Using Corpora for the Study of Word-Formation: A Case Study in English Negative Prefixation*

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Kwon, Heok-Seung. 2001. **Using Corpora for the Study of Word-Formation: A Case Study in English Negative Prefixation.** *Korean Journal of English Language and Linguistics* 1-3, 369-386. This paper will show that traditional approaches to the derivation of different negative words have been of an essentially hypothetical nature, based on either linguists' intuitions or rather scant evidence, and that native-speaker dictionary entries show *meaning potentials* (rather than *meanings*) which are in fact linguistic and cognitive prototypes. The purpose of this paper is to demonstrate that using a large corpus of natural language can provide better answers to questions about word-formation (i.e., with particular reference to negative prefixation) than any other source of information.

1. Introduction

The existence of different negative prefixes (*a-*, *dis-*, *in-*, *non-*, *un-*) in English poses potential problems for the study of word-formation as well as for teaching and learning. Much has already been written on negative prefixation, both by traditional linguists and, from the generative perspective, by Chomskyan linguists. Earlier works on this subject include Jespersen (1917), Seale (1960), Zimmer (1964), Marchand (1969), Funk (1971), Quirk

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et al. (1985), Horn (1989), etc.

Many linguists, however, have either resorted to the information contained in dictionary entries, which by itself has often proved to be unreliable, or have depended on a few selected examples in order to validate pre-existing theories. Some of these linguists were also concerned with competence rather than performance. By contrast, corpus linguists today ask a different kind of question. They are concerned with performance rather than competence, and they are concerned with norms rather than possibilities.

As regards negative prefixation, many traditional approaches have been restricted to the semantic distinction between the individual negative prefixes, at the level of the word, from a semi-intuitive point of view. In real language use, however, words do not seem to remain independent in their patterning. Collocation, which is defined by Sinclair (1991:170) as "the occurrence of words within a short space[1)] of each other in a text," could provide useful clues to various patterns of lexical variation in negative prefixation. The basic assumption of this study is that not only the individual elements of the word but also the context within which it is used are involved in lexical variation.

The aim of the paper is to provide an overview of the studies in negative prefixation and to give some idea of the scope for language teaching, learning, and analysis that large language corpora (e.g., The Bank of English and the British National Corpus) can offer. This paper compares the results of previous studies with those obtained from authentic corpus texts, and describes the similarities and differences between these different sources of information. It also provides insights into the nature and extent of negative prefixation with particular reference to

[1]According to Sinclair (1991:170), the usual measure of proximity is a maximum of four words intervening.

multiple negative derivatives in present-day English.

2. Traditional Approaches

2.1. The Notions of 'contradictory' and 'contrary'

In many earlier discussions of negative prefixation, the two notions 'contradictory' and 'contrary' have played an important role in explaining the distinction between different negative derivatives. The distinction originally dates back to the Greek philosophers, but we shall restrict ourselves to looking at the contrast between the two terms described by Jespersen (1924: 322):

> Logicians distinguish between *contradictory* terms, such as *white* and *non-white*, *rich* and *non-rich*, and *contrary* terms, such as *white* and *black*, *rich* and *poor*. Two contradictory terms together comprise everything in existence, as any middle term is excluded, while two contrary terms admit one or more middle terms. For contradictory terms language generally employs either derivatives like *unhappy*, *impossible*, *disorder* or composite expressions containing the adverb *not*.

Not all words in opposite relations to each other are naturally divided into the two categories. There are words which do not fall under the classification of the opposition between the two terms. For example, Funk (1971:369) classifies some words such as *inadequate*, *inappropriate*, *infertile*, *immature* and *irrelevant*, into the class of 'opposites' which are contradictory in meaning but often imply a contrary sense *in-*, *un-*, and *non-*, as used by Jespersen (1917), Zimmer (1964), Marchand (1969), Funk (1971) and Horn (1989).

2.2. General Rules for the *in-/un-* Distinction

The *Oxford English Dictionary* regards the use of the negative prefixes *in-* or *un-* during the 15th, 16th and 17th centuries as 'largely a matter of choice.'[2] More recently, some sort of general principles for distinguishing between *in-* and *un-* prefixation have been formulated by 20th-century linguists. These rules were meant to be sometimes applicable to the whole range of words and sometimes to some particular examples. They are shown in Table 1 below:

<Table 1> General rules for the *in-/un-* variation

Source	Description
Jespersen (1917)	Pretty often *un-* is preferred before the shorter word, and *in-* before the longer word derived from it, which is generally also of a more learned nature (1917:139). *Un-* is preferred where the word has a distinctly native ending (1917:140).
Fowler (1926, 1965, 1996)	It is a general truth that, while it is legitimate to prefix *un-*, but not *in-*, to any adjective of whatever form, those negative adjectives in *in-* that exist are normally preferred to the corresponding *un-* forms; but when an *in-* (or *il-* or *im-* or *ir-*) adjective has developed a sense that is something more than the negation of the positive adjective, an *un-* form is often used to discharge that function without risk of ambiguity; *immoral* having come to mean 'offending against morality or wicked' *unmoral* is called in to mean 'not moral or outside the sphere of morality'; others are *ir, & un, -religious; in & un, -human; in & un, -artistic; in & un, -artificial; in & un, -sanitary; inept & unapt; insoluble & unsolvable; im, & un, -material.*

[2]For a detailed description of negative prefixation during the Early Modern English period, see Kwon (1997).

Marchand (1969:170)	Generally speaking, the difference between *in-* and *un-* is that the latter is the regular negative prefix with adjectives belonging to the common vocabulary of the language, and accordingly stresses more strongly the derivative character of the negatived adjective. The prefix *in-*, however, can only claim a restricted sphere; it forms learned, chiefly scientific words, and therefore has derivative value with those speakers only who are acquainted with Latin and French. ...*impractical* (termed 'rare' in the OED) is the common American word for British English *unpractical*. ...AE *unmoral* (the word does not seem to exist in British English) merely means 'not moral, non-moral,' whereas *immoral* is more or less an equivalent of *licentious*.
Funk (1971: 376-377)	The majority of alternative derivations by the prefixes *in-* and *un-* are pairs of equal semantic structure, called into existence apparently by a shift of productivities (1971:376). The *in-* derivative has a broader variety of meanings with stems like *-artistic* and *-essential*, the *un-* derivative with *-declinable* (*indeclinable* only refers to grammar) and *-measurable*. Two different lexical meanings are denoted, in present-day usage, by *inartificial* 'rude, clumsy' and *unartificial* 'natural.' Similarly, *unhuman* is contradictory to *human* while *inhuman* forms the contrary opposite to *humane* (derivatives of *humane* having become obsolete).
Quirk et al. (1985:1540)	IN- 'not,' 'the converse of,' combines with adjectives of French and Latin origin, and is less common than *un-*; e.g., *incomplete*. cf. also the noun *inattention*... Of these prefixes, *un-* is by far the most productive, and it typically involves less lexicalization than the other prefixes. With adjectives, *un-* can usually replace *in-* or *dis-* for *ad hoc* use, but with semantic consequences. Thus *unrepairable*, *unreplaceable*, *unmovable*, etc. are more absolute and more literally related to the respective bases than *irreparable*, *irreplaceable*, *immovable*, etc.

In the entry for the negative prefix *un-*, the *OED* states that in some cases semantic changes in the original function of the negative prefix *in-* led to the creation of a new form with the negative prefix *un-*. Fowler (1926:674) provides similar explanations

for the co-existence of *in-/un-* pairs. We can see that almost all statements given in Table 1 suggest the productive nature of the prefix *un-* and the existence of a semantic distinction between *in-* and *un-* forms.

2.3. Multiple Negative Derivatives

In addition to the *in-/un-* distinction, there are also larger word sets of negative derivatives (i.e., triplets or quartets) which exhibit multiple variation. Linguists have made attempts to establish a pattern for negative prefixation based on the semantic distinction of relatively small sets of words. Table 2 is a brief summary of linguists' explanations for multiple negative derivatives.

<Table 2> Linguists' explanations of the semantic distinction between negative derivatives

Source	Negative derivatives	Description
Jespersen (1917)	amoral, immoral, unmoral	While *immoral* means the opposite of *moral*, ...a term implying having nothing to do with morality, standing outside the sphere of morality ...is 'sometimes expressed by *amoral*, ...sometimes by *unmoral*.'
Zimmer (1964)	amoral, immoral, nonmoral, unmoral	An interesting set of forms is constituted by *amoral*, *immoral*, *nonmoral*, and *unmoral*, where *immoral* is the contrary opposite of moral on the dimension of morality, but where the precise differences, if any, between *amoral*, *nonmoral*, and *unmoral* are not very clear.

Funk (1971)	essential (in-, un-, non-) human (in-, un-, non-) mechanical (un-, non-, a-) moral (in-, un-, non-) political (in-, un-, non-) religious (in-, un-, non-) sensitive (in-, un-, non-) social (dis-, un-, non-, a-)			The position of extreme evaluative contrary is kept by the prefix *in-*, sometimes approaching the meaning of *anti-* and often implying a great deal of depreciation. Extremely neutral and purely contradictory negation is denoted, as usual, by *non-*, whose derivatives generally indicate that the respective category appears to be simply irrelevant. Between these extremes, the *un*-derivatives take a middle position by frequently denoting a person's lack of interest or of some ability or future (i.e., less positive than the *in*-derivative but still evaluative).
Horn (1989)	inhuman immoral irreligious impious	unhuman unmoral unreligious unpious	nonhuman nonmoral nonreligious nonpious	The derived forms become gradually more descriptive and contradictory as we move from left to right.

The negative prefix *non-* has been added to Jespersen's binary contrast between *immoral* and *amoral/unmoral* to form a three- or sometimes four-way distinction. In this context, it is worth noting the view expressed by Horn (1989:281) that 'the post-Jespersenian ear might detect a more fully neutral and contradictory negative adjective formed with the fully productive *non-*, *...nonmoral* (or *amoral*).' He lists three more sets of examples and provides a gradability test as the source of evidence for this distinction. He predicts that '*in-* and (usually) *un-* adjectives can be inserted into the scalar frame *X was {somewhat/rather/extremely/very/awfully/downright} ADJ*, while the nonscalar *non-* forms cannot occur in that frame.'

The explanations given in Table 2 above provide a basis for a preliminary survey of the subject matter of this paper. A close

examination of these explanations leads to the general assumption that theoretical explanations tend to be of an essentially hypothetical nature. There seems to be no independent test of their truth. This paper examines negative prefixation on the basis of empirical evidence, and compares the results obtained from the analysis of authentic language with those linguists' explanations.

3. Dictionary Information

3.1. Native-speaker Dictionaries

The set of multiple negative derivatives *amoral*, *immoral*, *non-moral* and *unmoral* has been used as one of the typical sets of examples showing the semantic relationship between different negative derivatives. The *Collins English Dictionary* (1991) entries contains the whole set, which would not be available from the type of entries given in learner's dictionaries. Consider the definitions of the quartet given by the *CED*:

amoral *adj.*
1 having no moral quality; nonmoral.
2 without moral standards or principles. **amorality** *n.* **amorally** *adv.*
Usage. *Amoral* is frequently and incorrectly used where *immoral* is meant. In careful usage, however, *immoral* is applied to that which infringes moral rules and *amoral* is only used of that which considerations of morality are irrelevant or of persons who lack any moral code.

immoral *adj.*
1 Transgressing accepted moral rules; corrupt.
2 sexually dissolute; profligate or promiscuous.
3 unscrupulous or unethical: *immoral trading.*
4 tending to corrupt or resulting from corruption: *an immoral film; immoral earnings.*

nonmoral *adj.* not involving or related to morality or ethics; neither moral nor immoral.

unmoral *adj.* outside morality; amoral. **unmorality** *n.* **unmorally** *adv.*

The set of examples above illustrates the thesaurus-like nature of modern comprehensive dictionaries. The definition of *unmoral* gives *amoral* as its synonym, and the definition for sense 1 of *amoral* gives *nonmoral* as its synonym. This generates a circular explanation. However, the usage note given in the entry for the headword *amoral* points out the confusion between *amoral* and *immoral*, and gives a prescriptive account of 'correct' usage.

The ninth edition of the *Concise Oxford Dictionary* (1995) was published in both printed and electronic (CD-ROM) form. This new edition claims to have some basis in a corpus. The Preface to the *COD* states that it has benefited from access to large bodies of corpus and citational evidence, such as the BNC, the *OED* and the OUP's computerized collection of selected citations from its Dictionary Department.

We now look briefly at the treatment in the *COD* of the same set of headwords that has been described in the previous section. Derived words and pronunciation are omitted.

amoral *adj.*
1 not connected with or outside the scope of morality (cf. IMMORAL).
2 having no moral principles.
immoral *adj.*
1 not conforming to accepted standards of morality (cf. AMORAL).
2 morally wrong (esp. in sexual matters).
3 depraved, dissolute.
non-moral *adj.*
not concerned with morality.
unmoral *adj.*
not concerned with morality (cf. IMMORAL).

In the definitions of *amoral* and *immoral*, different senses of each word are distinguished from each other. The first part of the definition text of sense 1 of *amoral* is used primarily to define both *non-moral* and *unmoral*. These three words are defined as synonyms of each other, in a way not unlike the treatment of

the *CED*.

As can be seen from these samples, the two modern native-speaker dictionaries reproduce all four negative derivatives from the stem *moral*, and supply almost the same information about them. It seems likely that the *OED* definitions have been used as the basis for the information contained in both the *CED* and the *COD*.

3.2. Learner's Dictionaries

Unlike the native-speaker dictionaries examined in the previous section, the three learner's dictionaries provide entries for the headwords *amoral* and *immoral*, but not for *non-moral* and *unmoral*. The entries of the three learner's dictionaries in Table 3 have been reproduced without pronunciation details:

<Table 3> Entries for *amoral* and *immoral* in OALD (1995), LAAD (2000) and COBUILD (2001)

Dictionaries	Entries
OALD (1995)	**amoral** *adj.* not based on moral standards; not following any moral rules; *a totally amoral person.* **immoral** *adj.* **1** not following accepted standards of morality(1); bad or wicked: *It's immoral to steal.* **2** not following accepted standards of sexual behaviour; *an immoral young man live on/off.* ***immoral earnings*** (e.g., as a prostitute) *Some people still think it is immoral to have sex before marriage.*
LAAD (2000)	**amoral** *adj.* having no moral standards at all: *an amoral, greedy businessman.* **immoral** *adj.* **1** morally wrong: *Their church believes that dancing is sinful and immoral.* **2** not following accepted standards of sexual behaviour.

COBUILD (2001)	**amoral** If you describe someone as **amoral**, you do not like the way they behave because they do not seem to care whether what they do is right or wrong. *...a society threatened by amoral and often random violence... The film was violent and amoral.*	ADJ-GRADED disapproval ∓moral
	immoral If you describe someone or their behaviour as **immoral**, you believe that their behaviour is morally wrong. *...those who think that birth control and abortion are immoral.*	◆◇◇◇◇ ADJ-GRADED disapproval

Native-speaker dictionaries tend to differentiate between different senses of the word (e.g., four senses of *immoral* in the *CED* and three senses of *immoral* in the *COD*) and the provision of examples usage is extremely limited. In contrast, learner's dictionaries have examples of usage, but provide only the main senses of the word (e.g., two senses of *immoral* in *OALD* and *LAAD*, and one sense of *immoral* in *COBUILD*).

There are some differences between the three learner's dictionaries. *OALD* and *LAAD* seem to adopt similar definition patterns used in native-speaker dictionaries. The distinguishing feature of *COBUILD* is that information about usage is contained in the definitions.

4. Corpus Information

4.1. Investigating the Frequency of Words

Corpus data enables us to see a variety of linguistic aspects. In this section, we shall simply look at the word frequency, which shows whether and how frequently the word in question is used in real language. We shall examine two corpora: the Bank of English[3] (a sample of 323 million words) and the

[3]The Bank of English is a continuously expanding monitor corpus. The analysis in this paper is carried out by using a sample of 323 million words. For more information about the Bank of English, visit the

British National Corpus[4] (100 million words).

The frequencies of occurrence of some *in-/un-* pairs are shown in Table 4 below:

<Table 4> Frequencies of some *in-/un-* pairs

	The Bank of English (323 million words)		British National Corpus (100 milion words)	
	in-	*un-*	*in-*	*un-*
artistic	2	1	6	1
artificial	0	0	0	0
apt	6	0	3	0
material	352	1	130	0
mov(e)able	165	5	68	5
religious	32	1	21	1
repa(i)rable	209	3	54	1
replaceable	195	0	43	0

NB: The number refers to the frequency of the word in each corpus.

Some patterns are obvious. In most cases, *in-* words are much more frequently used than their corresponding *un-* words. In the case of *in-/unartistic*, no semantic distinction is observed in the context between the two words, contrary to the explanation of Fowler (1926:674) given in Table 1 above. There is no instance of the *in-/unartificial* pair in the corpora being examined. In most other pairs, *un-* words are extremely rarely used, and the occasional appearances of *un-* words do not show any different usages from their corresponding *in-* counterparts.

A similar comparison of the semantic distinction made between

website at http://titania.cobuild.collins.co.uk.

[4]The British National Corpus (BNC) consists of a sample collection which aims to represent contemporary British English. It is a balanced corpus in that it attempts to capture the full range of varieties of language use. It is also a mixed corpus, containing both written texts and spoken ones. For more information about the BNC, see Aston and Burnard (1998).

the three negative prefixes *in-*, *non-* and *un-* in Funk (1971) and Horn (1989), described in Table 2 of Section 2 above, also shows a substantial disparity between linguists' explanation and corpus data. The items given by linguists are different from those derived from the two corpora. The frequencies of occurrence of some multiple negative derivatives are shown in Table 5 below:

<Table 5> Frequencies of some multiple negative derivatives

	The Bank of English (323 million words)			British National Corpus (100 milion words)		
	in-	*non-*	*un-*	*in-*	*non-*	*un-*
essential	27	199	7	10	40	1
human	354	127	8	120	94	2
moral	598	1	0	323	1	1
pious	23	0	0	12	0	0
political	0	188	18	0	71	13
religious	32	68	1	21	20	1
sensitive	647	5	0	209	1	0

NB: The number refers to the frequency of the word in each corpus.

Generally, *in-* or *non-* is the most frequent form in each set of multiple negative derivatives. The frequency of one or two forms is zero or very low, which suggests that they rarely occur in real language use.[5] Once again, the patterns identified by the examination of corpus data do not clearly show the semantic relationship made by linguists. In fact, it is impossible to test these relationships where no examples exist in the corpora. However, zero occurrence of some words in large corpora challenges the validity of Horn's description of the set of, for example, *-pious* words, among which *impious* is the only word occurring in the corpora being examined.

[5]According to Sinclair (1991:61), when we have "only one of two occurrences to go on, we cannot distinguish formally between *ad hoc* usages and indications of forthcoming change."

4.2. Analyzing the Use of Words in Contexts

In the case of the *a-/immoral* pair, the set of possible derivatives from the stem *moral* has usually been *amoral*, *immoral*, *non-moral*, and *unmoral*, as described in 3.1. The whole set of these four derivatives occur as headwords in native dictionaries like *CED* and *COD*. This has been one of the most typical examples of multiple derivation in the literature, and there has been much controversy over their usage and meaning.

While *amoral* has the frequency of 128 occurrences and *immoral* 598 occurrences in the Bank of English, there is only one occurrence of *nonmoral* and zero occurrence of *unmoral*. The British National Corpus has similar pattern in the distribution of the frequency of these words. There are 60 occurrences of *amoral* and 323 occurrences of *immoral*. However, there is only one occurrence of *nonmoral* and *unmoral*. The low frequency of occurrence of the two derivatives strongly suggest that actual usage of the two words do not correspond with that linguists and lexicographers have descried so far.

Let us consider now the occurrences of *amoral* and *immoral* in the corpus. Here is a sample of 10 concordance lines for *amoral* and *immoral* taken from the British National Corpus:

1 they can or wish to be merely **amoral** dispensers of knowledge
2 stars Ice-T playing a seemingly **amoral** heavyweight crack dealer
3 SCOTTISH teenagers are not **amoral** hedonists living for the
4 terly immoral and unashamedly **amoral** call-girl, &bquo a
5 the pop industry is seen as an **amoral** instigator so unlike Fleet
6 nstinct for self-preservation. An **amoral** man applying a fixed
7 esents moral respectability; the **amoral** others are perceived as
8 As Brian Jones dissolved into an **amoral** Pan-hysterics at the end
9 llem Dafoe's moral man in an **amoral** society against Mickey
10 call them Diakka, unclean and **amoral** spirits, who take great

1 smoke and I regard that as an **immoral** activity. Sir Richard
2 id the enforcement of illegal or **immoral** acts. Leaving aside these
3 se of the danger posed by her **immoral** behaviour. The 1834 Act
4 te life is scandalous or involves **immoral** conduct, and this has
5 tart getting done with living off **immoral** earnings, brothel-keeping
6 a mortuary slab. It would be **immoral** for me to give up on my
7 usury was a sin and considered **immoral**. He is dishonest in the

8 ievous, aggressive, and totally **immoral**. He wasn't enough for
9 ity that it should pass unjust or **immoral** laws. But one can have
10 ons to procure young girls for **immoral** purposes ran through her

An examination of the entire concordance lines in which these words occur shows that collocates of *amoral* include *call-girl, crack dealer, charlatan, dispensers, friends, hedonists, hero, instigator, kids, man, majority, opportunist, Pan-hysterics, professional, and woman,* but collocates of *amoral* include *act, activity, behaviour, conduct, earnings, laws, means, purposes, support, usury, venture,* and *war.*[6] From this we can see that *amoral* is often used to describe people, *immoral* is more usually used to describe behavior or actions which are morally wrong.

The analysis of the concordances shows that while the most frequently occurring right collocates of *amoral* form a group of words with the superordinate 'person,' while the most frequently occurring right collocates of *immoral* form a general group of words with the superordinate 'activity,' although there are some cases in which *amoral* collocates with behavior, and *immoral* collocates with people.[7]

Another feature of this comparison is the difference in the position or function of *amoral* and *immoral* within the sentence: an analysis of the 323 million words of the Bank of English shows that while *amoral* occurs 82 times (64%) in attributive position, *immoral* occurs 174 times (29%) in the same position. A typical structural pattern of *immoral* is 'it ... immoral (for X) to + infinitive.' This pattern occurred 43 times in the 323 million word sample of the Bank of English. By contrast, there is only one instance of *amoral* in this structure. The tendency towards the relative frequency of the attributive use of amoral compared

[6]The 20 sample concordance lines do not show the full list of the collocates of amoral and immoral.

[7]As described in the usage note of the *CED* (1991) entry for *amoral* given in Section 3.1 above, there seems to be some confusion among speakers about the use of the two words *amoral* and *immoral.*

to its attributive use, represents another distinguishing feature of the two words.

The two words *amoral* and *immoral* have similar meanings, and are sometimes confused with each other. As already described in sections 3.1 and 3.2 above, even dictionary information about their meaning and usage could cause confusion to the learners of the language. However, the identification of collocates and collocational patterns of individual words in the corpus contributes significantly to our understanding of how the two words are actually used in real texts.

5. Conclusion

This paper shows that much of what has already been written about the semantic distinction between different negative derivatives does not always coincide with the evidence of how those words are actually used in the real world. It is evident that traditional approaches to the derivation of different negative words have been of an essentially hypothetical nature, based on either linguists' intuitions or rather scanty evidence, and that native-speaker dictionary entries show *meaning potentials* (rather than *meanings*) which are in fact linguistic and cognitive prototypes.

Analysis of the information contained in dictionaries provides an account of perceived correct usage, and makes it possible not only to identify the discrepancy between the information provided by the dictionaries and the information revealed by real language use, but to gain insight into the lexicographic practice of dictionary makers.

The corpus-based approach provides a detailed picture of the variation patterns of negative prefixation, and highlights the disparities between linguists' attitudes to lexical variation and speakers' actual use of variant forms. The problem for traditional linguists seems to be that word-formation rules are highly

productive, and only the evidence of text is likely to control what is otherwise a long list of forms. It is because of this that any attempt to give a fully accurate description of how language is used must be directly based on representative corpus evidence.

We have explored some of the ways in which corpus-based investigations can throw light on the study of English word-formation. Corpus-based approaches attempt to uncover typical patterns rather than making judgments of grammaticality based on speakers' intuitions. Comprehensive studies of language use cannot rely on intuition or small samples. They require empirical analysis of large databases of authentic texts. For these reasons, it can be argued that the corpus-based approach has made it possible to conduct new kinds of investigations into language use and to expand the scope of earlier investigations. It can thus bring to the fore aspects of language use that have not received attention in traditional studies.

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