

Some Notes on Stress Assignment in English Noun Compounds and Noun Phrases

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0. Introductory remarks

The problem I will attempt to deal with in this paper is that of finding factors which affect the placement of stress in compound words and noun phrases.¹ Observe the examples in (1):

- (1) a. computer ¹error computer ¹graphics computer ¹programme
 computer ¹science computer ¹software
 b. com ¹puter age com ¹puter game com ¹puter language
 com ¹puter problem com ¹puter screen com ¹puter skills
 com ¹puter system com ¹puter user com ¹puter virus

Although the compounds and phrases listed above all consist of *computer* and a noun, The stress position of the lexical items in (1a) is different from that of the items in (1b): the former has primary stress on the second element, while in the latter primary stress is placed on the first element.²

This fact shows that just knowing the orthography of a compound or syntactic phrase does not necessarily enable one to

predict its stress pattern with any confidence. One solution is to check in a good dictionary to be sure of the stress on a particular combination, as Swan (1995) and others recommend. But, how then, does the non-native speaker determine where to put stress in those collocations not normally listed in a dictionary with phonetic or phonemic notations, for example idiomatic phrases, slogans, new words, mottos or advertisements?

In this paper I want to explore to what extent the principles proposed in previous studies are helpful for non-native learners of English to predict the appropriate place of stress in compound words and noun phrases that are not given phonetic information in dictionaries. I furthermore want to show how the stress position in a number of compounds and habitual collocations is affected by more than one rule.

1. Scope of the study

Before I begin it is necessary to delimit my area of discussion in the present study. Firstly, English compound words can be morphologically classified into three types: noun compounds, adjective compounds and verb compounds. This study does not deal with word stress in compounds functioning as adjectives and verbs.³

Next, this work deals with noun compounds generally written as two separate words, and not with those that are generally written together (e.g. *supermodel*) or with a hyphen (e.g. *girl-friend*)⁴ because the stress pattern is usually predictable: the primary stress is placed on the first.⁵

Another important point is that the syntactic phrases that will be discussed in this paper are those used in relatively fixed ways, i.e. those in the left column in (2) below, which can be distinguished from the freer phrases in the right column.

| | |
|-----------------|-------------------|
| (2) pet dog | white dog |
| elder sister | married sister |
| single parent | rich parent |
| iced tea | strong tea |
| college student | dedicated student |

Also significant is that this study observes British pronunciation rather than American pronunciation.⁶ There are often differences between the stressing of compounds in British English and in American English, as many have pointed out. American speakers have the tendency to place primary stress on the first element of certain compound words (e.g. *peanut butter*), which are generally late stressed⁷ in present-day British pronunciation.⁸

Finally, it should be pointed out that the stress patterns shown in this paper are those that apply if no special emphasis is required. The stress pattern of a word can be changed if the speaker wants to emphasize a particular contrast. For example, in isolation *cheese* ¹*sandwich* is normally pronounced with late stress: its second element has primary stress. The same is true of *cucumber* ¹*sandwich* or *ham* ¹*sandwich*. If all three forms were read aloud as a list, however, a native speaker would probably pronounce each with early stress: its first element has primary stress like ¹*cheese sandwich*, ¹*cucumber sandwich* and ¹*ham sandwich*.

| | | |
|--|---|--|
| l ¹ laughing matter | l ¹ linking verb | l ¹ listening comprehension |
| l ¹ mixing bowl | l ¹ opening/ l ¹ closing time | |
| pro l ¹ nouncing dictionary | re l ¹ ording studio | |
| re l ¹ cycling bin | l ¹ shopping basket | l ¹ singing voice |
| l ¹ sleeping sickness | l ¹ smoking section | l ¹ teaching materials |
| l ¹ trading stamp | l ¹ tuning peg | l ¹ visiting hours |
| l ¹ washing line | l ¹ wedding dress | l ¹ working conditions |

Since I have found no counter-examples to this rule, I believe learners of English can definitely rely on it.

2.1.2. Past participle + noun combinations

Adams (1973) says that compounds of the participial adjective-noun kind, for example *minced meat*, *inverted comma* or *split infinitive*, are always late stressed. It is not difficult to think of collocations that fit into this class. Some examples are:

| | | |
|---------------------------------------|-----------------------------------|-------------------------------|
| (5) applied lin ¹ guistics | canned l ¹ laughter | cleft l ¹ sentence |
| corned l ¹ beef | fermented l ¹ soybeans | flavoured l ¹ tea |
| given infor ¹ mation | iced l ¹ tea | kept l ¹ woman |
| mashed po ¹ tato | stained l ¹ glass | |

Two exceptions to this rule are *given name* and *printed matter*, which generally take early stress. Accordingly, this rule seems to be the second most reliable.

2.1.3. The first element is a number

Roach (2000: 109) and Roach, Hartman & Setter (2003: 111)

mention that compounds with a number as the first element tend to be have late stress. Roach's examples are *three-¹wheeler* and *second-¹class*, and Roach, Hartman & Setter's is *three-¹piece*. Although their examples are all hyphenated, I have noted some open words:

| | | |
|-----------------------------|-----------------------------|------------------------------|
| (6) first ¹ aid | first ¹ class | first ¹ floor |
| first ¹ lady | first ¹ officer | first ¹ round |
| first ¹ sight | second ¹ home | second ¹ language |
| second ¹ thought | second vio ¹ lin | sixth ¹ sense |
| Third ¹ World | Twelfth ¹ Night | |

To the best of my knowledge the only exceptions to this principle are *¹first name*, *¹first school* and *¹second name*. Therefore, I regard this rule as the third most reliable.

2.1.4. Present participle + noun combinations

Takebayashi (1996: 388) mentions that *leading article*, *revolving fund* and *visiting fireman*, which are made up of a present participle and a noun, are late stressed. Examples of the same type I have found are:

| | | |
|---|--------------------------------|---|
| (7) accompanying ca ¹ ssette | flying ¹ fish | flying ¹ saucer |
| folding um ¹ brella | propelling ¹ pencil | revolving ¹ door |
| ruling ¹ party | running ¹ battle | shooting ¹ star |
| Sleeping ¹ Beauty | sliding ¹ door | sparkling ¹ water ⁹ |
| splitting ¹ headache | standing o ¹ vation | visiting pro ¹ fessor |
| working ¹ mother | | |

Wells 2000) have observed, collocations involving *cake*, *juice* and *water* take early stress for some reason,¹¹ as in (11):

(11) ˈalmond cake ˈorange juice ˈbarley water (Wells 2000: 163)

It is interesting to compare the following pairs:

(12) ˈapple juice apple ˈpie
 ˈchocolate cake chocolate ˈpudding
 ˈbarley water barley ˈtea
 ˈcheese cake cheese ˈsandwich

It can be said that the rule above is very useful as long as one realizes that certain expressions such as *cake*, *juice* and *water* are exceptions to this rule. Two other noteworthy exceptions I have found are ˈ*rubber boots* and ˈ*wax figure*.

2.1.6. Noun + gerund combinations

Thomson & Martinet (1986: 31) suggest that noun + gerund collocations tend to be early stressed. Some of their examples are ˈ*fruit picking*, ˈ*lorry driving*, ˈ*sheep farming* and ˈ*wind surfing*.

The following constructions are taken to belong to the same class.

(13) ˈarm wrestling ˈear training ˈflower arranging
 ˈinternet dating ˈlanguage teaching/learning
 ˈparagraph writing ˈrock climbing ˈsamba dancing
 ˈsight reading ˈsky diving ˈstamp collecting
 ˈtelevision advertising ˈtoilet training

Unlike the rule for gerund + noun collocations, the examples in (14) do not seem to follow this rule:¹²

- (14) city/family/language ˈplanning insider ˈdealing/ ˈtrading
interior ˈdecorating/deˈsigning pedestrian/pelican/zebra ˈcrossing

Still, it seems that this rule holds for the majority of combinations of this type.

2.2. Rules with a number of exceptions

2.2.1. Noun + noun combinations

Most English phonetics books (Roach 2000, Cruttenden 2001, among others) write that the main stress in N + N compounds is commonly on the first element. However, this rule is not quite true in compounds like the following:

- (15) computer ˈgraphics city ˈcentre combine ˈharvester
garden ˈcity garden ˈsuburb interior ˈdecorator
interior deˈsigner laser ˈprinter mother ˈtongue
science ˈfiction trade ˈunion¹³

To the best of my knowledge these exceptions are in the minority, and it seems that the great majority of N + N compound nouns are early stressed.

It is also of interest to note that a variety of well-established noun + noun syntactic constructions are also early stressed like most N + N compounds:

- (16) 'baby soup ba'nana skin 'egg carton 'massage oil
 'salad bowl 'shark fin 'table leg T'V guide

Furthermore, I want to point out that there is some relationship between the stress patterns of combinations like the following, the items in (16) and some of the examples shown in (1), and the semantic relations of the first and second elements.¹⁴ (A denotes the first element, and B the second one.)

- (17) B for A: 'baby soup com'puter language 'egg carton
 'massage oil 'salad bowl T'V guide

- (18) B is part of A: ba'nana skin com'puter screen
 'shark fin 'table leg

- (19) B by A: cable'television computer'error
 computer'graphics computer'programme
 laser'printer microwave'oven
 piano a'ccompaniment

Word-stress seems to be easily predictable in collocations of these kinds.

What can be said by analysing the examples in this section is that certain types of habitual syntactic phrases take early stress on some semantic relationships between the first and second elements, and certain types of compound nouns take late stress.

2.2.2. Contrasts

According to Adams (1973), Takebayashi (1996) and some other literature, one important reason for early stress rather than late

stress is contrast. That is, the first element of a particular compound has a tendency to have main stress when contrasted with combinations whose second element is the same as that combination. Adams (1973: 60) comments:

In some cases, the placing of the accent seems to be dictated by the need to express a contrast. ¹ *War crime* is a particular kind of crime, ¹ *Sunday school* is a particular kind of school, and accordingly, the emphasis in both cases is on the contrasting first element; in *midnight* ¹ *sun*, on the other hand, no contrast is implied, or accentually expressed, since there is only one sun....

Takebayashi's examples are:

- (20) day: ¹ birthday, e¹ lection day, ¹ field day, ¹ Labor day, ¹ pay day
disease: ¹ Alzheimer's disease, ¹ Basedow's disease,
¹ Hansen's disease, ¹ Parkinson's disease
house: ¹ custom house, ¹ discount house, ¹ ranch house, ¹ rest house,
¹ school house
room: ¹ bathroom, ¹ cloakroom, ¹ guest room, ¹ reception room,
¹ rest room
school: ¹ charm school, ¹ grammar school, ¹ night school,
¹ Sunday school, ¹ summer school
system: ¹ honor system, ¹ merit system, ¹ point system, re¹trieval
system, ¹ sprinkler system, ¹ solar system, Co¹pernican system
theory: communi¹cation theory, ¹ game theory, infor¹mation theory
(Takebayashi 1996: 385)

This criterion of contrast with other items seems to be able to account for a large number of cases such as the following:

- (21) card: |business/|credit/I|D/|library/|loyalty/|membership card
 chain: ho|tel/|restaurant/|supermarket chain
 critic: |film/|literary/|music/|theatre critic
 driver: |ambulance/|rickshaw/|taxi/|train driver
 glass: |beer/|brandy/cham|pagne/|wine glass
 gloves: |boxing/|cycling/|gardening/|oven/|surgical gloves
 leave: com|passionate/ma|ternity/pa|ternity/|sick leave
 lover: |art/|music/|nature lover
 massage: |back/|foot/|shoulder massage
 name: |brand/|code/|family/|first/|maiden/|pet/|place name
 outing: |class/|family/|school outing
 party: |birthday/|dinner/|drinks/|fancy dress/|garden/
 sur|prise/|tea/|welcome party
 person: |city/|dog/|night/|outdoor person
 rate: |birth/|crime/|death/unem|ployment rate
 rental: |car/|telephone/|television/|video rental
 service: consul|tation/|credit/|customer/infor|mat|ion/
 |postal/|room service
 shop: |discount/e|lectrical/|furniture/|hardware shop
 show: agri|cultural/|comedy/|fashion/|quiz/|radio/T|V show
 song: |Beatles/Ch|ristmas/|folk/|love/|pop songs
 student: |college/|literature/post|graduate student
 studies: |business/|Chaucer/|social/|women's studies
 tag: |gift/i|dentity/|name/|price tag
 tour: |audio/|ghost/|mystery/|package tour¹⁵

train: | Birmingham / co|mmuter / ex|press / |goods / |night /
 |stopping train
 tree: |cherry / |chestnut / Ch|ristmas / |oak tree

It is possible here to consider that *literary critic* has implicit contrast with *music critic* or *film critic* and *maternity leave* with *paternity* / *sick* / *compassionate leave*, and so on.

This principle helps me find the reason why given name in section 2.1.2, *computer age* / *game* / *problem* / *skills* / *system* / *virus* in example (1),¹⁶ *garden party*, *stomach cancer* and *mouth ulcer* in 2.2.5 and *Christmas tree*, *Sunday school*, *summer school*, *night shift* and *night train* in the preceding section take early stress.

However, Adams also suggests that ‘we find *cottage* | *cheese*, *mountain* | *ash*, which, since they denote a particular kind of cheese and a particular kind of ash, we might have expected to have accented first elements’ (p 60). Some other examples that seem to be counter-examples of the same kind are:

- (22) holiday: bank / Christmas / New Year / school / summer | holiday
 planning: city / family / language | planning
 pudding: black / Christmas / Yorkshire | pudding
 restaurant: Chinese / Italian / Japanese | restaurant
 tea: afternoon / breakfast / cream / high | tea
 wedding: diamond / shotgun / silver / white | wedding

The ratio of these exceptions is small and the rule in the present section seems to be quite dependable.

2.2.3. Adjective + noun combinations

Bowler & Cunningham (1999: 32-33) remark that adjective + noun forms (e.g. *mobile phone*, *digital television*, *central heating*) are late stressed. This tendency is very noticeable when comparing the following pairs:

| | |
|------------------|---------------|
| (23) big wheel | Ferris wheel |
| classical music | jazz music |
| first class | economy class |
| nautical mile | sea mile |

The compounds in the left column, whose first elements are an adjective, are stressed on the second element, while those in the right column are early stressed because its first element is a noun.

The reason why compounds and well-established collocations like those in (24) do not take early stress can be accounted from the same perspective.

| | | |
|---------------------|--------------------|--------------------|
| (24) black sheep | cognitive science | dental floss |
| domestic violence | double standard | dry ice |
| English literature | fast food | floppy disk |
| global village | green salad | herbal tea |
| hot pepper | lower case | new man |
| personal stereo | plastic surgery | private eye |
| remote con trol | roast chestnuts | sexual ha rassment |

Some exceptions:

- (25) |dry goods |easy chair |high street |nervous system
|old boy |postal service |social worker |soft drink
|technical college

These constructions are generally early stressed even though their first element is an adjective.¹⁷

Another difficulty would be pointed out by giving the following compounds, which are all taken from the entry ‘cold’ in Wells’ (2000) pronunciation dictionary.

- (26) a. cold |chisel cold |comfort cold |feet cold |fish
 cold |steel cold |storage cold |sweat cold |turkey
 cold |war
 b. |cold cream |cold frame |cold snap |cold sore

The problem is that how one can explain why the items in (26b) receive early stress but those in (26a) do not. It seems impossible to answer this question at the present stage. But it is possible to say that it would be safe for non-native learners to put stress on the second element when they encounter a certain compound or noun phrase composed of an adjective followed by a noun, because the ratio of exceptions to this rule is so small that the rule can be seen as relatively dependable.

Here it seems important also to note the function of a noun modifier. In English it is often the case that nouns are used in a similar way to adjectives in order to modify other nouns. The

following cases could be seen as good instances of this type:

- (27) baby ¹boy boy so¹prano Buddhist ¹nun
child ¹prodigy child prosti¹tution garden ¹city/ ¹suburb
human ¹nature lead ¹vocalist learner ¹driver
student ¹teacher tenor ¹saxophone welfare ¹state
Zen ¹Buddhism

It can be said that these noun modifiers (i.e. *baby*, *garden*, *student* and so on) are morphologically nouns but semantically adjectives, and they tend to be late stressed as in most of the adjective + noun combinations above.

2.2.4. The first element names a time

Thomson & Martinet (1986: 31) say that a compound noun whose first element indicates the time of the second tends to be late stressed. The following are their examples.

- (28) summer ¹holiday Sunday ¹paper November ¹fogs
 spring ¹flowers dawn ¹chorus

It is not difficult to think of combinations that fit into this class. Some examples are:

- (29) afternoon ¹tea Christmas ¹present Easter ¹break
 evening ¹dress harvest ¹moon morning ¹star
 night ¹watchman spring ¹roll summer ¹gift
 winter ¹clothes

Some notable exceptions:

- (30) ¹Christmas tree ¹Easter egg ¹night duty
 ¹night owl ¹night person ¹night school
 ¹night shift ¹night train ¹summer school
 ¹Sunday school

Except for *Easter egg* and *night owl*, these items would be possible to be accounted for by the rule of contrasts, which was discussed above (2.2.2).

2.2.5. The first element names a place

Thomson & Martinet (1986: 31) mention that when the first element of a two-element collocation denotes the place of the second element, that combination generally receives late stress, giving the following examples.

- (31) city ¹street corner ¹shop country ¹lane

The items in (32) below can be accounted for in a similar way.

- (32) bathroom ¹ceiling bottom ¹drawer city ¹centre
 garden ¹chair/¹path ground ¹water kitchen ¹sink
 outdoor ac¹tivities school can¹teen sea ¹breeze
 town ¹hall university ¹library world ¹leader

Like other rules, there are some exceptions to this principle:

- (33) ¹bathroom scales ¹garage sale ¹garden party
¹kitchen scales ¹mouth ulcer ¹road sign
¹room temperature ¹sea fog ¹sea weed
¹stomach cancer ¹street lamp / market / musician / performer
¹town house

Within these counter-examples, *bathroom / kitchen scales*, *garden party*, *mouth ulcer* and *stomach cancer* could be explained by using the rule in section 2.2.2.

3. Concluding comment

In this study I have tried to show the degree of reliability of the eleven syntactic or semantic principles in previous literature, presenting many collocations whose stress patterns are not usually shown in dictionaries. Each of these rules, except for the rule for gerund + noun combinations, inevitably has exceptions to a greater or lesser degree like other linguistic matters. It has also been shown that most of these exceptions could be accounted for by another rule. The non-native learner, I believe, can definitely be helped by knowing these tendencies.

Notes

1. We might draw the dividing line between compound and phrase using Cruttenden's (1997: 16-17) explanation that in a phrase 'a relatively large amount of paradigmatic variation is possible in each half of the combination and the meaning is clearly derivable from the

two elements', while a compound 'admits of rather less paradigmatic variation for each element and the semantics of the combination is often less obviously derivable from the two elements'.

There is often no clear dividing line, however, between two-word compounds and pairs of words that happen to occur together frequently. For example, although we will agree that *computer problem* in (1b) is a noun phrase and *computer game* is a compound, the judgement may divide the status of *computer programme* in (1a). This is because the first element of this collocation seems to be exchangeable with an item such as *TV*, and yet the sequence appears to have become an idiomatic expression. I will set aside the difference just pointed throughout this paper. For detailed discussion and exemplification concerning the boundary between the compound noun and the syntactic construction, see Huddleston & Pullum (2003: 448-451).

2. If a primary stress is located on one element of a compound noun or a phrase, then there must be a secondary stress on the other. This paper, however, does not mark the secondary stress in all examples for the sake of simplicity.

As a general rule the standard IPA stress-marking system is employed throughout this article, for primary (ˈ). The mark precedes the stressed syllable. In Adams (1973), Cruttenden (1997) and others the indication of stress is done by placing the mark over the vowel, e.g. *central héating*. This type of stress marking is changed into the above way in this study.

3. Compounds functioning as nouns account for 90% of compounds, according to Cruttenden (2001: 229).
4. In many cases usage varies, and some combinations can be often found written in two different ways even in one dictionary (e.g. *policymaker*, *policy-maker*).
5. Two of the few exceptions I have found are *aromatherapy* and

- blackcurrant*, which receive primary stress on the second element.
6. My observations made in the present study are based in part on the stress patterns of compound words or habitual noun phrases listed in Roach & Hartman (1997), Wells (2000) and Cruttenden (2001). Much other phonetic information includes a variety of spoken sources such as discourse between native speakers of British English and me, audio cassettes and CDs, all of which were recorded after 1992, and recent radio programmes on the BBC World Service.
 7. If a two-word item is late stressed or final stressed, it means the second element of that expression receives primary stress.
 8. No work seems to have been done on the reason why such a difference exists between the two major varieties of English.
 9. Note that *sparkling water* generally receives late stress against the rule for collocations ending in *water*.
 10. I might be able to explain why these four collocations behave differently in stress position from other sequences of the same structure by saying that the items in (8) all have ‘specialized meaning’. Take *rocking chair* for example. It is not a chair that is rocking at the moment, but a particular type of chair that has the capacity to rock.
 11. No one that I know of has ever attempted to explain why only items including *cake*, *juice* and *water* are early stressed. I asked several phoneticians teaching at the 2003 University College London Summer Course in English Phonetics for some comment about the reason, but all of them could not explain why.
 12. I find it very difficult to explain why these combinations take late stress.
 13. All these examples but *interior decorator/designer*, *science fiction*, and *trade union* could be given a satisfactory account by other rules dealt with in the present study. That is, *garden city/suburb* was already explained in section 2.2.3, and *city centre* will be treated in 2.2.5,

computer graphics and *laser printer* will be discussed later in the present section.

14. I will not pursue this matter any further in the present study. For further discussion and exemplification of the meaning relationship between the two parts of noun + noun sequences, see Adams (1973: Chapter 5) and Biber, Conrad & Leech (2002: 273-275), although these scholars do not talk much about the relationship between the semantic structure of a combination and its stress pattern.
15. Although combined with *tour*, *national tour* or *promotional tour* are generally late stressed. This might be because their first element is an adjective. (See section 2.2.3 below.)
16. For example, *computer problem* can be taken to be implicitly contrasted with *drink problem*, *family problem* or *health problem*, and *computer virus* with *the flu virus* or *the AIDS virus*.
17. Within these counter-examples, *nervous system*, *postal code* and *technical college* are possible to be accounted for by the rule in 2.2.2.

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