Prefixes in English Word Formation*

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1. Introduction

This paper deals with several related issues involving English words formed with certain prefixes. First of all, what are the relationships and constraints on full lexemes and semantic units smaller than lexemes? Traditionally, lexical semantics has concentrated on lexemes, devoting relatively little attention to semantic units that are smaller or larger than words. Secondly, among morphologists, there is a controversy concerning the nature of affixes; namely, whether they are ordinary signs, for example, like lexemes, or whether they are rather different. The third topic, and the one that most of the paper deals with is a description of the semantics of English prefixes. Most English prefixes have two interesting properties: they are iterative and they combine freely. Finally, a recent paper by Keyser and Roeper on the prefix re- is discussed.

1.1 For this study, I assume a model of word-formation as presented in Aronoff (1976), in which a word-formation rule specifies a base as an input (specifying the syntax and semantics along with subcategorization and selection restrictions, where appropriate) and phonology. Although traditional literature in word-formation, e.g. Marchand (1966), has attended to the semantics of the base, in contemporary morphology and word-formation much more attention has been given to the syntactic and phonological aspects than to the semantics, and I view this paper as providing additional data on the semantic and pragmatic components of word-formation.

1.2 Affixes as Signs. Within morphological theory two diametrically opposed views on the status of sublexemic units (e.g. bound morphemes) are found. Baker (1988) and Lieber (1992), on one hand, claim that bound morphemes are signs, no different from free words (lexemes), whereas Beard (1988) argues that affixes
(and also function words) are quite different from lexemes. My position on this point is that it is a false dichotomy. Rather there is a whole scale from affixes that are very lexeme-like to those that are very different. For example, if one selects a set of nominalizing suffixes (-ance, -ence, -ce, -cy, -ity, -ness), one can present a convincing case that these are not word-like since their meaning and distribution cannot be easily stated, as it can with full content words.

This may indeed be one end of a spectrum, and perhaps something we might expect with affixes that function mostly as grammatical morphemes. However, many affixes have definite 'lexeme-like' meanings, and it is these I will investigate in this paper.

2. Preliminaries and Assumptions

2.1 In the recent theoretical morphological literature on English, there has been more attention paid to suffixes than to prefixes. One reason is these works often reflect a greater interest in the phonological and syntactic aspects of affixation, and in English, suffixes are more likely than prefixes to change the stress assignment and to change the argument structure of the base. Moreover, suffixes are more likely than prefixes to be heads. There are a few exceptions, of course. There has been considerable discussion of the English prefixes be-, en-, de-, which appear to be heads, in that they can change category. But be- is no longer productive, and the others are no longer highly productive. However, prefixes have two very interesting properties: (1) they are iterative, and (2) they can combine freely.¹

2.2 Word Formation Rules must pay attention, not only to the syntactic category of the base and to the meaning of the affix, but also to the meaning(s) of the base, a concern in the traditional word-formation literature (e.g. Marchand 1966.) The semantic compatibility of the affix and the base is not a simple matter of matching features; rather, it requires a semantic-pragmatic assessment. For example, if an affix must be attached to a noun that denotes an event, the speaker must decide which nouns can be construed as events. In other words, considerable inferencing is necessary.

Each affix has a range of senses, not all of which are currently productive. The list of words with a given affix may reveal the diachrony of that item — carrying with it earlier productive processes that are no longer productive. Also, many English words were borrowed from Latin and Greek, and the bound morphemes contained in these words were never productive in English. The approach I will take, which follows that of Bauer (1983), is not to seek a single abstract, general sense that might underlie all uses. Rather, the focus will be on the contemporary productive sense(s).
2.3 The topic of productivity has become one of much interest and debate. (See Aronoff 1976; Bauer 1983; Corbin 1989; Baayen & Lieber 1991; van Marle 1988; and references therein. *Yearbook of Morphology* 5 is devoted to the topic of morphological productivity.) Like Bauer (1983), I take the presence of neologisms to be evidence for the contemporary productivity of an affix. But, in addition, I accept judgments of acceptability for neologisms from native speakers.

2.4 There is one final point to take up before turning to the data, namely, that of deciding which morphemes are prefixes and which are not. Most scholars of word formation (and also many dictionaries) distinguish between affixes and combining forms. Combining forms are bound, but they are stem-like. Some of these combining forms are clippings or allomorphs of existing lexemes, such as *anthro*- or *bio*-. Others are the result of reanalysis, such as *-holic* and *-thon*, as in *telethon*. Although some scholars and dictionaries refer to these as neo-classical compounds, since they are most often based on Latin or Greek forms, combining forms are common with non-classical morphemes as well, such as *-scape*, e.g. *moonscape*. Bauer (1983) treats most items below as prefixes and presents criteria for distinguishing prefixes from initial combining forms (pp. 213-220). Marchand (1966) treats all the Latinate items as prefixes but the Germanic ones as compounds. He observes that the foreign prefixes entered the language as prefixes, although a few have subsequently become independent words, such as *super* and *extra*. However, distributional evidence shows that the Germanic elements act like the Latinate ones, and therefore, they are treated as prefixes, too. Further discussion of these issues can be found in Adams (1973), Bauer (1983), Warren (1990) and references therein.

In this paper I will mainly follow the classifications listed in the dictionaries (*Oxford English Dictionary*, *Merriam Webster*, *Random House*). In cases of disagreement, or where I diverge from lexicographers, I will try to justify my choice.

First I will discuss prefixes of Latin and Greek origin to illustrate their iterative and combinatorial possibilities. The prefixes in this category are *meta*-, *anti*-, *pro*-, *counter*-, *micro*-, *macro*-, *mini*-, *maxi*-, *multi*-, *extra*-, *ultra*-, *super*-, *pseudo*-, *sub*-, *mid*-, *hypo*-, *hyper*-, *retro*-, *trans*-, *pre*-, *post*-, *ante*-, *arch*-, *vice*-, *ex*-. Since there is not space to deal with them in detail, I will concentrate on a few that have especially interesting properties or that illustrate some theoretical point. Next I will turn to a small number of Germanic prefixes, namely, *mis*-, *un*-, *over*-, *under*-, and *out*-. Finally, I will turn to an analysis by Keyser and Roeppe (1992) which discusses constraints on combining the prefix *re*—with other things.
3. English Prefixes

3.1 Meta-

The prefix *meta-* is especially interesting semantically in that it illustrates well several of the general points discussed above: present productivity vs. non-analyzable words, subtle constraints on the meaning of the base, and ranges of meanings with semantic drift. *Meta-* is found not only in dozens of established words, such as *metaphysics, metalinguistics, and metaphor*, but is also productive in contemporary English. Syntactically, *meta-* can be prefixed to nouns (both count and mass) and adjectives. I include gerunds, such as *metathinking* as a noun, since *meta-* is not used with verbs; that is, we cannot say *I metathink all the time*. Among the innovations I have heard are *metamental, metamovie, metaplanning, metaperformance, metapopulation, metagrumbles, metacriterion, metarule, metacomunication, metamessage, metacognition, metaweight, metasemantic, metajudgment, metacomparative, metacategory, and metalove*.

Of the productive senses, there are two primary clusters of meaning, both of which are present in some words. Also both senses can be subsumed under a more general rubric of a higher order type, but I have found it more insightful to treat the two as polysemous. First, *meta-X* has a sense of a foundational theory of *X*, as in *metahistory, metapsychology, metasociology, metapolitics, etc.* *Meta-language* and *metalinguistics* can be placed here as well, where *metalinguistics* is interpretable as the theoretical foundation of the study of language or linguistics. An example of semantic drift can be seen with the word *metatheorem*, which is not a foundational study of theorems; it is a theorem derived from a system of metamathematics.

The other sense — and in my opinion more interesting sense of *meta-* is that of ‘aboutness’, where *meta-X* can be paraphrased roughly as ‘(an) X about (an) X’. In other words, the semantics of *meta* contains a variable, which is to be replaced by a copy of the base to which it is attached.

- A metalanguage is a language about language.
- A metamovie is a movie about a movie (about movies).
- Metacognition is cognition about cognition.
- A metarule is a rule about rules.
- A metamessage is a message about a message (about messages).

Some semantic differences between *meta-X* and the paraphrase follow from the syntactic differences. The syntax of prepositional phrases, e.g. *about NP*, requires a decision on the number and definiteness of the nouns, where no contrasts are possible with the *meta*-words. Hence, *metalanguage* could be defined in any of the following ways:
A metalanguage is a language about a language.
A metalanguage is a language about languages.
Metalanguage is language about language.
Metalanguage is language about languages.

As in interpreting any utterance, pragmatic factors require fine tuning based on contextual factors.

The semantic requirements of the bases to which meta- can be attached are discussed in Lehrer (1993), and I shall only summarize those points. One aspect of the meaning of these novel uses of meta- is the ABOUTNESS requirement. One can understand what a metamovie is, (a movie about a movie) but it is perplexing to imagine what a metapotato might be, just as it is perplexing to interpret ‘a potato about a potato’. Potatoes do not have aboutness properties, but movies do.

This sense of meta- can be prefixed to nouns and adjectives that denote something with content or representation or intentionality (in the philosophical sense). Examples of items to which meta- can be attached are speech acts (metaquestion, metapromise), literary genres (metabook, metadocumentary), linguistic units (metasentence, metaphrase), linguistic representation (metawriting, metasign), thought and thinking (metathought, meta-idea), visual and performing arts (metamovie, metapicture).

There may be a drift of meaning from ‘about X’ to ‘of X’. Michael Pendlebury (p.c.) has suggested as possible new words metacriteria ‘criteria of criteria’, meta-awareness ‘awareness of awareness’, metamagnitude ‘magnitude of magnitudes’, metapopulation ‘population of populations’, and metacontainer ‘container of container’.

Many morphologists have commented on the extensive individual differences concerning the acceptance of new words. Some individuals are highly conservative and reject most lexical innovations, whereas others accept neologisms with great enthusiasm. This can be illustrated with meta-words. One requirement in accepting a new word is the possibility of imagining a possible referent. Can there be metamusic? The answer will depend on one’s decision as to whether music represents anything and being able to decide what, if anything, music can be about. My initial response was to reject metamusic (as well as music about music), but Dirk Geeraerts (personal communication) pointed out that a piece of music can “comment on” other music, and he even suggested compositions that did so. Another category of marginal items involves prefixing meta- to emotional states, since they, too, are intentional. A person can be happy about being happy and afraid of being afraid, and some consultants accept metahappiness and metafear as acceptable words.
Meta-, like other prefixes to be discussed, can be used iteratively. Adding meta- to metalanguage yields metametalanguage, ‘a language about a metalanguage’, which is attested in the Oxford English Dictionary. Similarly, we can construct words like metametamovie ‘a movie about a metamovie’; metametathought ‘a thought about a metathought’, etc. Limitations are due to constraints on processing and lack of a likely referent, not to any limitation on WFRs.

3.2 Anti- and Pro-
Anti- and pro- are not only highly productive; they have, as Boertien (1992) shows, the interesting property of being category changing, and therefore, according to Boertien, of being heads. They can be prefixed to nouns or adjectives, yielding adjectives. For example, using traditional tests for determining adjectival status, very as an intensifier and seem as a linking verb, we can construct the following sentences:

(1) The advocates seem very anti-government.
(2) The bill seems very pro-consumer.

But removing the prefixes yields ungrammatical sentences:

(3) *The advocates seem very government.
(4) *The bill seems very consumer.

Other examples are anti-government, anti-war, anti-slavery, anti-vivisection, anti-American, anti-communist, anti-bacterial, anti-corrosive, anti-aircraft, anti-convulsive; and pro-government, pro-communist, pro-Clinton, pro-education(al). Both prefixes, which are attached to noun and adjective bases, have a range of senses, but the most important have the sense of being against or for some person, thing, group, or ideology, and these latter notions form the semantic restrictions of the base. In addition, anti- has a sense of preventing or neutralizing something considered to be undesirable. Both prefixes may be applied iteratively, yielding words like anti-anti-government ‘being opposed to being anti-government’, pro-pro-education ‘being in favor of being pro-education’, etc.²

3.3 Counter-
Another prefix that overlaps in meaning with against or in opposition to is counter-, which can be prefixed to nouns and verbs, as in counterweight, counterpoint, counterrevolution, counterespionage, counterreact, countersign, counterattack, etc. The verbal and nominal bases tend to be acts and events, rather than things (with a few notable exceptions, like counterweight). Counter- can also be used with a few adjectives, as in counterbacterial (drug), but this use
is somewhat marginal. The meaning of *counter-* is best characterized by Marchand’s gloss ‘opposite and parallel X’, where X is the base.

*Counter-* and *anti-* have somewhat different bases, but they both share nominal bases, and where they do, they are not synonyms; they contrast in meaning. *Counter-* refers to an action or event in response to another action or event, whereas *anti-* is typically used in order to prevent some action. Consider the difference between *counterdemonstration* and *antidemonstration*. A *counterdemonstration* takes place in response to some prior demonstration. *Antidemonstration* is not an event, but possibly an attitude or ideology opposing demonstrations. Or try to imagine the difference between an *antibacterial drug* and a *counterbacterial drug*. The first is likely to be preventative, while the latter is likely to be remedial.

*Counter-*, like the prefixes discussed above, is iterative. Thus a response to a *counterdemonstration* might be a *counter-counterdemonstration*, which in turn might lead to a *counter-counter-counterdemonstration*, etc.

### 3.4 Prefixes of quantity, location, and direction

Many of the iterative prefixes fall into a small number of semantic classes with mostly adverbial functions, designating quantity and/or size (*mini-*, * maxi-*, *micro-*, *macro-*, *uni-*, *multi-*, *extra-*); direction and location (*super-*, *sub-*, *hyper-*, *hypo-*, *mid-*, *trans-*, *ultra-* and *retro-*). However, many direction and location prefixes have quantificational senses as well, exploiting the conventional metaphorization of ‘over’ as ‘more’ and ‘under’ as ‘less’. Some of these are of limited productivity, but they can be used iteratively.

Lack of space does not permit a careful analysis of each of them, but I will comment briefly on the prefixal status of *micro-*. The *OED* lists this item as a prefix, whereas the *Random House* and *Merriam Webster* dictionaries list it as a combining form. In fact, it is both. As a prefix, attached to nouns, *micro-* most often means ‘(very) small’, as found in *microbus*, *microbrewery*, and *microfracture*. It also has a technical sense ‘one-millionth’. As a combining form it is a clipping of *microscope*, as found in words like *microsurgery*, *microsection*, and *microorganism*. *Microsurgery* is surgery done using a microscope; a *microsurgeon* is a surgeon who performs microsurgery, not a very small surgeon. In *micro-economics* and *micro-linguistics* we see some semantic drift, possibly based on previously existing words like *microbiology* and *microphysics*, sciences that deal with small phenomena, hence, small-scale studies of larger phenomena. *Macro-* the antonym of *micro-*, meaning ‘large’ or ‘elongated’, is less productive. *Micro-* and other prefixes of size and quantity are iterative, but the practical effect of that is intensification, playing a role similar to the word *very*. A *micromicrocomputer* is a very small microcomputer. *Micromicrolinguistics* would deal
with a very small part of the discipline. Further iteration is also possible. For instance, a micromicromicrobus would be a very small bus indeed. But as Mayrthaler (1988) points out, such iteration is rare in natural language because such constructions are difficult to process and because of a universal tendency to avoid this kind of "pseudo-reduplicate structures" (p. 89).

The locational prefixes super- and sub-, which are attached to noun and adjectival bases, share a range of senses (and each has additional ones), including that of physical location with respect to a vertical orientation, 'over' or 'above' for super- and 'under' or 'lower' for sub-. These notions are extended to quantificational senses of 'more' and 'less', to abstract realms involving power and importance, and to organizational principles. Some examples are superstructure, subglacial (location); superintelligent, subnormal (quantity); superintendent, subordinate (power); superset, subcommittee (organization).

Recursion is possible, yielding examples like supersuperset ('a collection of supersets') or subsubbasement ('lower than the subbasement'). But iteration is best with quantificational senses, as in (5) and (6):

(5) Sam is supersuperintelligent 'extremely intelligent'
(6) Sam is subsubnormal 'extremely unintelligent'.

Hyper- and hypo- are semantically similar to super- and sub-, but they are much less productive. However, recursion is possible, at least with a quantificational sense. A hyperhypercritical person is very critical; a hypohypoactive thyroid is extremely sluggish.

The prefix ultra-, glossed as 'beyond' or 'extremely', is prefixed to nouns and adjectives that imply a scale, but ultra- works like very in not caring which end of the scale is relevant. Thus something can be either ultramodern or ultratraditional, ultraconservative or ultraliberal. This prefix can also be used iteratively, as in ultra-ultraloyal ('a supersuper patriot') or ultra-ultrareligious.

Extra- could be included here, with the meaning of 'outside', and one needs to imagine an appropriate situation. For example, extracurricular activities at a school are those activities outside of the usual school subject. But one could describe activities that are beyond those as extra-extracurricular. Extra- also functions as an intensifier, meaning 'beyond the usual' and 'additional', and recursion is possible here.

3.5 Temporal prefixes: pre-, post- and ante-

Although all three of these suffixes have spatial as well as temporal uses, they are most productively used as prefixes of time. They are prefixed to nouns and adjectives that denote events or with nouns that can be interpreted as referring to periods of time. Examples for pre- 'before' are prewar, preschool, ('the period of
time before the normal beginning of school — either the school day or the normal years of schooling’), pre-Victorian, and pre-Depression.

In addition, pre- is productively used with verbs denoting activities, where the meaning is often ‘to do something earlier, according to some norm’. Thus preboard or preregister is ‘to board [a plane] before most other passengers’ or ‘register before the normal registration period’. Other examples are precook, predate (a check), prearrange, preprint, presurvey.

Post- ‘after’ has a parallel range of temporal uses with nouns and adjectives, but its use with verbs is more limited. Thus we find postwar, post-Gothic, post-Darwinian, postnatal, and postdate (a check). It could be that the absence of words like postboard, postregister, postprint and postsurvey is merely pragmatic; so far no need for them has developed, and it is not difficult to imagine situations where they would be used.

Ante- ‘before’ is much less productive than pre-, but it can be found with nouns and adjectives that can be interpreted as points or intervals of time, as in antebellum, antediluvian, ante-Christian, and antewar.

All three prefixes are potentially iterative, but as with super- and sub-, the semantic difference may be neutralized by a meaning postulate (or logical inference), that simplifies the prefixes. Thus pre-prewar ‘earlier than the prewar period’ = ‘prewar’. However, if pre-World War II comes to be conventionally interpreted as the years between 1935 and 1939, then pre-pre-World War II would refer to a period before that. Similarly, if an airline wished to allow handicapped people to board first, then passengers travelling with children, and then everyone else, it could use pre-preboard to describe the action to board the first group. (That such an expression is not likely to be selected is due to stylistic factors.)

Similar expressions can be constructed with post- and ante-: post-postwar, post-postJurassic, post-postnatal; ante-antebellum, ante-antehuman.

3.6 Pseudo-

Although pseudo- is listed as a combining form by Merriam-Webster, both the OED and Random House list it as a prefix. It can be prefixed to nouns and adjectives yielding a meaning of ‘false’ or ‘insincere’. Prototypical cases involve abstract properties and qualities of human beings and human activities. Examples are pseudo-intellectual, pseudo-scientific, pseudo-artistic, and pseudo-aristocratic. Pseudo- is iterative, and iteration yields examples like pseudo-pseudo-intellectual, ‘pretending to be pseudo-intellectual’ and pseudo-pseudoscientific ‘pretending to be pseudoscientific’. The interpretation of multiple uses of pseudo- allows for several possibilities. One pseudo- could cancel out a second. For example, a pseudo-pseudo-intellectual could be a true intellectual who poses as a pseudo-intellectual, but he need not be an intellectual. Alterna-
tively, if it became fashionable to be a pseudo-intellectual, and certain behaviors and attitudes became associated with this class, then a pseudo-pseudo-intellectual could be someone who tries to imitate a pseudo-intellectual without completely succeeding.

3.7 Arch-, ex- and vice-

These three prefixes may be marginally iterative, but I include them here as candidates for consideration. Arch-, meaning 'principle', attaches to nouns referring to people occupying an important social or psychological role. If I have a number of archenemies, would my principle archenemy be my arch-archenemy? Ex-, meaning 'former,' attached to nouns and adjectives, refers to people and things denoting a position or role that can be changed. Jimmy Carter is an ex-president. If he were re-elected as president, would he then be an ex-ex-president? Vice-, meaning 'next in rank' can precede nouns referring to titles or positions. If the vice-principal of a school has a potential replacement, would that person be a vice-vice-principal? I suggest that these are possible words in English, and if they are rejected, it is for pragmatic and stylistic reasons.

3.8 Other Prefixes

A few more morphemes could be included here: mid-, quasi-, proto-, and semi-, although these are not all treated as prefixes by standard lexicographers. However, the kinds of bases and appropriate contexts can be found in which they can be used iteratively. Semi-semi-X, however, is likely to be lexicalized differently, just as half of a half is lexicalized by a quarter.

4. Combinations of Prefixes

We have seen that the prefixes discussed can be iterative, and they can also be combined, provided that they can attach to the same stem. (Often the semantics will prevent this.) But among the possibilities are the following:

(7) pro-anti-government = pro-
anti-pro-government = anti-
anti-counter-espionage = counter-
pseudo-anti-intellectual = anti-
anti-pseudo-intellectual = pseudo-
ex-vice-president = ex-
ex-pseudo-anti-intellectual = p faux-
In fact, it appears that these prefixes can appear in any order, and the interpretation is quite straightforward: the scope will correspond to the order of the prefixes, with the outermost one taking scope over everything to its right. (Except, see note 2.)

To return to meta-, although it is easier to construct examples where meta- is next to the stem, as in mini-metalanguage or pseudo-metarule, it is possible to place meta- outside of another prefix. The difficulty lies in the fact that meta- attaches to a semantically restricted class of base. Consider a different meaning of anti- from the senses discussed above. This sense appears in words like anti-hero or antinovel, where its meaning denotes something nonconventional or something that diverges significantly from a prototype. Since antinovel is a semantically possible base for meta-, since it refers to an intentional object, we can construct meta-antinovel, which means 'a novel about an antinovel'.

Similarly we can combine mini- and meta- in either order. A minimetalanguage is of course 'a small metalanguage', but I think we can have a meta-minilanguage as well, which would mean 'a language about a minilanguage'.

Combining scalar prefixes, like super- and sub- can create ambiguities. For example, supersubintelligent could be interpreted as 'remarkably stupid', where super- acts as an intensifier of subintelligent, as well as 'above subintelligent'.

4.1 Bracketing Paradoxes

In models of word building, where all affixation takes place before compounding, there are bracketing paradoxes with words like clinical-psychologist. The suffix -ist is added before the compound is formed, but the meaning is 'one who does clinical psychology', not 'a psychologist who is clinical'.

Exactly the same situation arises with prefixes. Anti-animal rights is 'being against animal rights', not the 'rights of anti-animals'. Of course, in a word-building model that allows compounding before (as well as after) affixation, such as that of Scalise (1984), there is no paradox. See Carstairs-McCarthy (1992: 94ff) for various proposals.

The semantics of combinations of suffixes and prefixes shows considerable variability. Thus, in anti-STEM-ism, the stem can be construed either with the prefix or with the suffix. Thus anti-racism is 'being opposed to racism', while anti-Americanism is 'the ideology of being anti-American'. Anti-liberalism can be either 'being against a liberal ideology' or as 'the ideology of being anti-liberal'. Anti-meta-psychologist can be interpreted as 'being against a person who does meta-psychology'. Thus I propose the following scopal relationships as the most likely interpretations:
(8) anti-[rac-ism]
   [anti-American]-ism
   anti-[liberalism] or [anti-liberal]-ism³
   anti-[[meta-psychology]-ist]

No doubt, other construals are possible as well.

5. Germanic Prefixes

The prefixes discussed above are of Latinate origin, but English also has some of Germanic origin, the most productive of which are in-, out-, up-, down-, under-, and over-. My initial response to this class of prefixes was that (1) they are not iterative, (2) they cannot be combined, and (3) they must occur immediately next to the base. Evidence for the first two points is that a scan of desk dictionaries did not turn up any words that utilized repetition or mixing when their productive meanings were considered. Each Germanic prefix is used in many lexicalized forms, of course, and although originally their meaning was (and still is) in spatial domains, one of the most productive meanings of over- and under- is 'too much' and 'too little' respectively, and one productive meaning of out- is 'surpass'.

Consider first the possibility of recursion. If a person is underweight and we wanted to emphasize the extent of being much too underweight, we can describe that person as underunderweight. An excessive overachiever could be described as an overoverachiever. If someone outperforms to a surpassable extent, we can say that she outoutperforms.

To turn to mixing, imagine a person who is supposed to be overdressed but who does not reach that degree of overdress. We might describe that person as underoverdressed. If someone outperforms other individuals to an excessive degree, we would describe him as overoutperforming. Or if a person is too inhibited, perhaps a good characterization would be overuptight. Selkirk (1982) gives outundersell, overbacktrack, and outovereat as words with two prepositional prefixes.

Finally, there is the question of whether the German prefixes must appear directly next to the base. They certainly can be outside of a Latinate prefix when it is semantically opaque or when the prefix plus stem is fully lexicalized, as in overindulgent, where in- must be considered an integral part of the base. But finding novel constructions is difficult, partly because the various prefixes attach to different bases.
5.1 Re-, Mis-, and Un-

Re- ‘again’ is found largely with verbs. With intransitives, it refers to performing an activity or event again. But with transitive verbs, the activity or event must result in a potentially different outcome (see Marchand 1966:139). Mis- ‘wrongly’ or ‘badly’\(^4\) can be prefixed to deverbal nouns and to verbs denoting states, activities, and events.

Mis- and re- have been discussed in Pesetsky (1985), and both can attach to verbs (and verbal derivatives) in either order. Thus we can get misreattach and remisattach, with the expected interpretation of the outermost morpheme taking scope over everything to the right.

Re- and mis- are generally considered to be noniterative, although some consultants accept sentences with multiple instances. If a student rewrites a paper but the teacher is still not satisfied, the teacher might tell the student to re-rewrite the paper. Or imagine a play in which an actor is supposed to mispronounce words, but he does not mispronounce them the way the director wants. The director might complain that the actor is mis-mispronouncing his lines. Although these expressions are intelligible, they might be rejected for stylistic reasons, such as a preference for not iterating morphemes.

How do re- and mis- interact with the Latinate prefixes? First of all we must find syntactic and semantic contexts which are possible for all the prefixes involved. We have seen that mis- and re- attach to verbs, and of the prefixes discussed above, retro- and counter- also attach to verbs, although the semantic constraints differ a bit. Mis- and re- are best with activities, whereas counter is best with events. But the following seem acceptable to me:

\[
\begin{align*}
(9) \quad \text{miscounterattack} & \rightarrow \text{recounterattack} \\
\text{miscoutersign} & \rightarrow \text{recountersign} \\
\text{miscounterfire} & \rightarrow \text{reretrocede} \\
\text{misretrofire} & \rightarrow \text{reretrogress}
\end{align*}
\]

In these examples, the scope is straight-forward: the outermost prefix takes scope over the material to the right.

Pre- can also be attached to verbal bases, and one can construct words like mispreassign, repreassign, and prereassign. Premisassign is also possible, but it requires an elaborate story to make sense of it.

The prefix un-, attached to bases denoting reversible states, has been much studied (see Zimmer 1964; Horn 1989 and references therein), and it has some puzzling syntactic and semantic restrictions. It is not iterative, even though multiple instances of not are possible; it cannot attach to any other negative prefix, such as mis-, dis-, or in-, but it also does not attach to common adjectives that
have negative connotations, such as *sad and *bad. Therefore, *unsad and *unbad are unacceptable.

6. Keyser and Roeper: Constraints on Combinations

A recent paper by Keyser and Roeper (1992) notes that the prefix re- is in complementary distribution with several other items: internal datives, particles (in verb-particle lexemes), and post-verb nouns and adjectives in idioms. For example, we can say She read me the book and She reread the book, but not *She reread me the book. Or He refilled his cup is acceptable, as is He filled up his cup, but *He refilled up his cup is ungrammatical.

Keyser and Roeper suggest that other prefixes, for example, un-, may also belong to this class of things in complementary distribution. To account for this distribution, they establish a clitic position for verbs that can be filled by only one constituent, either by re- or un- or an internal dative or a verb-particle or an idiom chunk. However, a word like unrefaxable seems to be rather unremarkable. Moreover, when prefixing un- and re- to verbs, the constraints are due to semantic and pragmatic factors. Un- is used to reverse a state, whereas re- is used to restore a state or repeat a process, thus the two prefixes are in pragmatic opposition to each other.

As for the other prefixes discussed in this paper, they can occur together as we have seen, and therefore, they cannot be included in this clitic position postulated by Keyser & Roeper. As mentioned above, a semantic restriction on un-explains why it cannot go with mis-, since it does not attach to words with other negative prefixes.

Keyser and Roeper's analysis predict that there should be no recursion with re-, nor should there be recursion with Germanic prefixes. Also according to their analysis, there should not be any words with multiple occurrences of Germanic prefixes. We have seen that such examples are marginal, but some consultants are willing to accept them. Keyser and Roeper's claim that the explanation is syntactic might be correct, but until semantic and/or pragmatic based analyses are tried, we cannot rule out alternatives to syntactic explanations.

7. Summary and Conclusion

In this work on English prefixes, we have seen that many English prefixes have semantic properties like those of full lexemes. They have a range of related senses, and if we look at the semantics, we observe that they have something like 'selection restrictions', that is, their felicitous use requires looking at the semantic properties of the base, not just at the syntactic category. Moreover, we have seen that these affixes may be used iteratively, and they may be combined. I have ar-
gued that many limitations on recursion and combination of word-formation processes should be explained in terms of pragmatic and processing factors, as well as of the semantics of the affix and base. Thus this sample of affixes would tend to support the position of Baker and Lieber, that affixes are similar to lexemes. In fact, some of these prefixes are also adverbs, adjectives, or prepositions. However, since I have purposely chosen prefixes with this kind of semantic coherence, it is not fair to generalize to all affixes.

However, Beard’s claim that the kinds of meanings expressed by affixes is limited is also confirmed in this sample. The meanings are those that denote spatial, temporal, or quantificational notions.

Finally, the proposal by Keyser and Roeper was discussed, that sentences with re-, un-, and possibly other prefixes are in complementary distribution with each other as well as with internal datives and certain idiom chunks. Most of the prefixes that I have discussed do not fit into that class, and moreover, I have argued that semantic and pragmatic explanations should not be ruled out in advance.

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Notes
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1 Dressler & Merlini Barbaresi (1994) note that Italian diminutives als have these properties.
2 Ferenc Kiefer (p.c.) has pointed out that anti- and pro-, when used iteratively, also have an intensifying sense, so that anti-anti- and pro-pro- can mean ‘very anti’ and ‘very pro’, respectively.
3 The difference in meaning is subtle, but I think real. An anti-liberalist may have no ideology of her own; she may be opposed to all ideologies, for example.
4 Mis- is of Germanic origin, meaning ‘wrongly’, but it has become merged with Old French mé(s)- ‘bad’.
5 For example, French speakers are willing to accept rerelire as a possible word. This suggests a language-specific constraint.
6 Others are clippings; for example, mini is a clipping of miniskirt, but this is a different phenomenon.

References