

The Prosody and Quantity of English Compounds

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Submitted: 17.04.2014.

Accepted: 06.11.2014.

Abstract

Following the earlier works of Booij (1985) and Nespor & Vogel (1986) I provide further evidence that English compounds are made up of prosodic words. The length of the first components must be preserved because they are identical to basic lexical forms. In some other languages, as for example in Serbian, the length of the first components may be shortened because the inclusion of linking vowels can contribute to the building of the required 'derived environment' (Kiparsky 1985). This invoking of the strict cyclicity condition is however necessary only for those English dialects in which the accented syllables are not necessarily closed. In this paper I discuss the prosodic status and quantity of English compounds.

Keywords: English Compounds, prosodic structure, trochaic shortening, quantity, stric cyclicity

The introduction of prosodic phonology has shown that besides grammatical hierarchy there also exists prosodic hierarchy (s. Selkirk 1978, Nespor & Vogel 1982, 1986, Booij 1983, 1985). These hierarchies are in most cases parallel, but still they do not coincide. The parallelism between these hierarchies can be represented as in the following table:

(1)	<u>prosodic hierarchy</u>	<u>grammatical hierarchy</u>
	segment	segment
	syllable (σ)	morpheme
	foot (F)	
	prosodic word (ω)	morpho-syntactic word
	prosodic phrase (φ)	syntactic phrase

(Booij 1985, p. 29)

According to Selkirk (1978, 1980) the units of prosodic hierarchy are exactly those domains in which phonological rules processes apply. The grammar must determine what relations exist between prosodic and grammatical hierarchies. In the languages such as English and Dutch every syntactic word is usually also a prosodic word, but this is not always the case. Booij (1985, p. 29) notes that in the languages such as English and Dutch the following differences are possible:

- (2a) In compounds every component is an independent prosodic word;
 (b) Some affixes, which may be denoted as non-coherent, make particular, independent prosodic words.

Besides the Dutch examples, Booij cites the following English ones:

- (3) [black_Aboard_N]_N - (black)_ω (board)_ω
 [public_Aity]_N - (publicity)_ω
 [king_Ndom]_N - (king)_ω(dom)_ω

The first example represents compound components, while the following two are respectively the derivatives with coherent and non-coherent suffixes. The coherent suffix *-ity* combines with the stem *'public* into a prosodic word *pu'blɪcɪti*, while the non-coherent suffix *-dom* makes a separate prosodic word. With non-coherent suffixes there is no resyllabification across morphem boundaries that mark separate prosodic words. A particularly impressive example is the derivative with non-coherent suffix *-achtig* in Dutch. In the adjective *roodachtig* ('reddish') the principle of the maximal onset rule does not apply:

- (4) roodachtig - (rood)_w(achtig)_w

The compelling evidence is the devoicing of the syllable-final /d/ showing that this segment belongs to the coda, not to the onset – there is no resyllabification over the boundary of prosodic words (Booij, 2002, p. 189).

Kiparsky (1979) also cites examples showing that the compound components in English are separate prosodic words. In the following English compounds the principle of maximal onset does not apply:

- (5a) beef eater - (beef)_w(eater)_w / *(bee)_w(feater)
 (b) bee feeder - (bee)_w(feeder)_w

In (5a) the components are separate prosodic words – the coda of the first component /f/ does not go over into the onset of the second component, although /f/ is a possible onset, as the example *feeder* shows. The examples (5a) and (5b) are clearly different as the first /i/ is phonetically shorter in *beef* than in *bee*.

In this paper we intend to show further evidence that the components of English compounds are separate prosodic words.

2. In many languages the compounds are understood as combining of prosodic words. This means that all phonological rules whose domain is a prosodic word can be applied separately on the compound components, but not on the whole compound. This is true for phonotactic restrictions as well as for segmental and prosodic rules. In English there is a phonotactic restrictions that geminated consonants cannot appear inside prosodic words. The geminated consonants are not possible inside the compound components, but they can appear at the components boundary as is shown in (6):

- (6) back.cloth /'bæk-klɒt/ n.
 big game /ɒbɪg'geɪm/ n.
 bird dog /'bɜːdɒdɒg/ n.
 black comedy /ɒblæk'kɒmɪdi/ n.
 fast track /'fɑːstræk/ n.
 goosestep /'guːs-step/ n.
 etc.

However, in lexicalized compounds degemination is possible. Thus in *granddaughter* /'grænɒdɔːtɜːr/, the /d/ from the end of the first component is lost. The simplification of the

pronunciation reflects the lexicalized meaning of this compound, which deviates from the compositional meaning implied by the components.¹

Another phonotactical restriction refers to the agreement of obstruent in voicing. In the interior of prosodic words the adjacent obstruents must agree in voicing, but at the boundary of components this is not the case. This property of English compounds may be illustrated with the following examples.

- (7) back.bit.ing /'bækbaɪtɪŋ/ n.
 back.bone /'bækbəʊn/ n.
 baggage car /'bæɡɪdʒɑ:kɑ:/ n.
 bag.pipes /'bæɡpaɪps/ n.
 band.stand /'bændstænd/ n.
 bank.book /'bæŋkbʊk/ n.
 bank draft /'bæŋkdrɑ:ft/ n.
 news.stand /'nju:zstænd/ n.
 etc.

These examples clearly show that the given phonotactic restriction does not hold in English compounds, although they do hold in prosodic words. In some lexicalized compounds however the adjacent obstruents may agree in voicing. Thus for *newspaper* the variant pronunciations /'nju:zəpeɪpə/ and /'nju:səpeɪpə/ are possible, but for the noun *gooseberry* pronunciation is normally /'gʊzbrɪ/. Note however that *newspaper* and *gooseberry* are lexicalized compounds - their meaning does not follow compositionally from the meaning of their components.

The third known restriction refers to the velarization of nasals in prosodic words. In English, the alveolar /n/ is velarized before velars (e.g., *finger* /'fɪŋɡə/, *uncle* /'ʊŋkəl/, *pancreas* /'pæŋkriəs/) in prosodic words (Gimson 2001, p. 199). In English compounds velarization does not apply across morpheme boundary:

- (8) corn.cob /'kɔ:nkɒb/ n.
 corn.crake /'kɔ:nkreɪk/ (the bird) n.
 man.kind /'mæn'kaɪnd/ n.
 green.grocer /'gri:ngrəʊsə/ n.
 bean counter /'bi:nkaʊntə/ n.
 pan.cake /'pæŋkeɪk/ n.
 etc.

In lexicalized compounds velarization can occur as in *hand.kerchief* /'hæŋkətʃɪf/ (Allen 1978, p. 129).

In English, as in many other languages, syllabification does not apply across the compound boundaries because of the assumed principle that the syllable boundary must coincide with the morpheme boundary (Gimson 2001, p. 52).² Wells, who also assumes this principle, explains this principle in his introduction to the LPD (1990) in the following way:

- (11) The syllable boundary coincides with the word boundary, and also with the morpheme boundary between the compound components.

¹ In American English the compound *granddad* may be also written *grandad*, which means that lexicalization is also reflected in the spelling.

²Gimson (2001, p. 244) invokes four criteria for the word division: morphemic, phonemic, phonotactic and allophonic, but he adds that these criteria sometimes do not agree, and then we may additionally use the principle of maximal onset.

Booij (2007) cites Dutch examples that show that the sequence /lk/ is divided inside prosodic words (e.g. *kalkoenen* 'turkey'), but is included in the coda if it occurs at the end of prosodic words (e.g. *balk* 'beam'). When *lk* is at the end of the first compound component, as for example in *balk anker* ('a support for the beam'), there is no resyllabification across the components boundary, and the sequence /lk/ remains in the coda of the first component. It is not difficult to find similar examples for English:

- (12a) abundant /↔.b̥ɸn.d↔nt/ adj. (b) land owner /lʌndr↔Yn↔/ n.
advantage /↔d.vɑ:n.tɪdʒ/ n. current account /k̥ɸr↔nt.↔.r̥kɑYnt/ n.
franchise /frɒn.tʃaɪz/ n. lunch hour /l̥ɸntʃ. aY↔/ n.
bolster /b↔Yl.st↔/ v. false alarm /r̥fɔ:s.↔'lɑ:m/ n.
alternate /ɔ:l.tɛ:nɪt/ adj. adult education /r̥θ.d̥ɸlt.e.djY.r̥keɪ.ɛv/ n.
Moldova /m̥ɔl.d↔Yv↔/ field officer /fi:ld.r̥ɔ:fls↔/ n.
Atlanta /↔t.'lɒn.t↔/ n. battleaxe /b̥θt.↔l.θks/ n.
temper /tem.p↔/ n. stamp office /stɒmp.r̥ɑ:fls/ ,n.
Amundsen /'A:.m↔nd.s↔n/ Land's End /r̥lʌndz.'end/

In (12a) the underlined consonant sequences *nd*, *nt*, *ntʃ*, *ls*, *lt*, *ld*, *tl*, *mp* and *ds* are divided in prosodic words, while in (12b) they remain in the coda of the first component in compounds because there is no resyllabification across morphem boundary. Note however that there is no resyllabification when the second order suffixes are added, either, even in the cases when they begin with vowels (e.g. *land.ed* adj., *land.ing* n., *thorn.y* adj., *stamp.ing* n., Booij 1983, p. 267).

The impossibility of resyllabification across the morpheme boundary in compounds also affects the realization of affricates in English. The affricates in English are complex segments produced by combining plosives and fricatives. In English these are the combinations /tʃ/, /dʒ/, /tr/ i /dr/. Inside prosodic words, the combinations of these voices are pronounced as affricates, but at the conjunction of compounds they remain separated because they belong to different syllables.

Table 1. The place of affricates in prosodic units

	In the Interior of Words	At the Compound Conjunction
/tʃ/	<i>butcher</i>	<i>lightship</i>
/tr/	<i>mattress</i>	<i>Footrest</i>
/dr/	<i>tawdry</i>	<i>Handrail</i>

Gimson (2001: 172)

The example for the affricate /dʒ/ is difficult to find because only some words of French origin begin with /ʒ/, and these rarely appear as the second components in compounds.

Further evidence that English compounds are not prosodic words is provided by the allophony of the alveolar approximant /l/. In English, the alveolar approximant /l/ appears in two allophonic forms: palatalized and velarized (Gimson 2001, p. 203, Čubrović, p. 2011, 60). In the compounds in which the first component ends with /l/, and the second begins with a vowel, /l/ is not palatalized:

- (13) battleaxe /b̥θt.l.θks/ n.
 barrel organ /b̥θ.r↔l.r̥ɔ:g↔n/ n.
 capital assets /r̥kθ.pɪ.t↔l.'θs.ɛt/ n.
 real estate /rɪ↔l.l.r̥steɪt/ n.

travel agent /'trɒv.↔l.ɹeɪdʒ.↔nt/ n.
 waffle iron /'wA:f.↔l.ɹaɪr.↔n/ n.
 bottle opener /'bɒt.↔l.ɹ↔ɔp.n↔/ n.
 mail order /'meɪl.ɹɔ:d.↔/ n.

It is possible that in some cases the /l/ from the end of the first component is nonetheless palatalized. This will be the signal that the compound in question is lexicalized – it is understood as one whole. In fact, this is how Booij (1994, p. 8) interprets the observation of Durand (1990, p. 181) that in the compound *mail order* the /l/ is palatalized. In lexicalized compounds, resyllabification across morpheme boundary is possible, and, as usual in a such cases, the compound *mail order* is divided in syllables as a monomorphemic word, i.e. *mai.lor.der*.³

2. The vowel length of the first component in English compounds usually does not shorten, although it may shorten in Serbian and some other languages. In this paper, I try to explain why this shortening is lacking in English.

It is well known that in trochaic systems, feet may be ordered by the following hierarchy:

- (14) (LL), (H) > (HL) > (L),
 where H denotes heavy syllable, and L light syllable (Prince 1990, p. 8).

According to Prince (1990), in trochaic systems the trochaic shortening (HL) → (LL) produces the preferred foot structure because (LL) and (H) are the optimal feet in trochaic systems. The trochaic shortening is a lexical rule that applies in derived environments; however, it never applies in English compounds.

In English, each compound component represents a separate prosodic word. As nouns and adjectives in English may contain long vowels, the first compound components may also contain such vowels. In (15), the point marks the syllable division, which normally does not cross the morpheme boundary.

- (15a) boot.leg /'bu:tleg/
 pea.nut /'pi:nɒt/
 cheek.bone /'tʃi:kb↔Yn/
 (b) auc.tion bridge /'ɔ:kʃənɹbrɪdʒ/
 for.tune cook.ie /'fɔ:tʃən.ɹkɪ /
 (c) ba.na.na peel /bə'nɑ:nəɹpi:l/
 beau.ti.ful /'bju:tɪfʊl/
 fea.ture film /'fi:tʃə.fɪlm/

LDCE (2003)

In the examples provided in (15), the length of the first components does not shorten. In the examples of (15a), the first components consist of one foot of the type (H), which does not undergo shortening because it is optimal according to the hierarchy (14). In the example (15b) the first components *auc.tion* and *for.tune* consist of two heavy syllables (H)(H), and with this foot structure no shortening is possible. The shortening is only possible if there is the foot (HL) in a prosodic word, and the first syllable is not closed. In (15a) and (15b) this condition is not fulfilled.

The conditions for trochaic shortening are not fulfilled in (15c), either, because every component behaves as a separate prosodic word that keeps its lexical form. The first components *banana* /bə'nɑ:nə/, *beauty* /'bju:tɪ/ and *feature* /'fi:tʃə/ are lexical words, and the environment in which the

³ In EPD the compound *mail order* is divided into syllables with *mail.or.der* where /l/ is velarised. Obviously some dictionaries, as well as some speakers, may differently assess (estimate) whether a particular compound is lexicalized or not.

length occurs in (15c) has not been changed. The principle of strict cyclicity bans the application of lexical rules in a non-derived environment. Kiparsky (1985) explains that ‘derived environment’ means “an environment which satisfies the structural description of the rule either by virtue of a morphological operation on the same cycle, or by virtue of the prior application of a phonological rule on the same cycle” (p. 137). The domain of foot formation as well as the domain of syllabification is a prosodic word. The first components *banana*, *beauty* and *feature* are respectively divided into feet (bə)_F(nɑ:n.ə)_F, (bju:tɪ)_F and (fi:tʃə)_F. The feet (nɑ:n.ə)_F, (bju:tɪ)_F and (fi:tʃə)_F contain the heavy, but also open, first syllables. The conditions for trochaic shortening are satisfied, but the trochaic shortening cannot apply because the first components of compounds in (15c) do not occur in a derived environment. Therefore, the shortening of the vowel length of the first components in these compounds is not possible. Because of the principle of strict cyclicity, the shortening of the vowel length of the second components in English compounds is also impossible.

If the compound is lexicalized, the vowel shortening of the first component may be possible in English. The compound *gooseberry* is pronounced /gYzbəri/ in the standard which reflects Received Pronunciation. Because of lexicalization, in the basic form /gu:sbəri/, the adjacent obstruents undergo agreement in voice and the whole word is divided into syllables as a monomorphemic word – gu:zbə.ri. The first two syllables make up a foot, and the third syllable is extrametrical. In the metrical structure (gu:zbə)_F<ri>, the foot (gu:zbə)_F satisfies the conditions for trochaic shortening which as a result produces the outcome /gu.zbəri/. The alternative pronunciation /gu:sbəri/ survives in those English dialects in which this compound is not completely lexicalized (s. LDCE). In the pronunciation /gu:sbəri/, the components are separately divided into syllables, which provides the division 'gu:s.bə.ri. The foot division gives (gu:s)_F(bə)_F<ri> where the final syllable is extrametrical. The first foot is heavy, and therefore optimal, which means that no trochaic shortening is possible.

In Serbian, the length of the first component in compounds is often shortened, and this shortening is simply accounted for as trochaic shortening in the words with long-falling accents.⁴

- (16) křv 'blood' > křvotōk 'bloodstream'
vi↓d 'sight' > vi%dokru#g 'field of vision'

In (16), the compounds are constructed with a linking vowel -o-, which provides for the required derived environment. The underlying structures for the compounds in (16) are parsed into feet with (křvo)_F(tōk)_F and (vi↓do)_F(kru#g)_F. Here the first components fulfill the conditions for trochaic shortening, and the result are the forms *křvotōk* and *vi%dokru#g* with short syllables in the first component. In (16), the linking vowel has the crucial role as it provides ∪a derived environment∪. If there is no linking vowel in compounds, the shortening is impossible:

- (17) pra⊥h-še∩čer 'powdered sugar', to⊥n-film 'soundfilm', go⊥l-ra≡zlika 'goal difference' (in sport).

In (17), the components keep their accents and length, and, in particular, the first components *pra⊥h* 'powder', *to⊥n* 'tone', *go⊥l* 'goal' keep their long-falling accent. In the grammars, the compounds of this type are called semi-compounds ('polusloženice') because they do not make prosodic words.

⁴ In standard Serbian, as in the other standard languages based on Neoštokavian dialects of former Yugoslavia, the four different accents are commonly distinguished:

short-falling	long-falling	short-rising	long-rising
ri%ba 'fish'	gra⊥d 'town'	se∩lo 'village'	gla≡va 'head'

The case of the long-falling accent is somewhat more complicated because its shortening involves a change of tone, the reason for which is not completely clear (e.g. *hva%lospēv* 'eulogy' < *hvála* 'praise' -o-*spēv* 'poem', s. Rakić 2012).

3. I must however note that the accent of the words in (15c) is marked differently in different dictionaries. For example, in LPD (1990), the accented syllables are always closed. In this dictionary, the first components in (15c) have the transcriptions *banana* /bə.'nɑ:n.ə/, *beauty* /'bju:t.I/, *feature* /'fi:tʃ.ə/, where the accented syllables are closed, and no trochaic shortening is possible. On the other hand, in CALD (2008) the same words are phonetically transcribed with /bə.'nɑ:n.ə/, /'bju:t.I/ and /'fi:tʃ.ə/ suggesting that there may exist dialectal differences in the syllabification of these words. In those English dialects in which the accented syllables are not necessarily closed, we are free to recall the principle of strict cyclicity in order to account for the lack of shortening of the first components in compounds, because the conditions for trochaic shortening are fulfilled. The observations made in this paper may have some explanatory value for these dialects only.

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