Phonological Features of *in-, un-* and *non-*

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Abstract. This paper aims at the investigation of the linguistic features of English negative prefixes, *in-, un-* and *non-* from the viewpoint of phonology. It can be said that phonological features in the English negative prefixes are of importance in order to analyze other linguistic properties. Generally speaking, phonology is the foundation for other branches of linguistics, for the phoneme which is a minimal unit to distinguish one sound from another connects with each other to produce the morpheme which is the minimal distinctive unit of morphological grammar. Based on the descriptions of other linguists, this paper focuses on two phonological aspects of assimilation and stress shift of the prefixes, and shows some distinctive or similar features of the prefixes.

Keywords: Phonological, Negative Prefixes, Morpheme

1. Introduction

We know that English has many different negative prefixes such as *in-, un-* and *non-* in Present-day English. In order to make the differences of these different prefixes clear, it is necessary to investigate the linguistic features from the viewpoints of phonology, because as seen in the descriptions of Tazaki (1993), what lies in the center of language study is phonetics and phonology, which are well-studied areas in linguistics. Phonological analysis of the three prefixes in question is inevitable for us to recognize the distinctive features.

As Selkirk (1982) points out, English affixes have long been analyzed with respect to their phonological properties. Chomsky and Halle (1968), Siegel (1974), and Allen (1978b) are the main scholars for investigating the prefixes. The first two scholars show the detailed phonological properties of English affixes, dividing them into *non-neutral* and *neutral* affixes[1]. The two classes of English affixes Class 1 (C1) and Class 2 (C2) which Siegel gives correspond to non-neutral and neutral affixes. The words categorized in C1 show us unique properties, whereas special properties cannot be found in C2 words. In this paper, certain phonological features of the three prefixes will be presented from a viewpoint of assimilation and stress shift.

2. Assimilation

2.1. *In-*

Assimilation is a phonological change caused by a following consonant. As far as prefixation is concerned, the final sound of a prefix becomes more like the first sound of a root, if the articulation of the two sounds is quite close. This assimilation, however, does not always occur although two sequential sounds are under a phonological environment for assimilation. First, the phonological environment of assimilation of *in-* will be shown below.

Among these three prefixes, *in-* has conspicuously different assimilation behavior from the other two. This prefix assimilates to /im/ before bilabials /p/, /b/ and /m/, to /il/ before alveolar /l/, and to /ir/ before alveolar /r/, and these are reflected in the spellings *im-, il-* and *ir-* respectively. There are some examples below.

(1) Bilabial Stop /p/, /b/

/p/ *in- + possible → impossible, in- + polite → impolite*

/b/ *in- + balance → imbalance, in- + becile → imbecile*

(2) Bilabial Nasal /m/

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in- + *moral* → *immoral*, *in-* + *morta l* → *immortal*

(3) Alveolar Lateral Liquid /l/

in- + *legible* → *illegible*, *in-* + *licit* → *illicit*

(4) Alveolar Retroflex Liquid /r/

in- + *rational* → *irrational*, *in-* + *relevant* → *irrelevant*

Concerning assimilation processes and allomorphs, Lieber (2010) points out as follows.

Phonologists assume that native speakers of a language have a single basic mental representation for each morpheme. Regular allomorphs are derived from the underlying representation using phonological rules.

(Lieber, 2010: 159)

Let us take *in-* as an example. The negative prefix *in-* is pronounced /in/ both before alveolar-initial bases such as *decent* and before vowel-initial bases *alienable*, whereas the other allomorphs are only pronounced before certain consonant-initial bases. This is why phonologists assume that our mental representation of *in-* is /in/ rather than /ir/, /il/ or /iŋ/, and the underlying form of a morpheme is the form that has the widest surface distribution[2]. The negative prefix *in-* is assimilated to the following sound of the bases they are attached to. Lieber defines these types of assimilation as follows.

Nasal assimilation: a nasal consonant assimilates to the point of articulation of a following consonant, and to the point and manner of articulation of the consonant if it is a liquid.

(Lieber, 2010: 160)

In short, when the underlying form as in *in-* is attached to a base beginning with anything other than a vowel or alveolar consonant, correct allomorphs as in *il-*, *im-*, *ir-* are derived based on this phonological rule[3]. As Carney (1994) points out that many words assimilate to the following first sound of the roots.

As a matter of fact, the prepositional prefix *in-* meaning 'in' or 'into' also gives rise to assimilation as in *illumine* or *immerse* because of the same phonological environment as the negative *in-*. If the assimilation process applies with every *in-* words, the following will apply.

(5) English prefix *in-* (meaning both 'not' and 'in' or 'into') + word → derived word

↑

Assimilation Rule

In other words, all cases of *in-* prefixes assimilate to the first consonant of roots under the phonological environment for assimilation.

On that point, we can find, however, that the prefixes do not always assimilate to the following first sound of roots if the roots are of native origin. None of the words below leads to assimilation.

(6) *inboard, inborn, inbound, inbreed, inlay, inland, inlet, inmate, input, inroad*

The prepositional prefix *in-* does not assimilate to the roots, all of which are of native origin. The words above, therefore, are traced through the following derivational process.

(7) *in-* (meaning 'in' or 'into') + word (native origin) → derived word

(Assimilation Rule is not applied.)

Comparing (5) and applying Carney's analysis with (7), one difference will be found about prepositional *in-* prefixation. In most cases, the occurrence of assimilation with prepositional *in-* is restricted to prefixation to roots of Latin or French origin (it is true that most of the words in (6) originated in Latin or French), whereas the negative *in-* assimilates even to roots of English origin. This leads linguists (Quirk, et al. 1972) to say that the negative *in-* is not productive any more, and that it is rare for a prefix to be attached to English words in order to create new words.

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[2] It seems that this notation is slightly simplified but it is good enough for this paper.
[3] Lieber admits that this rule is slightly simplified, and phonologists usually use different forms of notation to express the rule in a more succinct fashion.

As has been pointed out, English has two types of prefix *in-*. When the prepositional meaning of *in-* occurs within English, the assimilation process is not applied to derived words. On the other hand, *in-* with a negative meaning is usually not added to Germanic words but to Latin words, where the assimilation rule is applied.

2.2. *Un-* and *non-*

While *in-* shows a conspicuous tendency for assimilation, the other negative prefixes *un-* and *non-* do not change as shown by the examples below.

(8)   *un- + polluted → unpolluted* (**umpolluted*)

   non- + personal → non-personal (**nom-personal*)

   un- + balanced → unbalanced (**umbalanced*)

   non- + business → non-business (**nom-business*)

(9)   *un- + marked → unmarked* (**ummarked*)

   non- +medical → non-medical (**nom-medical*)

(10) *un- + lawful → unlawful* (**ullawful*)

   non- + legal → non-legal (**nol-legal*)

(11) *un- + reasonable → unreasonable* (**urreasonable*)

   non- + restrictive → non-restrictive (**nor-restrictive*)

If *in-* could be attached to all the words above instead of *un-* and *non-*, assimilation would be expected to take place. As Siegel and Allen describe, *un-* and *non-* are categorized as C2 where no phonological influence is applied to the derived words.

However, there is one thing to note which affects *un-* prefixation. The assimilation processes which have been illustrated so far are reflected in the spelling of the derived words, as in *impossible* (*in- + possible*). However, there is also assimilation in which the derived words do not reveal the assimilation in their spellings. Allen's paper illustrates this with examples of *in-* and *un-* prefixation to the words, *gratitude* and *grateful*.

(12) *ungrateful*   **uŋgrateful*   *?*ingratitude*   *ingratitude*

   [ʌnˈgreɪtfʊl]   [ʌŋˈgreɪtfʊl]   [ɪnˈgratɪtjuːd]   [ɪŋˈratɪtjuːd]

(Allen, 1978b: 15)

Since *un-* is included in C2 family, the assimilation process does not influence *un-* prefixation as in example (8) to (11). As to the last two words in example (12), *ingratitude* is acceptable as an English word, whereby nasal assimilation takes place between 'n' of *in-* and 'g' of *gratitude* in pronunciation /ŋ/. On the other hand, *?*ingratitude* is difficult to be acceptable as an English word, if assimilation does not take place between the prefix and *gratitude*. This is precisely the same phonological environment as *un-* prefixation to *grateful*, which is completely accepted as an English word. This is because *un-* prefixation prohibits assimilation from happening between the '-n' of *un-* and the /g/ sound of *grateful*. The problem is the unacceptable item **uŋgrateful*, in which nasal assimilation /ŋ/ takes place. If the occurrence of assimilation is allowed with *un-* prefixation, then *un-* could no longer be considered a member of C2 affixes any more. On that point, Carney (1994) argues that "there is free variation between /n/ and /ŋ/ in prefixes ending in 'n'". That is, the occurrence of this type of assimilation depends on people, region, or situation, etc, and it is impossible to give a definition that *un-* does not assimilate to the neighboring sound. For nasal assimilation, I will support Carney's statement, because the way of pronunciation varies among people. Moreover, there are many words in which the connection of *-n-* and *-g-* appears, for example, *length*, *sunglasses*, etc. The combination of *-ng-* can be pronounced either as /ng/ or /ŋg/, both of which are acceptable in English (it seems that /ŋg/ is rather usual pronunciation). Allen's argument in assimilation of *un-* prefixation is not deniable, but it is fair to consider that /ŋg/ occurs as a free variant on a phonetic level but not on a phonological process. Therefore, *ungrateful* and *ingratitude* may be acceptable as correct English words.

3. Stress Shift

Before describing stress shift, it is necessary to demonstrate the stress patterns shown by adding *in-*, *un-* and *non-*. According to Allen, the prefixes on which stress falls are *in-* and *non-*. While primary stress falls on *in-*, secondary stress is given to *non-*. These types of stress patterns are not found in *un-*. Allen provides the following examples.

(13) *ímpious, ímpotent, ínfinite, ínnocent, indolent*

(14) *un ármed, unden íable, unp ópular, unm úsical, unw éarable*

(15) *n òn-adj ústed, n òn-Am érican, n òn-auth éntic, n òn-Chr ístian, n òn-úsed*

<div align="right">(Allen, 1978b: 16, 73)</div>

Both the stress patterns of the three prefixes are, in fact, more variable than this; the stress pattern of each prefix may be primary stress on one occasion, and secondary stress on another. For example, primary stress does not fall on *in-* in the word *impossible*, although the phonological environment of *in-* prefixation to *possible* is the same as *impious*. Similarly while Allen states that *un-* never takes primary or secondary stress on itself, there are, however, some words in which secondary stress falls on *un-*. We can recognize that many *un-* words take secondary stress on the prefix *un-*, for example, *ìnadv ísable, ìndem ónstrative, ìnpoll úted*, etc. The stress pattern of *un-* is described in detail in Jespersen (1954a), where weak stress is regarded as the exception. The weak stress pattern of *un-* takes place in some of the most common words such as *unc ómmon, unh áppy, unk índ, unn átural*, etc. The other stress patterns occur under certain phonological environments which Jespersen describes for *un-* as follows.

(16) Even stress pattern; when a word following *un-* begins with a strong stress or a weak stress before a strong one; *ún áided, únj úst, únm úsical*, etc; *únab áshed, únimp órtant, únprod úctive*, etc.

(17) Full stress pattern; when a word has secondary stress on the second syllable, or a word has secondary stress on the first and full stress on a later syllable; *únconv èntion ális, únden òmin átional, únint èlligib ílity*, etc; *únc òmplim éntary, úns èntim éntal, únsỳmpath étic*, etc.

<div align="right">(Jespersen, 1954a: 464-65)</div>

As Jespersen himself points out about example (16), *un-* takes secondary stress in a word such as *ìnad últerated*. Whether *un-* takes even stress or secondary stress, Jespersen's analysis stands opposed to Allen's.

The stress pattern of *non-* is also described slightly differently by Allen and Jespersen. *Non-* does not take primary stress according to Allen, while Jespersen cites the derived word, *nonentity*, as containing *non-* with primary stress. For *in-*, Allen provides examples of the derived words in which primary stress falls on *in-* in order to distinguish this affix clearly from *un-* and *non-*. However, there are, in fact, a number of derived words in which *in-* is unstressed or has secondary stress.

(18) Words in which *in-* is unstressed

imm édiate, imm énse, inc éssant, ind ífferent, inv ísible, etc.

(19) Words in which *in-* takes secondary stress

ìlleg ális, ìmpert úrbable, ìndescr íbable, ìnexh áustible, ìrred éemable, etc.

<div align="right">(Jespersen, 1954a: 473)</div>

Each linguist has slightly different views of the stress behavior of *in-*, *un-* and *non-*. As seen in the previous section, there seems to be some free variation in English use, which leads linguists to different descriptions. Generally speaking, all the three prefixes usually take weak or secondary stress, and it is an exceptional pattern to take primary stress.

Here, my description turns to stress shift. Since *in-*, *un-* and *non-* do not take primary stress in general, the words in example (13) given by Allen are exceptional derived words. Before *in-* prefixation, each word has its own primary stress, e.g. *p íous, p átent, f ínite*. However, *in-* prefixation results in stress shift: a movement of primary stress from the root (*p íous*) to *in-* itself (*ímpious*). As a result, the pronunciation of the root *pious* [p áiəs] changes to *impious* [ímpiəs][4]. This type of stress behavior is not found in *un-* and *non-*.

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[4] Some dictionaries show the other pronunciation of *impious* like [imp áiəs].

The position of primary stress is preserved in *un-* / *non-* derived words as in examples (14) and (15). Therefore, just as *in-* shows unique property in assimilation, so that it also shows special characteristics as regards stress shift.

However, the stress which *non-* carries must be paid attention to carefully, since it is undoubtedly similar to that of the initial lexical elements of many compound words. Comparing this with the *un-* words, Allen shows the examples of the stress pattern of *non-* as follows.

(20) *Un-*; single primary stress   *Non-*; double stress

     unwéarable   nòn-wéarable

     unpollúted   nòn-pollúted

     unfíxed   nòn-fixed

     unrevolútionary   nòn-revolútionary

<div align="right">(Allen, 1978b: 4)</div>

As to the examples above, it is obvious that the primary stress falls on the first element as well as on the second one in derived words prefixed with *non-*. It seems that this pattern is almost similar to compound words as in *chérry brándy* or *ólive óil*[5]. It is true that *non-* is definitely now an English prefix, but the stress pattern is not similar to that of *un-* words but of compound words[6]. In order to handle the problem of Class division with regard to *non-* and compound words, Allen suggests that they should be categorized in Class 3 apart from *un-*. This dissertation will not deal with this position taken by Allen about the classification of *non-*.

As for the stress pattern of the three negative prefixes, Namiki (1994) shows examples in which the secondary stress falls on *non-*; they are *nòn-fíxed* and *nòn-pollúted*. Although these examples slightly differ from the ones given by Allen, who suggests that *non-* itself has the primary stress in the derivatives, it is certain that *non-* has its own stress and does not have an influence on the stress of roots. It is true that *in-* often carries primary stress in its derivatives, but a different feature from the behavior of *non-* is that *in-* can cause the primary stress of some words to move as in *infinite* and *impious*. Furthermore, when stress movement occurs, sound change may also take place in the roots. It is impossible to see these kinds of stress movement and sound change in any *non-* words.

From these phonological behaviors, it will be recognized that the combination of *in-* and roots is the strongest covered here because assimilation and sound change do not occur within the framework of *un-* and *non-* prefixations.

4. Conclusion

In this chapter, the phonological features of *in-*, *un-* and *non-* have been argued from the viewpoint of assimilation and stress shift. From what Siegel points out, the affixes which lead to assimilation and stress shift are categorized as C1. Since *in-* shows the distinctive phonological features among the three prefixes, it is a member of C1 affixes. In fact, *in-* has another phonological feature, which is called 'Deletion'. The second phonetic sound of the variant forms (*im-*, *il-* and *ir-*) caused by assimilation process is deleted as in *immoral* [ɪˈmɒr(ə)l], *illegible* [ɪˈlɛdʒɪb(ə)l], *irrational* [ɪˈraʃ(ə)n(ə)l].

In contrast to *in-* prefixation, the other two prefixes are only placed at the front of the root. For *non-* prefixation, it is often the case that a hyphen is inserted between the prefix and the root. The loose combination of *non-* results in non-occurrence of assimilation and stress shift, and the prefix itself has always its own stress even in derived words, being similar to compound words. *Un-* prefixation has not as strong connection with roots as *in-* prefixation, and does not lead to assimilation and stress shift. Since *non-* can attach to compound words (e.g. *non-baseball player*), the stress behavior is similar to that of other words. As for *un-* prefixation to compound words, different statements arise among some scholars; *un-* prefixation to compound words is not allowed in Allen's model, while Selkirk allows it to occur (e.g. *un-forward-looking*).

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[5] The stress patterns of compound words are described well in Oishi (1994).

[6] Allen (1978a) says that 'appropriate information must be available in some form to the stress rules so that words derived in *un-* and in *non-* are not assigned identical stress patterns.'

These different description results from the uncertainty of the stress behavior of *un-*; in Allen's model, *un-* has no stress, while, in Selkirk's model, *un-* has secondary stress. Therefore, *in-* has the strongest connection with roots. While *non-* connects with roots most loosely, *un-* is positioned between *in-* and *non-*.

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