

SR:
lyd af lydskiftet

SOME CONDITIONING PHONOLOGICAL FACTORS FOR THE
PRONUNCIATION OF SHORT VOWELS IN DANISH WITH
SPECIAL REFERENCE TO SYLLABIFICATION¹

Hans Basbøll

1. Introduction

The aim of the present (very preliminary) paper is to shed light on what some linguists would earlier have called rules for allophonic variation of short vowel phonemes. Thus the distinctive feature analysis of the Danish vowels is not at issue here (see Rischel 1969 and Austin 1971 for general discussions of that subject), and questions about which vowels are found underlyingly are only briefly touched upon.

The theoretical framework of the present paper is basically that of a generative grammar. However, very little formalism will be used here since current notational conventions are on many points quite inadequate for expressing the generalizations discussed in this article.

The word "phonological" in the title of this paper indicates that differences in pronunciation due to different sociological, geographical or other background, as well as stylistic factors and purely phonetic factors (e.g. physiologically conditioned), are not taken into account.

The language under consideration is a variety of standard Danish. Unless otherwise stated, I think the features of pronunciation that are discussed are common to most non-provincial varieties of standard Danish. As long as no reliable material

1) I am very indebted to Eli Fischer-Jørgensen and Jørgen Rischel for valuable comments on the manuscript, and to Peter Holtse for many improvements on my English style.

on these problems has been published, it is of course impossible to decide on these matters. But I think that the very existence of the pronunciation patterns discussed here is interesting, even if some other varieties of standard Danish have deviating pronunciations on some points.

Except for section 3. (where the long vowels are used for comparison), the only vowels to be considered here are those which are genuinely short, i.e. phonetically short vowels which are not derived from long vowels. Thus we shall neither discuss the quality of phonetically long vowels derived from underlying short vowels (as in bade ['bæ:ðə], plural of bad [bað]), which have the same quality as the genuinely long vowels, nor the quality of phonetically short vowels derived from underlying long vowels (as in øvrig ['øʁi], cf. øverst ['ø·ʔvɔsd]). As a consequence of this latter limitation, one interesting problem in Danish phonology concerning vowel quality cannot be adequately dealt with here, viz. that of the two qualities [ɔ] and [ʌ] of shortened /ɔ:/ (e.g. på gaden, på den [p^hɔ 'gæ:ðən, 'p^hɔ dən] versus påsmøre ['p^hʌ, smø·ʔɔ], cf. the isolated word på ['p^hɔ·ʔ]).²

-
- 2) Although the problem has received some attention in the literature (e.g. in Rischel 1969 p. 190f and 202ff), it seems to me that the processes have not been stated in a very satisfactory way. It may therefore be worth while mentioning that short and long /ɔ/ should have the same opening degree in their underlying form, and that the distinction mentioned above is due to the fact that the vowel shortening in examples like påsmøre - a shortening which evidently belongs to derivational morphology - applies before the rule that opens short /ɔ/ to [ʌ], which again applies before the rule that shortens /ɔ:/ in certain syntactically conditioned environments, applying across word boundaries. This is precisely the rule ordering we should expect.

We shall presuppose that the input to the phonological rules contains the following nine short vowels (which will be written in //):

/	i	y	u
	e	ø	o
	ε		ɔ
	a	/	

They are normally said to have the following "main allophones":

[i	y	u
	e	ø	ɔ
	ε		ʌ
	a]	

We shall then consider the manifestations [o] and [ɔ] of /o/ (section 2.1.), and [a] and [ʌ] of /a/ (section 2.2.). We shall find that the syllable is a crucial unit in this connection, which motivates a discussion of some principles for syllabification in Danish (section 2.3.). Finally we shall discuss "r-colouring" (section 3.) and some aspects of the phonology of the short rounded front vowels (section 4.).

2. The role of syllabification

The use of the concepts "syllable" and "syllabification" in this connection will be clarified in section 2.3. below.

2.1. Short /o/

Apart from the position before /r/ (see section 3. below), native Danish words contain the following long rounded back vowels [u:, o:, ɔ:] (e.g. in hule, hole, åle) and the following short ones [u, ɔ, ʌ] (e.g. in hulde, hulle, holde). These have normally been taken to manifest the phonemes long and short /u/,

long and short /o/, and long and short /ɔ/, respectively, for reasons of pattern congruity. It is also well known that the vowel [o] occurs, partly as shortened /o:/, partly in some foreign words which have been treated as deviating from the native pattern (e.g. [ˈfot^so] foto, cf. Rischel 1969 p. 180).

It has been pointed out (Basbøll 1969 p. 44) that the short vowels [o] and [ɔ] both occur posttonally in complementary distribution, [o] occurring in open and [ɔ] in closed syllables. At the time I did not, however, fully realize the generality of this principle.

Consider the following words where the underlined letters represent the short vowel phoneme /o/:

[o]: foto, céllo, Víggo, onaní, Kosángas

[ɔ]: bonde, centrum, hul(le), luffe, undgæelig, mukkerí

We shall give evidence below (section 2.3.) that a single intervocalic consonant belongs to the syllable containing the preceding vowel if the following vowel is shwa, and to the following syllable if its vowel is a "full vowel" (not including weakly stressed posttonal i and e occurring in endings like ig, isk, ing). Under this supposition the rule seems to be: /o/ is pronounced [o] in open and [ɔ] in closed syllables, applying to /o/ in both pretonal, tonal, and posttonal position. Notice especially that the [o]-manifestations of short /o/ in the often cited "exception" foto are quite regular under this analysis: the syllable boundary occurs after the stressed /o/ (which is thus [o]) and before /t/ (which is thus aspirated and affricated). The fact that there is a posttonal /o/ indicates a foreign word structure.

I know of no evidence disconfirming the present hypothesis, but its value of course cannot be determined without regard to the principles of syllabification discussed below (in section 2.3.).

2.2. Short /a/³

It is well known that /a/ has several variants: A back vowel in the environment of /r/ (see further section 3. below), a mid vowel [α] occurring before velars, and a front vowel [a] occurring before dentals and in word final position. Before labials some conservative standards have a vowel between [a] and [α], whereas in the variety of standard Danish spoken around the capital the /a/-manifestation before labials is [α]. I shall base the presentation on data taken from this latter norm in the following, but all the arguments to be given below apply mutatis mutandis to the other variety mentioned.⁴

The formulation /a/ is pronounced [α] before non-coronal consonants, otherwise as [a] accounts for e.g. the following words:

[a]: da, land(e), hat(te), sofa, Aida

[α]: dam(me), lang(e), lak(ke), tap(pe), abstinent

However, in some cases where the above-mentioned rule predicts [α], we actually have [a]:

[a]: Amerika, akademiker, habilitet, kakofoni, ahorn

- 3) I am very much obliged to Henrik Holmberg for his kind permission to use some material concerning the /a/-variants which he collected in an independent and skillful manner during my course in Danish phonology in the spring of 1969. Henrik Holmberg then advanced the idea that the syllable played a crucial role for the determination of the /a/-variants too (cf. section 2.1. above).
- 4) From the generative point of view used in the present paper it is immaterial whether [α] is identical to the "r-coloured a", as is the case in advanced standard Copenhagen.

Compare the following words:

[α]: amfíteater, akkeléje, ábsalon, akcént

It seems reasonable to advance the hypothesis that the above-mentioned rule is correct but applies at the syllable level and not at the word level, or otherwise stated: that the rule has the syllable as its "domain". Note that syllabification follows the principles that are needed anyway for the prediction of the /o/-variants (section 2.1. above), see section 2.3. below.

Notice further that cases of vacillation like:

[a/α]: affrikat, amerikaner,

especially the latter one, support the hypothesis: the form affrikat can be syllabified either a.fri... (corresponding to a pronunciation with [a]) or af.ri... (corresponding to a pronunciation with [α]) (see below). The form amerikaner is pronounced with [α] if the second vowel is dropped, as it normally is ([amβi^hk^hæ·ʔnɔ]), otherwise with [a] ([ameβi^hk^hæ·ʔnɔ] like [a^hme·ʔβik^ha] Amerika; cf. footnote 9).

Compare the words sandkrabbe [ʼsan,k^hʁabə, ʼsaŋ,k^hʁabə] and (the invented) sangkrabbe [ʼsaŋ,k^hʁabə] whose first /a/'s would always be pronounced differently. The pronunciation [ʼsaŋ,k^hʁabə] (of sandkrabbe) shows that the /a/-variant used is independent of the operation of the optional nasal assimilation rule applying across a #, or in other words: that the quality of /a/ is determined before the mentioned assimilation rule applies. On the other hand, the determination of the /a/-variant presupposes that the nasal before a homosyllabic /g/ has already been specified as velar.

2.3. Principles for syllabification

2.3.1. Introductory remarks

Let me illustrate what I mean by "syllable" and "syllabification" with a German example where the facts are well known.

[s] and [z] only contrast between vowels, [s] being excluded word initially and [z] word finally (details left aside). Hjelmslev⁵ proposed to account for this fact by reducing [s] and [z] to one phoneme /s/ and describing the distinction reissen : reisen by means of different syllabification, reissen having the syllable boundary after /s/ and reisen before /s/. This is, however, in itself an empirically rather empty proposal, unless it is seen in connection with other facts of German phonology, as I shall do in the following.

It seems possible to claim that the following generalization holds in German: A stressed syllable must be a possible phonological word, i.e. it is always possible to syllabify a native German word in such a way that a stressed syllable does not violate any phonotactic rule for monosyllabic words. This principle explains why a word having a stressed short vowel followed by a voiced obstruent followed by shwa belongs to a non standard (High) German word type (e.g. Low German words like Ebbe, Kladde, Roggen): The syllable boundary cannot occur before the obstruent (since a stressed monosyllable can never end in a short vowel), nor can it occur after the obstruent (since a German word can never end in a voiced obstruent).

Now this principle (that a stressed syllable must be a possible phonological word), together with Hjelmslev's analysis of [s] and [z] as bound variants, explains why [z] never occurs after short vowels: An impossible phonological word like [hazən] could have the syllable boundary neither before [z] (since a stressed monosyllable can never end in a short vowel),

5) "Es könnte in derselben Weise [as with [x] and [ç]] nachgewiesen werden, dass das stimmhafte und das stimmlose s (Lenis- und Fortis-s) im Deutschen silbenbedingte Varianten ein und derselben Ausdruckseinheit sind" (1938 p. 156f).

nor after [z] (since the pronunciation of /s/ is [s] and not [z] in syllable final position).

To an imaginary objection that the above-mentioned facts can more simply be stated like this "voiced obstruents do not occur after short stressed vowels", I should make the following points:

- (i) The principle "all obstruents are voiceless in the final (i.e. postvocalic) part of the syllable"⁶ accounts for the otherwise quite disparate facts that in native words voiced obstruents are found neither word-finally nor after short vowels.
- (ii) The use of syllable boundaries to account for the distribution of [s] and [z] correctly predicts the very restricted number of possible contrasts between them. Furthermore, this principle explains why only [z] occurs between a sonorant consonant and shwa (e.g. Amsel, Hülse), since the syllable boundary goes between the two intervocalic consonants (as can be seen from contrasts like halben, Alpen, obstruents occurring between a sonorant and shwa are in syllable initial position).

6) Eli Fischer-Jørgensen has called my attention to forms like Redner, Wagner (pronounced with a voiced stop), derived from reden, Wagen, which could be syllabified /rē.də.nər, vā.gə.nər/ with obligatory loss of the first shwa after the rule for devoicing of syllable final obstruents has failed to apply (since its structural description is not met), cf. the fact that words like Regen [ʁe:gŋ] must be /rē.gən/ where the syllabification presupposes that the phonological form contains shwa. (A Danish parallel to such words is mentioned in section 2.3.2.1. below.) It should be added that words like Adler, leugnen should according to the present analysis contain a shwa between the phonetically intervocalic consonants when their syllabic structure is determined (cf. Twaddell 1938 p. 223). - Foreign words and names have a deviating phonological structure in this respect as in many others.

The points I wish to illustrate by this digression on German are the following:

- (a) The use of syllable boundaries may connect ("explain" in a vague sense) many facts which are apparently quite disparate.
- (b) In some cases (e.g. Grüsse / gr̄ys.ə/) the postulated syllable boundary may not coincide with the intuitively felt syllable boundary or with some experimentally established syllable boundary (or better: experimental data may seem to contradict the proposed syllable boundary). This may indicate that the syllable we are dealing with is a more abstract entity than the phonetic syllable, viz. a "phonological syllable". Nevertheless I dare use the term "syllable" since it is an entity which has, in Danish at least, exactly one phonological vowel and whose boundaries can be posited in accordance with some generally recognized principles for syllabification (e.g. principles (A) and (B) below). I should furthermore like to suggest the hypothesis that in the cases where the boundaries of the phonological and phonetic syllable do not coincide, the phonetic syllable boundaries will always be universally less marked than the phonological ones (e.g. if a sequence ... VCV ... has different phonological and phonetic syllable boundaries, the phonetic one will always be before C). This is the case in Danish words like [bæ:ðə] bade where the phonological syllable boundary occurs after [ð], whereas the phonetic boundary (if such a boundary is recognized at all) is before the consonant. In short: a sound chain may be "syllabified" either in the universally unmarked way (in "phonetic syllables", if you like), or in "(phonological) syllables", or (according to principle (C) below) in a way which is sensitive to grammatical boundaries. The three ways of syllabifying a sound chain may of course interact.

2.3.2. Some principles for syllabification in Danish

It has already been made clear that the unit which we try to establish, i.e. the "(phonological) syllable", is one that functions as the domain for several phonological rules, and which furthermore has certain characteristics that are always ascribed to the syllable under any definition. For instance it never contains two or more vowels that are separated by one or more consonants (in Danish there is the stronger requirement that the syllable contains exactly one phonological vowel, and also that in Danish the syllable always follows principles (A) and (B) below).

The following four principles for syllabification in Danish form a sort of hierarchy.

- (A) Word boundaries coincide with syllable boundaries.
- (B) Syllables always begin with a "full vowel" or with a possible word-initial consonant or consonant cluster, and they always end in a vowel or in a possible word-final consonant or consonant cluster.
- (C) If there is an intuitively transparent morpheme boundary between two "full vowels" in the same word, the syllable boundary coincides with this morpheme boundary in so far as it does not thereby violate principle (B).
- (D) One intervocalic consonant belongs to the syllable of the preceding vowel if the following vowel is /ə/, and to the syllable of the following vowel if this is a "full vowel" for which a derivation from shwa cannot be postulated (i.e. which is neither /ə/ nor weakly stressed i (in the endings ig, isk, ik) nor weakly stressed e (in ing), see further section 2.3.2.2. below).

I need not emphasize the highly tentative character of these proposals (of which the first ones are of course very well known and the third one extremely vague). It is also clear that further principles are needed for the situation with more

than one intervocalic consonant (in some of these cases vacillation may occur, cf. section 2.2. above), cf. the following section.

2.3.2.1. Tentative justification for the proposed principles

The phonological rules which I think can most naturally be formulated with the "phonological syllable" as their domain and which thus constitute evidence for syllabification, may be stated in the following vague form.⁷ I do not claim that these are the only such rules.

- (1) /o/ is pronounced [o] in open syllables and [ɔ] in closed ones.
- (2) Except in the environment of /r/, /a/ is pronounced [ɑ] before a non-coronal consonant belonging to the same syllable, otherwise it is [a].
- (3) /g/ is dropped after a nasal belonging to the same syllable, otherwise it is pronounced [ɣ] in the final part of the syllable and [g] in the initial part.
- (4) /d/ is dropped after a sonorant belonging to the same syllable, otherwise it is pronounced [ð] in the final part of the syllable and [d] in the initial part.⁸

-
- 7) As already mentioned I shall not give explicit rule formulations, but in such formulations the syllable should not be mentioned in the environment of the rule (i.e. it should be a property of the rule itself that its domain is the syllable). I certainly do not make the claim that none of these "rules" are instances of the same rule, nor that none of these "rules" contain different rules. Both of these claims would obviously be false.
 - 8) For some problems in connection with rules (3) and (4) see section 2.3.2.2. below. Furthermore it should be added that /d/ is dropped before a dental stop belonging to the same word, and that /g/ is pronounced [g] in the final part of the syllable before +t if the preceding vowel is shortened. See Rischel 1970a who was the first to state and discuss these problems within a generative framework.

- (5) /p, t, k/ are heavily aspirated (and /t/ furthermore affricated) in syllable initial position, but unaspirated in syllable final position. (Furthermore, they may be aspirated in utterance final position.)
- (6) /r/ is pronounced [ɣ] in the final part of the syllable, [ʁ] in the initial part.⁹
- (7) Short /ø/ is lowered before a nasal or a /v/ belonging to the same syllable (see section 4. below for more careful formulations).
- (8) /h/ only occurs syllable initially before a vowel (this is in fact not a phonological rule, but a sort of well-formedness condition).

Syllable boundaries are used by Hjelmslev (1951) to account for the different manifestations of /d/ and /g/ (as in rules (3) and (4) above). It is important to realize, however, that our claim is much stronger than Hjelmslev's. Whereas he indicates syllable boundaries everywhere in the underlying representations (his "ideal taxeme notation"), we predict the occurrence of the syllable boundaries by means of general principles, or in other words: the syllable boundaries are inserted by rule.¹⁰

-
- 9) In this form the rule does not cover very conservative standards where intervocalic word-internal /r/ not occurring before /#/ is most often manifested as a consonant (this manifestation is used for nearly all instances of /r/ except when preceded by shwa in even more conservative standards). For the younger standards it should be added that [ɣ] may be substituted for intervocalic [ʁ] before an unstressed vowel. See further footnote 15.
- 10) As mentioned in Basbøll 1971 (p. 207f) Hjelmslev misses several generalizations by his way of using syllable boundaries: In all cases where the placement of the syllable boundary has any phonological effect according to him, either the placement of it is predictable, or the phonological effect in question is due to some other independently established factor. (In most cases different placement of the syllable boundary has no phonological consequences at all.)

Notice that as the hypothesis stands, a lot of empirical data could disconfirm the proposed principles for syllabification. Some items of justification will now be given together with types of evidence that would disconfirm the principles.

Ad (A) I know of no cases where the mentioned rules apply across word boundaries. Evidence which would disconfirm (A) would be e.g. if da [da] were pronounced [dɑ] in phrases like da manden kom, or if valg [valʔɣ] were pronounced with final [g] in valg ét. Not the slightest tendencies in this direction can be found.

Ad (B) A form like yngle [ʔŋlɐ] has the syllable boundary before l although the morpheme boundary is after l ([ŋl] is an impossible termination of a Danish monosyllable).

Ad (C) This principle accounts for the fact that the syllable boundary coincides with the juncture # separating the two parts of a compound (e.g. dám#and ['dɑmɑnʔ] versus dámask ['dɑmɑsg]¹¹). Principle (C) also applies to some cases of derivation where (D) would give a different result. For instance a word like skuespillerinde is normally pronounced [sguəsbe|ɒ'ene] but it has an older pronunciation [sguəsbe|ɒ'βene].¹² The former

11) According to the principles put forward in Rischel 1970b, damask should have an underlying geminated m: /dammask/ in order to predict stress on the first syllable. This need not conflict with our principles for syllabification, however, since the rule shortening long (or geminated) word-internal consonants can apply before the syllable boundaries are inserted. I have found no cases where syllabification should apply to geminated consonants.

12) There is nothing strange in the fact that the latter form seems to correspond to a spelling skuespillerrinde (cf. Rischel 1969 p. 197), since the r-colouring effect applies across syllable boundaries (but not across the juncture #), see section 3. below.

presupposes a syllable boundary after /r/ (coinciding with the morpheme boundary), the latter before /r/ (which is the phonetically unmarked place for it to occur). Similarly in a case like jøde, jødinde ['jø:ðə, jøð'enə], cf. Rischel 1970b, p. 133f ("additive and replacive suffix insertion"), and section 2.3.2.2. below. Note further that a word like abusus is correctly pronounced [ɔb'u:sus], but that a person not being able to analyze it into ab+usus will pronounce it [a'bu:sus], as everybody would pronounce some African name Abutu [a'bu:tu].

Ad (D) This principle is the crucial one for the present paper, and it is supported by a lot of data, e.g. the following (remember that the term "full vowel" denotes all vowels except shwa and weakly stressed posttonal i and e occurring in certain endings):

- (i) Intervocalic /d, g/ is pronounced [d, g] before full vowel, but [ð, ɣ] before shwa: Ada, saga versus node, bage.¹³ The sounds [ð, ɣ] never occur before full vowels belonging to the same word.
- (ii) Intervocalic /p, t, k/ are heavily aspirated before full vowels, but not before shwa: kvota, ekko ['k^hvo:t^sa, 'ɛk^ho] versus otte, takke ['ɔ:ðə, 't^sαgə].
- (iii) /h/ occurs before full vowels (also unstressed ones), but never before shwa: Uhu (a trade mark), Ahasverus ['u:hu, ahas've:ɔsus] versus Brahe, Brahetrolleborg ['bɔa:ə, bɔaə't^sɸAləbɔ.ʔɣ]. (h is not dropped, however, when occurring before a full vowel which is phonetically reduced to shwa, e.g. the first h in kom herhén!)

13) In certain northern Jutlandic dialects words like Ida, soda ['i:da, 'so:da] are pronounced ['i:ðə, 'so:ðə], i.e. with final shwa and therefore intervocalic [ð].

- (iv) Evidence from the pronunciation of short /o, a/ has already been given in sections 2.1. and 2.2. above.

As already mentioned, the formulation of (D) has not been given in its full generality. The same principle should be extended to account also for the manifestation of the intervocalic consonant clusters /ng, nd, ld/ by stating that the syllable boundary occurs before the stop when the following vowel is a full vowel, but after the stop, which is therefore deleted, when the following vowel is shwa: Angus, vandal, Hulda [ˈɑŋɡʊs, vɑnˈdæ·ʔl, ˈhulda] versus bange, vande, hulde [ˈbɑŋə, ˈvɑnə, ˈhulə]. Note especially alternations like diftong, diftongere [dɪfˈtˢʌŋ, dɪfˈtˢʌŋˈɡe·ʔn] (and vand, vandig [vɑnʔ, vɑndɪ], see sections 2.3.2.2. and 4. below). Similarly, the medial clusters /lg, rg/ exhibit the same syllabificational pattern, as shown by the different /g/-manifestations: Volga, ergo [ˈvʌlɡɑ, ˈærgo] versus bølge, værg [ˈbølyə, ˈvæpyə].

As a quite informal experiment, I have tried to syllabify the medial clusters found in native Danish infinitives ending in shwa according to the principle that the border should go as much toward the right as is permitted by principle (B). There are three classes of exceptions where the syllable boundaries thus established fail to predict the correct pronunciation: (i) Where the cluster consists of a sonorant consonant followed by dr, the syllable border must be before d (e.g. ændre, skildre, fordre, all pronounced with medial [d]).¹⁴

14) This is maybe no exception at all, since in the cases in question (viz. the clusters [ndʁ, ldʁ, ʁdʁ]), [d] could possibly be inserted by rule. There are, however, some exceptions in the case of ldr (but none in the other two): words like aldre, buldre etc. have no pronounced [d]. (If there is a /d/ in the underlying form, there are thus some instances of medial /ldr/ with syllable border after /d/ (e.g. aldre 'ages', related to ændre); and if d is inserted by rule, this rule has some exceptions.)

(ii) Where the cluster /rd/ is preceded by a short (or short-ened) vowel, the syllable border must be before d (see the end of section 2.3.2.2. below). (iii) Two words could not be syllabified at all without violating either principle (B) or the principle of manifestation predictability, viz. the verbs tordne and ordne [¹t^soɔdnə, ¹ɔ:dənə]. It is extremely interesting that both of these verbs are derived from dissyllabic (and quite regular) nouns: torden and orden [¹t^soɔdən, ¹ɔ:ɔdən], syllabified /tor.dən, ɔrɔ.dən/.¹⁵ The verbs can thus be syllabified /tor.dən.ə, ɔr.dən.ə/ with later loss of their first shwa. This is a striking parallel to the German examples mentioned in footnote 6.

There is no doubt that the reason why the role of syllabification for the determination of e.g. the variants of /o, a/ has not been given full credit in the literature is that native monomorphemic words are generally either monosyllables, or dissyllables with shwa as their second vowel; and in the latter case the first syllable comprises at least one final consonant (if there are any intervocalic consonants, otherwise the distinction between long and short vowel is neutralized in favour of the long one), i.e. the relevant consonantal environment for the first vowel. Occurrences of "unexpected" variants of /o, a/ were then taken as signalling foreign word types. However, in my view the correct way to state the facts is to say that unstressed full vowels in themselves signal foreign word types, whereas all the other facts of pronunciation we have discussed can be deduced directly from the principles of syllabification which are highly sensitive to the distinction between full vowels and shwa.

15) According to Ordbog over det danske Sprog (ODS), orden is pronounced with a short first vowel and stød on /r/, in contradistinction to words like år which, still according to ODS, is pronounced with a long stød-vowel. Today, however, long as well as short /ɔ/ together with a following /r/ is nearly always pronounced as one long vowel: [ɔ:] or [ɔ:ɔ] (cf. Rischel 1969 p. 194ff). (The /a(:)r/-sequences are pronounced in a similar manner.)

2.3.2.2. Some further problems of syllabification in Danish

It is clear from the preceding discussion of principle (D) that one class of vowels has not been taken into account, viz. those which are neither full vowels nor shwa, i.e. posttonal i and e in endings like ig, isk, ik, ing which can possibly be derived from an underlying shwa with subsequent application of the assimilation rule

$$e \longrightarrow [+high] / \text{ ______ } ([+cor]) \left[\begin{array}{c} C \\ +high \end{array} \right]$$

(These endings are always unstressed, and phonetic shwa is excluded before a velar belonging to the same word, with or without an intervening coronal consonant. The lowering of i to e before a nasal is regular, see section 4.)

The reason why these endings have been excluded from consideration is that they form a rather complicated picture as regards syllabification, as will be illustrated in this section. Since I do not know how to incorporate the syllabification associated with these endings into an overall description, I shall only briefly state what I think are the main facts.

Consider the following examples:

- (i) (a) Erotik, erotisk [e'ʁo't^sig, e'ʁo'ʔt^sisg]
 (b) Parodi, parodisk [p^ha'ʁo'di'ʔ, p^ha'ʁo'ʔdisg]
 (c) Metodik, metodisk, metode [met^so'dig, me't^so'ʔðisg,
 me't^so:ðe]
- (ii) (a) Oda, modig, ode ['o:da, 'mo:ði, 'o:ðe]
 (b) Hulda, heldig, holde ['hulda, 'heldi, 'hʌlɐ]
 (c) Gerda, færdig, færdes ['gæpda, 'fæpdi, 'fæpðes]

Ad (i) This is evidently a problem of how derivations take place, and the reader is referred to Jørgen Rischel's interesting but brief discussion of examples like these under the heading "additive and replacive suffix insertion" (1970b p. 133f).

Ad (ii) If the distribution of stops and continuants is to be explained by syllabification according to the principles stated earlier, the ending ig seems to count as beginning with shwa after one single intervocalic consonant, but as a full vowel-ending after a consonant cluster. This might indicate that syllable boundaries are introduced before the rule that raises shwa in cases like modig applies, but after in cases like heldig, færdig (with an intervocalic consonant cluster), but this of course does not explain anything.

In forms with underlying intervocalic /rd/ before shwa, it looks as if the syllable boundary goes before /d/ if the preceding vowel is short (færdes, hærde), otherwise after /d/ which is therefore deleted (på færde, jorden, Norden, cf. jordisk, nordisk with shortened first vowel and pronounced /d/). Compare contrasts like verden, værtten ['væɾden, 'væɾtən], in very conservative standards only, whereas no such contrasts are found where the stressed vowel is phonologically long.

3. r-colouring

Several aspects of the problem of the r-conditioned variants of vowel phonemes have been dealt with elsewhere (e.g. Diderichsen 1957, Rischel 1969, Austin 1971). I shall therefore limit myself to giving some very crude rules accounting for which of the stressed vowels are subjected to "r-colouring".¹⁶

16) Austin (1971) gives several complicated rules which seem to me rather unrevealing of the linguistic facts, partly because he uses a distinctive feature system (with "high" and "mid" accounting for vowel height) which in my view obscures the regularity of the processes in question.

The following vowel diagram shows which phonologically distinct vowels are found in the environment of /r/. For reasons which will become clear in a moment, the language used here is the variety of standard Danish spoken by the young Copenhagen generation.

	Long vowels	Short vowels
After /r/	i: y: u: ----- ε: œ: o: æ: ¹⁷ - ɔ: a:	i y u ----- ε œ ɔ æ - ¹⁸ ʌ a
Before /r/	i: y: u: e: ø: o: ----- æ: ¹⁹ œ: ɔ: a:	i y y _20 _20 _20 ----- æ œ ɔ a

- 17) In words like græde, træde [gβæ:ðə, t^sʁæ:ðə] where the older generation has [ε:].
- 18) The vowel [æ] occurs before nasals, but there we have no [y], so it is sufficient to posit 2 short rounded front vowel phonemes if partial overlapping is allowed (see section 4. below).
- 19) The long /ε:/ before /r/ of the conservative standards is regularly lowered to [æ:] in the language of younger people, e.g. bære ['bæ:ɐ] (= bager in this idiolect, conservative ['bæ:ɣɐ]) (Lund and Brink, oral communication).
- 20) There is in general no distinction between /i, y, u/ and /e, ø, o/, and the young generation normally uses the narrow manifestations throughout (except for a few words with /o/: sort, hurtig).

The dotted lines in the vowel systems separate those vowels which are r-coloured (in the bottom and, after /r/, left corner of the diagrams) from those which are not.

It is evident from this table that whether a vowel is r-coloured or not depends on whether it comes before or after /r/, but (in the advanced standard Copenhagen dialect) it is independent of vowel length. The rule in this variety of standard Danish can be stated informally in the following way:

$$\left[\begin{array}{c} \text{v} \\ \text{-high} \end{array} \right] \text{ "is r-coloured"}^{21} / \left\{ \begin{array}{l} \text{r} \left[\overline{\text{-back}} \right] \\ \left[\overline{\text{+low}} \right] \text{r} \end{array} \right\}$$

The only important difference between the advanced Copenhagen standard and more conservative norms as to which vowels are subjected to "r-colouring" is that /ɛ:/, and in some standards even /æ:/, is not r-coloured in these latter norms (cf. footnotes 17 and 19). The evolution from conservative to advanced standard in this respect is evidently a kind of rule simplification.

It is interesting to notice that this r-colouring effect applies across syllable boundaries (but not across boundaries marked by the juncture #, including word boundaries). In examples like araber [a'ba·?bɔ] even the first /a/ is r-coloured although the syllable boundary occurs before /r/. (This placement of the syllable boundary is confirmed by the consonantal

21) Exactly what is implied by a vowel being "r-coloured" is not under investigation here, but roughly speaking it means that the vowel is moved "one degree" in the direction toward the right bottom corner of Jones' vowel diagram. (Note that the /a(:)/ which is input to the rule is not a back vowel.) In more conservative norms the over all degree of r-colouring is smaller than that of the advanced Copenhagen standard. Therefore the phonetic notation used in the vowel diagrams exaggerates the differences between r-coloured and non-r-coloured vowels in the conservative norms. Further, it should be said that in the conservative norms the degree of r-colouring is smaller in the long vowels than in the short vowels (except for /a(:)/).

pronunciation of /r/, but the fact that there are two r-coloured a's but only one /r/ suffices under the present supposition that there are no segment-internal syllable boundaries.) Also compare examples like skuespillerinde [sguəsbeɪn¹(ʁ)enə] and arrest [ɑ'ʁəsɔ].²²

4. Short rounded front vowels

As mentioned by Henning Spang-Hanssen (1949 p. 66) there is no environment where more than two contrasting short rounded front vowels are possible, viz. [ø] and [œ] before nasals, [y] and [ø] otherwise. All the vowels in question are subject to r-colouring according to the principles mentioned in the preceding section (cf. Table I below).

Hjelmslev (1951 p. 23) has mentioned derivations like mand - mandig [manʔ, 'mandi] in support of underlying forms like /mand/. The "latent" /d/ (to use his term) explains the stød (which occurs automatically in monosyllables ending in a consonant cluster whose first member is a sonorant), and is pronounced before the derivative ending ig. However, Rischel (1970b p. 129) has proposed that we have long (or geminated) sonorant consonants in such cases (i.e. /mann/), and that d is inserted between long sonorants and the suffix in question by

22) A small handful of examples like Anders, anderledes, andre, vandre, aldrig ['ɑnɔs, 'ɑnɔ, le.ʔðəs, ɑnɔʁ, vɑnɔʁ, 'ɑɪɔʁi] seem to indicate that r-colouring can apply across intervening consonants. But for the following reasons I think it is preferable to give these words an exceptional phonological form in the lexicon and continue to claim that r-colouring can only affect neighbouring segments: Firstly, there are other words, like klandre, which in the same phonologically relevant environment have the expected [a]; second, this supposed effect does never cross morpheme boundaries: words like vante+r etc. all have [a]_s, although r-colouring normally does: ta', tar etc. [t^sɑ.ʔ, t^sɑ.ʔ]; finally, /a/ would be the only vowel which could undergo this strange rule (e.g. the /ɛ/ of kantre, andre etc. does not undergo the slightest r-colouring).

a general rule. Since there are minimal pairs like skynd (imperative), skøn [sgøⁿ?, sgæⁿ?], which should both end in /-nn/ according to Rischel, he is forced to recognize two different underlying short rounded front vowels before nasals (e.g. synd [søⁿ?]/synn/ versus skøn /sgøⁿn/).

However, we shall follow Hjelmslev more closely and propose an alternative, viz. that there is only one underlying short rounded front vowel before nasals, and that the underlying distinction between synd and skøn (apart from the prevocalic consonant(s), of course) resides in the final consonant cluster: /sYnd/ versus /sgYnn/. There is then, according to this hypothesis, a regularity (i.e. a redundancy rule or condition) saying that /Y/ is relatively narrow before a nasal followed by a non-nasal consonant, but otherwise relatively open before a nasal. The following facts all speak in favour of this latter hypothesis:²³

- (i) All words which can be shown to have a "latent" /d/ have stød when occurring as monosyllables.
- (ii) There are no stød-less monosyllables in [-øⁿ] (cf. søn [søⁿ]).
- (iii) Most words having [ø] before n can be shown to have a "latent" /d/: synd, fynd, ynde, kynd(ig), mynd(ig), whereas no words having [æ] before n can be shown to have /d/.

23) These arguments are given in fuller form in Basbøll 1972. - It should be borne in mind that monosyllables whose underlying form ends in a sonorant consonant followed by at least one other consonant have stød. (/r/ does not count as sonorant in the clusters /rp, rt, rk, rf, rs/, which historically have unvoiced /r/).

- (iv) The adjectival derivative endings ig and lig are synonymous. No words with [ø] before n take lig, whereas no words with [œ] before n take ig.²⁴
- (v) No words ending in m can be shown to have a "latent" consonant, say b, and there are no words with short [ø] followed by an m which is not followed by another consonant.
- (vi) There are no words with [œ] followed by [ŋ] (which in turn is derived from /ng/).

These facts are mere accidents (or better: are quite unconnected) according to Rischel's proposal, whereas they are predictable consequences of our proposal (that there is only one underlying short rounded front vowel before nasals, which shows up as a relatively narrow vowel before a nasal followed by a non-nasal consonant, otherwise as a relatively open vowel²⁵), together with independently established suppositions on the stød (on which Rischel agrees).

Table I shows how the different manifestations of the short rounded front vowels can be derived. It should not be taken too seriously, and there is no space here to discuss all the rules mentioned. The language is advanced standard Copenhagen.

-
- 24) I thus consider ig and lig to be instances of the same formative, the choice between them being determined mainly by phonological environment. A counterexample like mandig 'manly' versus mandlig 'masculine' is only apparent: the distinction has been lexicalized. The "irregular" (unexpected) form mand+lig is probably formed in analogy (whatever that means) with kvinde+lig 'feminine' - which is not opposed to anything like mandig - where the lig-ending is quite regular.
- 25) The rule is in fact not restricted to nasals, cf. fylde, fyldig [fyle, 'fyldi] (and similarly skylde, skyldig), whereas no derivatives in [-øldi] can be found. Cf. the fact that there are no stød-less monosyllables in [-yl] (but there are in [-ø1], e.g. ø1).

TABLE I

	dyrke	dørke	grynt	grønt	synder	sønner	rytter	bryst	støvle	vrøvle
(1) UF	Y	ø	Y(nt)	Y(nn+t)	Y(nd)	Y(n)	Y	ø	Y	Y
(2) RR	-	œ	Y	ø	Y	ø	-	-	œ	œ
(3) NL	-	-	ø	œ	ø	œ	-	-	-	-
(4) RC	-	œ	œ	œ	-	-	-	œ	-	œ
(5) PO	Y	œ	œ	œ	ø	œ	Y	œ	œ	œ

Explanation of the abbreviations of Table I:

- (1) UF = Underlying form. /Y/ means a short rounded front vowel unspecified as to degree of opening, or the maximally unmarked short rounded front vowel. The symbol /Y/ is used (instead of simply /Y/) to indicate that there is no lexical contrast in vowel height.
- (2) RR = Redundancy rules, or the like. Including the rule (or condition) discussed in the present section, the rule (or condition) alluded to in footnote 20 that a non-high short vowel before /r/ is low, and the rule (or condition) that a short vowel before /v/ is low.
- (3) NL = Nasal lowering. A rule that lowers some short vowels one degree before nasals (the details of this rule are rather dubious and could not be investigated here).
- (4) RC = r-colouring. See section 3. above.
- (5) PO = Phonetic output.

Note that the ordering of nasal lowering and r-colouring is crucial: the /y/ in grynt must be lowered to \emptyset before r-colouring can apply to give [gʁæn[?]d̥], cf. rytter with [y]. This is the unmarked ordering ("feeding order") of the two rules.

References

- Austin, John S. 1971: Topics in Danish Phonology (unpublished thesis, Cornell University). ✓
- Basbøll, Hans 1969: "The Phoneme System of Advanced Standard Copenhagen", ARIPUC 3/1968, p. 33-54.
- Basbøll, Hans 1971: "A Commentary on Hjelmslev's Outline of the Danish Expression System (I)", Acta Linguistica Hafniensia XIII.2, p. 173-211.
- Basbøll, Hans 1972: "Some Remarks Concerning the Stød in a Generative Grammar of Danish", Proceedings of the KVAL Spring Seminar 1972 (preliminary title only), held in Åbo and Stockholm on April 8th and 9th (forthcoming, to be published by Skriptor, Stockholm). ✓
- Diderichsen, Paul 1957: "Om udtalen i dansk Rigssprog", Danske Studier, p. 41-79.
- Hjelmslev, Louis 1938: "Neue Wege der Experimentalphonetik", Nordisk Tidsskrift for Tale og Stemme 2.10, p. 153-194.

- Hjelmslev, Louis 1951: "Grundtræk af det danske udtryks-system med særligt henblik paa stødet", Selskab for nordisk Filologi. Aarsberetning for 1948-49-50, p. 12-24. [Reprinted in English translation in Louis Hjelmslev, Essais linguistiques II (1972, forthcoming).]
- Rischel, Jørgen 1969: "Notes on the Danish Vowel Pattern", ARIPUC 3/1968, p. 177-205.
- Rischel, Jørgen 1970a: "Consonant Gradation: A Problem in Danish Phonology and Morphology", The Nordic Languages and Modern Linguistics (ed. Hreinn Benediktsson), p. 460-480.
- Rischel, Jørgen 1970b: "Morpheme Stress in Danish", ARIPUC 4/1969, p. 111-144.
- Spang-Hanssen, H. 1949: "On the Simplicity of Descriptions", Recherches structurales = TCLC V, p. 61-70. [Reprinted in Hamp et al. (eds.), Readings in Linguistics II (1966), p. 234-241.]
- Twaddell, W.F. 1938: "A Phonological Analysis of Intervocalic Consonant Clusters in German", Actes du quatrième congr. intern. de linguistes (Copenhagen 1936), p. 218-225.