

Stress Rules for English Compound
Adjectives Consisting of a
Noun + an Adjective

Eiji Yamada

Yamada, Eiji. 1984. "Stress Rules for English Compound Adjectives Consisting of a Noun + an Adjective." *Fukuoka Daigaku Jinbun Ronsoo (Fukuoka University Review of Literature & Humanities)* 15: 1425-1438.

Yamada, Eiji. 1984. "Stress Rules for
English Compound Adjectives Consisting
of a Noun + an Adjective." *Fukuoka
Daigaku Jinbun Ronsoo (Fukuoka
University Review of Literature &
Humanities)* 15: 1425-1438.

福岡大学人文論叢
第15巻第4号 抜刷
昭和59年3月 発行

Stress Rules for English Compound Adjectives Consisting of a Noun + an Adjective*

Eiji Yamada

0. The present paper is intended to give a rather detailed classification of compound adjectives consisting of a noun+an adjective with tertiary-primary (3-1) stress pattern. The relation between their lexical structure and stress pattern will be also examined within the framework of Liberman and Prince (1977).

1.1. In the framework of Liberman and Prince (1977, henceforth LP) compound adjectives listed in (1), the stress pattern of which is not satisfactorily explained in Chomsky and Halle (1968), are assigned 3-1 stress pattern by the application of the Lexical Category Prominence Rule (96) (hereafter LCPR (96))¹ under case (D).

(1)	a.	b.	c.	d.
	³ ¹ <i>bittersweet</i>	³ ¹ <i>blue-eyed</i>	³ ¹ <i>clean-cut</i>	³ ¹ <i>easy-going</i>
	<i>blue-black</i>	<i>good-natured</i>	<i>fair-spoken</i>	<i>fast-moving</i>
	<i>dark-blue</i>	<i>hard-fisted</i>	<i>first-born</i>	<i>good-looking</i>
	<i>German-Russian</i>	<i>hard-headed</i>	<i>high-strung</i>	<i>high-flying</i>
	<i>heavy-thick</i>	<i>hot-headed</i>	<i>ill-spent</i>	<i>ill-judging</i>
	<i>honest-true</i>	<i>long-legged</i>	<i>quick-frozen</i>	<i>long-looking</i>
	<i>red-hot</i>	<i>swift-footed</i>	<i>widespread</i>	<i>quick-setting</i>

However, the compound adjectives listed in (2) receive the reverse primary-tertiary (1-3) stress pattern, though they meet the condition of case (D) which permits LCPR (96) to assign 3-1 stress pattern to the words.

(2)	a.	b.	c.	d.
	¹ <i>air</i> ³ <i>proof</i>	¹ <i>bow</i> ³ <i>-legged</i>	¹ <i>air</i> ³ <i>-bound</i>	¹ <i>breath</i> ³ <i>-taking</i>
	<i>air-tight</i>	<i>eagle-eyed</i>	<i>bloodshot</i>	<i>earth-shaking</i>
	<i>blameworthy</i>	<i>milk-livered</i>	<i>flea-bitten</i>	<i>face-saving</i>
	<i>bloodthirsty</i>	<i>ring-necked</i>	<i>footworn</i>	<i>hair-raising</i>
	<i>color-blind</i>	<i>rose-colored</i>	<i>heart-broken</i>	<i>heartbreaking</i>
	<i>love-sick</i>	<i>harebrained</i>	<i>moth-eaten</i>	<i>life-giving</i>
	<i>news-greedy</i>	<i>shop-soiled</i>	<i>tongue-tied</i>	<i>soul-destroying</i>

Liberman and Prince explain the stress distribution on the words listed in (2) by employing morphological and lexical information about these words. More accurately, (i) all the words in (2) contain a noun as their first element, and (ii) the lexical category of the words in (2) is that of the adjective. To take an example, the internal structure of the words in (2a) such as ¹*air*³*proof*, ¹*blood*³*thirsty*, ¹*color*³*-blind* is analyzed into a noun+an adjective. Words in (2b), (2c), and (2d) such as ¹*eagle*³*-eyed*, ¹*heart*³*-broken*, and ¹*soul*³*-destroying* are analyzed into a noun+a noun+*-ed*, a noun+a verb (past-participle), and a noun+a verb+*-ing*, respectively. Note here that all the words in (2) uniformly have a noun as their first element, but not as the second one. Therefore, according to LP, such compound adjectives as those listed in (2) are regarded as exceptions to case (D), and are marked as [-case D]. As a result, they are assigned 1-3 stress pattern by Rule II, which gives 1-3 stress pattern to words in LCPR (96).

1.2. Now, let us consider compound adjectives such as ³*grass*¹*-green*, ³*ice*¹*-cold*, ³*waist*¹*-deep*. They are not included in list (2) because they do not bear 1-3 stress pattern, though their internal word structure is represented as a noun+an adjective and they contain a noun as their first element. However, since their first element is a noun and their lexical category is adjectival, they might, if they were marked as [-case D], be assigned *1-3 stress pattern improperly by Rule II of LCPR (96). Therefore, in order

not to receive the unacceptable stress pattern *1-3, they are regarded as exceptions to the rule which deals with the words marked as [-case D] in LP.

1.3. We have now seen how the stress distribution of compound adjectives is treated in the framework of LP. The words in (1) go by case (D); the words in (2) are marked as [-case D]; words such as ³*grass*¹*-green*, ³*ice*¹*-cold*, ³*waist*¹*-deep* are exceptions to the rule which deals with the words in (2).

Then, if we can find some specific features which are common to such compound adjectives as ³*grass*¹*-green*, ³*ice*¹*-cold*, and ³*waist*¹*-deep*, which, as will be shown later, belong to as productive a category as any other, it is well-motivated for us to incorporate the words with such specific features into word group (1) in order to reduce the exceptional treatment of the words within a rule.

2.0. As is mentioned in section 1, the internal structure of the words listed in (1a) is analyzed into an adjective+an adjective with 3-1 stress pattern; and the words in (1b) an adjective+a noun+*-ed* with 3-1 stress pattern; the words in (1c) an adverb+a verb (past-participle) with 3-1 stress pattern; the words in (1d) an adverb+a verb+*-ing* with 3-1 stress pattern. On the other hand, the words listed in (2a) are parsed into as noun+an adjective with 1-3 stress pattern; and the words in (2b) a noun+a noun+*-ed* with 1-3 stress pattern; the the words in (2c) a noun+a verb (past-participle) with 1-3 stress pattern; the words in (2d) a noun+a verb+*-ing* with 1-3 stress pattern.

All the words in (2) contain a noun as their first element and show 1-3 stress pattern. However, words such as ³*grass*¹*-green*, ³*ice*¹*-cold*, ³*waist*¹*-deep* indicate 3-1 stress pattern, although they are analyzed into a noun+an adjective and contain a noun as their first element. Therefore, before entering direct discussion on these words showing the structure of a noun+an adjective with 3-1 stress pattern, let us briefly review in this section how they are treated in Adams (1973), Koziol (1972), Marchand (1969) and

Quirk, *et al* (1972).

2.1. In Adams (1973) the second element of the words in question 'is specified by a comparison with some quality characteristic of what the first element denotes.' He classifies them into two major groups, either 'intensifying' or 'particularization' with sub-categorization for each as follows:

(3) a. Intensifying

- i) Noun-adjective: ³ice-¹cold, ³jet-¹black, ³pitch-¹black,
- ii) Verb (-ing)-adjective: ³freezing-¹cold, ³roaring ¹drunk

b. Particularization

- i) Noun-color adjective: ³blood ¹red, ³sky ¹blue
- ii) Noun-adjective of 'extent' or 'measurement':
¹day-³long, ³knee-¹deep, ¹life-³long, ³skin-¹deep

Since the first element of the words in (3 aii) is parsed as a verb (-ing), they will not be dealt with here. The question is how Adams differentiates the words in (3 ai) from those in (3 bi). If the first element of a word such as *jet-black* is designated as an intensifying element, the first element of a word such as *blood-red* would also be described as such. This is because the first element of both intensifies what the second element denotes. Moreover, though words such as *day-long* and *life-long* reveal the reverse 1-3 stress pattern of words like *knee-deep*, *skin-deep*, they are concurrently arranged in the same category.

2.2. Koziol (1972) classifies words consisting of a noun+an adjective according to their internal structure, adopting the term 'Verleich' as a heading for the words in (4 a), 'Höchststufe' for those in (4 b); and simply 'Substantiv und Adjectiv' for the words in (4 c):

- (4) a. ³blood-¹red b. ³span-¹new c. ¹air-³proof

- | | | |
|-------------------|--------------------|-------------------|
| <i>lily-white</i> | <i>dog-weary</i> | <i>heart-sore</i> |
| <i>skin-deep</i> | <i>death-black</i> | <i>sea-worthy</i> |

However, it is not clearly shown that the words involved in one degree or another of comparison display the stress pattern 3-1 rather than 1-3. That is because in making this classification, account has not been taken of the fact that stress pattern plays an important role in distinguishing the words in (4 a) and (4 b) from those in (4 c).

2.3. In Marchand (1969) the words in question are classified into three categories according to the syntactic and semantic relation underlying the words. Marchand's classification is shown in (5):

- (5) a. ³bottle-¹green b. ³ice-¹cold c. ³knee-¹deep
- ³emerald-¹green ³jet-¹black ³knee-¹high
- ³grass-¹green ³snow-¹white ³skin-¹deep
- ³poppy-¹red ³stone-¹deaf ³waist-¹deep
- ³salmon-¹pink ³sky-¹high ³waist-¹high

The second element of the words in (5 a) is a color-denoting adjective. According to his explanation, comparison is used to mark a specific nuance in the quality expressed by the adjective. Also, in (5 b) comparison is used to indicate an absolute degree of the quality expressed by the first element of the words. Their first element functions as an emotional intensifier if the semantic connotation between the first and second element is not close; that is, the term 'extremely' or 'absolutely' can be substituted for their first element.

Notice here that he improperly classifies words such as *jet-black* and *snow-white* into (5 b), the second element of which is a color-denoting adjective. Furthermore, as shown later, a word

like ³ ¹ *sky-high* should be included in category (5c) rather than (5b). The words in (5c) have the meaning 'reaching as far as (what is denoted by the first element).' For this reason, he classifies them differently from the other categories.

The words listed in (6a) and (6b) are merely identified as pseudo-compounds without clear explanation of the reason:

- | | | |
|-----|---|---|
| (6) | a. | b. |
| | ¹ ³
<i>agelong</i> | ³ ¹
<i>city-wide</i> |
| | <i>daylong</i> | <i>country-wide</i> |
| | <i>lifelong</i> | <i>state-wide</i> |
| | <i>nightlong</i> | <i>nation-wide</i> |
| | <i>yearlong</i> | <i>world-wide</i> |

2.4. Quirk, *et al* (1972) cite the words enrolled in (7) as compounds of the type ³ ¹ *grass-green*, stating that those words can be paraphrased into a comparative expression such as 'as adjective as noun' or 'adjective like noun' with no consideration of their stress pattern:

- | | | |
|-----|--|---|
| (7) | ³ ¹
<i>bottle-green</i> | ³ ¹
<i>ocean green</i> |
| | <i>brick red</i> | <i>sea green</i> |
| | <i>midnight blue</i> | |

3.0. Our observation so far has shown that in recent studies on morphology and phonology no relation can be clearly established between the stress pattern of words and their internal structure in the case of compound adjectives consisting of a noun+an adjective. In the following discussion, we will make an appropriate classification for these words, and make clear the relationship between their stress pattern and internal structure.

3.1. We will now turn to the discussion of the classification and internal structure of compound adjectives with the form of

a noun+an adjective with 3-1 stress pattern.

The words exemplified in (8) show that they have an internal structure of a noun+a color-denoting adjective, and can be paraphrased into 'as adjective as noun' or 'adjective like noun':

- | | | | | |
|-----|---|---|---|--|
| (8) | ³ ¹
<i>blood-red</i> | ³ ¹
<i>jet-black</i> | ³ ¹
<i>poppy-red</i> | ³ ¹
<i>sky-blue</i> |
| | <i>bottle-green</i> | <i>lily-white</i> | <i>pitch-black</i> | <i>silver-gray</i> |
| | <i>brick-red</i> | <i>milk-white</i> | <i>pitch-dark</i> | <i>snow-white</i> |
| | <i>emerald-green</i> | <i>nut-brown</i> | <i>salmon-pink</i> | <i>pea-green</i> |
| | <i>grass-green</i> | <i>peacock-blue</i> | <i>sea-green</i> | |

Take the word ³ ¹ *blood-red* for instance. It can be semantically equivalent to the comparative expression of 'as red as blood' or 'red like blood.' Moreover, their first element particularizes the quality which is denoted by the second element; that is, in the examples ³ ¹ *blood-red* and ³ ¹ *poppy-red*, a color-denoting adjective *red* is specified by the words *blood* and *poppy*. Consequently, what is signified by each *red* in the compounds is different in either case.

Let us turn to another group of words. The first element of the words listed in (9) functions as an 'intensifier' of the second element:

- | | | | | |
|-----|--|---|--|---|
| (9) | ³ ¹
<i>bone-dry</i> | ³ ¹
<i>dog-cheap</i> | ³ ¹
<i>ice-cold</i> | ³ ¹
<i>stone-blind</i> |
| | <i>brand-new</i> | <i>feather-light</i> | <i>razor-thin</i> | <i>stone-dead</i> |
| | <i>cock-sure</i> | <i>honey-sweet</i> | <i>stock-still</i> | <i>stone-deaf</i> |
| | <i>dirt-cheap</i> | | | |

The structure of this type of example is an 'intensifier' noun+an adjective with 3-1 stress pattern. Supposing that the words in (9) are analyzable as having an underlying comparative form like the examples in (8), we would predict that the comparative expression for the word ³ ¹ *stone-blind* should be 'as blind as a stone.' However, this conversion from the word ³ ¹ *stone-blind* to the para-

phrase 'as blind as a stone' is not smoothly done since semantic features between the first element *stone* and the second element *blind* are not so closely connected.²

Next, consider the examples itemized in (10):

- (10) ³*country-wide* ³*nation-wide* ³*state-wide* ³*waist-high*
³*knee-deep* ³*skin-deep* ³*waist-deep* ³*world-wide*
³*knee-high* ³*sky-high*

All examples of this type consist of a noun+an adjective of 'extent' or 'measurement' with 3-1 stress pattern. The words in (10) suggest that a certain referent which is specified by the compound extends, approaches, and moves to a degree or level which the first element of the word indicates. For example, the word *waist-high* can be interpreted as extending as high as the waist, the word *waist-deep* can be explained as being at the level of the waist, and the word *world-wide* can be interpreted as extending throughout the world.

We will summarize what we have mentioned so far. (i) All the words listed in (8)-(10) have an underlying comparative form such as 'as (second element) as (first element)'. (ii) The first element semantically intensifies what is denoted by the second element. (iii) Phonologically, primary stress is assigned to the second element. (iv) The words are clearly classified into three groups according to the semantic relation between the two elements.

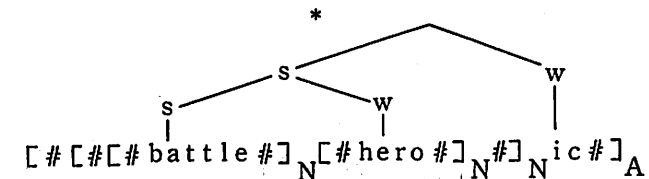
3.2. Now, let us examine further the words in question from the viewpoint of morphology. Word formation rules, which are advocated by Siegel (1974) and developed by Allen (1978) with slight modification, are applied in a fixed order. This Ordering Hypothesis has been proposed to explain the fact words are composed in the direction from Level I to Level III as illustrated in (11):

(11) Word Formation Rules (Ordering Hypothesis)

↓	Level I	+Affixation: <i>in-</i> , <i>-ion</i> , <i>-ity</i> , <i>-ic</i> , etc.
↓	Level II	#Affixation: <i>un-</i> , <i>en-</i> , <i>-ed</i> , <i>-ing</i> , etc.
↓	Level III	##Compounding

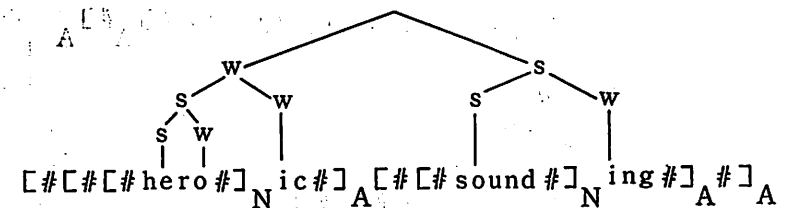
To take an example, the suffix *-ic*, which belongs to Level I, is not affixed to the compound *battle-hero* after the formation of the compound since compounds are formed at Level III. Therefore, the formation of the unacceptable compound **battle-heroic* is blocked:

(12) **battle-heroic*



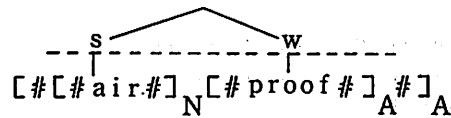
In the case of the compound *heroic-sounding*, on the contrary, the suffix *-ic* is affixed to the word *hero* at Level I to form the compound properly at Level III:

(13) *heroic-sounding*

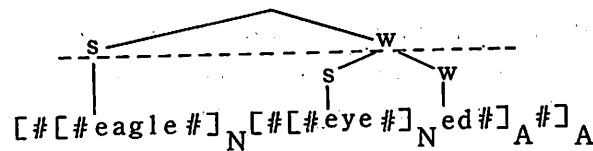


3.3. In section 1.1, the lexical structures of the words listed in (2a)-(2d) have been linearly analyzed into each elements. Furthermore, in accordance with Allen (1978), their lexical structures are hierarchically decomposed into those in (14):

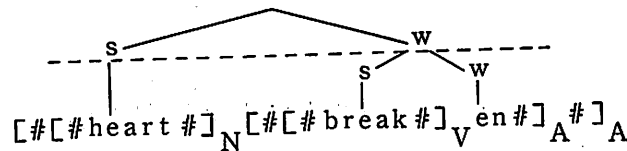
(14) a. *airproof*



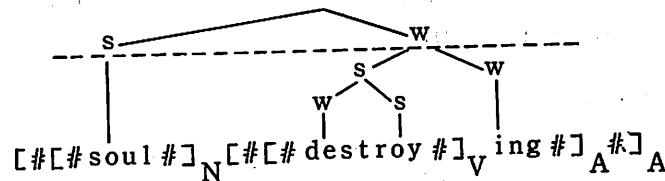
b. *eagle-eyed*



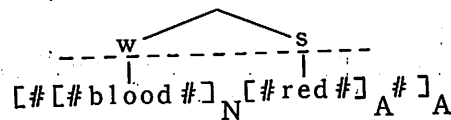
c. *heart-broken*



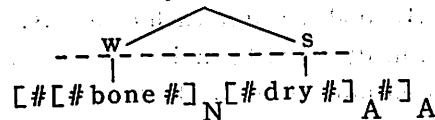
d. *soul-destroying*



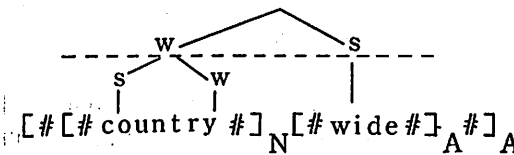
e. *blood-red*



f. *bone-dry*



g. *country-wide*



The words *airproof* in (14 a), *eagle-eyed* in (14 b), *heart-broken* in (14 c), and *soul-destroying* in (14 d) are taken from lists (2 a), (2 b), (2 c), and (2 d), respectively. The words *blood-red* in (14 e), *bone-dry* in (14 f), and *country-wide* in (14 g) are from lists (8), (9), and (10), respectively. Level III lies above the broken line.

Notice here that the second element of the words in (14 b)-(14 d) branches at Level I or II while relevant words in (14 e)-(14 g) do not branch at that level.

3.4. Taking all of the observations presented in section 3.1-3.3 into consideration, we can specify the features of the words enrolled in (8)-(10) as (15):

- (15) N_1 =noun, and=[+C] and N_2 /non-branch (at Level I, or II)

This condition suggests that the first element of the word is a noun, containing the feature [+C] (i.e., [+Comparative]). Its second element does not branch at Level I or II. In other words, it is immediately associated with the right node at Level III.

Incorporating condition (15) into conditions of case (D) in LCPR (96) as additional condition (iii), an appropriate 3-1 stress pattern can now be assigned to the words which have been dealt with as exceptions to the Rule. Moreover, in section 3.1, we have clarified what the term 'comparative' in LP's analysis means.

3.5. Let us examine how condition (iii) operates in LCPR (96). Take first a pair of words *skintight* and *watertight*, which display

opposite stress pattern from each other:

- (16) a. ³ ¹ *skintight* b. ¹ ³ *watertight*

The first element of the word *skintight* contains the feature [+C] and its second element does not branch at Level I or II. Therefore, condition (iii) of case (D) in LCPR (96) holds good for the word *skintight*. Consequently, 3-1 stress pattern is properly assigned to the words, the meaning of which is 'fitting as tightly as skin.'

On the other hand, in the case of the word *watertight*, application of condition (iii) of case (D) is blocked, since the first element of the word is not specified as [+C]. Hence, Rule II in LCPR (96) assigns 1-3 stress pattern to the word, the meaning of which is 'so closely constructed or fitted that water cannot leak through'—with no comparative implication. The following are of the *watertight* type:

- (17) ¹ ³ *air-tight* ¹ ³ *steamtight*
¹ ³ *raintight* ¹ ³ *vapor-tight*

3.6. Finally, we have to mention here some exceptional words. Those listed in (18) carry 3-1 stress pattern, though the first element of the words is not specified as [+C]:

- (18) ³ ¹ *duty-free* ³ ¹ *ice-free* ³ ¹ *rent-free* ³ ¹ *tax-free*
³ ¹ *fancy-free* ³ ¹ *post-free* ³ ¹ *shot-free*

The stress assignment of those enrolled (19) can not be explained within the framework of LP. We will leave them open to question for the present:

- (19) ³ ¹ *country-bred* ³ ¹ *heaven-made* ³ ¹ *homeborn*
³ ¹ *heaven-born* ³ ¹ *home-bred* ³ ¹ *homemade*

4. To summarize briefly, we have examined the lexical structure of the words which are treated as exceptions to LCPR (96) in LP and incorporated them into our expanded system of rules to reduce the number of exceptional cases.

Notes

*This is based on a paper read at the Kyushu Branch of the English Literary Society of Japan, November 14, 1982.

†Recall that the LCPR (96) is proposed in Liberman and Prince (1977) as follows:

(96) Lexical Category Prominence Rule

In the configuration [N₁ N₂]_α

I. N₂ is *strong* if any one of the following conditions is met:

A. N₂ branches

B. N₂/[+F]

C. N₁/#C₀ V and not (N₂/affix)
 [-long]

D. α=non-nominal or [+R],

(i) N₁ does not branch, and not (N₂/-ate, -ize)

(ii) α=verb and N₂/stem[†]

II. Otherwise, N₂ is *weak*

*Notice that the word *stone-blind* does not completely lose its comparative connotation but retains it as *OED* describes one of the meanings of the word as 'blind as a stone.'

References

- Adams, Valerie. 1973. *An Introduction to Modern English Word-formation*. London: Longman.
 Allen, M. R. 1978. *Morphological Investigations*. PhD dissertation, University of Connecticut, Storrs.
 Aronoff, Mark. 1976. *Word Formation in Generative Grammar*. Cambridge, Mass.: MIT Press.
 Chomsky, Noam. and Morris Halle. 1968. *The Sound Pattern of English*. New York: Harper & Row.

- Kiparsky, Paul. 1982. From Cyclic Phonology to Lexical Phonology. In Harry van der Hulst & Norval Smith (eds.), *The Structure of Phonological Representations*. Dordrecht: Foris.
- Koziol, Herbert. 1972. *Handbuch der englischen Wortbildungslehre*. Heidelberg: Carl Winter.
- Liberman, Mark. and Alan Prince. 1977. On Stress and Linguistic Rhythm. *Linguistic Inquiry* 8: 2, 249-336.
- Lieber, Rochelle. 1980. *On the Organization of the Lexicon*. PhD dissertation, MIT.
- Marchand, Hans. 1969. *The Categories and Types of Present-Day English Word-formation*. München: C. H. Beck.
- Meys, W. J. 1975. *Compound Adjectives in English and the Ideal Speaker-Listener*. Amsterdam: North-Holland.
- Quirk, Randolph, et al. 1972. *A Grammar of Contemporary English*. London: Longman.
- Siegel, D. 1974. *Topics in English Morphology*. PhD dissertation, MIT.
- Strauss, Steven L. 1982. On the Theory of Word-Formation and Its Role in Phonological Analysis. *Linguistic Analysis* 9, 254-276.
- Yamada, Eiji. 1981. Stress Rules for Compound Adjectives in English. *Kurokami Review* 4, 33-49.