. With a roughly evenly division (20% in each genre) in the five genres as COCA, COHA allows researchers to observe the changes of language conveniently.

3.2 Research procedure

The main linguistic features in question are, generally speaking, already tagged and/or accessible via the online search functions of the corpora. Thus, taking advantage of the versatile search functions of the COCA and COHA, this study uses a nearly three-phase query and analysis procedure: first, a query of the overall frequencies of *-less* and *-free* in both COHA and COCA; second, a query of the frequencies of each type of N-*less* and N-*free* constructions; third, I manually perused some of the types in the contexts, a practice also known as “concordance

contextual analysis” (Hardy & Colombini, 2011). It is imperative in the current study since synonymous suffixes typically may have different meanings in the same context with the same distributions, where the information in question is not accessible via a machine query. The extent of the context ranged from concordance lines (if the contextual information suffices to be obtained) to passages with approximately 250 words, which proved typically adequate for our query purposes in COCA and COHA.

4. Analysis

4.1 General usage patterns

The raw frequency and frequency per million value for the lexical items attached by the suffixes *-less* and *-free* were firstly retrieved from COHA for a better understanding of their usage patterns during the period from the 1810s to 2000s.

Figure 1. General overall frequency of *-free* with COHA results

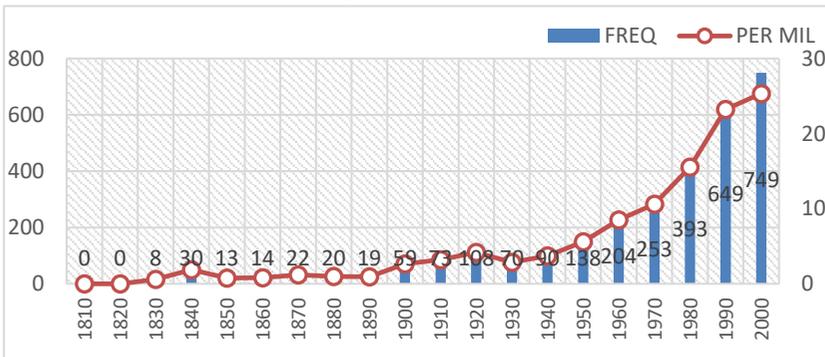
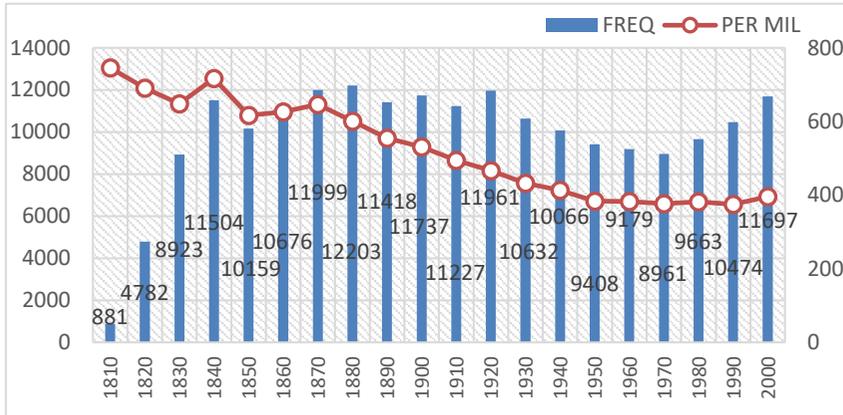


Figure 1 overtly demonstrates the increasing trend of *-free* with stable augmentation in both frequency and the corresponding data (per million). Surprisingly, *-free* in COCA has the analogous PER MIL

Figure 2. General overall frequency of *-less* with COHA results

value with that of COHA. Although *-free* showed non-obvious difference as it increased before the 2000s, it did have a sporadically dramatic variation (maximally 33.05 per million words in 2015 and 15.79 in 2017) in the recent seven years from 2010 to 2017 if we further investigate COCA.

Figure 2 shows us a fact that the bound morpheme *-less*, irrespective of the low frequency (881) in the 1810s, has the highest frequency per million in COHA. Despite the impossibility to look into the data in the previous time before 1810s, the results obviously demonstrate that the tendency for *-less* is also decreasing in the analogously steady way to the augment of *-free*, except the sudden increase (11,504) in the 1840s. Finally, it was not until the 1950s that frequency per million of *-less* realized its stable state, which reduced by half in comparison to the initial value. This finding can be further verified via an investigation into COCA regardless of the salient difference of *-less*'s frequency per million in COHA, since frequency per million for *-less* (around 250 per million) in COCA from the year 1990 to 2009 shows no dramatic fluctuation, in conform with the pattern during the 1990s and 2000s in COHA. Thus, it provides us with evidence that *-less* has a steady pattern from the 1950s until recently.

Another effective way, namely the productivity of affixes, can give support to the conclusion in terms of steadiness of the suffixes *-less* and *-free* respectively. The productivity value is assumed to provide information on suffixes' capability of yielding novice word forms. As *-less* and *-free* are generally not in across-the-board comparison of affixes, the formula mentioned in Baayen & Lieber (1991) is applied in this paper as a calculating method of productivity. They used the hapax legomena (hereafter hapaxes) in the corpus-based measurement and made it clear that the number of hapaxes is an indication of the tendency of neologisms, and the productivity measure is formulated as follows.

$$[1] P = n_1^{\text{aff}} / N^{\text{aff}}$$

P value denotes productivity value, a ratio of n_1^{aff} and N^{aff} . n_1^{aff} refers to type for hapaxes (the number of types with the required affix that occur only once) of certain affixes in a corpus, while N^{aff} stands for tokens for all words with that affix.

Table 1. Productivity value of the suffixes *-less* and *-free*

suffix	type	token	hapax	P
<i>-less</i>	3,082	267,466	1,743	0.0065
<i>-free</i>	3,093	27,564	1,817	0.0659

The result in Table 1 shows that P value of *-free* is much higher than that was calculated for *-less* constructions, resulting from a similar number of hapaxes but a huge difference in tokens. This denotes that there are more possibilities for *-free* than *-less* to be lexicalized, but both of them survive productively in the lexicon by co-occurring with new words. On the other hand, if either *-less* or *-free* does not allow itself to produce new elements, it will eventually cease to be productive, irrespective of the previously created forms fossilized in the lexicon.

4.2 Semantic patterns of N-less and N-free constructions

According to Firth (1957), “the complete meaning of a word is always contextual” (p.7) and we “know a word by the company it keeps” (p.11), suffixes, too, are subjected to the bases they combine with and the categories of semantics they contribute to in each case.

A total of 3,082 N-less constructions together with 3,093 N-free constructions were manually retrieved from COCA, with 232 and 88 cases (frequency>50) respectively selected for further analysis. To determine the semantic differences among the nouns in each construction, I classified the pre-existing roots into relatively fine-grained semantic categories, classified based on dictionary definitions and encyclopedic knowledge, as well as contexts of different genres. To be specific, the semantic meanings of the roots preceding *-less* and *-free* both have eight-way distinctions³: (ai) *location* (bi) *time*. The two above are the categories particularly belonging to *-less*, whereas the following six are the universal parts shared by both of *-less* and *-free*: (c) *material* (d) *ecological* (e) *active* (f) *conceptual* (g) *animate* (h) *measurable*. Apart from that, *-free* in the data gathered attaches to the roots that are specially generalized into two categories: (aii) *disease* (bii) *chemical*.

The results are as in Table 2, and in order to achieve the visual clarity, I used the Greek variable letters α and β to denote the null values of the counterparts. Numbers in the left in the bracket refer to the occurrences

³ (ai) location (denoting place or direction, e.g. *bottomless*) (bi) time (referring to time and date, e.g. *timeless*). (c) material (material product created by people in the process of social development, e.g. *windowless*, *cage-free*) (d) ecological (the geographical and environmental conditions of the people living, e.g. *cloudless*, *ice-free*) (e) active (describing agents' psychological and physiological activities, e.g. *blameless*, *worry-free*) (f) conceptual (denoting a general notion or abstract objects, e.g. *valueless*, *barrier-free*) (g) animate (denoting certain properties of human or animals and their body organs, etc., e.g. *heartless*, *hands-free*) (h) measurable (a dimension always involved with a gauge or an authorized evaluation form, e.g. *depthless*). (aii) disease (literally related to illness of people, animals, plants, etc., caused by infection or failure of health, e.g. *cancer-free*) (bii) chemical (a substance that is produced by or used in a chemical process, e.g. *acid-free*).

Table 2. Types of the bases attached by *-less* and *-free* in COCA

<p><i>-less</i> location (7, β) time (6, β)</p>	<p>material (31, 10) ecological (19, 7) active (38, 13) conceptual (42, 14) animate (54, 6) measurable (30, 11)</p>	<p><i>-free</i> disease (α, 4) chemical (α, 16)</p>
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in each category for *-less*, and those in the right mean the occurrences in each category for *-free*.

The results show that the synonymous *-less* and *-free*, with nuanced semantic distinction, present a relatively different picture of roots' semantic categories. The overwhelmingly prominent divisions for *-less*, as in Table 2, reside in their common *conceptual* (42) and *animate* (54) categories, followed by (*active*)-*less* structures (38) as well as categories of *material* (31) and *measurable* (30) with rather close amount. The suffix *-free*, however, demonstrates the high distribution frequency in roots of *chemical* with merely two differences to *conceptual*, the common and secondly ranking category. Obviously, *-less* shows the lowest frequency to co-occur with roots pertaining to *time*, while it is most uncommon phenomenon for the suffix *-free* to attach to *disease* roots, as well as *animate* roots. If we look at the table as a full picture, in comparison with that for *-less*, inclination to the slightly wider and more salient distribution range of register can be found in the roots that the suffix *-free* attaches to.

In the comparison of *-less* and *-free*, they will have the preference to different semantic domains and those that are much more preferred than others will be attached by them respectively. The most obvious

examples show up in *location, time, disease, chemical* categories that are not superimposed in Table 2 but pertain to individual or private selections.

Indeed, like the examples *careless* and *carefree*, divergent connotation meanings will appear when the common base elements combined with *-free* and *-less*. Sometimes people tend to be *careless*, a situation that they would like to avoid under normal conditions, and they would prefer to caring more about the thing they're doing in the future. Nevertheless, when people are *carefree*, it denotes that they are not willing to care, or care is not preferred in most situations. Another pair of examples can be found in *noiseless* and *noise-free*. In *noiseless steps*, the noise can be permitted when it comes out from the steps by accident, while in contrast, any noise is not allowed to appear in *noise-free images*. Here we can say in a formal way that the noun in N-*less* structure refers to a referent that is preferred or permitted to the existence (of the referent), while that in N-*free* construction is a referent that is preferred to the nonexistence (of the referent). This is not only applicable to the same noun stems, but also the distinct ones. In this situation, same stems can be found by *-less* and *-free* with the results of two different connotation meanings.

In general, either the fact that two words containing an identical stem may have the different meaning when it is attached by different suffixes that have the identical denotation meanings, or the rather apparent fact that different meanings are given rise to the words when different suffixes follow individual bases, further proves that the synonymous affixes have their own preference in their own semantic scope.

Following the previous sections on the suffixes' productivity and the semantic distinctions of the pre-existing roots, the next presentation is the discussion with regard to the alternation in frequency of N-*less* and N-*free* via the data collection during the period from 1990 to 2017. Figure 3 and Figure 4 are scatter grams for the alternation of top 10 N-*less* and N-*free* constructions.

Figure 3. Frequency of top 10 N-less constructions with COCA results

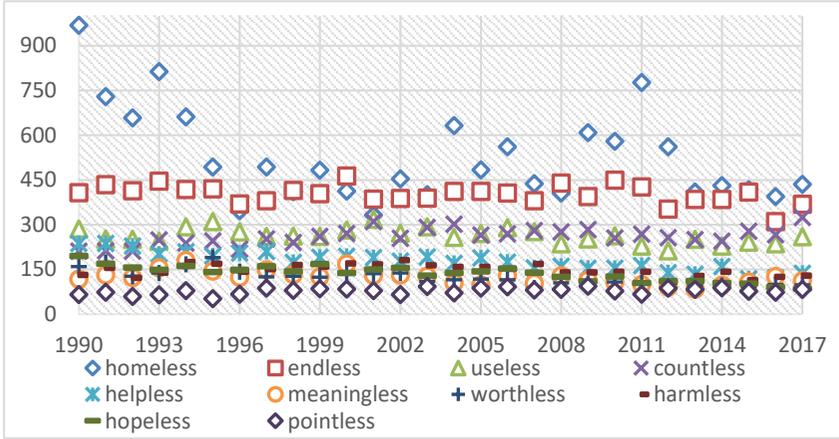
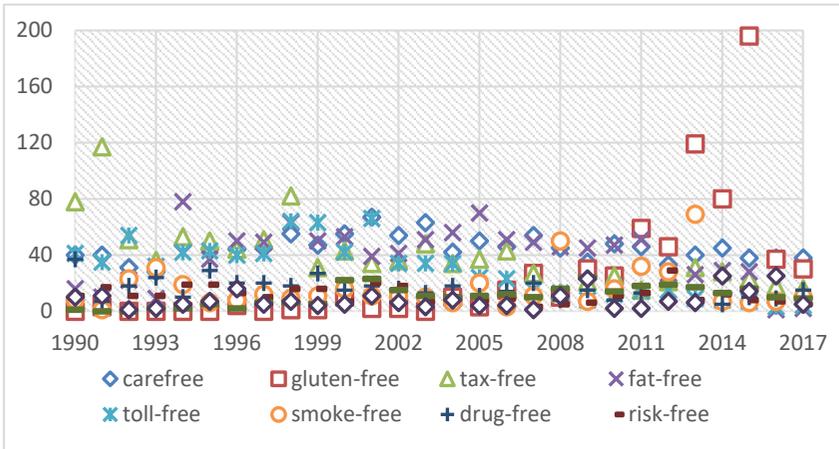


Figure 4. Frequency of top 10 N-free constructions with COCA results



Respectively ten lexical items ranked with high frequency for the suffix -less and -free were extracted from COCA to make further comparison with respect to semantic development. As for the co-existing roots for the suffix -less, *homeless* demonstrates a most saliently fluctuating status and almost decreased by a half, initially from nearly 1,000 frequency in 1990 to around 450 in 2018. However, the fluctuation has

become steady with the difference that has been not overt since 2013. Historically speaking, *homelessness* emerged as a national issue of America in the 1870s, and the number of homeless people significantly augmented in the 1980s due to the increasing housing, social service cuts and deteriorated economy, resulting in the lexical item, *homeless*, to rank most highly. During the 1990s, as homeless shelters, soup kitchens, and other supportive services sprouted up in cities and towns across the nation, the serious situation was relieved but these approaches were not successful in solving the root causes of homelessness issues, also as shown in the trend of *homeless* during this period. Moreover, the number of homeless children reached record highs in 2011 and 2012 due to children homelessness, which would be one factor causing the consequent increase in the usage of *homeless*. Nevertheless, *endless*, which takes the second position in frequency, swings not as dramatically as *homeless*, and ends with the analogous data. *Countless* nearly coincides with *useless* with respect to the variation of frequency, generally higher than the remainder of six words, *helpless*, *meaningless*, *worthless*, *harmless*, *hopeless*, *pointless*, which exhibit an almost identical pattern of frequencies during the final four years.

In addition to the huge difference between the overall frequency (*-free*'s frequency is considerably lower than *-less*), a striking fluctuation can be found in roots attached by the suffix *-free*, particularly *gluten-free* with no occurrence in 1990 but soaring from 2012 to 2016. An analog of *smoke-free* is shown in Figure 4, with two sudden increases in 2008 and 2013. *Tax-free* occurred frequently before 1999 but declined progressively from then on. Nevertheless, we should note that all of the frequencies came to be less than 40 (merely *gluten-free* and *carefree* more than 20) in respective of great variations before 2016.

Thus, generally speaking, N-*free* currently can be interpreted as an uncommon construction in American English, but there are still possibilities existing for other different sets of roots with frequent

occurrences due to the high p-value. Conversely, the structure *N-less* inclines to be steady without any big alternations except *homeless* during the period of 27 years, which indicates a stable semantic distribution pattern. Besides, the fluctuation of individual words likewise denotes that since there are still many commonly-shared bases between *-free* and *-less*, *-free* will not be able to prosper and there even will be no existence for their comparison if one of stems attached by *-free* disappears.

4.3 Diachronic distribution of *N-less* and *N-free*

This section will provide us with the diachronic distribution of semantic categories first in accordance with that in section 4.2. *-less* and *-free* should be broadened to the comparison in a historical way by focusing on the variation between their past and present individually.

Table 3. Types of the bases attached by *-less* and *-free* in COHA

Category	Total (FREQ>50)
active	39 √(1)
animate	40
ecological	19 √(1)
measurable	26 √(5)
conceptual	48 √(1)
time	2
location	9
material	24
chemical	√(2)

*Note: The symbol √() was created for representing the involvement of the suffix *-free*, and numbers in the bracket denote the occurrence of the types of *-free*.

Merging the distribution categories of *-less* and *-free* into one list contributes to ruling out the vacuum value for each category, since

relatively scarce cases are found in the frequency of the suffix *-free* which is above 50. The data in the left column denote the categories involved in the emergence of *-less* and *-free*, whilst the right column shows that the corresponding values without the symbol $\sqrt{(\)}$ are the type values for *-less* and those with the symbol refer to the type value of *-free*.

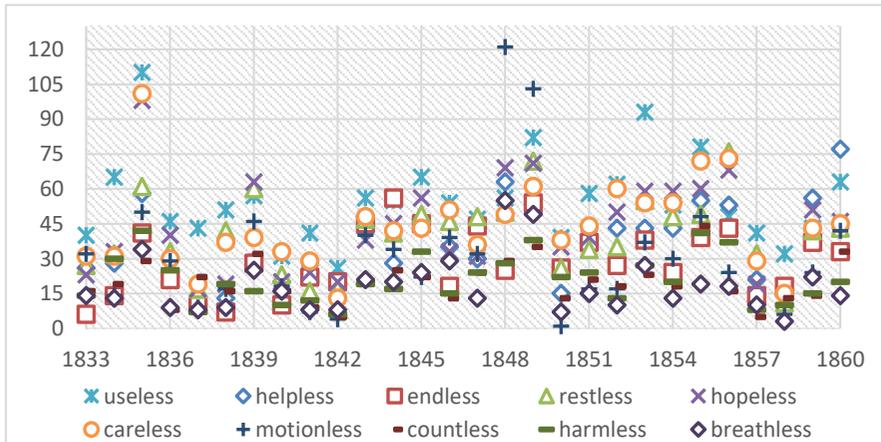
Thus, we can infer that *conceptual* is the most highly occurring semantic category during the period from the 1800s to 2000s, with a value of 48. *Animate* category ranks as the second position in COHA rather than the first as in COCA, and it has a rather close difference (1 difference) higher than *active*. In this case, it is obvious to see that the noun roots belonging to *conceptual* and *animate* category tend to have stronger collocation with *-less* over the course of time, and *animate* is most favored by *-less* in Present-Day English. In comparison to *-less*, *-free* has a total number of 10 cases that have frequencies more than 50. The most frequent occurrence of *-free*, as in the above table, is found in *measurable* category, while the other four cases are distributed in the other four categories (*ecological*, *conceptual*, *active*, *chemical*) evenly, with merely one or two type occurrences. This is a quite different distribution since *chemical* category has the most prominent type value in COCA. We can see the negative suffix *-free* was involved in the early history and the semantic categories have changed dramatically in a dynamic process.

As we introduced the top 10 lexical items containing the suffix *-less* in the last section, here the above figure also shows us ten first-ranking words in COHA and their trend from the year 1833 to 1861, in correspondence with the recent 27 years in COCA. The overall trend of the ten words is found to be much more fluctuate than that in Present-Day English, which further gives a verification that this period was a developing stage for *-less* with many unpredictable factors.

We can see there are four items, *restless*, *careless*, *motionless*, *breathless* in Figure 5 that are not used frequently now, while *homeless*,

meaningless, *worthless* and *pointless* which take the leading position in COCA, have no track in the ranking entry in Figure 5. A general large variation is demonstrated by *useless* with dramatic augments and *motionless* has the broadest range of value with a maximum frequency of around 120 in 1848 and a minimum of nearly 0 in 1850. The year 1835 demonstrates a simultaneous increase of the ten words when the salient variation in value has taken place in the three examples, *useless*, *hopeless*, and *careless*.

Figure 5. Frequency of top 10 N-*less* constructions with COHA results



In this way, if we retrospect the previous section where we pointed out the fluctuate tendency for top 10 words containing *-free* in COCA, we can deduce with an analogy that *-free* is in its developing stage nowadays and risk to conjure from the information above that the suffix *-free* will be likewise subjected to an analogous process of word formation to the suffix *-less* in the course of time, varying from fluctuation towards stability, although the productivity for *-free* contemporarily is still much higher vis-a-vis the suffix *-less*.

In addition, it should be noted that the reason for setting the investigation period from 1833 to 1860 is to avoid the vacuum data for

-free in that *-free* initially appeared in 1833. Here, we can further study the behavior of *-free* via scrutinizing the contexts in each of the stages. The suffix *-free* had the first appearance dating back to the 1830s when there was a total of four occurrences: *scot-free*, *rent-free*, *tithe-free*, and *custom-free*, as in the examples from (1) to (4). They are all exhibiting semantic meanings “without” like “for which no rent/tithe/custom is paid”, “without receiving the punishment”. In this period, *-less* and *-free* merely appeared with the results of different connotation meanings, namely “preference or permission to the referent’s existence” and “preference to the referent’s nonexistence”.

(1) *That man's principles must be very weak and wavering who can be swayed either one way or the other by a few words, ..., who finds his virtue giving way on seeing a vicious gentleman now and then get off scot-free on the stage.* (Crayon Sketches [ed.], 1833, FIC, COHA)

(2) *Measures will therefore be multiplied for assessing wastes; for resuming rent-free lands; for invalidating former alienations;...* (Essay On Rate Wages, 1835, NF, COHA)

(3) *Such must continue to be the case so long as the corn laws shut out the competition of tithe-free land abroad, ...* (Essay On Rate Wages, 1835, NF)

(4) *A peer can have wine custom-free; an earl eight tuns.* (By Order King, 1833, NF, COHA)

During the 1840s, great divergence took place in *rent-free* (16 occurrences) compared with other N-free constructions (1 occurrence for most) as regards the frequency. However, note that the meanings of root Ns were generalized, together with new meanings given rise to the suffix *-free* in (5), “not bound”, such as *soul-free*, where soul is mainly

not bound by any social factors. The analog is *tongue-free*, with the nuanced difference to *soul-free* since tongue is more likely to be dominated by physiological constraints, like human's cerebral cortex that directly sends out signals.

(5) *Are you not, measurably, simulacra hominum feminarumque? Are you foot-free, tongue-free, soul-free?* (Margaret A Tale Real, 1845, FIC, COHA)

With the complication of roots' semantic meanings, since the 1910s, another denotation meaning, "prohibition", has been naturally given to the suffix *-free*, like *liquor-free*, *smoke-free* in (6) and (7), occasionally performing the speech acts in particular situation nowadays.

(6) *If America becomes liquor-free in the next generation, as some industrial leaders predict, it will probably be because of the drastic action of our industries, which can not stand by and see large possible profits swallowed up by alcoholism.* (Atlantic, 1915, MAG, COHA)

(7) *The fresh breeze was cool on their sweaty faces, and their lungs sucked gratefully at the smoke-free air.* (Fire, 1948, FIC, COHA)

Rather distinct from the suffix *-free*, the development of *-less* has undergone a long history initially originating from Proto-Germanic *lausaz*, which, too, serves as the cognates for Dutch *-loos*, German *-los* "*-less*", Old Norse *lauss* "loose, free, vacant, dissolute", German *los* "loose, free", and Gothic *laus* "empty, vain". The Old English suffix *-leas*, then, was generated from the Old English free morpheme *leas* "free (from), devoid (of), false, feigned" and gave rise to the Modern English suffix form *-less* at a later date.

Data of *-less* from COCA can be used to reflect or verify its

involvement to differentiate from the suffix *-free* in terms of newly derived meanings. Based on the fact we mentioned in the previous section, the steady traits of *-less* can be readily found in the recent periods of Present-Day English with the prominent denotation meanings “without or devoid (of)”, with common examples like *doubtless* “without doubt” in (8).

(8) *The connected and wealthy will do fine, and will doubtless increase their power as the poor become more desperate and vulnerable to manipulation.* (dailykos.com, 2012, BLOG, COCA)

Other meaning of *-less*, irrespective of rareness, tends to show a trait of “ability” demonstrated in (9) and (10), such as *flightless* “unable to fly”, or *breathless* “having difficulty in breathing”.

(9) *Perhaps the military's biggest mistake was assuming the flightless birds would surrender without a fight.* (Gizmodo, 2017, MAG, COCA)

(10) *I was breathless at the first landing on the moon -- followed the entire space program carefully, and loved watching launches, etc. in school.* (blogs.ajc.com, 2012, BLOG, COCA)

It is particularly notable that some cases of N roots are combined with *-less* with another tier of connotation meaning to describe the individuals or events with positive or negative emotions and such observations can be verified with examples like *seamless*, *heartless*, *selfless*, *faceless*, etc. We use these words to describe the individuals or events with positive or negative emotions. For example, when the speaker gives a description to the individual by using *faceless* as in (11), he or she shows disfavor with someone who has an uninteresting feature or has no character.

(11) *Bush did not have a popular mandate, only the dubious blessing of a majority of the country's faceless electors.*
(...erjudy.wordpress.com, 2012, BLOG, COCA)

In general, we can see *-less* and *-free* have undergone considerable semantic changes as the language evolves in a dynamic process where they evade the synonymous counterpart. Different periods endow the suffixes *-less* and *-free* with an ongoing inflow of new meanings when they attach to the preferred bases, giving rise to the combinations where the meanings that differentiated them - “preference or permission to existence” and “preference to nonexistence” - were the only outcomes as *-free* was firstly involved.

5. Key findings

As in a dynamic alternation process, the suffix *-free* showed non-obvious difference as it increased before the 2000s, whereas it had a sporadically dramatic variation from 2010 to 2017. It was not until the 1950s that frequency per million of *-less* which used to strongly fluctuate realized its stable state. The productivity formalism in Baayen & Lieber (1991) can give support to the conclusion in terms of steadiness of the suffixes *-less* and *-free* respectively.

Individually speaking, *-less* and *-free* have their preferences to different semantic distributions and those that are much more preferred than others will be attached by them respectively. The most obvious examples show up in *location*, *time*, *disease*, *chemical* categories that are not superimposed but pertain to individual or private selection, which is likewise another way for them to differ from the synonymous counterpart, such as *tax-free*, *homeless*. Besides, it is obvious to see that the noun roots belonging to *conceptual* and *animate* semantic category tend to frequently co-exist with *-less* over the course of time, and *animate* is most favored by *-less* in Present-Day English. The most

frequent occurrence of *-free*, however, is found in *measurable* category in COHA with a quite different distribution since *chemical* category has the most prominent type value in COCA. With regards to the individual alternation, it is predictable that the suffix *-free* will be likewise subjected to an analogous process of word formation to the suffix *-less*, varying from fluctuation towards stability.

This study has also verified that when *-free* begins to be involved in the comparison with the synonymous counterpart *-less*, the result will be encapsulated into N-*less* constructions with the meaning “preference or permission to the referent’s existence”, as well as N-*free* constructions with the meaning “preference to the referent’s nonexistence”. The denotation meanings like “a trait of ability” and “positive or negative emotions”, as well as “not bound” and “prohibition” were generated for *-less* and *-free* respectively. We have to say, however, newly derived meanings will be added by further observations because of the dynamism of the process.

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