SEMANTIC RELATIONS AND STRESS IN ENGLISH COMPOUNDS

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1. Background

   English is a Germanic language spoken as the national language or as a language with official status in many countries, most notably the United Kingdom, The United States, Canada, and Australia. As in all Germanic languages, compounding is probably the most productive word formation process in English. This paper will discuss English compounding, and in particular stress patterns on compounds. Most compounds use a stress pattern called compound stress, but certain types of word combinations that, by all other criteria, are compounds, systematically use phrasal stress. In section 2, I describe the English stress system, and in section 3, I talk about types of compounds and how stress differences among compounds correlate with the semantic relations of the component lexemes. Section 4 presents a summary and a conclusion.

2. English Stress

   Stress applies to entire syllables, not individual segments. I will therefore present data using standard English orthography, which is adequate for showing syllables.

2.1. Lexical stress levels. English has three levels of what we can call “lexical stress”, that is, stress levels that have to be included as part of the lexical information of a word.

   Primary stress: Every substantive word\(^1\) of English has one and only one syllable with primary stress,\(^2\) marked with an acute accent, e.g. mán, wóman, sándal, yéllow, cónifer, adápt, cocóon, conclúsion, análogy, cigarétte.

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\(^1\) “Substantive” essentially means noun, verb, adjective, adverb. Words such as determiners, prepositions, and pronouns are usually “clitics”, i.e. they “lean” on the substantive with which they are associated. One indicator of this leaning is that they do not bear stress, at least primary stress.
Unstressed: Unstressed syllables lack prominence. Unstressed syllables are unmarked in this paper. A hallmark of absence of stress in English is that the vowel of the syllable is reduced to [ə] or to a syllabic sonorant as in rubber [rʌbə], apple [æpl], sadden [sædən]. The exception is unstressed vowels in word-final open syllables, which are not reduced (háppy [hæpi], yéllow [yɛlo], árgue [ɑːgju]). The words used to illustrate primary stress above are pronounced as follows: [wάmən], [sændl̩], [yɛlo], [kánəfi], [ɔdæpt], [kɑkʊn], [kəŋklʊʒən], [ɔnæləðʒi], [sɪgjɛt]

Secondary stress: Syllables that do not bear primary stress but whose vowels are not reduced to [ə] are said to bear secondary stress, which I will mark with a grave accent. These syllables usually have more prominence than unstressed syllables, and they can count as “stressed” in contexts such as poetic metrics. Note the difference between the final syllables in tórmènt [tɔrmɛnt] and tórrent [tɔrɛnt], where the vowels are spelled the same, but the second syllable bears secondary stress in the former but is unstressed in the latter. Here is a word family showing how morphology causes shifting of stress with consequent changes in vowels: phótogràph [fɔtɔɡæf], photógraphy 3 [fɔtɔɡəfɪ], phòtográfic [fɔtɔɡəfɪk].

2.2. Nuclear stress. Lexical stress, described in 2.1, is a property of every word. In speech, intonation also plays a role in prominence. Every utterance spoken with “neutral” intonation has a nuclear stress (“neutral” intonation meaning that no words are

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2 This claim assumes that “stress” has some recognizable phonetic correlates. What these correlates are has been the subject of much phonetic investigation. Typically, a stressed syllable in English bears higher pitch than neighboring syllables, perhaps more duration, and more “energy”, whatever this may mean.

3 Since vowels in unstressed final open syllables do not reduce to [ə], it is often hard to know whether a final syllable is unstressed or bears secondary stress. I have left it unmarked = unstressed here.
given special prominence for emphasis, the speaker is not using “robotic” speech, and the like). Nuclear stress in English falls on the last syllable of the utterance that has primary lexical stress. In the examples below, the syllable bearing nuclear stress is capitalized, and the lexical stresses of the individual words are marked as above.

STÁbilíze it!

Stábilíze the reFRÍgeràtor!

Samántha STÁbilízed it.

Samántha stábilízed the reFRÍgeràtor.

Samántha stábilízed the refrígeràtor YÉSterday.

2.3. Phrasal stress. When substantive items form a phrase, each item in the phrase bears more or less the same stress pattern it would bear if used alone unless the last item in the phrase happens to be in the position to bear nuclear stress. In the examples below, the phrase of interest is underlined and something additional follows. This following material “protects” either item in the phrase from bearing nuclear stress.

ADJECTIVE+NOUN: Magénta mátresses are ÚGly.

POSSESSOR+ADJECTIVE+NOUN: Samántha’s fávorite ánimal is a PÁNda.

VERB+OBJECT: Samántha collected petúnias in the GÁRden.

VERB+ADVERB: I procrástinàted yésterday all day LÓNG.

3. Compounds and Compound Stress

Every neutral utterance of English observes the stress patterns above: all words have lexical stress, including one and only one primary stress; all utterances have one and only one nuclear stress; phrasal stress consists of giving relatively equal stress to the primary stressed syllable of each word in the phrase (except for a word that bears nuclear stress).
Compounds are morphologically complex units that comprise two or more lexemes (= “substantive” items—see footnote 1). In English, a sure sign that a grouping of words comprises a compound, not a phrase, is compound stress. In a compound, the primary stress of the entire compound falls on the primary stressed syllable of the first item of the compound and any following stressed syllables bear secondary stress. We can diagram this stress pattern as \([ X_{\text{PRIMARY}} \ Y_{\text{SECONDARY}} ]_{\text{COMPOUND}}\). The compounds below show that this pattern holds regardless of the word categories of X and Y or the number of syllables in X and Y. The X can itself be a compound or other complex item, in which case only its internal X has primary stress. It also does not matter whether the compound is endocentric (the semantic head is the Y) or exocentric (the semantic head is not part of the compound itself). I have put “[exocentric]” in brackets following exocentric compounds. Note that English spelling is not a good indicator of compound status. Compounds are sometime written as one word, sometimes as separate words, and sometimes with a hyphen. The compound stress pattern is, however, a reliable indicator of compound status since this stress pattern would never be possible in a syntactic phrase.

N+N: cówbòy, schóol bùs, Christmas présente, bàllét lèsson, élevátor òperàtor, pèanùt bùtter jàr làbel, blóckhèad [exocentric]

A+N: bláckbèrry, yéllow jàcket [exocentric]

V+N: (V-subject) wáchtègg, crýbàby, còver làtter; (V-object) scárecròw, kílljòy, éndgàme [most V-subject compounds are endocentric, most V-object compounds are exocentric]

N+A: cársick (but in general, X+A compounds have phrasal stress—see below)

N+V: súnbàthe, wáterskì, bówhùnt
A+V:  fréeload, deep-frý

V+V:  stír-frý, tîe-dýe

(All X + V compounds are endocentric.)

The range of word category combinations (a multi-word compound!) and semantic relations illustrated here, all of which take compound stress, make it seem that compounding and its stress pattern must be inseparable. Consider the following, however: pitch BLÁCK, rúubber CHÉCK, Súnsèt STRÍP. These expressions meet a number of the criteria that would make us want to call them compounds: they comprise full lexemes, they comprise combinations that could not normally be generated as syntactic phrases (no syntactic rule would generate a phrase of the form N+A or N+N), and they are idiomatic (compare pitch black with ?tar black, Sunset Strip refers to a particular part of Sunset Boulevard) or non-compositional (a rubber check is made of paper). Yet, in citation form, they appear to have a stress pattern \([ X_{\text{SECONDARY}} Y_{\text{PRIMARY}} ]\), which is the opposite of compound stress. This is deceptive, however, because in citation form, they comprise complete utterances, where nuclear stress falls on the last primary stressed syllable. They actually have phrasal stress, with both elements receiving approximately equal stress, as can be seen when they are not final in an utterance, e.g. the pitch bláck NÎGHT, my rúubber chéck ruined my CRÉDIT RÀTING. We can therefore diagram pattern of expressions like pitch bláck as \([ X_{\text{PRIMARY}} Y_{\text{PRIMARY}} ]_{\text{COMPOUND}}\).

Compounds with phrasal stress rather than compound stress fall into several well-defined groups:

TYPE+A:  snów-whíte, rúby-réd, bútt-úgly, líght cýan (where “TYPE” is a noun that is a proto-type of the thing that has the quality of A or a word that delimits the A)
X+PARTICIPLE (where X modifies the participle): réd-chéeked, píg-héaded, lével-héaded, hóme-grówn, óver-ráted, hóme-cóoking, láte-blóoming; but NOT sight-sèeing, mórntain-clímbing, (maybe) wáter-lògged, bóok-màrked, where X = the semantic object of the participle and the expressions have compound stress.

COORDINATIVE: Áfrican-Américan, pláyer-cóach

NX+N_Y where Y is made of X: chéese ómelette, stéel màgnólia, páper tíger, ápple píe

NAMES OF ALL KINDS (proper names, titles, place names, events, games, etc.): Rússell Schúh, Proféssor Schúh, Président Òbáma, Wilshire Bóulevàrd, Câtalina Íslánd, Griffith Párk, Gréybàr Hôtél, Lòs Ángeles Márathòn, Téxas Hóld’em, five-cárd dráw\(^4\) [the latter two being exocentric with the understood head being “poker”]

The last type has some exceptions that systematically take compound stress rather than phrasal stress, two being holidays that incorporate “day” (Lábór Dày, Véteran’s Dày) and thoroughfare names that include “street” (Máin Strèet, Éasy Strèet). I return to this below.

Some compounds can potentially take either compound stress or phrasal stress. I have always pronounced ice cream, band aid, and boy scout with phrasal stress, but I think many, if not most people pronounce them with compound stress.\(^5\) The existence of individual differences in stress patterns for such compounds has a semantic explanation: for the first two, phrasal stress implies that the X is the material from which Y is made.

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\(^4\) The five-cárd part of this compound itself is a compound with phrasal stress. Other NUMBER+N compounds have this pattern as well, e.g. thréé-póint lánding four-stár géneral, fifty-méter pól.

\(^5\) I assume that my childhood peers in Klamath Falls, Oregon pronounced these words as I do. Since moving to the big city, I have been the object of abuse for my unrefined pronunciation!
(cream made of ice, a type of aid composed of a band) while compound stress implies that Y is a type delimited by X (ice cream is a type of cream, a band aid is a type of aid); for boy scout, phrasal stress implies a COORDINATIVE meaning (someone who is both a boy and a scout) whereas compound stress implies a type of scout (boy vs. girl vs. cub).

As another example, for me Milky Way is a name parallel to Sherman Way and has phrasal stress, but some people use compound stress, Milky Way, presumably parallel to other A+N compounds of the yellow jacket type.

One would like to find a principled reason for why these groups systematically take phrasal stress rather than compound stress. The fact that COORDINATIVE compounds take phrasal stress suggests the following hypothesis: compounds take phrasal stress if X and Y are shared properties of the referent of the compound. The referent will be Y (the head of the compound) in an X+N compound and will be the modificiee in an X+A (where A can be either an adjective or a participle used as an adjective).

For COORDINATIVE compounds, the name of the compound type directly indicates that X and Y are both properties shared by the referent, e.g. the referent of African-American has both African and American properties. In the case of TYPE+A compounds, the referent has characteristics of both parts of the compound: snow-white hair resembles snow and has the quality of being white. There are two types of X+PARTICIPLE constructions. For those with phrasal stress, X is a property of Y and this compound property is, in turn an inherent property of the modificiee (in late-blooming genius, late describes the blooming and being a late-bloomer is a property of the genius), whereas this relationship does not hold for those with compound stress (in mountain climbing, mountain is the object of climbing, not a property of it). For the N_X+N_Y “Y made of X”
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compounds, Y has properties of both X and Y: a *chéese omelette*, in addition to being an *omelette*, is composed, in part, of *cheese*. Finally, both parts of *names* are descriptors of the referent: *Wilshire Bóulevàrd* is a boulevard, but we can refer to this thoroughfare simply as *Wilshire*.

We can test the “shared properties” hypothesis by taking at least the N+N phrasal stress compounds, give them compound stress, and see what effect this has. A *páper tíger*, with phrasal stress, refers (metaphorically) to a tiger made of paper. A *páper tiger*, with compound stress, though not a standard compound, would mean “a tiger associated with paper” (he carries paper, he destroys paper, he is the logo for a newspaper, etc.), but not a tiger made of paper. Haspelmath (2002:46) illustrates compound formation with *chéese bòard* (with compound stress), presumably meaning “a board on which to cut cheese”. If we were to give this compound phrasal stress, *chéese bòard*, it would mean something like “a piece of cheese in the form of a board”, i.e. “a board composed of cheese”. This hypothesis explains why *names* of holidays that include *Day* have compound stress, even though most names have phrasal stress: *Lábor Dày* is a *day* associated with *labor*, *labor* is not a property of the *day*. This contrasts with *Christmas Dày*, with phrasal stress, where the *day* is, itself, the holiday *Christmas*. I admit, however, that I have no explanation for why thoroughfare names using *street* (*Máin Strèet*, etc.) all have compound stress.

If we try to substitute compound stress for phrasal stress in the types other than N+N, we get a different result: *snów-white*, *láte-blòoming*, *Áfrican-Amèrican*, *Wilshire Bòulevàrd*. The semantic relation between X and Y remains the same as in the forms with phrasal stress and the [X PRIMARY Y SECONDARY] stress pattern is interpreted not as
compound stress, but as contrastive stress. That is, we would be contrasting SNÓW-white with, say, ÖFF-white. In all these types of compounds, it is hard to imagine what semantic relationship could exist between X and Y other than the phrasal stress one, and indeed, we cannot impose compound stress on them to create such a relation.

None of the compound types listed as consistently taking phrasal stress have V as either X or Y. Compounds like wáchtòg (dog is subject of watch), scárecròw (crow is object of scare), or wáterskì (water has an adjunct relation to ski, i.e. ski on the water). There is no way that the X and Y in these compounds could be properties shared by a referent. However, the heads of A+V compounds like déep-frỳ and V+V compounds like stír-frỳ do share properties: deep is a kind of frying (like late is a property of blooming in lâte-blómoing), and stír-frỳ is COORDINATE (both stirring and frying are taking place). I find both compound stress and phrasal stress acceptable on A+V and V+V compounds, but phrasal stress is impossible in compounds like wáchtòg. I am not sure why compound stress is acceptable here, but the fact that phrasal stress is possible, whereas it is impossible in all the other type of compounds listed among those taking compound stress, is further support for the hypothesis that phrasal stress is conditioned in compounds where X and Y are shared properties of the referent of the compound.

4. Conclusion

In this paper, I have described the system of English stress, and for expressions comprising more than one lexeme, I have distinguished compound stress and phrasal stress. Most expressions that linguists would classify as compounds take compound stress, i.e. a pattern \([X_{\text{PRIMARY}} Y_{\text{SECONDARY}}]_{\text{COMPOUND}}\). However, certain types of expressions which, on a number of criteria, would be considered compounds, take phrasal stress, i.e. a
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pattern \([ X_{\text{PRIMARY}} \ Y_{\text{PRIMARY}} \]_{\text{COMPOUND}}\). I argued that the latter types can be semantically characterized as compounds where X and Y are shared properties of the referent of the compound (generally the head of the compound = X) or of the modifier of adjectival compounds.

One common way of classifying compounds, particularly N+N compounds, is in terms of semantic relationships between X and Y, e.g. “purpose”, “appearance”, “location”, “material”, etc. Haspelmath (2002:87) says, “…such a classification is not particularly useful, because there seem to be almost no restrictions on the kinds of semantic relations that may hold between the dependent and the head in compounds.” Booij (2007:74-75) says, “The exact nature of the semantic relation between the two constituents receives no formal expression, and is a matter of interpretation by the language user. As language users, we have to interpret the relationship on the basis of the meanings of the compound constituents, our knowledge of the world, and sometimes the context in which the compound is used.”

The results of this paper suggest that these statements are a bit too strong. In fact, it seems that working out certain types of semantic relations between constituents of a compound can be important and can “receive formal expression”.

References
