

Syllabification of Consonant Clusters Across Internal Word Boundaries in English Compound Words

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Abstract

This paper deals with the principles responsible for the syllabification of consonant clusters across internal word boundaries in compound words in English. It shows, among other things, that the interword morphological boundary in compound words is not strong enough to prevent the syllabification mechanism from moving consonants from one member of the compound to another. The syllabification rules in this case are, therefore, comparable to those responsible for the syllabification of intervocalic consonant clusters in simple words in English. The paper also shows that progressive syllabification is far more common and more natural than regressive syllabification.

I. Introduction

In Abu-Salim (1997),¹ the principles governing the syllabification of intervocalic consonant clusters in simple words in English were discussed in some detail. It was shown that stress was a significant factor in determining the syllable affiliation of such consonant clusters.

In the present article, this issue of syllabification is further investigated by examining the principles governing the syllabification of consonant clusters across internal word boundaries, or interword consonant clusters, in compound words in English. The main objective of the paper is to find out whether the same or similar principles which apply to simple words are applicable as well to compound words, and whether the internal word boundary in compounds is strong enough to prevent the syllabification mechanism from moving consonants from one member of the compound to another.

The data examined in this article come primarily from Webster's Seventh New Collegiate Dictionary (1976)², which represents "the standard speech of educated Americans." (p. 5a). It is to be pointed out, in this regard, that not all American dictionaries follow the same transcription system, nor do they have the same syllabification method for compound words (cf. American Heritage Dictionary of the English Language, 1973)³. However, the transcription system used in Webster's dictionary has been slightly modified in this paper for typographical purposes⁴.

The paper is organized as follows: In section II, entitled 'No-Crossing Syllabification', I examine the cases where the internal word boundary in compound words coincides with a syllable boundary, i.e., the cases where the syllabification mechanism does not move any of the interword consonants onto the neighboring syllable. In section III, I examine cases of what is referred to in this paper as cases of progressive syllabification, where consonants at the end of the first word in the compound are syllabified in the onset of the first syllable of the second word. In section IV, I examine cases of what is referred to here as cases of regressive syllabification, where consonants at the beginning of the second word in the compound are syllabified in the coda of the last syllable of the first word. In the conclusion, some generalizations are made about these methods of syllabification.

II. No-Crossing Syllabification

In this section, the cases where the internal word boundary in compound words is not crossed over by the syllabification mechanism are considered. The internal word boundary coincides, therefore, with a syllable boundary. This situation is found in the following cases:

1) When combinations of word-final and word-initial consonants are neither possible in the coda nor in the onset of the English syllable:

bird's-foot	/bɜːrdz. fʊt/
coastline	/kəʊst. laɪn/
racehorse	/reɪs.ho: (ə)rs/
fox-hole	/fɔ: ks. hoʊl/
nightcap	/naɪt.kap/
houseroom	/haʊs. ru:m/

The syllable boundary in these examples and similar ones coincides with the internal word boundary since it is impossible to move any of the consonants at the end of the first word and those at the beginning of the second, from one syllable to the neighboring one due to phonotactic constraints on the co-occurrence of consonants in the onset and coda of the English syllable (Kahn 1976, Gimson 1980, Selkirk 1982, among others).^{5,6,7} Clusters such as /zʃ/, /tʃ/, /ʃh/, and /tk/ are neither possible in the onset nor in the coda.

2) There are cases where it is possible to syllabify the second word's initial consonant in the coda of the preceding syllable, but this syllabification is blocked by other principles of syllabification:

folktale	/fouk. teɪl/
deep-sea	/di:p.si:/
lean-to	/li:n. tu:/
leafstalk	/li:f.sto:k/
light-struck	/laɪt.stɹɛk/

In these examples, it is possible to syllabify the second word's initial consonant in the coda of the preceding syllable. Consonant clusters such as /kt/, /ps/, /nt/, /fs/, and /ts/ are quite possible in the coda, but not in the onset, of the English syllable (cf. act, collapse, mint, laughs, and cats). But that consonant remains in the onset of the second syllable due to the fact that intervocalic heavy

codas are generally discouraged by the syllabification mechanism. A syllable is considered heavy, for purposes of stress assignment, if its rhyme contains either a lax vowel followed by one consonant, or just a tense vowel (Hyman 1985).⁸ In the examples above, the first syllable contains not only a tense vowel in its nucleus, but also a consonant in its coda. This consonant is not needed to add extra weight to the first syllable for purposes of stress assignment. Any other consonant added to its coda would, therefore, be rendered weightless.

The second word's initial consonant is, moreover, prevented from getting syllabified in the coda of the preceding syllable because of the effects of the Maximal Syllable Onset Principle (MSOP), which gives priority to the syllable onset over its coda in the syllabification of intervocalic consonant clusters (Selkirk 1982).⁹ Thus, it remains in the onset of the second syllable.

When the first word in the compound contains a lax vowel followed by a consonant, the second word's initial consonant remains in its onset, firstly because of the effects of the MSOP, and secondly because only one consonant is needed to make the first syllable heavy for purposes of stress assignment (Hyman 1985)¹⁰, as in necktie /nék. tàì/.

3) A single consonant at the end of the first word in the compound remains in the coda of the first syllable that contains a lax vowel when that syllable is stressed:

deadwood	/déd.wùd/
gasworks	/gəs. wàrks
necklace	/nék.lə s/
neck-rein	/nék. rèin/
kickoff	/kik.òf/
sellout	/sél.àut/

Consonant clusters such as /dw/, /sw/, /kl/, and /kr/ are quite possible in the onset of the English syllable (cf. dwell, swear, climb, and cry), but the first consonant in the cluster remains in the coda of the preceding stressed syllable so as to maintain the affinity between stress and heavy syllables (Hayes 1982, Durand 1990).^{11,12} The MOSP is therefore deactivated in this case just to allow for that affinity to be observed.

This syllabification pattern of compound words is comparable to that of the syllabification of simple words in English having similar structures, where stress plays a significant role in their syllabification (cf. Abu-Salim 1997).¹³

4) The MSOP is also deactivated in cases where the resulting cluster would be among those possible but infrequent, or rare, clusters in the onset if the MSOP was enforced:

cease-fire	/si:s.fài (ə)r/
icefall	/áis.fòul/

The cluster /sf/ is less frequent than other clusters in word-initial position (Gimson 1980)¹⁴, and, as far as I know, it does not occur at all in the syllable onset in word-medial position. This is why /s/ remains in the coda of the first syllable although it is preceded by a tense vowel.

III. Progressive Syllabification

In this section, the cases where a consonant at the end of the first word in the compound is syllabified in the onset of the second word are examined. These include, firstly, the following cases, where the second word begins with a vowel:

5) When the last syllable in the first word of the compound contains a tense vowel:

age-old	/éi.jòuld/
beam-ends	/bi: /mèndz/
drive-in	/drái. vin/
all-out	/ó: .làut/
cross-eye	/kró: .sàì/
vice admiral	/vái.sàd.m (ə-)rə l/
walkaway	/wó: .kə .wèi/
five-and-ten	/fài . və n. tén/

The presence of the tense vowel in the nucleus of the first syllable in these examples makes that syllable heavy (Hyman 1985)¹⁵, thus making it attractive to stress. There is, consequently, no need for any consonant to be placed in its coda to make it heavier for stress assignment. Only one exception to this generalization has been encountered, and that is thought-out θ ó:t. àut/, where the intervocalic /t/ is syllabified in the coda of the first syllable despite its containing a tense vowel.

6) When the first syllable in the second word is stressed:

come-outer	/kə /máut.ə r/
seven-up	/sèv.ə .nə`p/
southeast	/sau. θ í:st/
Queen Anne	/kwi: .nán/
afterimage	/áf.t ə .rim. ij/

This manner of syllabification is characteristic of the syllabification of intervocalic single consonants in simple words, where stressed syllables attract consonants onto their peripheral subconstituents (Abu-Salim 1997)¹⁶. The two principles in (5-6) above are both applicable to examples such as southeast and Queen Anne, where the first syllable does not accept the intervocalic consonant in its rhyme because it contains a tense vowel, and the second syllable attracts that consonant into its onset because it is stressed (Hoard 1971, Selkirk 1982, Fudge 1984).^{17,18,19} Both principles, moreover, contribute to maintaining the MSOP.

7) When the first word's final syllable and the second word's initial syllable are both unstressed, thereby maintaining the MSOP:

aftereffect	/áf.tə .rə .fèkt/
gentleman-at-arms	/jènt.ə l .mə .nə t. á: rmz/
butter-and-eggs	/bət.ə .rə .né gz/ ²⁰
adam-and-eve	/əd.ə .mən. (d) i:v/
daughter-in-law	/dó:t.ə .rən. lò:/

8) When the first word in the compound ends in a consonant cluster, followed by a vowel-initial second word:

bird's-eye	/b érd. zai/
closed-end	/klóuz. dènd/
fold-away	/fóul. d é .wèi/
goings-on	/gou.i ʔ .zón/
grandaunt	/grán. dánt/
Punch-and-Judy show	/p ən. è e n.../

In these examples, only one consonant is detached from the first word and syllabified in the second. This is due to the fact that the consonants forming the cluster do not form a permissible syllable onset in English.

However, there are examples where the first word's final consonant cluster is possible in the syllable onset, but again only the last consonant is placed in the onset of the following syllable:

blast-off	/blás.tò:f/
cast-off	/kás. tò:f/

This is done so as to maintain the affinity between stress and heavy syllables. The first syllable in these examples is stressed, and therefore it is expected to be heavy. Since it contains a lax vowel, one consonant remains in its coda to make it heavy, thus preserving the affinity between stress and heavy syllables.

To sum up, we have seen that the internal word boundary in the examples in (5-8) above is not strong enough to prevent syllabification from moving consonants from the coda of the last syllable of the first word to the onset of the first syllable of the second word in the compound, thus maintaining the MSOP. As in the syllabification of intervocalic consonants in simple words in English (Abu-Slaim 1997),²¹ stress is sometimes taken into consideration in explaining this manner of syllabification.

The second situation in this section involves cases where the first word in the compound ends in a consonant or more, and the second word begins with a consonant or more. Firstly, we begin with examples where the first word ends in one consonant and the second word begins with one consonant:

baselevel	/béi.slev.ə l/
bridewell	/brái. dwel/
cakewalk	/kéi.kwo:k/
deep-rooted	/di: .prù:t.ə d/
face-plate	/féi. splèit/
housetop	/háu. stà: p/
greasewood	/gri: .swùd/
cross-link	/kró: .sliŋ k/
dogwatch	/dó: .gwà. ċ/

In these examples, the first word's final consonant is syllabified in the onset of the following syllable. This is characteristic of the syllabification of intervocalic two-consonant clusters in simple words in English (Abu-Salim 1997),²² where the

two consonants are syllabified in the onset of the following syllable when the preceding vowel is tense, thus maintaining the MSOP without, of course, violating the stress-heavy syllable affinity principle. The first stressed syllable in these examples contains a tense vowel, which makes it, of course, heavy (Hyman 1985).²³ There is, therefore, no need for any consonant to be placed in its coda to make it heavier to attract stress.

Secondly, there are examples where the first word ends in two consonants, and the second word begins with one consonant. Here, too, the MSOP is enforced:

bankroll	/báŋ .kroul/
boxwood	/bá:k .swud/
cat's-paw	/kát. spo:/
cockscorb	/ká:k .skoum/
driftweed	/dríf. twi:d/
handrail	/hán. drèil/
hardware	/há:r. dwà (ə) r/

We notice here that only the last consonant is detached off the first word and syllabified in the onset of the following syllable regardless of the tenseness/laxness property of the preceding vowel. This is due to the fact that the intervocalic three-consonant cluster does not form a permissible syllable onset in English.

Thirdly, there are examples where the first word ends in three consonants and the second word begins with one consonant. Again, the MSOP is enforced, allowing the maximum number of consonants permissible in the syllable onset to be syllabified in the onset of the second syllable:

first-rate	/fə r .strèit/
sportscast	/spóu (ə) rt. skàst/
sportswear	/spóu (ə) rt. swèi (ə) r/

In first-rate, the last two consonants in the first word are syllabified in the onset of the following syllable, simply because the resulting consonant cluster /str/ is permissible in the onset, whereas in sportscast and sportswear, only /s/ is syllabified in the onset of the following syllable since the clusters /tsk/ and /tsw/ are not possible in the syllable onset.

Finally, in this section, there are examples where the first word ends in one consonant and the second word begins with two consonants. In this case, the three intervocalic consonants are syllabified in the onset of the following syllable, when they are, of course, permissible in the syllable onset:

crosstree	/kró: .stri:/
ice cream	/ái .skri:m/
moss-trooper	/mó: .strù: .pə r/

Both principles mentioned above, i.e., the MSOP and the stress-heavy syllable affinity, are observed in these examples.

So, we see that in all examples of progressive syllabification mentioned in this section, the syllabification of interword consonants in compound words is moving consonants forward, i.e., towards the onset of the following syllable. This method of syllabification is far more common and more natural than regressive syllabification, which moves consonants backward, as will be seen in the following section.

IV. Regressive Syllabification

This method of syllabification, whereby a consonant at the beginning of the second word in the compound is syllabified in the coda of the preceding syllable, is far less common than progressive syllabification. It is found only in a few examples, where the first word in the compound ends in a vowel, and the second word begins with a consonant, as in the following examples:

ready-to-wear	/rèd.i:t.ə .wá (ə) r/
three-dimensional	/ə ri:d.ə .ménč. n ^ə l/
(cf. three-decker	/ə ri: .dé +k.ə r/)
threepence	/ə ríp.ə n (t) s/
(cf. threepence	/ə rí: .pèn (t)s/)
threepenny	/ə ríp. (ə.) ni:/
(cf. threepenny	/ə ri: .pèn. i:/)

No satisfactory explanation can be provided for this method of syllabification, as it is found only in a few isolated examples. In threepence /ə ríp. ə n (t)s/ and threepenny /ə ríp. (ə.) ni:/, the first stressed syllable contains a lax vowel. The following /p/ is therefore placed in its coda to maintain the

stress-heavy syllable principle. In *three-dimensional* / θ ri: d. e .ménc. n^v /, on the other hand, the first syllable is heavy because it contains a tense vowel. Therefore, there is no need for any consonant to be placed in its coda to make it heavier for stress assignment. Yet, the intervocalic /d/ is syllabified in its coda in violation of the MSOP. The same violation is also found in *ready-to-wear* /rèd.i:t.θ^θ .wá (θ) r/, where the intervocalic /t/ is syllabified in the coda of the last syllable of the first word, but not in the onset of the second word in the compound.

V. Conclusion

This paper has shed some light on how interword consonant clusters in compound words in English are syllabified. We have seen that the internal word boundary in compound words is not strong enough to prevent consonants from getting syllabified in neighboring syllables across the internal word boundary. This means that the phonological process of syllabification is not sensitive to the interword morphological boundary. Consequently, the compound word is treated as if it were simple for the purpose of syllabification. This, in turn, explains why some basic principles of syllabification applying to intervocalic consonant clusters in simple words in English are also applying to interword consonant clusters in compounds.

We have also seen that progressive syllabification is far more common and, therefore, more natural than regressive syllabification. This is in line with the MSOP, which seems to be one of the basic principles of syllabification in English.

REFERENCES AND NOTES

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4. These modifications are as follows:

Webster's	This paper	Webster's	This paper
ù	u	ē	i:
ū	u:	ẽ	e
ö	o:	au	au
ō	ou	th	θ
ā	ei	n	ŋ
ä	a:	ch	ç
	ai		

- in this paper to indicate syllable boundary, the acute sign (') to indicate primary stress, and the grave sign (`) to indicate secondary stress.
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 20. /n/ is syllabified in the onset of the last syllable by the principle in (6).
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 22. Ibid.
 23. Hyman, L. (1985).

