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 Nu-
clear Stress Rules (henceforth CR and NSR), which account for
the difference in stress between the compound bláckbòard and the
noun phrase blâck bóard; the former rule applies to a surface
structure $[\#[\#black\#][\#board\#]\#]$, the latter to $[\#[\#black\#][\#board\#]\#]$.[2]
$\quad$ N A $\quad$ A N $\quad$ N N $\qquad$ NP A $\quad$ A N $\quad$ N NP
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]

âpple píe

India ínk

machîne translátion

kîtchen sínk

Vîetnam wár[5]

câmpus unrést

sîtuation éthics

ârmchair diplómacy

Câesar sálad

ânimal húsbandry

dîll píckle

cârdboard bóx

There are also many adjective-noun expressions with nuclear
stress which differ from NP like blâck 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

nûclear phýsics

cîvil enginéering

cîvil wár

cîvil ríghts

lîberal árts

âcademic fréedom

constitûtional authórity

gêneral wélfare

doméstic scíence

sulfúric ácid

húman náture

cúltural exchánge

syntáctic cýcle

cérvical cáncer

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 at-
tained. 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 stress	Compound stress
Criméan Wár	Bóer Wàr
Avogádro's númber	Párkinson's disèase
Stánley Stéamer	Géiger còunter
ápple píe	ápplesàuce
díll píckle	mústard pìckle

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 in-
volved: 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 as-
sumption 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: blácksmìth, góldsmìth, cóppersmìth, sílversmìth

other names of occupations

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

-bone: báckbòne, wrístbòne, légbòne, wíshbòne etc.

names of streets ending in street

Nuclear stress

-pie: âpple píe, chêrry píe, blâck-bottom píe,
  Côttleston píe etc.

-pudding: chôcolate púdding, rîce púdding, Yôrkshire
  púdding etc.

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

-<u>psychology</u>: chîld psychólogy, sôcial psychólogy, indûstrial psychólogy, revêrse psychólogy etc.

-<u>history</u>: Amêrican hístory, âncient hístory, ârt hístory, nâtural hístory etc.

names of streets ending in <u>avenue</u>, <u>boulevard</u>, <u>road</u>, <u>lane</u>, <u>place</u>, <u>drive</u>, <u>circle</u>, <u>throughway</u> etc.

In other cases stress placement seems to be governed by the choice of attributive. All examples with <u>right</u> seem to take nuclear stress: rîght árm, rîght fóot, rîght wíng, rîght fíeld, Rîght Bánk. The same is true for <u>left</u>, of course. Also <u>north(ern)</u>: Nôrth Dakóta, Nôrth Carolína, Nôrth Vietnám, nôrth fórty, Nôrthern Líghts, nôrthern 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 *<u>the arm</u> <u>which is right</u> etc.) Charles Kisseberth has pointed out to me that <u>blood</u> appears to be an attributive requiring compound stress: blóod bàth, blóod mòney, blóod bròther, blóodbànk etc.

There are also subregularities of this type. Thus compounds with <u>school</u> always have compound stress when the <u>type</u> of school is indicated: grámmar schòol, hígh schòol, tráde schòol, médical schòol etc. When the <u>name</u> of the scnool is indicated, nuclear stress results: Wáshington Schóol. This cannot be predicted by the fact that it contains a proper name; cf. <u>Montessóri</u> 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

paper have compound stress in German. Compare, for example, English exp̂erimental ph́ysics, with nuclear stress, and German Experimentálphysìk, 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 l̂ettuce sálad, frūit sálad, ch̆icken sálad, Ĉaesar sálad with nuclear stress but potáto sàlad with compound stress. I have grēen béan, Līma béan with nuclear stress but stríngbèan, návy bèan with compound stress; d̂ill píckle with nuclear stress but mústard pìckle 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 func-
tion of the choice of attributive: I have potáto sàlad with com-
pound stress but frûit sálad with nuclear stress. Potato cannot
be marked as undergoing either rule since I also have potâto 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 cap-
ture 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 generali-
zations. 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 pre-
dictable should not make us try to predict it always. To take an
analogy from segmental phonology: the voicing of the plural mor-
pheme of English nouns is predictable according to the voicing of
the preceding segment. Yet in other cases we cannot predict whe-
ther 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 repre-
sentations 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 excep-
tional 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 uninsightful 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:

> spêcies-specífic
>
> côntext-sénsitive
>
> brând néw
>
> îce cóld
>
> 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 nèw cár, îce còld béer, âd hòc rule,
âbsent-mìnded 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   ûphìll fíght
>
> Mônday mórning   Mônday mòrning depréssion
>
> ôver the cóunter   ôver-the-còunter sále
>
> rîght wíng   rîght-wìng 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

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

[2] Pp. 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.

[3] Actually, 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 Ávenue, with nuclear stress on the second element, versus Fífth Street, with compound stress on the first element. Furthermore, proper nouns (e.g. John Smíth, John Paul Jónes) and names with titles (President X̂, Senator Ŷ, etc.) typically have the nuclear stress of phrases rather than the initial stress of compounds, as do such noun-noun constructions as stone flóor and iron bóx... 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 pro-
vide for an ad hoc deletion of the node N dominating such com-
pounds. 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 in-
vestigating everything; but since they have, in fact, investi-
gated 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.

   [4]Examples 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.

   [5]Note the shift in stress on <u>Vietnam</u>. This phenomenon occurs
frequently in these expressions and is discussed further in the
appendix.

   [6]This is one conceivable criterion for compoundness, but it
is not infallible. Examples like <u>whîte màn</u> and <u>óld pèople</u> are
paraphrasable by <u>man who is white</u>, <u>people who are old</u>. Further-
more, there are no corresponding NP analogous to <u>blâck bóard</u>;
<u>whîte mán</u> and <u>óld péople</u> are possible only in contrastive con-
texts.

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

   [8]There 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 lexi-
con. Or one might propose that the productive rules belong to
syntax, while the unproductive ones belong to the lexicon. Un-
fortunately, there are both productive (<u>cârdboard bóx</u>, <u>Frénch
tèacher</u>) and unproductive (<u>lîberal árts</u>, <u>blâckbòard</u>) types exhi-

biting both kinds of stress.

[9]This 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. bâby dóctor 'doctor who is a baby'. Note that probably any native speaker of English would know what bâby dóctor is supposed to mean. Similarly, speakers know that cárdboard bòx 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.

[10]Exception (in my dialect, at least): blâck 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.