

A STRESS MESS

by

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One of the more important claims made in The Sound Pattern of English is that stress is predictable in English.¹ One of the examples of the predictive power of the grammatical model used by Chomsky and Halle is the application of the Compound and Nuclear Stress Rules (henceforth CR and NSR), which account for the difference in stress between the compound bláckbòard and the noun phrase bláck bóard; the former rule applies to a surface structure $_{N} \# [_{A} \# \text{black} \#] [_{N} \# \text{board} \#] \#$, the latter to $_{NP} \# [_{A} \# \text{black} \#] [_{A} \# \text{board} \#] \#$.² Unfortunately, Chomsky and Halle give little consideration to the implications of their brief treatment and fail to answer - or even pose - at least three crucial questions: 1) how are the surface structures which are input to these rules attained? 2) how are exceptions to be accounted for?³ and 3) what is a compound anyway?

An answer to the third question is implied in the respective surface structures Chomsky and Halle assign the two expressions above. At this point, however, it would be unjustified to use such a putative syntactic difference as the criterion for whether a given nominal expression is or is not a compound; one would first like to find an independent criterion and then attempt to find syntactic justification for the proposed surface structures

so that the problem of the correct structure would become an empirical question, given independently motivated assumptions about the grammar of English. Unfortunately Chomsky and Halle provide neither a criterion for compoundness nor justification for the surface structures they assign to compounds. Since they do admit the existence of what they refer to as exceptions to CR, it is clear that their criterion for compoundness is not a phonological one.

An answer to the third question is obviously necessary before one can ask - let alone answer - the second, for one must first know that some nominal expression which fails to undergo CR is in fact a compound before one can characterize it as an exception. Similarly, one must have some principled method of deriving the desired surface structures before one can determine how exceptional expressions are to be handled: is the exceptional character of a given expression an idiosyncratic property or does it derive from some general principle?

I have no answer to any of these questions, but I feel that it is imperative to bring them up. It is simply not the case that there are only a few isolated exceptions to CR; there are a great many, and many of the exceptional expressions seem to be formed by productive processes. Consider, for example, the following noun-noun expressions with nuclear stress:⁴

apple pie

India ink

machine translátion

kitchen sínk

Víetnam wár⁵

câmpus unrést

sítuation éthics

ârmchair diplómacy

Câesar sálad

ânimal húsbandry

díll píckle

cârdboard bóx

There are also many adjective-noun expressions with nuclear stress which differ from NP like bláck bóard in that they cannot be paraphrased by the analogue of board which is black and hence, presumably, cannot be derived in the same manner as the latter:⁶

Amêrican hístory

Gêrman grámmar

Ênglish hórn

acôustic phonétics

núclear phýsics

cívil enginéering

cívil wár

cívil ríghts

líberal árts

âcademic fréedom

constitútional authórity

gêneral wélfare

domestic sciencesulfuric acidhuman naturecultural exchangesyntactic cyclecervical cancer

For purposes of discussion, let us refer to the first element in each expression as the attributive and to the second as the head. Now, if it could be shown that some motivated syntactic derivation(s) produced the expressions listed above by ultimately sister-adjoining the attributive to the head, while other rules produced the expressions undergoing CR by Chomsky-adjoining the attributive to the head, the Chomsky-Halle analysis could be saved, since the desired surface structures would thus be attained. It is immediately obvious that such an approach will run into serious difficulties. In many cases structures which would underlie the first type of expression would underlie corresponding examples of the second type. Compare the following:⁷

Nuclear stressCompound stressCrimean WarBoer WarAvogadro's numberParkinson's diseaseStanley SteamerGeiger counterapple pieapplesaucedill picklemustard pickle

It thus looks at this point as if we are faced with a series

of parallel rules which differ only in the type of adjunction involved: sister-adjunction in the cases with nuclear stress, and Chomsky-adjunction in the cases with compound stress. Apparently these rules would be lexically governed, a point to which we shall return later. This is indeed a messy situation (which may of course prove to be necessary); however, before accepting the assumption that differences in surface structure are responsible for the differences in stress, we ought to look into the situation more closely.⁸

In some nominal expressions, it seems to be the case that choice of compound- or nuclear stress is governed, in some way, by the choice of head, as in the following examples:

Compound stress:

-doctor: éyedòctor, fóotdòctor, hórse-dòctor, báby-doctor etc.⁹

-smith: blácksmith, góldsmith, cóppersmith, síversmith

other names of occupations

-bread: whíte brèad, rýe brèad, córnbrèad, spóon-brèad, ráisinbrèad etc.¹⁰

-bone: báckbone, wristbone, légbòne, wishbone etc.

names of streets ending in street

Nuclear stress

-pie: ápple píe, chêrry píe, bláck-bottom píe, Cóttleston píe etc.

-pudding: chòcolate púdding, rice púdding, Yòrkshire púdding etc.

other foods: -ice cream, -sherbet, -soup (in my dialect),
-stew, -jam etc.

-psychology: child psychólogy, sócial psychólogy, indús-
trial psychólogy, reversé psychólogy etc.

-history: Amèrican hístory, áncient hístory, árt hístory,
nátural hístory etc.

names of streets ending in avenue, boulevard, road, lane,
place, drive, circle, througway etc.

In other cases stress placement seems to be governed by the choice of attributive. All examples with right seem to take nuclear stress: right árm, right fóot, right wíng, right fíeld, Right Bánk. The same is true for left, of course. Also north(ern): Nóρθ Dakóta, Nóρθ Carolína, Nóρθ Vietnám, nóρθ fórtý, Nóρθern Líghts, nóρθern hémisphere; the same is true of the other directions. (Notice that these are locative expressions, not derivable by WHIZ deletion and adjective preposing; one cannot say *the arm which is right etc.) Charles Kisseberth has pointed out to me that blood appears to be an attributive requiring compound stress: blóod bàth, blóod mòney, blóod bròther, blóodbánk etc.

There are also subregularities of this type. Thus compounds with school always have compound stress when the type of school is indicated: grámmar schòol, hígh schòol, tráde schòol, médical schòol etc. When the name of the school is indicated, nuclear stress results: Wáshington Schóol. This cannot be predicted by the fact that it contains a proper name; cf. Montessóri schòol. Nor can it be predicted by the fact that the whole expression is a proper name; surely Státe Strèet is every bit as much a proper

name (although, admittedly, most proper names do indeed take nuclear stress).

Another type of regularity shows up in cases like cervical cancer, abdominal cancer beside lung cancer, breast cancer. If the attributive is superficially an adjective, nuclear stress obtains; if it is a noun we get compound stress. Compare also:

Nuclear stress

Compound stress

abdominal surgery

heart surgery

cerebral hemorrhage

brain hemorrhage

venereal disease

hoof-and-mouth disease

nuclear attack

mortar attack

biological science

food science

historical novel

war novel

international law

divorce law

periodic table

log table

nuclear stress

compound stress

In these cases there seems to be an etymological correlation: the adjectives (cases with nuclear stress) are of Latin or Romance origin, while the nouns (cases with compound stress) are frequently of Germanic origin. This is probably not an accident: the nuclear-stress cases are typical of Romance syntax (ignoring the word-order) while the other cases follow a Germanic pattern. (It is interesting, in fact, to compare the facts in German, which, for the most part, exhibits the same compound- and nuclear stress patterns as English. Most expressions of the type considered in this

paper have compound stress in German. Compare, for example, English exp̄erimental ph̄ysics, with nuclear stress, and German Experi-
mentálphysik, with compound stress.)

In other cases it is neither the attributive nor the head which governs stress placement but the combination. Thus in my own speech I have l̄ettuce sálad, fr̄uit sálad, ch̄icken sálad, C̄aesar
sálad with nuclear stress but potáto sàlad with compound stress. I have gr̄een b̄ean, L̄ima b̄ean with nuclear stress but str̄ingb̄ean,
návy b̄ean with compound stress; dill p̄ickle with nuclear stress but m̄ustard p̄ickle with compound stress.

Can rule features possibly be made to account for these facts? Suppose we have syntactic rules of compound-formation involving both Chomsky- and sister-adjunction, as discussed above. It is fairly easy to see that rule features will not possibly be able to account for all the cases unless the notion of rule feature is to be expanded to a point where it is practically vacuous. We have noted that in some cases stress placement is governed by the choice of attributive, in others by the choice of head, in others by the combination. This means that in some cases rule features must be stated on the attributive, in others on the head; in the last category the rule features would have to be context-sensitive, whether stated on the attributive or the head. The context to which they would be sensitive would have to be a list of lexical items. It could not be a feature shared by these lexical items, as these could occur in compounds exhibiting both kinds

of stress. To give an example from my dialect, potáto sàlad: salad could not be marked as undergoing either the Chomsky-adjoining or the sister-adjoining rule since which rule it undergoes is a function of the choice of attributive: I have potáto sàlad with compound stress but frùit sàlad with nuclear stress. Potato cannot be marked as undergoing either rule since I also have potáto sóup with nuclear stress. A context-sensitive rule feature on salad would have to mention potato, not a feature which potato shares with other lexical items. A context-sensitive feature on potato would have to mention salad, not a feature which salad shares with other lexical items.

An analogous problem occurs if we posit stress-assignment rules sensitive not to surface structure but to (phonological) rule features stated on lexical items.

Is there a way out of this mess? Perhaps the first step out is to recognize the situation for what it is: a mess. It is going to be futile to try to formulate a few nice, simple rules to capture generalizations which don't exist. Some generalizations do exist, of course, and should be captured. It does seem to be the case that in some instances stress assignment is governed by the choice of head or attributive, in others by syntactic characteristics (whether the attributive has the superficial form of an adjective or a noun). There ought to be rules that capture these generalizations. In other cases stress assignment is an idiosyncratic property of individual compounds and ought to be indicated in the

lexicon as such. The fact that stress placement is sometimes predictable should not make us try to predict it always. To take an analogy from segmental phonology: the voicing of the plural morpheme of English nouns is predictable according to the voicing of the preceding segment. Yet in other cases we cannot predict whether a final s will be voiced or voiceless. This does not seem to bother anybody. We simply take it for granted that in some cases the voicing of word-final s is predictable and that in other cases it is not. We may disagree as to the nature of underlying representations and rules involved but not on the generalization we want the grammar of English to capture.

This brings us back to the question of predictability. One might argue for the analysis suggested by Chomsky and Halle, whereby a special boundary would block the application of CR in the exceptional cases. This way, one could claim, stress assignment is still predictable. Note, however, that making use of such an ad-hoc boundary would be notationally equivalent to saying that stress is not predictable in the exceptional cases, since, as we have seen, there is no general principle by which such a boundary could be predicted. It is important, I feel, to exclude such analyses, if the notion of predictability is not to be a vacuous one. One often hears statements to the effect that generative grammarians have shown that English stress is predictable, contrary to the claims of structuralists. But notice what such a statement means. It does not mean that structuralists were less observant than gene-

rative grammarians; it indicates, rather, a difference in the definition of predictability. To the structuralist, English stress is not predictable, since it is not uniquely determined by phonetic representation (thus contrasting with, say, Latin stress). Thus when the structuralist states that stress is or is not predictable in a given language he is making an empirically falsifiable, and therefore, interesting claim about that language. To the generative grammarian, this definition of predictability is an un insightful one, for by looking at stress in this way we are unable to distinguish cases where stress assignment is truly idiosyncratic from those where it follows from general principles which happen to involve more abstract representations. However, in order to make his claims as interesting as the structuralist's, the generative grammarian must define 'predictable' just as rigorously. Otherwise the statement 'Stress assignment in language X is predictable' is of no more interest than 'Look how I can fudge stress assignment in language X.'

In conclusion, then, this paper purports to have shown that choice of compound- or nuclear stress for English nominal expressions cannot always be a function of what rules were used in formation of the expression. At least some compounds must be listed in the lexicon along with an indication of their idiosyncratic stress properties. I do not mean to suggest here that in the latter case no syntactic rules have applied to the structures underlying these compounds. I am simply stating that in these

cases stress placement cannot be predicted on the basis of what rules have applied.

APPENDIX: COMPOUND ADJECTIVES WITH NUCLEAR STRESS

As in the case of nominal expressions, there are compound adjectives which do not undergo CR in post-copular position, such as the following:

spécies-specific

côntext-sénsitive

brând néw

ice còld

âd hóc

hârd-héarted

ôpen-mínded

âbsent-mínded

ûnderdevéloped

In attributive position, however, it appears to be the case that CR has applied, as in brând néw cár, ice còld béer, âd hòc rule, âbsent-mínded proféssor etc. This phenomenon also occurs in other cases of prenominal expressions (including many polysyllabic simple nouns and adjectives as shown in many of the examples in this paper) which, in isolation, have nuclear stress:

ûphíll

but

ûphíll fíght

Mônday mórning

Mônday mórning depréssion

ôver the còunter

ôver-the-còunter sále

right wíng

right-wíng extrémist

This phenomenon presents a serious problem for the principle of the phonological cycle as argued for by Chomsky and Halle. Note that on the cycle at which NSR and CR are first applicable, it is impossible to know whether these expressions are in prenominal position. One might suppose that on a later cycle some stress-adjustment rule might operate, but such a rule could not be formulated like the other stress rules, i.e. by assigning primary stress. There are probably several possible and equally unmotivated ways of getting around this problem, but I see no well-motivated solution at this time.

FOOTNOTES

¹I wish to thank Charles Kisseberth for valuable comments on an earlier version of this paper.

²Pp. 16ff., 89-94. These rules also apply to other constituents: CR applies to N,A or V; NSR applies to others. In this paper I am principally concerned with nominal expressions; some compound adjectives are discussed in the appendix.

³Actually, Chomsky and Halle do touch on this question as follows (p. 156): 'The exceptions to the Compound Rule are of various sorts. There is considerable dialectal variation in connection with the placement of primary stress in items such as chocolate cake, apple pie, and many others. There are also widely maintained but syntactically unmotivated contrasts such as Fifth Avenue, with nuclear stress on the second element, versus Fifth Street, with compound stress on the first element. Furthermore, proper nouns (e.g. John Smith, John Paul Jones) and names with titles (President X, Senator Y, etc.) typically have the nuclear stress of phrases rather than the initial stress of compounds, as do such noun-noun constructions as stone floor and iron box... The fact that a phrase is not subject to the Compound Rule might be formally indicated in various ways: for example, by a feature specification of the boundary between the constituents, in which case the rule can be limited to boundaries not containing this feature. This, obviously, does not solve the general problem, but serves only to eliminate it from the domain of phonology. The problem remains of determining under what syntactic conditions

this feature is or is not present. Alternatively, we might provide for an ad hoc deletion of the node N dominating such compounds. In fact, the general problem certainly belongs in part to syntax, in part to the readjustment component, rather than to phonology proper, and it can be clarified and resolved only by an investigation of the conditions, syntactic and other, under which the Compound Rule is applicable. For this reason, we will make no attempt to go more deeply into the question here. We have throughout been limiting ourselves arbitrarily to problems of phonological interpretation, and are making no attempt in the present study to investigate the processes by which the syntactic component of the grammar forms the surface structures that are phonetically interpreted by the rules we have been discussing here.'

One cannot, of course, fault Chomsky and Halle for not investigating everything; but since they have, in fact, investigated so little that is relevant here, one cannot help wondering how much justification there is for CR. At the very least, one would like some justification of the surface structures which are supposed to be the input to this rule.

⁴Examples are based on my own pronunciation. There seems to be quite a bit of variation between compound and nuclear stress with certain expressions. However, since these expressions with nuclear stress occur in all dialects, the problem is not affected by variation in some expressions.

⁵Note the shift in stress on Vietnam. This phenomenon occurs frequently in these expressions and is discussed further in the appendix.

⁶This is one conceivable criterion for compoundness, but it is not infallible. Examples like white man and old people are paraphrasable by man who is white, people who are old. Furthermore, there are no corresponding NP analogous to bläck böard; white män and öld péople are possible only in contrastive contexts.

⁷For further examples, see Lees (1966), especially pp. 180-85.

⁸There are logically possible alternative analyses, of course, but they all look equally messy. For example, one might propose compound-formation rules within the lexicon, à la Jackendoff. This would simply transfer the problem to the lexicon. Or one might propose that the productive rules belong to syntax, while the unproductive ones belong to the lexicon. Unfortunately, there are both productive (cârdboard böx, Frénch têacher) and unproductive (liberal árts, bläckböard) types exhi-

biting both kinds of stress.

⁹This is probably a function of the rule(s) forming these expressions rather than having to do with doctor specifically. I do not believe that it is a fact of English grammar that we don't have e.g. bāby dōctor 'doctor who is a baby'. Note that probably any native speaker of English would know what bāby dōctor is supposed to mean. Similarly, speakers know that cārdboard bōx would denote a box to contain cardboard. These are just two examples showing that not all apparent exceptions to CR are in fact exceptional; some of them follow regular principles. Clearly the formation of English nominal expressions is more complicated than has previously been supposed.

¹⁰Exception (in my dialect, at least): blāck bréad. Is this really an exception, or is it just an accident that most examples with bread as head undergo CR?

REFERENCES

- Chomsky, N. and M. Halle. 1968. The sound pattern of English. New York: Harper & Row.
- Lees, R.B. 1966. The grammar of English nominalizations. The Hague: Mouton.