

MORPHEME STRESS IN DANISH

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1. Introductory remarks

According to the glossematic analysis by Hjelmslev (7) there is commutation in Danish between two syllable accents, one of which manifests itself as strong stress, and the other as weak stress. The opposite view is held by Andersen (1, p. 312-313), who claims that Danish has no word stress but only sentence stress. Andersen discards the evidence of distinctive stress placement by stating that the examples of commutation are either foreign words, which are not valid as proof of such a commutation in Danish proper (I return to the problem of genuine versus foreign words in section 1.1.), or special cases (with pretonic for-).

One type of proof given by Hjelmslev is the opposition between wordforms like forfald 'unavoidable absence' with strong stress on the first syllable versus forfald 'decay' with strong stress on the second (since many people are somewhat hesitant about the accentuation of the former word, it may be preferable to choose another example like forbenet 'the foreleg' versus forbenet 'ossified; pigheaded'). According to Hjelmslev forms like forfald 'unavoidable absence' have strong stress on both syllables in the "ideal" formal representation (which corresponds rather closely to the underlying, morphophonemic representations of generative phonology as of today), but one of the two stresses is replaced by a weaker stress under the dominance of the other. In sequences with ideally two strong stresses after each other either one or the other may be replaced by

a weaker stress by a so-called "implication" (which in Hjelmslev's theory is a kind of syncretism between strong and weak stress). An example is fadø1 'draught beer' with stress reduction on ø1 versus fad ø1 'barrel of beer' with stress reduction on fad. In a sense the stress patterns of fadø1 and fad ø1 are commutable, which from an autonomous phonemic point of view might seem to make the analysis invalid. But, in Hjelmslev's words, "the commutation is a consequence of the implication, which, in turn, is a consequence of the syncretization, which is the signal" (8, p. 204), the stress relationships signalling specific types of constructions. From a generative point of view Hjelmslev is evidently right. The degrees of stress found in compound words and other syntactical constructions do not reflect different stress phonemes but are due to rules of grammar. On the other hand the difference between compound words with the root morpheme for as first member, and words with the prefix for- can be reasonably interpreted as a difference between phonemically strong and weak stress (cf. Basbøll (2), p. 39), i.e., there seem to be morphemes with and morphemes without inherent strong stress. In this sense the examples with for may be said to prove the phonemic status of stress.

The other type of proof given by Hjelmslev is the different stress placement in wordforms of foreign origin like korset 'the cross', kanon 'canon', plastic 'plastic (i.e., PVC, etc.)' with stress on the first syllable versus korset 'corset', kanon 'gun', plastik 'plastic art; plastic surgery' with stress on the second syllable. It may be argued (and it has indeed been argued, at least orally) that these examples are all suspect. Some of them (korset 'the cross', plastik) differ from the others in that they are morphemically complex.¹ The word pair remaining if these are discarded is a subminimal pair (kanon having a

1) Hans Basbøll first called my attention to this peculiarity of the pair plastic - plastik.

long vowel in the first syllable if it means 'canon' but a long vowel in the second syllable if it means 'gun', a fact that obviously has something to do with the stress placement). There are, however, other more perfect minimal pairs (August as a personal name has initial stress, whereas the name of the month has final stress), and it is clear that stress is at any rate not entirely predictable from any immediately observable features of the segmental structure. ²

In a generative phonology it may be proposed instead that stress depends on some more abstract feature of the underlying representations, a feature that does not always appear in the phonetic output except as stress (placement). One may wonder why Hjelmslev did not attempt to interpret intramorphemic stress placement in this way, i.e. as a signal of special structure types (as shown in 2.2. below this kind of approach is not entirely out of question). Anyway, the establishment of stress accent as a formal category plays a very important role in the glossematic analysis of the Danish expression system, since the definitions of syllable, vowel, and consonant depend upon it.

1.1. "Genuine" and "foreign" wordforms

It may be argued against the kind of proof constituted by such word pairs as plastic - plastik that they are not relevant to the structure of "genuine" Danish words. Non-compound polysyllables inherited from Old Danish have, on the whole (cf., however, section 7. below), stress on the first syllable, and except for the suffixes -(1)ig and -(n)ing noninitial syllables only contain "shwa". It is obviously of great interest to describe the structure of this restricted part of the Danish language and to state the simple stress relationships found here. However, it would be meaningless from a synchronic point of view to discard all other wordforms as not belonging to the Danish language.

2) For words with different stress placement see Hansen (6, p. 267 ff).

Words like kasket 'cap' must indeed be listed as Danish lexical entries in spite of non-initial stress, but it is of course possible to mark them by an abstract feature "+foreign". A categorization by means of such a feature would make it possible to set up a specifically simple set of rules for the inner core of "genuine" words, and an additional, more heterogeneous set of rules for the more peripheral words. It could be done, although it must be admitted that the dividing line is not very sharp. Non-initial stress is, for example, not avoided in strictly colloquial wordforms, cf. starut, stabejs, kanut (all with stress on the second syllable) 'strange fellow', so the intuition of Danish speakers about the foreignness of this stress placement is hardly very strong (as an example of the opposite, compare colloquial East Norwegian with such forms as 'avis for a'vis 'newspaper' = Danish avis with stress and stød on the second syllable).

The problem with a division into "genuine" and "foreign" wordforms is that a mere dichotomy does not suffice at all. It is possible to set up at least five different categories, which roughly speaking represent increasing degrees of foreignness (with the reservation that many foreignisms may happen to follow the pattern of "genuine" Danish forms):

- I. forms inherited from Old Danish.
- II. loanwords from (Low) German, e.g. behandle.
- III. words from Latin or Greek, like profet.
- IV. words borrowed from French in a non-latinized form, e.g. gelé (gelatine belongs to III).
- V. recent, entirely unassimilated words, mainly from English, e.g. week-end.

The first two categories are very closely related. They share numerous roots and suffixes (cf. handle - behandle, handling - behandling), and are probably impossible to keep entirely apart. The most important feature of the second category is that it exhibits some prefixes

which can never take stress.

The roots and derivational affixes of the third category are almost entirely different from those of the first two categories (with the important exception of some few suffixes like -er-, -ing, -isk, cf. kanonisering 'canonization', magisk 'magic' with suffixes that are apparently related to those of håndtering 'profession', dansk 'Danish'). This nearly complementary distribution of not only root morphemes but also derivational affixes supports the validity of the categorization.

The relationship between the morphemes found in the remaining two categories and those found in the others, is less clear.

There can be no doubt that it would be interesting to study the Danish sound pattern with reference to such a categorization of the morphemes. However, this can hardly be done with stress rules alone. I do not even know to what extent it is at all possible to make a valid categorization on a synchronic basis. The present paper generally does not distinguish between native and foreign morphemes, although some appalling deviations from the general pattern are explained by the foreign origin of the morphemes in question.

1.2. Aim and disposition of the present paper

It is the aim of the present paper to study the stress placement in Danish wordforms and to determine to what extent it can be predicted from the structure of the wordforms. In order to avoid undue confusion of conditioning factors I shall begin by examining monomorphemic forms and proceed stepwise to the grammatically more complex types. The stress rules specific to compound words will only be touched upon very briefly, and those pertaining to other syntactical constructions will hardly be considered at all. Thus the present paper limits its scope to "lexical" stress,

dealing with such problems as inherent stress versus lack of stress and predictable versus unpredictable stress placement. - The stress rules conditioned by syntactical structure will probably not pose problems that are essentially different from those found in analyses of other Germanic languages, cf. Chomsky-Halle (4), p. 89 ff, Kiparsky (9), Elert (5). However, before Danish can be profitably analysed from this point of view it must obviously be determined what the input to these rules is like, i.e. how the stress patterns of simple wordforms are generated (it being assumed that the stress rules altogether operate "outwards").

It seems to me particularly important to examine the segmental structure of monomorphemic wordforms in order to decide whether stress can be predicted (and hence inserted in phonetic representations) by sufficiently simple rules or whether it must be indicated in underlying representations. There is no doubt that the answer to this question depends (more or less) on one's methodological prerequisites. As long as there is no universally accepted way of comparing rule complexity with the "cost" of additional marks in lexical entries, and as long as there is no universally accepted way to distinguish between well-motivated and ad hoc solutions,³ the best one can do is to present the data in such a way that the findings can be easily restated in a different framework. I have, therefore, organized the initial section on morpheme stress in such a way that stress is first considered in relation to surface structure and afterwards in relation to some hypotheses about the underlying form. The following sections, on polymorphemic forms, are of course not arranged in this "autonomous phonemic" fashion, but many points are stated in a very provisional form. A coherent set of rules is not presented until section 8., which gives a brief survey of the findings.

3) Kiparsky rightly warns against too much abstractness in phonology.

1.3. Phonetic transcription

The phonological behaviour of Danish obstruents and vowels is characterized by the rather drastic effects of a series of late rules, which shorten vowels, weaken or de-voice obstruents, and the like (cf. Rischel (11), (12)). In a discussion of stress placement a transcription which takes these late rules into account, is not expedient to use. It is simpler to establish a level of representation which expresses the differences that are relevant to the subject matter but does not give irrelevant details of the phonetic output, i.e. something like an autonomous phonemic notation.

In the present paper I use a notation of this kind. Its rather strange appearance is due to the fact that it mostly employs the letters of the Danish standard orthography (S.O.), i.e. it resembles a broad version of the Dania transcription slightly more than it resembles the IPA transcriptions used in some previous papers.

When comparing the data given here with data given in S.O. one should bear the following differences in mind:

- (1) Vowel length is here marked by :. The S.O., on the contrary, marks vowel shortness in some word types by doubling the following consonant letter or by adding a d.
- (2) The occurrence of stød is marked by '.
- (3) Since the Danish vowels are often one degree lower than indicated in standard orthography, the present transcription has e for orthographic i in many wordforms, and similarly æ for e, ø for y, ö for ø, o for u, and å for o.
- (4) The transcription has ŋ for orthographic ng (it is likely that the underlying form has /ng/, too, perhaps with the exception of French loanwords with orthographic n, nt like balkon, in which the lack of stød points to a single segment /ŋ/).

The fricative variants of /d, g/, orthographically d, g, are transcribed as ð, ɣ (in order to make the fricative

pronunciation predictable in forms like metodisk as against parodisk with unaspirated stop and erotisk with (at least optionally) aspirated stop).

(5) The position of the main stress is indicated by an acute accent over the vowel. When necessary, secondary stress is indicated by a grave accent, and if degrees of secondary stress must be distinguished, the stronger is indicated by a circumflex in accordance with American usage. Since the paper does not deal with phonetic degrees of stress to any noteworthy extent, this rather inadequate system of transcription was considered sufficient.⁴ It has the obvious advantage compared to the IPA system that no decisions need to be made concerning the location of syllable borders.

The most important deviations from the IPA transcriptions used in other articles on Danish phonology are:

(1) æ(:), ø(:), å: correspond to IPA [ɛ(:), œ(:), ɔ(:)]
â (in stressed wordforms) corresponds to IPA [p]
a: corresponds (in some environments) to IPA [æ:]

(2) As mentioned above some vowel and consonant modifications due to late rules are disregarded.

The last-mentioned point may seem to be in conflict with the claim made in section 1.2., i.e. that the placement of stress should be examined in relation to the phonetic structure of the wordforms. However, there is not the slightest doubt that the vowel and consonant modification rules in question are later than the rules assigning stress to simplex wordforms, and that the inclusion of all phonetic details would obscure rather than clarify the relevant facts. The relationship of stress placement to optional quantity and stød is not equally clear, and accordingly the latter features are marked consistently. To give an example: the first syllable of the definite form badet 'the

4) Some of the shortcomings of autonomous phonemic transcriptions were discussed in Rischel (10).

bath' has an underlying short vowel which is lengthened and gets stød according to general phonological rules of Danish. According to a late rule the vowel may be shortened again, but retains a quality different from that of short /a/. In such cases the transcription used here indicates length and stød: ba: 'ðæt. Thus, whenever a vowel is long at some stage in the derivation and is not shortened again by an obligatory rule, it is transcribed as long.

Finally, it should be mentioned that "shwa", orthographically e, IPA [ə] or (when fused with /r/) [ɐ], is represented by ë.

2. Stress placement in monomorphemic wordforms

2.1. Is stress predictable from the surface structure?

The placement of stress on one or another syllable of monomorphemic wordforms is to a high extent predictable from the syllable number and syllable structure of their phonetic representations. In the following, three kinds of conditioning factors will be distinguished.

2.1.1. Stress in relation to full vowels versus shwa

Monomorphemic wordforms of more than one syllable fall into two categories: (a) those of which the first vowel is a "full" vowel but all following vowels are ë (shwa), (b) those containing more than one syllable with a full vowel. The latter are almost exclusively words of foreign origin (with the exception of old compounds like vénu 'window'; forms like sá:li 'blessed, saved', rá:leŋ 'rail' may be considered "quasi-derivations" belonging together with the forms treated in 3.1. below).

Rule 2.1.-A Syllables with shwa are never stressed.

According to this rule the stress placement in the vast majority of noncompound wordforms is immediately predictable

provided that shwa is distinguished from full vowels in the phonological representations.

Some occurrences of shwa are clearly derived from underlying full vowels, and it may be postulated that the remaining ones also reflect underlying full vowels, although they are always realized as shwa. In Hjelmslev's notation such indeterminate shwas are rendered as ε , which seems to be a reasonable interpretation if stress is considered distinctive. If, on the other hand, stress is to be inserted by phonological rules, the derivation of $\underline{\underline{\varepsilon}}$ and $\underline{\underline{\varepsilon}}$ from a common underlying vowel may still work in monomorphemic wordforms, but we shall be faced with a problem in morphemically complex forms, cf. $\underline{\underline{\underline{a}}}\underline{\underline{\underline{r}}}\underline{\underline{\underline{\varepsilon}}}\underline{\underline{\underline{s}}}\underline{\underline{\underline{d}}}$ 'gaol' versus $\underline{\underline{\underline{k}}}\underline{\underline{\underline{a}}}\underline{\underline{\underline{\varepsilon}}}\underline{\underline{\underline{s}}}\underline{\underline{\underline{d}}}$ 'coldest'. In such a wider context it seems more immediately attractive to derive shwa from the vowel underlying the half-close front vowel $\underline{\underline{e}}$, since the vowel $\underline{\underline{e}}$ is most uncommon in non-initial syllables (of non-compound words), except for the suffix $\underline{\underline{(n)}}\underline{\underline{e}}\underline{\underline{\eta}}$ (where $\underline{\underline{e}}$ may be said to replace $\underline{\underline{\varepsilon}}$, since the latter does not occur before $\underline{\underline{\eta}}$). Apparent counter-examples like $\underline{\underline{\underline{p}}}\underline{\underline{\underline{a}}}\underline{\underline{\underline{s}}}\underline{\underline{\underline{d}}}\underline{\underline{\underline{\varepsilon}}}\underline{\underline{\underline{l}}}$ 'pastil' versus $\underline{\underline{\underline{f}}}\underline{\underline{\underline{i}}}\underline{\underline{\underline{s}}}\underline{\underline{\underline{d}}}\underline{\underline{\underline{\varepsilon}}}\underline{\underline{\underline{l}}}$ 'fistula' differ in $\underline{\underline{st}}\underline{\underline{od}}$, which must be generated or marked anyway. Other forms with non-initial short $\underline{\underline{e}}$ can perhaps be considered distinctly "foreign" and thus set up as a group which does not make the general rules invalid although its members must be marked as exceptions to it. The words in this group are almost exclusively words of French origin with final stressed $\underline{\underline{e}}$, like $\underline{\underline{s}}\underline{\underline{j}}\underline{\underline{e}}\underline{\underline{l}}\underline{\underline{\varepsilon}}$ 'jelly'; these belong to a larger category of words which are exceptional anyway (cf. 2.1.3. below).

No matter whether shwa is derived from /e/ or set up as a separate unit, it must be distinguished from the other vowels at a fairly early stage in the phonological rules. Here an additional problem presents itself: in forms like $\underline{\underline{\underline{f}}}\underline{\underline{\underline{l}}}\underline{\underline{\underline{\varepsilon}}}\underline{\underline{\underline{t}}}\underline{\underline{\underline{\varepsilon}}}\underline{\underline{\underline{r}}}$ 'moves' /t/ is in "weak position" (cf. Rischel (12)) conditioned by the following $\underline{\underline{\varepsilon}}$ and therefore unaspirated, whereas the same consonant in forms like $\underline{\underline{\underline{m}}}\underline{\underline{\underline{o}}}\underline{\underline{\underline{:}}}\underline{\underline{\underline{t}}}\underline{\underline{\underline{\varepsilon}}}\underline{\underline{\underline{r}}}$

'motor' is in "strong position" and aspirated. However, in ordinary speech the unstressed sequences ēr and ār tend to merge so that only the preceding consonant betrays the underlying difference. This merger of a full vowel and shwa must obviously be stated as a late rule, whereas the derivation of shwa in flótēr from a full vowel must be an early rule preceding all rules relating to "strong" and "weak" positions. It remains to be stated what is gained or lost by deriving all shwas from underlying full vowels. (For more details concerning alternations between full vowels and shwa see Rischel (11), p. 198-201.)

In the following it will be assumed that those shwas which do not alternate with full vowels in the surface representations and which condition a syllable division putting the preceding consonant (if any) in "weak position", are distinguished from full vowels in the underlying representations. This, however, does not exclude the possibility of deriving them ultimately from a full vowel.

2.1.2. Stress in relation to long versus short vowel

Rule 2.1.-B A long vowel in a stressed monomorphemic wordform carries the stress.

There is stress on the first syllable of mí:nus, só:lo but on the second syllable of matró:'s 'sailor', palá:' 'mansion' (note that word final stress is accompanied by stød if permitted by the composition of the syllable). Other examples with more syllables are pó:'dagra, petró:'leom, mausolá:om, kamæleó:'n (note that stress on the antepenultimate is accompanied by stød under the same conditions as word final stress).

There are a few morphemes that have two long vowels, e.g. paradis and possibly satyr. Such forms as paradis behave like compound words, i.e. the second long vowel has a reduced stress (secondary stress), the stress pattern of

paradis being similar to that of compounds like sparegris 'piggy bank' (note, however, that according to section 3.4. below a sequence of two long vowels in the underlying form of a morpheme does not necessarily appear as a sequence of two phonetically long vowels).

It follows from what has been said that the placement of stress on long vowels is predictable from the surface structure. Consequently, if the underlying quantity relationships are identical with those of the surface structure, stress on long vowels need not be marked in lexical entries.

2.1.3. Stress in relation to syllable type

In monomorphemic wordforms of which all vowels are short there is a strong tendency to let the stress placement depend on the structure of the last syllable containing a full vowel. There are many irregularities (see below) but the general tendency can be formulated like this:

Rule 2.1.-C A stressed, monomorphemic wordform which contains no long vowel, takes stress on the last full vowel that is followed by a consonant.

Examples are: (with stress on the antepenultimate) hásdië 'host (sacramental word)', kolóm'bia; (with stress on the penultimate) kulisë 'side scene'; fiásgo, makaráni 'macaroni', vila 'villa'; (with stress on the last syllable:) kalát 'skullcap', absén't 'absinth', anorák, provián't 'provisions', masdodán't 'mastodon'.

There is a number of monomorphemic wordforms with two or more syllables which have stress on a short vowel followed by zero. Some of these are interjections such as uhá (also ú:há), others are words of French origin like pasé 'passé', tabló, kupé (type of car - the word for 'compartment' is more often pronounced kupé:'), sjalú

'jealous', sjelé 'jelly'. Most words of this category have a distinctly foreign character and must definitely be considered as deviating from the normal pattern of Danish, i.e. they should be listed as a set of exceptions which do not make the general rules invalid. They can be fully assimilated to the Danish pattern by a lengthening of the final vowel (as in kupé:'), by pronunciation of the final written consonant (bukét 'bunch of flowers' as against buké 'perfume of wine'), or by some other modification (I have heard sjosé (chaussé) 'set paving' pronounced sjau'sēr by road makers, who probably use the word more than most other people).

Another type of exception is constituted by words ending in a short vowel which have stress on the antepenultimate instead of the penultimate. Such forms are not very frequent, however. Some of them are foreign names: áfrika (also á:frika), pán'ama (or panamá:'), mál'aga (versus maláka); júpítår represents a related type of exception.

A quantitatively much more serious problem is posed by wordforms which end in a closed full vowel syllable but nevertheless have non-final stress. This category includes a number of names of foreign origin. Other reasonably common examples are: bóngalåu 'bungalow'; íslam, lókom 'privy', táلكom 'talc powder'; gálån 'gallon', hæsjan 'hessian', rododéndrån 'rhododendron', sjam'piån 'champion'; orángutañ; ántabus (drug against alcoholism), fónkis 'functionalism', gæsduş 'gesture', kándis 'rock candy', katékíşmus, råbtus 'craze', sdél'is 'goldfinch'; gålup, sénåp (or rather sénöp) 'mustard'; måmut; plåsdik 'plastic'; bålasd 'ballast'; hårnisg 'harness', dåmasg 'cane'.

It is possible to take care of a good deal of these exceptions to rule 2.1.-C by introducing an additional rule:

Rule 2.1.-D Word final syllables ending in a single nasal do not take stress (the stress being put instead on the preceding one, if possible).

However, the introduction of such a rule creates a new series of exceptions, namely words of French origin ending in orthographical n or nt. Some of these are pronounced with a long vowel plus n or a short vowel plus n't, in both cases with final stress, which does not violate any rule (examples are: makró:n 'macaroon', agsán't 'accent' (in the sense of accentuation or accent mark)). Others, however, are pronounced with a short vowel plus ŋ; these wordforms likewise have stress on the last syllable and thus violate rule 2.1.-D,⁵ unless this rule is modified in such a way that it applies only to nonback nasals. Examples are: balkánŋ 'balcony', agsánŋ '(foreign) accent'.

Forms like balkánŋ are deviating in much the same way as forms like sjelé. Final stressed vowels in polysyllabic wordforms are normally long and accompanied by stød, and similarly a final stressed sequence of vowel plus voiced consonant in polysyllabic wordforms normally has stød, cf. hotál' 'hotel'. This might be taken as evidence that the loanwords discussed here take final stress by a late ad hoc rule of the form: "Add stress to the last syllable of morphemes marked for "French accentuation"", all lexical entries having this deviating pattern being marked accordingly by some abstract feature. However, some more details must be mentioned here. Firstly, there is one (probably unique) bisyllabic morpheme ending in l which has final stress without stød: metál; this form would have to be marked as a "French" exception as well, which makes the category phonologically less well defined. Secondly, and more importantly, forms like balkánŋ, sjelé take stød (and, as far as final vowels are concerned, length) in inflected forms in which a syllable is added to them: balkánŋ'ën 'the balcony', sjelé'ën 'the jelly'. This is due to a general rule of Danish phonology which also applies to unstressed final vowels: víla 'villa' - víla'ën 'the villa', rá:leŋ 'rail' - rá:leŋ'ën 'the rail', and thus it does not contradict the assumption that the final stress in balkánŋ, sjelé

5) Provided that ŋ is not derived from /ng/.

is due to a late rule.

The remaining exceptions to rule 2.1.-C cannot be taken care of by any simple rule. There is no obvious reason why, for example, there is final stress in palás 'palace', lakrís 'licorice', anáks 'annex', obélísg, krabásg 'cane', augósd (name of month) but initial stress in hélás 'Hellas', bális 'daisy', ájáks (name), hárnisg, dámásg, áugosd (personal name), since we find quite analogous vowel-consonant sequences in both series. Similarly, there is no overt reason for the difference of stress placement between mál'aga and maláka, since it is reasonable to assume that the stød is dependent upon the stress placement rather than the other way round (the opposite view would lead to quite intolerable consequences in Danish phonology).

Thus, in spite of the partial coverage obtained by means of the few and simple rules stated above (2.1.-A,B,C,D) it must be concluded that the stress placement in polysyllabic morphemes is not entirely predictable from the surface structure, i.e., in autonomous phonemic terms stress is phonemic in Danish.

Nevertheless, the rules stated above are of some interest since they express the prevailing tendencies.

2.2. Stress and underlying representations

It was found in section 2.1. that the stress placement in most Danish morphemes can be predicted on the basis of a few simple rules. On this background it would seem reasonable to assume that the forms which do not agree with the rules differ somehow in their underlying representations from those that do agree with the rules, although the underlying difference may only be reflected in different stress placement.

There is in Danish no basis for postulating dummy vowels (constituting extra syllables) which vanish in the output representations after having triggered some stress

placement rules (cf. Chomsky-Halle (4), p. 147-148). It is not either possible to take care of unpredictable stress placements by introducing a distinction between "tense" and "lax" vowels, since we already recognize a difference between long and short vowels and a difference between full vowels and shwa. There is no basis whatsoever for postulating more oppositions of this nature.

It may be postulated, however, that syllables with stress have either a long vowel or a long postvocalic consonant or a postvocalic consonant group in the underlying form. Wordforms like those cited in the last part of section 2.1.3. can then be distinguished like this in their underlying representations:

palas:	hæl:as
anæks	aj:aks
krabasg	dam:asg
etc.	etc.

According to these examples, a syllable with a long consonant takes precedence over a syllable with a final cluster. Similarly, a syllable with a long vowel takes precedence over a syllable with a final cluster (according to rule 2.1.-B), cf. names like á:dáks (a brand of film). If two syllables both exhibiting a short vowel which is followed by two consonants, compete about stress placement, the rule seems to be that the last one takes the stress if it ends in a stop consonant (kardésg 'brush, float', absén't 'absinth'), whereas the first one takes the stress if this is not the case (túrnips 'turnip'). Exceptions to the last-mentioned rule like hárnisg, áugosd (as a personal name) behave as if they were derivations (*harn-isk) or compounds (*af-gust) and may be marked for this pseudo-complexity in their lexical representations.

The French forms like balkán, sjelé cannot be covered by these rules. One might set up a rule according to which long vowels are obligatorily shortened before the velar

nasal; this would permit us to represent words like balkán with a long second vowel in their underlying forms. However, this kind of hocus-pocus would not help to explain the final stress in forms like metál, sjelé (since an underlying long vowel stays long before /l/ and zero, cf. forms like poká:l 'goblet', idé:l).

It being granted that the two kinds of loanwords exemplified by balkán, sjelé must be taken care of by some special rule, the remaining monomorphemic wordforms can, with very few exceptions, be accounted for by a set of simple rules. One way to do this is to assign the feature [+stress] to every full vowel and to delete some of the stresses afterwards, "heavy" syllables (syllables containing a long segment or a postvocalic consonant cluster) conditioning the deletion of stress in lighter syllables according to a particular rank ordering. Another possibility is just to assign stress to the vowels that shall have stress, the rank ordering of syllables according to their segmental content being incorporated in an ordered set of rules. The problem of formalization must, however, be postponed until polymorphemic wordforms have been considered, too. At present, the rules will only be stated in an informal way according to the second solution:

Rule 2.2.-A A vowel segment containing the classificatory feature [+long] receives stress.

Rule 2.2.-B If rule 2.2.-A has applied vacuously, a vowel segment followed by a consonant segment containing the classificatory feature [+long] receives stress.

Rule 2.2.-C If rules 2.2.-A&B have applied vacuously, a vowel segment (the last vowel segment?) that is followed by two consonant segments of which the second is a stop, receives stress.

Rule 2.2.-D If rules 2.2.-A&B&C have applied vacuously,

the first vowel segment that is followed by two consonant segments receives stress.

It may seem rather artificial to postulate underlying consonant length, since consonants are phonetically short in Danish in all environments (except for "syllabic" consonants representing a fusion of shwa plus consonant, or consonant plus shwa, according to a late, optional rule). However, there is some evidence that consonant length must be posited anyway, partly as a classificatory feature appearing in lexical entries and partly as a feature generated at some intermediate stage in the phonological rules. This is, at least, a possible way to explain (predict) the distribution of stød, and hence an analysis which postulates the existence of underlying consonant length as a feature which is deleted by a late rule, is not entirely without support from evidence of a different kind.

Underlying consonant length serves to generate the correct phonetic output in cases where the accentuation type manifested by stød is expected on grammatical grounds. It being assumed that Danish has a distinction like the Norwegian or Swedish one between "accent 1" (being grammatically predictable in forms like pén' 'pen', kát 'cat', or in the definite forms pén'ën, kát'ën, etc.) and "accent 2" (grammatically predictable, for example, in the plural forms pénë, kátë or in monomorphemic forms like énë 'end'), we find that this distinction is neutralised everywhere except in syllables containing a long vowel or a vowel followed by at least one voiced consonant. In such syllables (with so-called phonetic stød-basis) "accent 1" may appear as stød, otherwise there is no phonetic distinction between the two alleged types of accentuation (this statement holds true only for some varieties of Standard Danish). In this respect Danish differs radically from Norwegian and Swedish (note further that "accent 1" is the marked one in Danish, whereas it is generally considered the unmarked one in Norwegian and Swedish). It is, however, interesting that the (early) rules inserting "accent 1" and "accent 2" (or rather only the former, since the latter need not be marked at all) are very closely related to those of Norwegian and Swedish. The various manifestations of "accent 1" and its neutralisation with "accent 2" under certain conditions, must be taken care of by a later set of rules that are specific to Danish.

However, the situation is further complicated by the fact that even syllables with a voiced postvocalic consonant do not necessarily take stød under conditions where "accent 1"

is expected on grammatical grounds, cf. ván 'friend' versus pán 'pen'. On the other hand, there is invariably stød in monomorphemic wordforms that contain an additional consonant after the voiced one, cf. kán't 'edge', and similarly if the vowel is long, cf. pá:'n' 'nice'. According to Hjelmslev (7), monosyllables with stød on a final voiced consonant such as man' 'man' has a latent /d/ after the postvocalic sonorant, whereas there is no latent consonant in forms without stød under similar conditions. /d/ is postulated here because it appears in derivations with -ig, cf. mándi 'manly'. However, I should rather like to speak about underlying length in such cases (it is not difficult to formulate a rule inserting d between long obstruents and the suffix in question). Accordingly, the phonetic forms may be generated from underlying forms differing in length:

¹væn → ván

¹pæn: → pán'

¹pæ:n → pæ:'n

This analysis does not take care of the accentuation in inflected forms like ván'ën. However, the fact that "accent 1" is manifested by stød here can be explained in terms of a rule which lengthens a postvocalic consonant before a following vowel (which in turn may be inserted by a phonological rule). This abstract consonant lengthening (which does not appear in the output except through its effect on accentuation) only takes place in certain cases; in other cases the vowel is lengthened instead, cf.

bað 'bath' definite form ¹baðët → bá:'ðët

væn " " ¹vænën → ván'ën

The lengthening of vowel or consonant is largely dependent upon the quality of the consonant; roughly speaking, vowels are lengthened before voiced approximants, whereas consonants are lengthened if they have partial or complete oral occlusion (i.e. both nasals and /l/ belong to the latter group; the classification of /r/ is most controversial). For more details see Basbøll (3).

Forms like ván must be interpreted as consisting entirely of short segments. They nevertheless take stress like other wordforms. We must, therefore, add a final rule to take care of forms of this kind:

Rule 2.2.-E If rules 2.2.-A&B&C&D have applied vacuously, the last full vowel is stressed.

Note that this rule (which also takes care of the form metá1) makes the feature of consonant length redundant in final voiceless consonants provided that there is no preceding long syllable to attract the stress. Forms like bukát can be represented in lexicon with a final short /t/, but since analogous forms like kasgát must have /t:/ in order not to get initial stress by the application of the rules as they stand, the possibility of omitting the length mark in a number of individual cases may not be particularly interesting from the point of view of the pattern. In the input to the phonological rules the two forms must have analogous representations. It is more interesting to note that consonant length is redundant in monosyllables ending in a voiceless consonant (like hát). In such forms the final consonant is short and remains short according to general marking conventions.

It is not at present clear to me how much is gained by generating stress or rather the placement of stress from underlying segment length and syllable complexity.⁶ The analysis attempted above may be criticized as being unduly abstract. Note, however, that in spite of the fact that there is no phonetically obvious parameter of length associated with the postulated underlying difference between long and short consonants, it is nevertheless a matter of terminology whether one should speak of absolute neutralization or not, since the accentuation effects are indeed very directly associated with underlying consonant length, the relationship being a perfectly regular one.

It is certainly possible to mark stress in lexicon, but then one misses all the true generalizations that can be made with reference to vowel length and consonant number, and the distribution of stød must be accounted for anyway.

6) In his analysis of Norwegian Weinstock (13) prefers to derive both vowel length and stress from consonant length. From an autonomous phonemic point of view one might do the opposite (with equal or more phonetic justification).

3. Stress in forms with suffixes

3.1. Suffixes with and without inherent stress

Suffixes which contain no full vowel are never stressed, cf. the superlative ending in tónēsd 'thinnest'.

Suffixes containing one or several full vowels may have inherent stress or no stress. The majority of these suffixes have stress, like ík in gráfík, ísd in violinísd; this group includes all suffixes containing a long vowel, e.g. ó: 'r in frísó: 'r 'hairdresser', ó: 's in nervó: 's 'nervous'.

The most important suffixes with unstressed full vowels are: i in kó: li 'cool', li in vánli 'friendly', isg in jó: óisg, iker in grá: fikuer 'lithographic artist', en, nen in má: len 'paint', hálnen 'slope'. These are all similar in that the unstressed full vowel is a non-open unrounded front vowel. One may consider the possibility of deriving i, e in these cases from shwa, which would make stress largely predictable from the underlying distinction between full vowels and shwas in suffixes. This analysis is not entirely satisfactory, however, since it conceals the fact that there is some kind of connection between suffixes like isg and suffixes like ík, ité: 't, cf. gráfík - grá: 'fisg, aksentrisité: 't - aksen'trisg. If consonants are assumed to differ in underlying length, the difference between stressed and unstressed suffixes can almost be accounted for by the morpheme stress rules formulated in section 2.2. The only exception noticed by me is isg, which is apparently related to sg, cf. jó: óisg 'jewish' versus dan' sg 'danish'. It may be possible to cut off the i as a separate morpheme or pseudo-morpheme (appearing in the mutually related suffixes above and in more peripheral suffixes like the complex á: 'riom in planetá: 'riom). If there is an internal border in isg

both parts of the complex must remain unstressed according to the stress rules set up in 2.2., which thus seem to apply to morphemes as well as monomorphemic wordforms.⁷

3.2. Suffix addition and stress deletion

In the following it will be assumed that each morpheme of a wordform is stressed or unstressed in some underlying representation, the morpheme stresses being introduced by early rules, i.e. at a point where the different kinds of phonological juncture are still symbolized in terms of the structure of the syntactic surface representation (except for morphemes which may have to be marked for stress or inability to take stress on a particular vowel). This approach (which of course does not agree with the formulation of stress rules in Chomsky-Halle (4)) seems to me meaningful since, for example, the accentuation of prefixes cannot be predicted except with reference to the morphemic composition of the wordforms. Thus, the stress rules are here put on roughly the same level as the rules generating "accent 1", which obviously must refer to boundaries reflected as /+/
in phonology, cf. makró:n+ër 'macaroons' versus matró:në+r 'matrons', pó:'dië+r 'platforms' versus ká:no:'+ër 'canoes', obviously by early rules referring to the structure of morphemes. If we assume each morpheme to be specified by early rules for stress (inexactly referred to as "inherent stress"), word stress must be generated by a deletion rule plus a related shortening rule:

Rule 3.2.-A A morpheme stress is deleted if there follows another stress without intervening juncture of the type delimiting lexical entries (i.e. #).

Rule 3.2.-A' A long vowel without stress is shortened before a syllable with a full vowel and optionally before a syllable with shwa.

violí:n+ísd+én:ë → violi:nisdén:ë → violinisdénë

7) This presupposes either that the vowel of (n)er is derived from shwa or that the final consonant is derived from one underlying segment (i.e. not from /ng/).

3.3. Additive and replacive suffix insertion

Suffixes containing a full vowel may either be added directly to the stem or replace the final part of it. The replacive transformation applies in particular if the stem ends in shwa, cf. jó:ǰë with the derivations jǰǰénë 'female jew', jó:ǰisg 'jewish', or metó:ǰë - metó:'ǰisg, but suffixes (or suffix clusters) like isg, ikër, isitë:'t also seem to replace full vowels in some cases, cf. melodí:' - meló:'disg, where the shortness of the last vowel proves that the suffix is replacive isg (not additive sg as in partí:' - partí:'sg).

It is characteristic of replacive constructions that the consonant preceding the replaced vowel tends to retain the quality it should have before this original vowel, cf. the two variants of /d/ in jó:ǰisg and metó:'ǰisg versus meló:'disg. The former, i.e. ǰ, is in "weak position", but the latter, i.e. d, is in "strong position" in the underlying stem form (cf. Rischel (12)).

In many instances the stem to which the replacive suffixes are joined is otherwise found only with stressed suffixes. In such cases it may not be valid to claim that the replacive suffixes replace any particular sequence, but the wordforms may nevertheless behave as if the suffixes replace a "dummy" syllable with stress. The presence or absence of a syllable of this type in the underlying form of the stem is sometimes apparent from the consonant quality. A typical example is the root morpheme /lo:g/ in logík 'logic', ló:'gisg 'logical', ló:'gikër 'logician' versus the derivative suffix /lo:g/ in filoló:γ 'philologist', filoló:'γisg (or filoló:'gisg), filologí:'. The root morpheme (which is not very clearly related to the derivational suffix from a synchronic point of view) does not occur alone but only with suffixes as in logík, which may be termed a "quasi-derivation" since the presence of a suffix ík is obvious, cf. etík, kritík, and other analogous forms. In

accordance with the fact that ló:'g₁isg, ló:'g₁ik₂ër are felt to be derived from log₁k, the /g/ keeps its quality as a stop consonant determined by strong position. In the form filoló:'y₁isg, on the other hand, the suffix isg may be taken as either added to filoló:'y or replacing the suffix of filolog₁:', and accordingly, there is some vacillation in the pronunciation. With /p t k/ the difference between underlying weak and strong position is probably not made very consistently.

Purely additive suffixes do of course not behave like this. A stem final consonant to which an unstressed suffix is added, remains in weak position, cf. ábe₂ð 'abbot', plur. ábe₂ð₂ër, whereas the addition of a stressed suffix puts the consonant in strong position (stated otherwise: the syllable border comes before the consonant), cf. the feminine derivation abed₁ís₂ë 'abbess'.

3.4. Stress shift and preservation of underlying vowel length before replacive suffixes

Alternations like arisdó:'t₂ël₂ës - arisdoté:'l₁isg 'Aristotelian', dé:m₁ån or dæmó:'n - dæmó:'n₁isg 'demoniacal', kán'ada - kaná:'d₁isg, kaná:'di₂ër 'Canadian', mártý:'r - mártý:'r₁iom 'martyrdom', pá:radì:'s - paradí:'s₁isg 'paradisiac', sá:tan - satá:'n₁isg 'satanic' show a tendency for unstressed replacive suffixes to cause the preceding morpheme to take stress on the last syllable. Moreover, the wordform gets "accent 1" (i.e. stød if phonetically possible), also in cases where the underlying stem is an "accent 2" form, cf. metó:ð₂ë - metó:'ð₁isg (jó:ð₂ë - jó:ð₁isg without stød points to a difference in the treatment of foreign and nonforeign lexical items).

(In their analysis of English Chomsky and Halle (4) set up a distinction between the adjective-forming suffix -ic(al), which they represent as /ik+æɪ/, and the noun-forming suffix -ic, which they represent as /ik/. In their own words, they resort to this artifice to account for the fact that the former suffix places stress on the immediately preceding syllable (4, p. 88). The corresponding Danish suffixes are replacive isg and ik, respectively. The underlying form of the latter is /ik:/ according to the analysis proposed here; that of the former is probably /i+sg/. There is no possibility of a solution like the one proposed by the said authors for English.)

The fact that the length is shifted from one vowel to the other in cases like sá:tan - satá:'nisg might suggest that the root morpheme in such forms has two underlying long vowels: /sa:ta:n/, of which the second is shortened by some phonological rule unless it has received stress. However, it is difficult to see how such a rule could be formulated in general terms without shortening also the last vowel of paradis, martyr. One way to except the latter words from such a shortening rule would be to mark them as quasi-compounds, i.e. with an internal boundary of the kind associated with lexical items, i.e. #. This somewhat arbitrary solution may be avoided if we take both vowel lengthening and stress attraction to be directly conditioned by the suffix /i/ in isg, iom, etc.:

Rule 3.4.-A Stress is moved to the vowel immediately before replacive suffix /i/.

Rule 3.4.-A' A vowel separated from replacive /i/ by one consonant, is lengthened.

The ability of the suffix to trigger this complex of rules must be marked as an abstract feature of it. The suffix found in kó:li 'cool', etc., which is superficially similar to the replacive suffix (element) in question, does not trigger the rules. Ultimately, the difference has obviously

something to do with the status of the suffixes as foreign or nonforeign.

3.5. Vowel length and stress in the suffix "-or"

Forms like láktár 'lecturer' - definite form láktár(ə)en - plural láktó:rer show that the nomen agentis suffix "-or" appears in two shapes: with short unstressed á and with long stressed ó:. If an underlying form is posited with /o/, both the opening in final syllable before /r/ and the lengthening to o: before a voiced approximant followed by a vowel tie in well with the general phonological rules of the language. It may seem strange that the lengthening is not found before the definite article, but this is true also of some monosyllables, cf. bár 'berry' - definite form bár'ëð (the lengthening rules applying to monosyllables with suffixes added to them are treated in detail in Basbøll (3)).

If the above analysis is correct, the lengthening rule in question must be prior to the rules assigning stresses to vowels, since the sequence /or/ does not fulfill the conditions for stress before the vowel is lengthened.

4. "Heavy" suffixes

Some suffixes (of German origin), in particular -hed, -dom, -skab, and partly -agtig, are stressed like the second part of compounds, the rhythmical patterns of djárvhè: 'ð 'frankness', mándám' 'manhood', klóysgà: 'b 'wisdom' being similar to those of bjárygè: 'ð 'mountain goat', dósdám' 'death sentence', bóysgà: 'b 'bookcase'. This suggests that the suffixes are characterized by being separated from the preceding stem by a boundary of the type /#/ unlike the suffixes treated in section 3., which were preceded by /+/.

The stress insertion rules given in section 2.2. apply to these suffixes. Two of them have a long vowel: /he:d/, /sga:b/, the others have a long consonant or a consonant cluster after the vowel, i.e. they fulfill the

conditions for the rules in 2.2. to apply. However, the stress deletion rule 3.2.-A does not operate across a boundary of the /#/ type. For sequences with this type of boundary see further section 6.

5. Prefixes and stress

Prefixes are characterized by occurring only word initially before a root morpheme. The Danish prefixes all have short vowels followed by none or one consonant (apart from the somewhat questionable prefix ent-), so they cannot possibly be stressed, according to the rules, provided that they are separated from the following morpheme by /+/, rather than /#/ . This difference of boundary distinguishes between /får+fal:/ 'decay' with a prefix and /får#fal:/ 'unavoidable absence' with a succession of two lexical units each of which gets stress according to 2.2.

The prefixes u 'un' and on (und-) 'away from (?)'⁸ differ from the other prefixes in that they appear both with and without stress. I see no other way of explaining this than by considering them to be quasi-lexical items separated from the following morpheme by /#/ , the unstressed variants being caused by a rule deleting /#/ in certain cases (the existence of a /#/ deletion rule in English is postulated by Chomsky and Halle (4), p. 86, this rule taking care of alternative stress patterns on words like analyzable). The same deletion rule is found with some regular compounds, and it will therefore be discussed in the next section.

The special status of the prefixes u and on must of course be explained by their role in the syntactical component of Danish grammar (which is not considered here). From a purely distributional point of view u clearly differs from other prefixes in that it can occur before a prefix, cf. ubesgrí:'vëli 'indescribable', which is another testimony of the fact that it has a special grammatical status.

8) and similarly the foreign prefixes de, a (the latter probably only with stress).

6. Compound words

As stated above compounds are normally characterized by their members being joined by junctures of the /#/ type. Within each sequence bounded by /#/ the stress deletion rule applies, but the remaining stress of each sequence is retained although the relationship between the members of the compound is signalled by differences in the degree of stress. If there are more than two such degrees, the lower degrees tend to be indistinguishable from absence of stress: a compound like undervandsbåd 'submarine' has normally no more stress on the third syllable than underbetalt 'underpaid', in which the third syllable is a prefix.

The rules generating degrees of stress in compounds will not be considered any further in this paper.

In some cases there seems to be a stress metathesis rule operating at a very late point in the phonological rule complex, compounds like stationsforstander being often pronounced sda:sjó:nsfårsdan'ër instead of sda:sjó:ns-fårsdan'ër. The compound, which means 'station master', definitely contains the lexical item /får/ 'for, front', not the prefix /får/, but the existence of the latter may have conditioned the frequent use of the form with apparent metathesis.

7. Compound words and similar stretches with /+/ instead of /#/

Quite a few compounds exhibit the stress pattern typical of sequences with /+/ junctures, i.e. with deletion of all but the last stress. This peculiar structure is found in a good many place-names and in a restricted number of ordinary compounds, but it seems to be associated in particular with stretches containing the suffixes i, li (orthographically -ig, -lig). Examples are: ansé:'li

'magnificent', latsén'di 'rash', sansyí:'nli 'probable',
maëgö:'rli 'tractable', tefárlá:'öëli 'reliable'.

This category is joined by a large number of words with the prefixes on and particularly u, e.g. onsé:'li 'shy',
ugyl'di 'invalid', uhál'di 'unlucky', utál'i 'innumerable',
ubönhö:'rli 'relentless', ulasaigö:'rli 'impossible to do'.

Many wordforms of this category are also deviating in that the parts of which they consist (when the suffix has been removed) do not both occur alone, or if they do, they may only occur with a different meaning or in a deviating phonetic shape. It might be assumed that the particular stress pattern were due to this opacity of the wordforms, but in fact the same stress pattern is found also with some forms which are entirely transparent, whereas others have the ordinary compound stress pattern, cf. uhál'di versus úvánli 'unfriendly'.

Somehow, the stress patterns probably depend upon how these adjectival forms are generated in the syntactical component. As for the forms with the negative prefix, it seems that those which are quite obviously composed of the prefix plus an independent adjective, have /#/ , i.e. the stress pattern of compounds, whereas those which are generated via a noun to which the negative prefix has been added, have /+/, i.e. no prefix stress. Finally, forms of which the nucleus is a verb (e.g. umésdëli 'inalienable') have /+/
(ugyl'di may represent this type). These superficial considerations are, of course, quite inadequate from the point of view of syntax, but they suffice to suggest that there may be a syntactical explanation of the stress patterns whereas it would not be possible to predict them on purely phonological grounds.

8. Summary and formalization of rules

This paper attempts to show that stress in Danish is largely predictable not only in "genuine" Danish words but also in words of foreign origin, with the exception of a number of loanwords from French, which must either be taken care of by quite specific rules or marked as "French", or the like (a binary distinction of +foreign is hardly sufficient to explain the heterogeneous character of the lexicon).

As for the commutation pairs listed in the beginning of the paper, kórset and korsét differ in their underlying representations as /kårs+äd/⁹ versus /kårsæt:/, fórfald and forfáld are respectively /får#fal:/ and /får+fal:/, kánon and kanón are respectively /ka:non/ (?) and /kanó:n/, plástic and plastík are respectively /plastik/ and /plast+ik:/.

It has been suggested in this paper that there is a phonemic distinction in Danish between shwa and other vowels. This may be taken care of by the feature "tense". It is further postulated that length is a classificatory feature distinguishing long and short vowels as well as long and short consonants in the underlying representations, although consonant length is deleted by a late rule. (It would be possible to speak of geminated vowels and consonants in order to avoid the feature "long", but I see no particular advantage in doing so.) Finally it is assumed that there are two kinds of marked boundaries in the word-forms: /#/ being the type of boundary that marks off lexical items, and /+/- being a morpheme boundary which does not have this property.

Whereas Chomsky and Halle in their description of

9) If this is a verb form, there is certainly a syllable with shwa, whereas the analysis of definite forms is controversial.

English put stress on wordforms by one main stress rule (with minor modifications by later rules), I have tentatively used a rather different approach. As presented in this paper, the Danish "main stress rule" consists of three sections, which do not belong directly together in the rule hierarchy. The first section (rules 2.2.-A&B&C&D) puts stress on each morpheme whose segmental structure permits it to take stress according to these rules. The second section (rule 2.2.-E) puts stress on wordforms (applying vacuously if they already have got morpheme stress). Finally, the third section (rule 3.2.-A) delete stresses before later stresses in the same wordform. A supplementary rule shifts stress to the position immediately before certain "replacive" suffixes (rule 3.4.-A), probably before the application of the last part of the main rule. - The rules demand for their application an input consisting of stretches bounded by /+ / or /#/ . Some of these stretches are supposed to exhibit a replacement of /#/ by a boundary type of a lower rank (replacement by /+ / or simply deletion). The "/#/ deletion rule" cannot be stated in the present paper, since it demands a good deal of syntactical considerations and probably belongs to the syntactical component of grammar.

The approach used in this paper violates the principles laid down in Chomsky's and Halle's book (4) since it postulates that certain stress rules operate with reference to boundaries of the /+ / type. This heresy has something to do with the fact that so many conditioning factors enter into the stress generating rule(s): position of long vowel segment, position of long consonant segment, position of postvocalic consonant cluster(s), and the distinction between full vowels and shwa. Since the subrules associated with these conditioning factors are disjunctively ordered, the rule complex becomes rather involved. Moreover, the rules generating "accent 1", and the later rules converting this abstract accent into stød under phonetically definable circumstances, should also be taken into account.

As far as I can see, there is only one point of disagreement between the principles governing the stress placement in monomorphemic wordforms and those governing the stress placement in polymorphemic noncompound wordforms. This point has to do with the unstressed full vowel suffixes, which can only be distinguished from the stressed ones if the latter are marked as "foreign": húrtísd 'fastest' having minus for this feature, gárdísd plus. This is intuitively an extremely satisfactory solution.

I do not want to insist that stress is generated together with "acc. 1", or lexical. It is possible to generate word stress by rules operating on a representation with /+/- and across such boundaries. This requires a rule for prefixes and probably a shortening rule for cases like solísd 'soloist' vs. ró:lísd 'calmest' if the former has /o:/, cf. só:ló.¹⁰

With these reservations it should be possible to set up the rules suggested in this paper in such a way that they apply to noncompound wordforms (i.e. within #-bounded strings). They are given here with a minimum of symbol use (disjunctive ordering permits further simplification):

Rule 8.-A

$$\left[\begin{array}{c} V \\ +\text{long} \end{array} \right] \rightarrow [1 \text{ stress}] / X_Y$$

where Y contains no $\left[\begin{array}{c} V \\ +\text{long} \end{array} \right]$ and X,Y
no [1 stress]

Rule 8.-B

$$V \rightarrow [1 \text{ stress}] / X_ \left[\begin{array}{c} C \\ +\text{long} \end{array} \right] Y$$

where Y contains no $\left[\begin{array}{c} C \\ +\text{long} \end{array} \right]$ and X,Y
no [1 stress]

Rule 8.-C

"Foreign" stress rule

$$\left[\begin{array}{c} V \\ +\text{tense} \end{array} \right] \rightarrow [1 \text{ stress}] / X_C \left[\begin{array}{c} C \\ -\text{cont.} \\ -\text{nasal} \end{array} \right] Y$$

10) Vowel length is definitely phonemic in Danish.

where Y contains no $\begin{bmatrix} C \\ -cont. \\ -nasal \end{bmatrix}$
 and X,Y no [1 stress]

Rule 8.-D

$\begin{bmatrix} V \\ +tense \end{bmatrix} \rightarrow [1 \text{ stress}] / X_CCY$

where X contains no CC
 and X,Y no [1 stress]

Rule 8.-E

$\begin{bmatrix} V \\ +tense \end{bmatrix} \rightarrow [1 \text{ stress}] / X_C$

where X contains no [1 stress]

With a more complete knowledge of Danish prosody it should be possible to reformulate the rules entirely to get something like the rules sketched by Weinstock (13). It would be interesting to see to what extent the various Scandinavian languages agree in their treatment of foreign words of different categories.

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