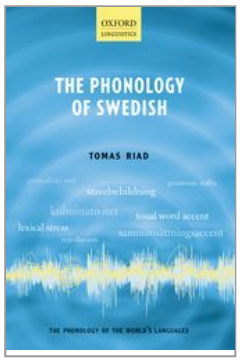

The Phonology of Swedish
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Print publication date: 2013
Print ISBN-13: 9780199543571
Published to Oxford Scholarship Online: January 2014
DOI: 10.1093/acprof:oso/9780199543571.001.0001

Introduction: Swedish and the languages of Sweden

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DOI:10.1093/acprof:oso/9780199543571.003.0001

Abstract and Keywords

This chapter discusses the spread of Swedish in the world and the various languages that are spoken within the borders of Sweden. Swedish is mainly spoken within Sweden, but is also one of the official languages of Finland, and is spoken in a few other places. There are five minority languages in Sweden: Finnish, Meänkieli, Romani, Yiddish and Saami. The Swedish sign language is not officially a minority language, but enjoys special status. There are large groups of speakers of e.g. Arabic, Bosnian/Serbian/Croatian, Kurdish, Greek and Somali. The chapter contains also some notes on the language policy of Sweden, dialect areas and Inter-Scandinavian understanding of spoken and written language. At the end of the chapter a brief overview of the rest of the book is given.

Keywords: language policy, minority language, majority language, immigrant languages

This book describes and analyses the phonology of Swedish, specifically Central Swedish (CSw), which is the regional standard emanating from the varieties spoken around Stockholm, and beyond (eastern Svealand). This variety is also the closest one gets to a national standard, as most frequently heard in broadcasts and found in teaching materials for Swedish as a foreign language. The authoritative grammar of Swedish, *Svenska Akademiens Grammatik* (SAG, Teleman, Hellberg, and Andersson 1999), takes Central Swedish as its point of departure, and major pronunciation dictionaries like *Norstedts svenska uttalslexikon* (NSU, Hedelin 1997) and *Svenska Språknämndens Uttalsordbok* (SSU, Garlén 2003) primarily describe this variety. This is in most respects the same variety as that referred to as Central Standard Swedish by Eliasson (2010: 8).

Swedish belongs to the group of North Germanic languages, within which it is closely related to Norwegian and Danish, and more distantly to Icelandic and Faroese. The Swedish language emerged as a written language in the 13th and 14th centuries, in law texts from various regions of Sweden. The standardization of the written language began in the 16th century, marked by the appearance of the Swedish translation of the New Testament in 1526, in a period when the state was consolidated under Gustav Vasa, and when Lutheranism was introduced as the state religion. The codification of the chancery style was strongly influenced by the Svea dialects, in part as a conscious effort to get away from previous Danish influences. The first complete translation of the Bible (*Gustav Vasas bibel*) was published in 1541, based on the language of the Stockholm district with a fair degree of orthographic standardization. This translation was highly influential in the ensuing standardization. Efforts toward the standardization of the spoken language were made much later, beginning in the late 18th century. The formation of the Swedish Academy in 1786 by Gustav III was one such step, where the primary task was to cultivate the Swedish language, among other things by encouraging authors to write in Swedish. Today there is an official body, the Language Council of Sweden (*Språkrådet*, formerly *Svenska språknämnden*), which works with many issues relating to things such as language planning, language cultivation, and communication between citizens and official institutions.

(p.2) 1.1 Language policy

Central Swedish is relatively homogeneous, both as regards socially conditioned variation in speech and in stylistic differentiation between contexts (<http://www.sprakradet.se/2444>). There is a general consensus that formal texts from governmental and societal bodies should be sufficiently comprehensible for all to understand and use. The stated objective is comprehensibility, and there have been official efforts aimed at simplifying and clarifying the written texts which emanate from official institutions, for example legal documents and information brochures of various kinds. Ultimately, these efforts are justified in the context of safeguarding democracy. These measures are also intended to limit linguistic complexity in areas where communication between experts (in a wide sense) and laypeople is regular.

In December 2005, the Swedish parliament (*Sveriges riksdag*) decided on a new language policy for Sweden, with four comprehensive goals, implemented as law in 2009.

(1) The language policy for Sweden

1 Swedish is the majority language in Sweden;
2 Swedish should be a complete language, in the sense that it should be possible to use in all areas of society;
3 The language of the authorities should be correct, simple, and understandable;
4 Everyone has a right to language: to learn Swedish, to learn foreign languages, and to use one’s mother tongue or minority language.

The origin of this language policy is a programme drawn up by the Language Council in 1998. The first three goals all concern the status of the national majority language, and they should guarantee that texts like safety instructions, operating manuals, product information, machine translation systems, etc. should be available in Swedish. Furthermore, the language used in the educational system should normally be Swedish, and a Swedish discourse should be maintained also in areas where the use of English is growing, such as in higher education, research, and internationally oriented business. The law is intended to meet the potential threat to democratic values, as many Swedes have insufficient knowledge of English (<http://www.sprakradet.se/international>). The fourth goal concerns all languages with a legally protected status, majority as well as minority languages. Regarding Swedish, it involves the responsibility for maintaining necessary resources for the teaching of Swedish as a second language.

(p.3) 1.2 The languages of Sweden

Swedish is spoken natively by about 8.3 million speakers, which puts it at number 88 in size among the languages of the world (<http://www.ethnologue.org>). Most of these speakers live in Sweden, which has a population of 9.6 million inhabitants (Statistics Sweden, SCB, July 2013). Of these, close to eight million have Swedish as their first language.

Five languages are national minority languages and are protected by the language law. In (2) approximate numbers of speakers are given, according to two general sources. To the left are the estimates given in the official investigation made in preparation for the languages law (SOU 1997:192). To the right, the estimates of Parkvall (2013) are given. Official statistics of first language are not kept in Sweden.[1] This means that an important, relatively direct source of information on the language situation in Sweden is unavailable. There are, however, various ways of arriving at estimates, reflected in the resultant figures, of course. Different concerns—historical, linguistic, demographic, political—may be involved in the process of determining which languages should be designated minority languages.

(2) Minority language, approximate number of speakers[2]

	Prep. SOU 1997:192	Parkvall (2013)
Finnish	250,000	175,000
Meänkieli[3]	50,000–60,000	20,000–45,000
Romani	15,000–20,000	*c*. 10,500
Saami	*c*. 9,000	3,500–7,500
Yiddish	3,000–3,500	*c*. 1,700

Defining criteria for the status as minority languages include a judgement that they are languages rather than dialects, and that they have been continuously spoken within Sweden for three generations or more, approximating a century. In addition, there should be a desire from the speakers themselves for their language to be considered a minority language. There are other varieties within Sweden that meet these criteria, but which have not been afforded status as minority languages (e.g. Älvdalska). Thus, there is a certain element of arbitrariness involved.

(p.4) Swedish sign language (SSL) largely fulfils the criteria, and is protected by the law (SFS 2009:600), but is not formally a designated minority language. SSL was legally recognized as the mother tongue for the deaf and hard of hearing in 1981. The total number of sign language users, including hearing people, is estimated to be about 100,000 (Bergman and Dahl 2010: 140). Of these, mother tongue users of SSL are be about 12,000 (Parkvall 2009: 35).

A large number of immigrant languages are also spoken in Sweden. The 20 largest of these are given here in descending order, also with some indication of size, according to the estimates of Parkvall (2013): Finnish (also a minority language, 2.5%), Arabic (1.64%), Bosnian/Serbian/Croatian (1.20%), Spanish (<1%), Norwegian, Danish, Persian, Kurdish, English, Albanian, Modern Aramaic, Vietnamese, Turkish, Cantonese, Hungarian, Somali, Estonian, German, Greek, and Russian. Several of these languages have attained substantial numbers in recent years. The following table gives an idea of the ongoing dynamics among the largest languages of Sweden over the last 32 years. The table is a comparison of estimates of the number of speakers made by Reinans (1983) and Parkvall (2013).[4]

(3) Changes in large (mostly immigrant) languages

Language	1979 (Reinans 1983)	2006 (Parkvall 2009)	2011 (Parkvall 2013)	Growth since 1979
Finnish	210,000	201,000	175,000	–17%
Meänkieli	25,000	30,000	20,000	–20%
Bosnian/Serbian/ Croatian	34,000	113,000	130,000	282%
Greek	19,000	14,300	16,000	–16%
Estonian	16,000	13,000	12,000	–25%
Spanish	14,000	65,000	75,000	436%
Polish	11,000	49,000	76,000	591%
Hungarian	10,000	21,000	24,000	140%
Turkish	9,000	34,000	45,000	400%
Italian	7,000	8,500	10,000	43%
Latvian	3,500	3,300	5,000	43%
				since 2006
Arabic		93,000	153,000	65%
Kurdish		66,000	84,000	27%
German		64,000	72,000	13%
Persian		59,000	74,000	25%
Norwegian		56,000	54,000	–4%

Language	1979 (Reinans 1983)	2006 (Parkvall 2009)	2011 (Parkvall 2013)	Growth since 1979
Danish		54,000	57,000	6%
Albanian		49,000	39,000	–20%
English		44,000	54,000	23%
Modern Aramaic		36,000	52,000	44%
Somali		25,000	53,000	112%

(Parkvall 2013: 24)

(p.5)

1.3 Swedish outside Sweden

The largest group of Swedish speakers outside of Sweden live in Finland, where Swedish is one of two official languages, the other being Finnish. Some five per cent of the population of Finland speak Swedish as their first language (<http://www.infopankki.fi>), which amounts to about 290,000 speakers. The population of Åland, a group of islands in the Baltic between Sweden and Finland, speaks Swedish primarily (97% of 26,000 inhabitants), and Swedish is the single official language there, even though Åland is legally part of Finland. There is a substantial Swedish-speaking population in mainland Finland too, mostly living along the south and west coasts.

There is a small community of Swedish speakers in Gammalsvenskby in southern Ukraine (German *Alt-Schwedendorf*, Russian *Starosjvedskaja*, Ukrainian *Verbovka*), who emigrated by decree from the Russian empress Catherine II, from Hiumaa (Swedish *Dagö*) in Estonia in 1781. According to Lindgreen (2001), about 15 speakers speak Swedish well today and some 150 understand it.

A few speakers of Swedish remain also in Estonia, e.g. in the peninsula of Noarootsi (Swedish *Nuckö*) in Estonia (see Hoppe 2004). Swedish has been spoken in Estonia probably at least since the 13th century. Estonia was under Swedish reign during the period 1580–1710 and Swedish was firmly established there up until the Second World War, in the northwestern part of the country, in **(p.6)** Noarootsi and Vormsi (Sw *Ormsö*), Osmussaar (Sw *Odensholm*), Ruhnu (Sw *Runö*), Pakri Islands (Sw *Rågöarna*), Naissaar (Sw *Nargö*), and part of the mainland. There was also a Swedish-speaking population in the city of Tallinn. Most of the Swedish-speaking population in Estonia fled to Sweden towards the end of the war, and only about a thousand stayed. Since 1980, some attempts at reviving the language have taken place.

Swedish is also spoken as a first language in North America by a now small number of people. These are descendants of immigrants from the emigration waves from Sweden in the mid 19th century to the early 20th century.[5] In 1865, after the American Civil War, the number of immigrants was around 25,000, radically increasing in the following years due to years of crop failure in Sweden. In the census of 1890 there were about 800,000 Swedes. The greatest number of settlers came to Minnesota, but many also came to Illinois, Iowa, and other midwestern states. Speakers today are in their eighties or nineties and they are second-generation immigrants (Tingsell 2011).

There is also a small community of speakers around the city of Oberá in the Misiones district in Argentina (Flodell 1986, 2002). The community was founded by people who originally emigrated to Brazil, in two waves (1890–91 and 1909–11), and who subsequently moved to Argentina. The number of speakers of Swedish is naturally decreasing from a high point of 811 around 1952, to a count of 438 in 1974 (Flodell 1986: 25f.), to around 150 early in this millennium (Flodell 2002: 13).

1.4 Inter-Scandinavian

A lot of people expect to be able to interact with fellow Scandinavians in their own language, and it is also felt to be socially desirable. Switching to the interlocutor's language is risky as it might be perceived as an attempt at imitation, and few people master any of the neighbouring languages well enough for that to be a useful strategy anyway. The situation from the outset of conversation is thus one where production of language is easy. Comprehension, however, may be rather more challenging.

The greatest challenge for Swedes in communicating with their closest neighbours is the understanding of spoken (Sjælland) Danish, a variety close to the perceived prototype for Danish. This variety has undergone a number of reductions and lenitions that make the phonetic surface rather distant from the underlying phonology (Basbøll 2005). The major varieties of Norwegian are all **(p.7)** phonologically much closer to Swedish, and thereby easier to immediately understand.[6] In a recent study of inter-scandinavian communication, Delsing and Lundin Åkesson (2005) found that mutual intelligibility has declined in comparison with earlier investigations from the 1970s. Norwegians remain the best at understanding Swedish and Danish, while it is no longer guaranteed that Swedes and Danes will be able to communicate with each other, each in their own languages. For the older generation, at least, the social pressure is to carry out conversation in your own Scandinavian language, while the sociolinguistic rules in the younger generation may be changing, English becoming an ever more viable choice.

It is much easier for a Swede to understand written Danish and Norwegian. Very much of the lexicon is shared, even though the correspondences between Danish and Norwegian bokmål (one of the two written standards of Norway) are greater than between Swedish and either of these neighbouring languages.

As for Icelandic and Faroese, these languages are not intelligible to Swedes, either spoken or written, even though a reasonably large part of the vocabulary is shared. Icelanders and Faroese speakers generally have a good command of Danish (sometimes inaccurately referred to as 'Scandinavian' because of the comparatively clear pronunciation), which makes interaction with other Scandinavians possible without recourse to English, the language otherwise used when communication in the respective mother tongues fails.

1.5 Dialect areas of Swedish

Swedish in Sweden and Finland can be divided into seven major regions, as listed in (4). Swedish terms that roughly correspond to the English names are shown on the right. The regions largely correspond to regional standards, too.

(4) Major dialect areas in Sweden

North Swedish	Norrländska mål
Central Swedish	Mälardalssvenska, Sveamål, Uppsvenska, Mellansvenska
Dala Swedish	Dalmål, Dalabergslagsmål
West Swedish	Götamål, Västsvenska
South Swedish	Sydsvenska
Gotland Swedish	Gotländska, Gutamål, Gutniska
East Swedish	Finlandssvenska, Östsvenska

(Bruce 2007a; Dahl and Edlund 2010: 9)

(p.8)

The main criteria that warrant this division are prosodic. They involve intonation (whether or not focus is signalled by a separate tonal accent, and what shape the focal tone contour has), and the realization of the lexical word tone as a high (H) or low (L) tone. These things affect the intonational system in very noticeable ways. Also, the proportions of segmental quantity in stressed syllables vary between dialects, yielding three types (Schaeffler 2005: 75, see Fig. 8.1). These prosodic features are quite coherent within each region. The regions are indicated on the map in Fig. 1.1, based on Elert (1994).

In addition, there are a number of segmental features to consider, but while they coincide with some of the regional boundaries, they do not themselves suffice to group the dialects into the major regions that people clearly perceive. South Swedish and East Swedish can however be distinguished on segmental grounds. South Swedish has uvular [ʁ], dental [l], and diphthongization of a number of long vowels, features that separate South Swedish from pretty much

(p.9) all other dialects to the north, where /r/ is apical [r] and /l/ is retroflex [ɽ] in certain positions. East Swedish (i.e. Finland-Swedish) largely lacks the retroflexion rule (see 4.1), yet has apical [r] (or a vocalized retroflex [ɹ]), setting it apart from all other dialects, which either have apical [r] *and* retroflexion, or uvular [ʁ]. The older variety of Gotland Swedish (older Gutnish), spoken on the island of Gotland, could well be considered a separate language. The dialects of Gotland derive from Old Gutnish, a different ancestor language from most other modern Swedish varieties, which derive from Old Swedish (Wessén 1960: 47; Gustavson 1974). Similarly, the dialects of Jämtland in northwestern Sweden, jointly referred to as Jamska are sufficiently different from Swedish to be considered a separate language (Oscarsson 2007). Jamska is closer to the West Nordic dialects than most of the Swedish dialects. By slightly different standards, the northern varieties of Överkalix (*Överkalixmål*) and Piteå (*Pitebondska*), the Finland-Swedish variety of Närpes, and western Älvdalska (or Elfdalian, *Dalska*) could be considered separate languages from Swedish. The most important criterion for such a view would be the intelligibility for speakers of the regional standards of Swedish. Speakers of the varieties that are quite different from any regional standard invariably command also one of the regional standards, and are hence bilingual.

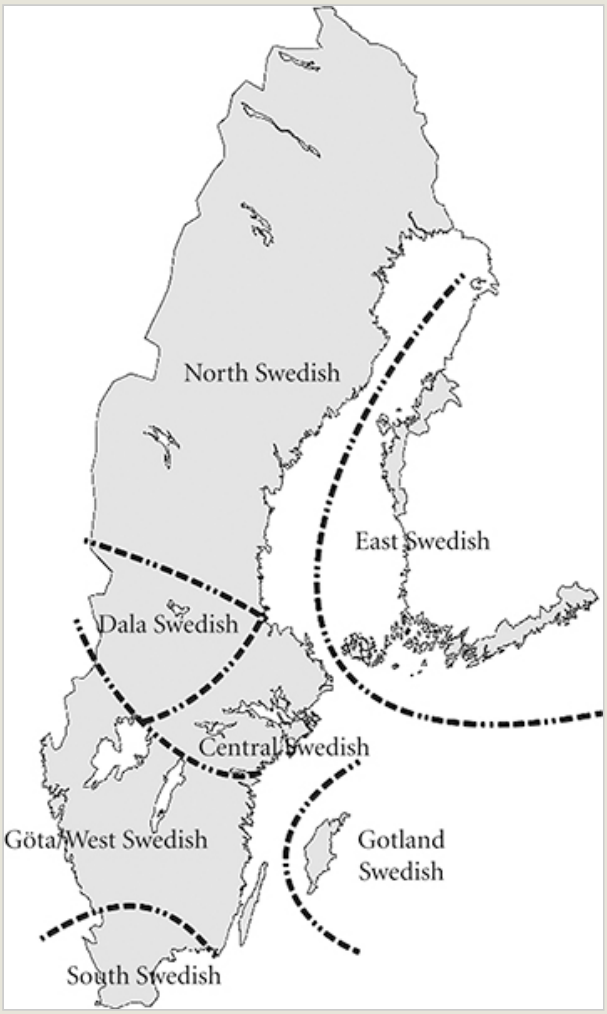


Fig. 1.1. Swedish dialect regions based on tonal prosodic type

Based on Elert (1994), with slight modifications

1.6 Resources

There are a number of linguistic resources for Swedish, as this language is fairly well worked through. Several dictionary projects are led by the Swedish Academy. The biggest of them all is the Swedish Academy Dictionary, SAOB (Sw *Svenska Akademiens Ordbok*), the first volume published in 1898 and the 36th in 2012, up to and including most of the letter U. This dictionary, to be finished within a few years, presents the vocabulary in a historical perspective, with text excerpts from various written sources going back to 1521 as general reference date, the year of publication of the first translation of the New Testament. There is an online version of the dictionary available at the dictionary's website, <http://www.saob.se>. The Swedish Academy also produces a smaller dictionary (*Svensk Ordbok*) and the Swedish Academy wordlist, SAOL (*Svenska Akademiens ordlista*), online at <http://www.svenskaakademien.se/ordlista>. The latter functions as an unofficial standard for spelling and word games. Other major dictionaries include *Nationalencyklopedins ordbok* (NE). There are at least two pronunciation dictionaries, *Norstedts svenska uttalslexikon* and *Svenska språknämndens uttalsordbok*. Several links to dictionaries are found on the website of *Språkrådet*, the Language Council of Sweden <http://www.sprakradet.se/>.

(p.10) Other resources include the corpora and lexical materials at the Swedish language bank (Sw *Språkbanken*) hosted by the University of Gothenburg <http://www.spraakbanken.gu.se/>, which contains a diverse collection of language materials. There are concordances of newspapers, novels, official texts, and blogs. Via this portal a number of links to old and new lexica can be accessed.

There is a major electronic resource for Swedish literature, called the Swedish Literature Bank <http://www.litteraturbanken.se/> where texts, both classics and less well-known work, are published as they are released from the copyright rules. Another site with the ambition of publishing Nordic literature is called Project Runeberg <http://www.runeberg.org/>.

1.7 Swedish phonology

The phonology of Swedish includes many of the features that are found elsewhere in the Germanic-speaking world, such as a fair-sized vowel system and tolerance for triconsonantal clusters. However, there are several peculiarities that are limited to the North Germanic area, or that are otherwise noteworthy. In this section, we briefly mention a few of these in order to provide a preliminary backdrop for the ensuing chapters. Fuller presentation of every point raised below occurs in the dedicated chapters later on.

1.7.1 Quantity

One of the salient features of most North Germanic standard varieties except Danish is the quantity system. Stressed syllables are invariably heavy, due to a prosodic condition (Stress-to-Weight, Prokosch's law, Vennemann 1988). This condition is met in different ways at the segmental level in either the vowel alone, or in a combination of the vowel and the following consonant. In a stressed syllable one segment must be long, either the vowel or the consonant, but not both at the same time. Segmental quantity is therefore said to be complementary. The segmental distinctions are thus controlled by the general prosodic weight requirement on stressed syllables (unlike e.g. Finnish, where the weight of a syllable is a direct function of the collective quantity of the segments in the syllable rhyme).

Vowels as well as consonants thus occur in long and short variants, and it is primarily in terms of quantity that these segmental distinctions are made and described, unlike the case in e.g. English where the tense/lax dimension is usually used, and where a consonantal quantity distinction is never assumed. There are qualitative differences within vowel pairs, but only a few of them have radical qualitative differences between long and short (/ɑ/, /e/, /ʉ/). Each long vowel has a short counterpart (though there is neutralization in the short vowels of /e/ and /ɛ/). The long and short consonants in a pair are naturally much more similar in quality. **(p.11)** Most consonants come in long/short pairs, but there are a few that exhibit a defective quantitative distribution. Two phonemes never occur directly after a stressed vowel, namely /h/ and /ɕ/, and hence lack long variants altogether. The phonemes /j̵/ and /ŋ/, on the other hand, are always long in a postvocalic coda position, provided the syllable is stressed. The phoneme /ŋ/ never occurs word initially but may occur intervocalically (and therefore as onset) in positions away from stress. The contrast between long and short /v/ is very limited due to the very few instances of long [vː].

Syllable weight in stressed syllables is phonetically and phonologically clear. Any stressed syllable is bimoraic, where the contribution of segments is as follows: A long vowel is bimoraic, a short vowel monomoraic. A long consonant is (mono)moraic, and a short consonant is non-moraic. If the vowel is long, then all is fine. If the vowel is short, then the following consonant must carry a mora, hence be long. Most of the other Germanic languages lost consonant quantity early on, Danish in the 14th century, and German shortly before then. This has led to rather different quantitative phonologies. In the chapters on vowels and consonants, we shall talk of long and short allophones or variants. We shall assume (with Eliasson and LaPelle 1973) that quantity is distinctive in consonants, but that some consonants have lexical length, while others become grammatically lengthened or shortened by syllabification (weight by position, stress shift). For the vowels, quantity is predictable from prosodic circumstance, that is, from the fact that a syllable is stressed, and from the (lexical or positional) quantitative information in the following consonant. The quantitative complementarity is the joint result of distinctive length in consonants and the fact that Stress-to-Weight is obligatory. In many speakers the quantitative properties of Swedish shine through in their use of English.

1.7.2 Vowels

The vowel system of Swedish is reasonably rich with nine pairs of long/short vowels (see 2.3). There is, in my analysis, no schwa in Swedish, and while there are varieties, especially in the south, that have the schwa-quality in some unstressed syllables, there is no phonological behaviour comparable to that in Dutch or German, where schwa is often treated as a vowel in its own right, rather than as a reduced variant of a full vowel. In Central Swedish, several vowel qualities are distinguished in unstressed syllables. For instance, the distinction between [a] and [ɛ] in poststress syllables is still maintained, whereas it has largely been lost in some Norwegian and most Danish varieties.[7]

(p.12) The vowel system contains a distinction between what phonetically looks like three front rounded vowels: /ø/, /y/, and /ʉ/. The vowel /ø/ is distinguished by being lower than the other two. The vowel /y/ will be treated as front, while /ʉ/ will be analysed as phonologically central, largely in view of its qualitative variation between long and short allophones (the short stressed allophone is [ʊ], clearly a phonetically central vowel). There is also the distributional fact that /ʉ/ does not co-occur with palatalization (see 4.12.1). Articulatorily, the difference between the long allophones of /y/ and /ʉ/ has been described as a difference in lip rounding, where [ʉ] has the same type of rounding as the back vowel [u], while the vowel [y] exhibits a more pouting stance of the lips (see Fig. 2.4). The crowding in the high, central to front region is historically due to the vowel shift of back vowels, where the old vowel /u/ was fronted in Swedish and Norwegian, rather than diphthongized as in English and German.

1.7.3 Consonants

The consonant inventory contains 18 qualitatively different phonemes, most of which occur in long and short variants, (see 3.5). Among the noteworthy things is the double phonetic contrast regarding voicing and aspiration (Helgason and Ringen 2008a). Beckman, Helgason, McMurray, and Ringen (2011) suggest that the fortis stops /p, t, k/ are in fact phonologically specified as [spread glottis], and the lenis stops /b, d, g/ are specified as [voice]. This over-specification makes some interesting predictions regarding the set of rules that could be expected as natural in the phonological system.

Another striking property of the North Germanic languages is the presence of the two fricatives /ʂ/ and /ɕ/, beside /s/, /j/, and /f, v/. The distinction between /ʂ/ and /ɕ/ occurs in onset position only, a position where the allophony of /ʂ/ is particularly big, the typical realization being [ɧ] or some variant of that. The phonetic distinction between [ɧ] and [ɕ] is one of the last to be mastered by L1 learners. While /ɕ/ has a stable place of articulation, /ʂ/ is subject to contextually conditioned allophony in Central Swedish, as well as to rather wide-ranging sociolinguistic variation, far beyond Central Swedish. The variation occurs primarily in onset position (e.g. [ɧ], [ɧʷ], [x], [ʂ]), while in postvocalic position the realization of /ʂ/ is mostly [ʂ] or [ʂː]. The prevocalic variation includes allophones in the alveolar region, as well as in the velar region, i.e. on either side of the constriction for /ɕ/, with the sometimes added feature of labialization. We shall interpret this variation as being due to a lack of place of articulation for that allophone (in turn probably due to the presence of the stable /ɕ/).

In the postvocalic position, the allophone [ʂ] is stable and we shall take this to be the main allophone, unlike most other accounts (see 3.3.5).

(p.13) In the postvocalic position, however, [ʂ] also neutralizes with one of the outputs of retroflexion, which is another striking feature of many North Germanic varieties, including Central Swedish. The retroflexion rule creates retroflex sounds from the coalescence of laminals /s, t, d, n, l/ with a preceding /r/, hence [ʂ, ʈ, ɖ, ɳ, ɭ]. One condition for this rule to apply is that the /r/ has an apical trill as main allophone, a fact that holds for most Swedish dialects north of Småland, and many East Norwegian and North Norwegian dialects.[8] There are several other constraints relating to quantity and morphology that control the distribution (see 4.1). The output of the rule is [ʂ, ʈ, ɖ, ɳ, ɭ], and these sounds are somewhat striking to the ear in a Germanic context. The phenomenon as such, however, broadly speaking the avoidance of /r/ + laminal sequences, is widely attested in Germanic, common solutions being deletion or (different kinds of) vocalization of /r/, as in varieties of English, German, and Dutch.

1.7.4 Prosody: stress and syllabification

As is common in Germanic languages, the prosodic word is the domain for syllabification in Swedish. The prosodic word is also the domain for stress, and here Swedish parts ways with some of the other Germanic languages in that only one stress is permitted within the prosodic word. To be more precise, both syllabification and stress are located within the minimal prosodic word. Larger word structures, such as compounds and certain prefixed forms, depart from these simple generalizations, and also warrant some structural complexity of the prosodic word.

The first important thing to note here is the defective character of foot structure in Swedish. There really is no evidence for the foot beyond the stressed syllable. As the stressed syllable is invariably bimoraic, a common size assumed for feet in other Germanic languages, all of it will be used up, as it were, within one syllable, under the quantitative system of Swedish, outlined above. These circumstances will lead us to assume that feet occur only where there is stress, i.e. once per minimal prosodic word. To the extent there are other prominences within the minimal prosodic word, they will be considered rhythmic, rather than properly phonological.

Given this view of stress in Swedish, we will have no use for feet as part of the localization of stress. Instead, we take a quite different approach to the stress system, by considering it as largely determined by morphology. The influence of morphology on stress in Germanic is widely acknowledged, but seldom put at the **(p.14)** centre of the actual analysis of the stress system. Here, we will assume that much of the foot-related information is specified in the lexicon, either directly in what we will call tonic morphemes, or as subcategorizations in so-called pretonic and posttonic affixes. There is also a substantial set of prosodically unspecified morphemes, which often trigger an entirely general phonological rule of final stress. The result of this approach is that stress is negotiated as a combination of morphological information and phonological requirements like Culminativity and Exhaustive parsing.

Beyond the more direct analysis of the stress system, there is a set of predictions flowing from this approach regarding the general shape of words in the lexicon. The stress system predicts that certain morphemes should combine harmonically in word formation, while others should create a prosodic conflict. These predictions, which are largely new to the discussion of stress in Germanic, are stated and made clear in chapter 10.

1.7.5 Prosody: tonal word accent

Swedish and Norwegian stand out among the Germanic languages by virtue of their tonal word accents, known as accent 1 and accent 2. One finds differently conditioned tonal distinctions also in Central Franconian varieties, and possibly also in Frisian, but there appears to be no historical connection between these systems. The tonal word accents occur in almost all dialects. The Swedish and Norwegian dialects that lack a tonal distinction at the word level are all bordering on Finnish-speaking areas (Överkalix in the north, most varieties of Swedish in Finland), or have been influenced by German (area around the former Hanseatic city of Bergen in Norway). The tonal distinction can also be lost as a lexical, partly unpredictable contrast by language-internal processes. This is the case where accent 2 becomes generalized in polysyllables, and this phenomenon is found in Uppland and Södermanland, around the city of Stockholm (Nyström 1997; Riad 2000; Bloch 2003; Larsson 2003).

In the structural analysis of tonal accent, we shall take the traditional stance and assume that the distinction is privative, where accent 2 contains an actual lexical tone, and where accent 1 is just intonation, plain and simple. The realization of the tonal accents varies between dialects, within a rather limited frame, but they are remarkably stable in their core distribution in the lexicon, and the dialects also share basic phonological properties like point of association (primary stress) and space requirement (accent 2 only in disyllabic words). We shall mark accent in a neutral way in all forms where they could be contrastive, with a superscripted digit right before the stressed syllable, since that is where the distinction occurs, e.g. *fegis* [^{1}'feːgɪs] ‘coward’, *sommar* [^{2}'sɔmːar] ‘summer’. The distinction does not carry much functional load at all, but is an important **(p.15)** key to understanding other aspects of Swedish phonology, in several domains. The distribution of lexical tone in the lexicon is, like stress, largely determined by properties of morphemes (rather than phonological information like the number of syllables, otherwise a common assumption). In particular, the lexical tonal information occurs in a large set of syllabic suffixes, which are all posttonic, hence that subcategorize for stress. The tonal information thus requires an adjacent stressed syllable in order to be realized. We find, then, a realizational pattern that tells us what is canonical morphological structure and what is relatively marked.

The tonal accents are also important in the study of intonation, since they contribute prominence to the forms that they occur in. There are two levels of tonal prominence (Bruce 2007a calls them ‘accented’ and ‘focused’), and in each level the distinction is realized. This allows us to investigate the two prominence levels quite systematically, and with the help of a categorical distinction at each level.

The tonal accents also provide some insight into the formation of domains at the level of the prosodic word and the prosodic phrase. Lexical accent 2 is assigned only within the minimal prosodic word. Any structure larger than that will get its accent via postlexical, prosodic routines. Thus, there is the equivalent of a compound rule which assigns accent 2 to word structures that contain more than one stress. And in structures containing only one stress, the postlexical accent assigned is accent 1. The formation of these word domains applies in limited ways also in the phrasal structure, and the tonal accents are instrumental in making us see that. Domain formation above the prosodic word is also accessible, but more indirectly, by the suppression of accent assignment (or deaccenting).

1.8 Conventions used in this book

Phonemic and phonetic transcriptions are in general fairly broad, but finer distinctions are discussed in the chapters on vowels and consonants, even if the transcriptions do not always fully reflect it. For some phonemes, e.g. /ʂ/, phonetic variation is common, also within Central Swedish. This means that the use of the main allophones [ʂ] and [ɧ] in transcription will have rather variable interpretation at the individual level. Extra attention is paid to vowel quality, where diacritic marks are used in several instances.

Transcription is mostly made of complete words. Sometimes, however, it is convenient to draw attention to the pronunciation of a single segment, and in these cases only that segment may be put in square brackets and transcribed, e.g. *karakt*[ˈæː]*r* ‘character’, *karakt*[ɛ̯]*rist*[ˈiː]*k* ‘characterization’.

(p.16) Morphological structure is often marked in phonemic transcription, with ‘+’ marking word boundary (e.g. within compounds) and ‘-’ marking derivational or inflectional boundary. Sometimes, the underlying form lacks a vowel that shows up in some surface forms. To keep track of these cases, the symbol ‘•’ is sometimes used. Conversely, in cases where an underlying vowel is syncopated on the surface, we use the symbol ‘■’. These measures might help to clarify things especially where forms are used in the text long before their phonological properties are discussed.

Stress is marked with the IPA signs, superscripted for primary stress and subscripted for secondary stress, in phonetic transcriptions (*bangård* [^{2}ˈbɑːŋ ˌgoːɖ] ‘railway yard’), and sometimes in orthographic forms (*ranso* ^{1}ˈ*nering* ‘rationing’). Stress is not marked in phonemic transcription (for the stress system, see chapter 10). In addition we mark output tonal accent 1 or 2 with a raised digit in forms that are polysyllabic and not stressed on the final syllable, i.e. in forms where the tonal information is not fully predictable (hence *morgon* [^{2}ˈmɔrːgɔn] ‘morning’, *paketet* [pa^{1}ˈkeːt̪t] ‘the package’, but *kanal* [kaˈnɑːl] ‘channel’. In the latter form, there is no syllable after the stressed syllable, and in those circumstances accent 2 never occurs. In monosyllables we will often leave out the stress mark, too, since stress as well as accent 1 are fully predictable there, e.g. *båt* [boːt] ‘boat’. Lexical tone occurs in some roots, and in many suffixes. These cases are marked in phonemic transcriptions with a subscripted digit (‘2’ for lexical tone inducing accent 2) after the suffix or root: *gata* /gɑt-ɑ$_2$/ [^{2}ˈgɑːta] ‘street’, *sommar* /somᵘɑr$_2$/ [^{2}ˈsɔmːar] ‘summer’. Note that the presence of a lexical tone does not always result in output accent 2. The cases of inhibited accent 2 are discussed in 11.5. Morphological structure is also regularly marked in phonemic forms, only where needed in orthographic forms, and never in phonetic forms.

Segmental quantity in lexical representations only occurs with consonants. In phonemic transcription, this is marked with a raised mora directly after the segment carrying the length, and with a colon in phonetic transcription: *kyssa* /ɕysᵘ-ɑ$_2$/ [^{2}ˈɕʏsːa] ‘to kiss’.

We will use the traditional terms ‘tonic’, ‘pretonic’, and ‘posttonic’ in reference to the position of a morpheme in relation to stress. We avoid the terms ‘prestress’ and ‘poststress’ in order not to create confusion in chapter 10 where morphemes are classified in these terms. The reader should be aware of the use of ‘tonic’ as referring to *stress*, not to tone.

Lexically represented stress (i.e. in tonic morphemes) is not marked in phonemic representations outside of the discussions concerned with precisely this issue (primarily in chapter 10).

Translations are given for nearly all examples in Swedish. When the spelling and meaning in English overlaps reasonably well with Swedish, translation is indicated by ‘id.’ for ‘identical’.

Notes:

([1]) Nor are statistics relating to ethnicity.

([2]) Presentations and discussions of Sweden's minority languages are found in e.g. Hyltenstam (1999) and Parkvall (2013). Estimates of number of speakers vary quite a lot, partly as a function of counting procedures. I have chosen to present the figures from Parkvall (2013) in a separate column. His estimates are the only ones that are based on an explicit argumentation, which makes the figures noteworthy. Official sources tend to be more sweeping on this point. Parkvall's figures are estimates of L1 speakers, which is not always the basis for other counts.

([3]) Meänkieli is a Fenno-Ugric language, closely related to Finnish.

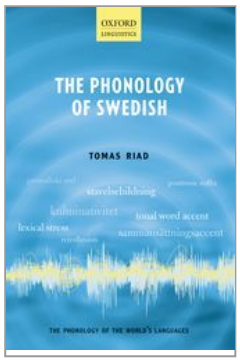
([4]) Where there are wide estimates, the mean figure is indicated.

([5]) There was an earlier colony in Delaware, New Sweden (Swedish *Nya Sverige*) settled in 1638, which constituted some 700 speakers. It was conquered by the Netherlands in 1655, and Swedish ceased to be spoken there in the mid 18th century.

([6]) From the Swedish perspective, the East Norwegian variety (Kristoffersen 2000) is considered as prototypical of Norwegian. The largest of the two written standards of Norwegian, bokmål (lit. 'book language'), is based on this variety.

([7]) On the whole, Danish stands out as separate from the other North Germanic varieties, because of the lack of consonant quantity and the presence of schwa.

([8]) The retroflexion rule emanates from the phoneme /r/, which we will take to be phonemically [retroflex], where the retroflex property is taken as derived from the trill, where the apex bends backwards. We will transcribe the segment as [r] throughout, as the trill is in the alveolar region, and not particularly retroflex-sounding.



The Phonology of Swedish
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Print publication date: 2013
Print ISBN-13: 9780199543571
Published to Oxford Scholarship Online: January 2014
DOI: 10.1093/acprof:oso/9780199543571.001.0001

Vowels

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DOI:10.1093/acprof:oso/9780199543571.003.0002

Abstract and Keywords

The vowel chapter goes over all vocalic phonemes and allophones and ends in a phonemic chart. Vowel quantity is taken to be predictable in Swedish, hence the long and short variants of each vowel can be considered allophones of the same phoneme. There are nine distinct vowel phonemes, all occurring with long and short variants. For two phonemes, /e/ and /ɛ/, neutralize in the short variant, as [ɛ]. The alternations between long and short alternant, as well as the rule-governed vowel alternations provide important cues to the phonemic system defended at the end of the chapter. For instance, the lowering of /ø/ and /ɛ/ before a retroflex (including /r/) motivate the height separation between /ɑ/, which is [low] and /ø/ and /ɛ/ which are [mid].

Keywords: vowels, allophonic length, alternation, lowering, vowel chart

2.1 Vowel phonemes and contrasts

The vowel system of Central Swedish is made up of nine vowel phonemes. Each vowel occurs in a long and a short allophone. We use the IPA symbol for the long allophone as symbol for the phoneme throughout. In addition there is further qualitative allophony for some phonemes conditioned by syllable structure or segmental context. The long and short allophones are given with their main qualities in (5), while further, qualitative allophony is discussed later. The orthographic symbol that most consistently represents the vowel is also given.

(5) Central Swedish vowels

Phoneme	Long vowel	Short vowel	Orthography
/i/	[iː]	[ɪ]	‹i›
/y/	[yː]	[ʏ]	‹y›
/e/	[eː]	[ɛ̝]	‹e›
/ɛ/	[ɛː]	[ɛ̝]	‹ä›
/ø/	[øː]	[ø]	‹ö›
/ʉ/	[ʉ̞ː]	[ɵ]	‹u›
/u/	[uː]	[ʊ]	‹o›
/o/	[oː]	[ɔ]	‹å›
/ɑ/	[ɑː]	[a]	‹a›

The length variation of vowels in stressed syllables is derivable from the stress and quantity system. We will therefore assume that the quantity of vowels as monomoraic or bimoraic is a predictable property, hence allophonic, whereas distinctive quantity resides with consonants. This is the analytical position taken here. The reverse, distinctive vowel quantity has also been proposed in the literature (for discussion, see 8.4). The quantitative variation is accompanied by qualitative differences, and there has been some discussion regarding which cues are the most significant in the perception of the distinction. In a perception study of the vowel pairs [iː]/[ɪ], [oː]/[ɔ], and [ɑː]/[a], Behne, Czigler, and Sullivan (1997, 1998) found that duration was the main cue in all three cases, though for the low vowel /ɑ/ the qualitative difference also makes a significant contribution to correct identification. Another vowel pair where the qualitative difference is **(p.18)** striking is [ʉ̞ː]/[ɵ]. The qualitative difference will obviously support the perception of quantity, which we analyse as basic throughout.[1]

As the vowel pairings in (5) show, there is neutralization of the two main short allophones of /e/ and /ɛ/, as [ɛ̝]. This results in eight short vowel allophones to match the nine long vowel allophones. Historically, this neutralization is a development in Central Swedish, and many dialects have nine long vowels and nine short vowels (Elert 1970, 2000; Leinonen 2010).[2] Morphophonologically caused length alternations and the patterning in unstressed syllables preclude a merger of these phonemes, see 2.2.4. A similar situation of neutralization actually holds for short /ø/ and short /ʉ/ in some varieties of Central Swedish, where some speakers have neutralization as [ɵ], see 4.3.

To establish the phonemic status of the vowels consider the contrasts in (6) and (7).

(6) Contrasting forms: long vowels

bit [biːt] ‘piece’; *byt* [byːt] ‘change’ (imp.); *bet* [beːt] ‘bit’ (past); *mät* [mɛːt] ‘measure’ (imp.); *böta* [^{2}ˈbøːta] ‘to pay a fine’; *muta* [^{2}ˈmʉ̟ːta] ‘to bribe’; *bot* [buːt] ‘cure’; *båt* [boːt] ‘boat’; *mat* [mɑːt] ‘food’.

(7) Contrasting forms: short vowels

vinn [vɪnː] ‘win’ (imp.); *fynd* [fʏnːd] ‘find’; *sett* [sɛ̟tː] ‘seen’ (p.ptcp.); *sätta* [sɛ̟tːa] ‘to set’; *lönn* [lønː] ‘maple tree’; *lund* [lʊnːd] ‘grove’; *bonde* [^{2}ˈbʊnːdɛ̠] ‘farmer’; *fond* [fɔnːd] ‘fund’; *vann* [vanː] ‘won’ (pret.).

These contrasts establish a number of qualitative phonemic distinctions, nine expressed in the long vowels and eight in the short vowels. We turn now to an overview of the phonemes and their main allophones.

2.2 Phonemes and allophones

The vowels exhibit allophony relating to stress and length. In addition there is contextually conditioned allophony, some cases of which are discussed here, otherwise in chapter 5. The phonetic characterizations of sounds primarily build on Elert (1997, 2000) and Kuronen (2000), with some modifications. In (8) we

(p.19)

include the allophony for two vowels in the mid to low front region, as marked with boxes. This allophony concerns the position before /r/ (or any other retroflex segment) vs. elsewhere.

(8) Long stressed vowels

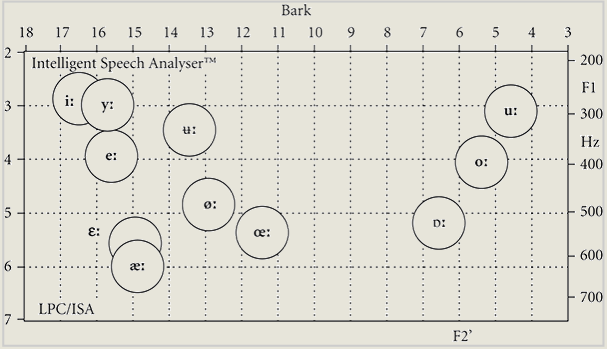


Fig. 2.1. Swedish long vowels in stressed syllables. Averages based on four speakers. The symbol /ɒ/ in the chart is rendered as /ɑ/ in this book.

From Kuronen (2000: 72)

	front	rounded	central	back
high	[iː]	[yː]		[uː]
mid-high	[eː]	[ʉ̟ː]		[oː]
mid	[ɛː]	[øː]		
low	[æː]	[œː]		[ɑː]

Phonetically these vowels are represented as in Fig. 2.1. The long vowels are all phonetically either front or back. In the phonemic analysis, which is joint for long and short vowels, they will come out as in (10).

The short vowels have a less peripheral phonetic spread. They are schematized in (9).

(9) Short stressed vowels

	front	rounded	central	back
high	[ɪ]	[ʏ]	[ɵ]	[ʊ]
mid	[ɛ̞]	[ø]	[œ]	[ɔ]
low	[æ]		[a]	

(p.20)

The short vowels make a slightly more compact system. Notice that the pairwise allophonies also seen for the long vowels are present here as well, but that one of the alternations appears to be more in the front to central dimension rather than mid to low. We shall take a closer look at these alternations in 4.2.

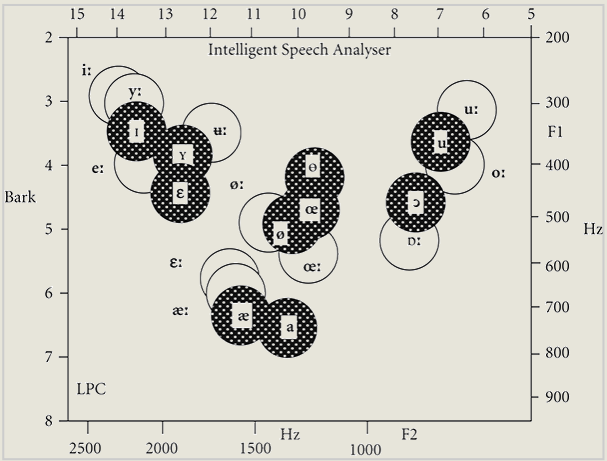


Fig. 2.2. Swedish long and short vowel allophones Average values for four male speakers of Central Standard Swedish (Nyköping), age 17–18. The panel is a psychoacoustic rendering matching Bark values and F1/F2 values visually, where 1 Bark for F1 corresponds to 1,35 Bark for F2 (Kuronen 2000: 28f.). White circles represent long vowel allophones, dark circles represent short vowel allophones.

From Kuronen (2000: 119)

A phonetic overview of the main allophones of the nine phonemes, with some of the allophones, is given in Fig. 2.2, taken from Kuronen (2000: 119). Note that while there are 18 vowel phonemes, this chart includes 21 vowel circles, a fact that is due to the inclusion of qualitative allophones of /ɛ/ and /ø/. The alternation is [ɛ]~[æ] and [ø]~[œ], each in a long and short variant, and due to a following retroflex segment (see vowel lowering, 4.2). Note also that the short allophones of /e/ and /ɛ/ neutralize as [ɛ], hence the uneven number of allophones. Kuronen transcribes /ɑ/ as the rounded [ɒ], while we use [ɑ] throughout.

There are several reasons to keep the vowel phonemes together pairwise (allophony, morpho phonological alternations). The system is given in (10).

(p.21) (10) Vowel phonemes

	front		central	back	
high	/i/	/y/	/ʉ/	/u/	rounded
mid-high	/e/			/o/	
mid	/ɛ/	/ø/			
low			/ɑ/		

In what follows we shall go through the vowels one by one and discuss their allophonies and articulatory properties. Each vowel is given a featural characterization. When there are major allophonies, characterizations are given for each allophone. At the end of the chapter we discuss the vowel system, and what arguments can be brought to bear on it.

2.2.1 */i/ [iː] ~ [ɪ] ‹i›*

Featural characterization of /i/: high, front, unrounded

The long allophone [iː] often has an offglide in Stockholm speech, hence [iːʲ]: *lina* /lin-ɑ$_2$/ [^{2}'liːna], [^{2}'liːʲna] ‘rope’. In hiatus and word-finally this is particularly audible: *bio* /biu/ [^{1}'biːʲʊ] ‘cinema’, *bi* /bi/ [biːʲ] ‘bee’. On top of this, some frication of the glide may occur.

In younger people’s speech the [iː] and [yː] may be damped, creating a buzz, transcribed [iːᶻ], [yːᶻ]: *fin* /fin/ [fiːᶻn] ‘fine; nice’, *fyra* /fyr-ɑ$_2$/ [^{2}'fyːᶻra] ‘four’. This pronunciation is known in the Central Swedish area as “Lidingö-*i*”, referring to one of the prestige suburbs to the east of Stockholm City. The pronunciation is spreading in Stockholm and is now in the process of losing its social charge.[3]

The long [iː] may also be diphthongized according to the prosodically conditioned vowel centralization process of the eastern Svealand region (Bleckert 1987; Kuronen 2000), e.g. *parti* /pɑrti/ [paˈʈiː(j)ᵊ] ‘party’, see 2.4.

The CSw short allophone [ɪ] as in *kvitter* /kvitᵘ•r/ [ˈkvɪtːɛ̟r] ‘chirp’ is slightly higher than the corresponding vowel in English. In unstressed position, the [ɪ] quality is retained: *militär* /milit-ɛr/ [mɪlɪˈtæːr] ‘military’, *maskinist* /mɑʂin-ist/ [mɑɧɪˈnɪsːt] ‘engine-man’, *alibi* /ɑlibi/ [ˈɑːlɪbɪ] ‘alibi’.

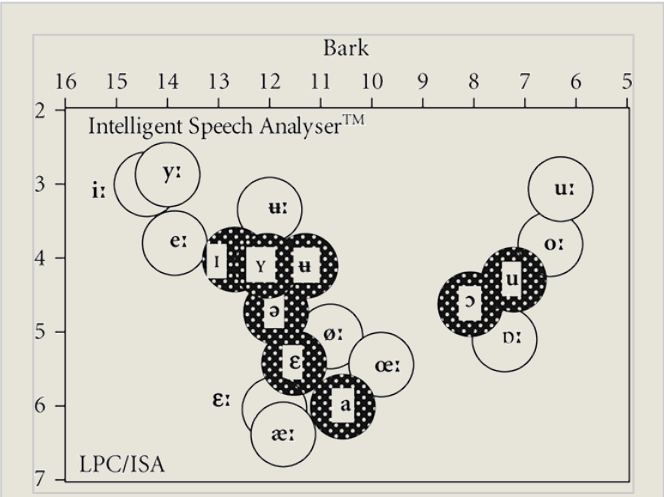
2.2.2 */e/ [eː] ~ [ɛ̟] [ę] [ɛ̝] ‹e›*

Featural characterization of /e/: mid-high, front, unrounded. The short allophone [ɛ̟] is mid, front, unrounded.

(p.22) In Central Swedish, as in several other varieties of Swedish, the short allophone of /e/ neutralizes with the short allophone of /ɛ/, in stressed syllables, as [ɛ̟]. The phonemic distinction can be diagnosed in morphophonological alternations involving vowel length variation, e.g. *ser* /se-r/ [seːr] ‘sees’, *sett* /se-t/ [sɛ̟tː] ‘seen’ vs. *väter* /vɛt-•r/ [ˈvɛːtɛ̟r] ‘wets’, *vätte* /vɛt-de$_2$/ [ˈvɛ̟tːɛ̟] ‘wetted’. Many dialects retain a distinction also between the short allophones (Elert 2000: 46; Leinonen 2010).

In unstressed position, the vowel /e/ is variably rendered in pronunciation dictionaries. In part the variation is positional, in part idiolectal. Central Swedish is based on dialects in the Svealand region, which is north of both the South and Göta areas of Sweden. Schwa is regular only in southern varieties.[4] Nevertheless, the IPA symbol [ə] is still often used also for Central Swedish /e/, in unstressed syllables following primary stress (e.g. *vante* /vɑnt-e$_2$/ [ˈvanːtə] ‘mitten’; NSU, SSU). Here, we shall however use [ɛ̟] for unstressed /e/ in this position. The slight difference with respect to the short vowel in stressed syllables ([ɛ̟]) is marked with the retracting diacritic, hence [ˈvanːtɛ̟].

Kuronen (2000: 184ff.) notes a systematic difference for the pronunciation of posttonic /e/ between the position before /r/ (*sovɛ̟r* ‘sleeps’) and elsewhere (*tummɛ̟* ‘thumb’, *makɛ̟n* ‘the husband’). The difference as instantiated by one speaker can be seen in Fig. 2.3.



(p.23) Unstressed vowels in prestress syllables tend to be less reduced than those in poststress syllables, and are not always stable in quality: *pedikyr* /ped-ik-yr/ [pɛ̝dɪˈkyːr] or [pe̝dɪˈkyːr] ‘pedicure’ and *paketera* /pɑket-er-ɑ$_2$/ [pakɛ̝[1]ˈteːra] or [pake̝[1]ˈteːra] ‘to packet’. Neither of the two pronunciation dictionaries consulted uses schwa in this position, but the vowel is variably rendered as [ɛ̝], [e̝], [ɛ], and even [e·]. The distribution is likely more organized in dialects which lack the neutralization between short /e/ and /ɛ/.[5]

Fig. 2.3. Unstressed vowels in posttonic position (dark circles), compared to stressed long vowels (white circles) Averages for one speaker. Sample words with the symbols used are *fjär*[ɪ]*l* ‘butterfly’, *band*[ʏ] ‘bandy’, *fur*[ʉ̞] ‘pine wood’, *sov*[ə]*r* ‘sleeps’, *tumm*[ɛ]/*mak*[ɛ]*n* ‘thumb’/‘the husband’, *hak*[a] ‘chin’, *sol*[u] ‘solo’, *pär*[ɔ]*n* ‘pear’.

From Kuronen (2000: 184)

2.2.3 */ɛ/ [ɛː] ~ [ɛ̝] [æː] ~ [æ] ‹ä›*

Featural characterization of /ɛ/: mid, front, unrounded. The allophone [æ(ː)] (low, front, unrounded) occurs in the position before a retroflex.

The main allophone of the phoneme /ɛ/ is [ɛ̝]. In CSw, the short allophone neutralizes with the short allophone of /e/. This is seen in morphophonological alternations like *heta* /het-ɑ$_2$/ [^{2}ˈheːta] ‘to be called’, *hette* /het-de$_2$/ [^{2}ˈhɛ̝tːɛ̝] (past), *leda* /led-ɑ$_2$/ [^{2}ˈleːda] ‘to lead’, *ledde* /led-de$_2$/ [^{2}ˈlɛ̝dːɛ̝] (past), where the past tense forms rhyme perfectly with *mätte* /mɛt-de$_2$/ [^{2}ˈmɛ̝tːɛ̝] (< *mäta* /mɛt-ɑ$_2$/ [^{2}ˈmɛːta] ‘to measure’) and *klädde* /klɛd-de$_2$/ [^{2}ˈklɛ̝dːɛ̝] (< *klä* /klɛ(d-ɑ$_2$)/ [ˈklɛː] ‘to dress’).

In the position before a retroflex segment both long and short /ɛ/ lower to [æ], in stressed as well as unstressed syllables. Retroflex segments include /r/ and the output of the retroflexion rule, where /r/ has coalesced with a laminal coronal (see 4.1). Here are some examples of the contrast: *läsa* /lɛs-ɑ$_2$/ [^{2}ˈlɛːsa] ‘to read’ vs. *lära* /lɛr-ɑ$_2$/ [^{2}ˈlæːra] ‘to learn’, *lätt* /lɛtʰ/ [lɛ̝tː] ‘easy’ vs. *lärka* /lɛrk-ɑ$_2$/ [^{2}ˈlærːka] ‘lark’, *länd* /lɛnd/ [lɛ̝nːd] ‘loin’ vs. *smärt* /smɛrt/ [smæʈː] ‘slender’, and in unstressed position (mostly names) *Fälldin* [fɛ̝lˈdiːn] vs. *Härdin* [hæˈɖiːn].[6] Vowel lowering of /ɛ/, which also targets /ø/, is discussed in the next section and in 4.2.

Normally, the spelling of this sound is ‹ä› as in *läka* ‘to heal’, *tvätt* ‘laundry’, *välta* ‘to turn over’, *värk* ‘ache’, and *nära* ‘near’.

2.2.4 Notes on */e/* and */ɛ/* in stressed and unstressed syllables

In this section we take a brief look at where the phonemes /e/ and /ɛ/ are distinct. Short /e/ neutralizes with short /ɛ/ as [ɛ̨] in stressed syllables, and this phonetic fact indicates that the neutralization goes in the direction of /ɛ/. The issue arises whether [ɛ̨] from /e/ ever takes part in the (further) vowel lowering to [æ].

(p.24) Whenever the short stressed allophone of /ɛ/ occurs before a retroflex, lowering to [æ] takes place. Both the graphemes ‹e› and ‹ä› occur before (tautosyllabic) retroflexes, where they represent short and stressed vowels, and lowering is in evidence in both cases: *värk* /vɛrk/ [vær:k] ‘ache’ and *verk* /vɛrk/ [vær:k] ‘work’, hence both are phonemically /ɛ/. The short stressed allophone undergoing vowel lowering is always tautosyllabic with the retroflex, hence always in a closed syllable. This fact also indicates that the neutralization of short /e/ and /ɛ/ goes in the direction of /ɛ/.

There does not seem to be a reliable morphophonological alternation with short /e/ where one alternant is followed by /r/ and the other not. Linell (1973: 26f.) mentions one case where unstressed [e̞] alternates with stressed [æ]: *offerera* [ɔfe̞'re:ra] ‘to offer’, *offert* [ɔ'fæʈ:] ‘offer, n.’, which would seem to introduce the possibility of having /e/ undergo vowel lowering just like /ɛ/, but the empirical foundation for a synchronic phonological process is weak, especially in view of the many non-phonological vowel alternations that occur in learned borrowings (e.g. *disträ* [dɪs'trɛ:] ‘absent-minded’, *distraktion* [dɪstrak'ʂu:n] ‘distraction’). We take this to mean that the underlying phoneme should be /ɛ/ in all stressed cases where vowel lowering is in evidence, despite spellings like *verk* ‘work’, *introvert* ‘id.’, *herr* ‘Mr’. If *offerera* is to be phonologically related to *offert*, we must allow for the unstressed allophone [e̞] beside [ɛ̨] in unstressed prestress position for the phoneme /ɛ/, for some speakers.

In unstressed syllables, the influence of a post vocalic /r/ is partly affected by the status of a syllable as open or closed. In prestress position there appears to be a marginal phonemic distinction between short /e/ and /ɛ/. This shows up in the position before /r/ when this /r/ is not tautosyllabic (unstressed syllables are always light).

(11) Lexical variation between /e/ and /ɛ/ in unstressed syllable before /r/

	[e̞]	[ɛ̞]	[æ]	
perestrojka	[pe̞re̞s'trojka]	[pɛ̞re̞s'trojka]		‘perestroika’
perifer	[pe̞rɪ'fe:r]	[pɛ̞rɪ'fe:r]	[pærɪ'fe:r]	‘peripheral’
periodisk	[pe̞r'i̯u:dɪsk]	[pɛ̞r'i̯u:dɪsk]	[pær'i̯u:dɪsk]	‘periodic’
peruk		[pɛ̞'rʉ̞:k]	[pæ'rʉ̞:k]	‘wig’
perfekt			[pær'fɛ̞k:t]	‘perfect’
pergament			[pærga'mɛ̞n:t]	‘parchment’
Suggested phoneme:	/e/	/e/	/ɛ/	

In closed, prestress syllables, lowering appears mandatory (*per.fekt, per.ga.ment*, for some speakers, possibly *per.io.disk* [pær.ˈi̯uː.dɪsk]), whereas in open syllables there is lexical variation. Speakers might here have set up different underlying forms. In the very few cases (maybe only one) where there is alternation **(p.25)** with /ɛ/ in stressed closed vs. unstressed open syllable, lowering is not mandatory in the open condition: *karaktär* [karakˈtæːr] ‘character’ vs. *karakt*[ɛ̝/æ]ˈ*ristisk* ‘characteristic’, *karakt*[ɛ̝/æ]*r*iˈ*sera* ‘to characterize’, *karakt*[ɛ̝/æ]*ris*ˈ*tik* ‘characterization’. These forms can all be spelled with either ‹ä› or ‹e› when the vowel is unstressed (e.g. ‹karaktäristisk› or ‹karakteristisk›). Similar sequences with postvocalic consonants other than /r/ are given in (12), where examples with sequences of at least two *e*-sounds are included. Pronunciations are taken from NSU and adapted such that schwa is replaced with [ɛ̝]. Also, indications of prestress length have been removed (see 10.2).

(12) Sequences of [e] and [ɛ] in unstressed, prestress syllables

renegat	[rɛ̝neˈgɑːt]	‘renegade’	[e̝]–[ɛ̝]
renässans	[rɛ̝nɛ̝ˈsanːs]	‘renaissance’	[e̝]–[ɛ̝]
recensent	[rɛ̝sɛ̝nˈsɛ̝nːt]	‘reviewer’	
segmentering	[sɛ̝gmɛ̝nˈteːrɪŋ]	‘segmentation’	
senegales	[sɛ̝nɛ̝gaˈleːs]	‘Senegalese’	[e̝]–[ɛ̝]
elefant	[e̝lɛ̝ˈfanːt]	‘elephant’	
rederi	[rɛ̝dɛ̝ˈriː]	‘shipping company’	
reglemente	[rɛ̝glɛ̝ˈmɛ̝nːtɛ̝]	‘regulations’	
reglementera	[rɛ̝glɛ̝mɛ̝nˈteːra]	‘to regulate’	
sekretess	[sɛ̝krɛ̝ˈtɛ̝sː]	‘secrecy’	
generös	[ʃ̝ɛ̝nɛ̝ˈrøːs]	‘generous’	
peneplan	[pɛ̝nɛ̝ˈplɑːn]	‘peneplain’	[ɛ̝]–[ɛ̝]

The pronunciations may certainly vary somewhat, but one pattern emerges regarding the preferred order of unstressed vowel qualities: the higher or fronter vowel quality precedes the lower or backer. Thus, unstressed [ɛ̝] never seems to precede unstressed [e̝], unless followed by /r/, see (11).

Only a few cases spelled with ‹ä› and ‹ae› can be found, and are shown in (13).

(13) Possible unstressed /ɛ/

ämabel	[ɛ̟ˈmɑːbɛ̟l]	‘kind; amiable’
ägrett	[ɛ̟ˈgrɛ̟tː]	‘egret, aigrette’
laestadian	[lɛ̟stadrˈɑːn], [lɛ̟stɑ·drˈɑːn]	‘follower of Laestadius’
aerob	[æˈroːb], [aɐ̟ˈroːb]	‘aerobe’
aeronomi	[ærɔnɔˈmiː]	‘aeronomy’

The latter two forms have alternants with stressed initial syllable in compounds like *aerodynamik* [ˈæːrʊdʏnaˌmiːk] ‘aerodynamics’. For these forms there should be an underlying /ɛ/, which undergoes vowel lowering before /r/. For the other forms there is no particular reason to assume that the underlying phoneme is /ɛ/, rather than /e/ (beyond spelling).

(p.26) In unstressed, poststress syllables the sequence [-ɛ̟r] is very common (present tense, many plurals). There is reason to assume that the vowel here is /e/, in view of the fact that many cases contain the epenthetic vowel, which is /e/ in CSw (see 2.3). In these instances, no lowering to [æ] takes place: *springer* /sprɪŋᵘ-•r/ [[1]ˈsprɪŋːɛ̟r] ‘runs’, *joner* /jun-•r/ [[1]ˈjuːnɛ̟r] ‘ions’. This indicates that there is no vowel lowering of the short (or long) allophone of the phoneme /e/, before a retroflex consonant (i.e. /r/ or the output of the retroflexion rule, 4.1).[7]

2.2.5 */y/ [yː] ~ [ʏ] ‹y›*

Featural characterization of /y/: high, front, rounded

This vowel is high, front, and rounded, and the long and short allophones are qualitatively quite similar, though a significant height difference is noticeable compared with the vowel /i/ (see Fig. 2.2). The long allophone often ends in a rounded approximant or a fricated glide, most clearly in hiatus (*lya* /ly-ɑ$_2$/ [[2]ˈlyːᵘ̯a], [[2]ˈlyːʲ̟a] ‘lair, den’) and word-finally (*by* /by/ [byːᵘ̯], [byːʲ̟] ‘village’), but it is also noticeable with some speakers before a consonant: *byk* /byk/ [byːᵘ̯k] ‘laundry’. The gliding is likely related to the corresponding damping of long [iː], i.e. “Lidingö-*i*”, see 2.2.1.

The short allophone of /y/ is slightly lower [ʏ]: *cykel* /syk•l/ [[1]ˈsʏkːɛ̟l] ‘bicycle’, *bahytt* /bɑhytᵘ/ [baˈhʏtː] ‘bonnet’.

In unstressed positions the vowel quality is allegedly close to [ʏ]: *jury* /jʉry/ [[1]ˈjʊrːʏ] ‘id.’, *bandy* /bɑndy/ [[1]ˈbanːdʏ] ‘id.’, and orthography probably supports it, but the rounding is not always maintained in poststress position, leading to neutralization with /i/ as [ɪ].

2.2.6 */ø/ [øː] ~ [ø̟] [œ] [œː] ~ [œ] [ɶ] ‹ö›*

Featural characterization of /ø/: mid, front, rounded. The allophone [œː] occurs before a retroflex: low, front, rounded [œː]

The main allophone of /ø/ is [ø]. The long allophone is the best fit for this IPA symbol: *möte* /møt-e$_2$/ [^{2}'møːtɛ̟] ‘meeting’, *lösning* /løs-niŋ$_2$/ [^{2}'løːsnɪŋ] ‘solution’. The short allophone is somewhat lower and represented by IPA symbols [ø̞] or [œ] in pronunciation dictionaries: *höst* /høst/ [hø̞s:t] or [hœs:t] ‘autumn’, *mjölka* /mj̩øl̩k-ɑ$_2$/ [^{2}'mj̩øl̩ːka] or [^{2}'mj̩œl̩ːka] ‘to milk’. Here we use the symbol [ø] for the higher long allophone, and [ø̞] for the higher short allophone, and [œ] for the lower allophones (long and short) that occur regularly before a retroflex (see 4.2), and more generally for some (younger) speakers. For the lower allophones, caused by vowel lowering before a retroflex, the IPA symbol [œ] is sometimes **(p. 27)** used, an indication of how low this front rounded vowel can become: *börja* /børj-ɑ$_2$/ [^{2}'bœrːja] or [^{2}'bœrːja] ‘to begin’, *fördel* /før-del/ [^{2}'fœːˌɖeːl] or [^{2}'fœːˌɖeːl] ‘advantage’, *dörr* /dørᵘ/ [dœrː] or [dœrː] ‘door’.

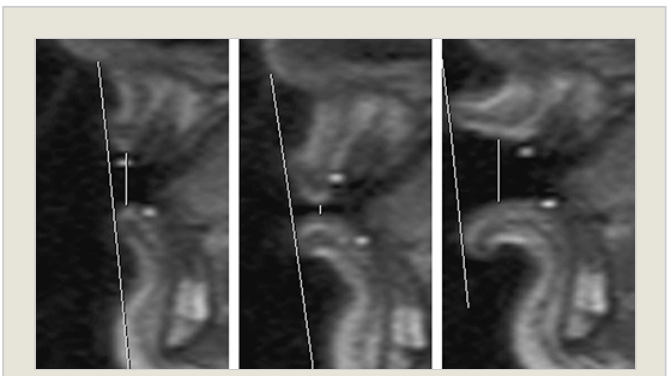
Within the CSw speaking region there is a tendency among younger speakers to generalize the lower allophones to all contexts, equally for [æː], too (see 4.2.2).

Moreover, there is a tendency for short [œ], and to some extent also short [ø], to neutralize with one of the short allophones of /ʉ/, namely [ɵ] (Wenner 2010). This neutralization—vowel centralization—constitutes important evidence for the structure of the vowel system (see 2.3). This rule is discussed in 4.3.

2.2.7 */ʉ/ [ʉ̟ː] ~ [ʉ̟] [ɵ] ‹u›*

Featural characterization of /ʉ/: high, central, rounded. The short allophone [ɵ] is mid, central, rounded.

Of the four high vowels in CSw, one is unrounded, /i/, and three are rounded, /y/, /ʉ/, and /u/. The vowel /ʉ/ (sometimes referred to as ‘Swedish *u*’) is acoustically closer to /y/ than to /u/. On such grounds one might want to classify it as a front vowel, not only phonetically but also phonemically. On the other hand, /ʉ/ shares properties with /u/ such as the type of lip rounding (sometimes referred to as ‘in-rounding’ or ‘narrow labialization’, Noreen 1903–1907; Gjerdman 1954; Danell 1937, or ‘vertical lip compression’, Ladefoged and Maddieson 1990; cf. Linell 1973: 20), whereas /y/ is pronounced with protruded lips (as is /ø/). This articulatory difference is visible in the magnetic resonance pictures given in Fig. 2.4.



(p.28) The production differences between the vowels are manifest also in the offglide that is commonly produced in long vowels or after the vowel (long or short) in hiatus. In these cases, [ʉ̟(ː)] exhibits an offglide variably transcribed as [β] or [$^{\beta}$] (McAllister, Lubker, and Carlson 1974; Elert 1997), or [w̟] or [^{w}˖] (Kristoffersen 2000: 35), whereas [y(ː)] exhibits palatal [j]/[^{j}] or [ɥ]/[^{ɥ}].

Fig. 2.4. Lip postures of unrounded [iː], and rounded [ʉ̟ː] and [yː] (in that order). Vertical lines indicate lip tangent. Female subject.

Magnetic resonance pictures taken from Ericsdotter (2005: 102)

(14) Offglides of long /ʉ/ and /y/

bua	/bʉ-ɑ$_2$/	[bʉ̟ːᵝa], [bʉ̟ːw̟a]	‘to boo’
byar	/by-ɑr$_2$/	[byːʲar], [byːjar], [byːɥar]	‘villages’

The selection of offglide indicates that /ʉ/ is at least non-front in the phoneme system, and thereby positionally distinct from /y/.

Another argument can be derived from the alternation between allophones. The main short allophone in stressed syllables is [ʊ] which is phonetically central, and significantly lower than [ʉ̟]. The alternation indicates that the phoneme reigns in the central acoustic space of the vowel system (Linell 1973).

A weaker argument can be garnered from the fact that /ʉ/ does not occasion lenition of preceding velars (see 4.12.1): *skur* /skʉr/ [skʉ̟ːr] ‘shower (of rain)’ vs. *skyr* /ʂy-r/ [ʃyːr] ‘shuns’. The lenition rule is however no longer productive, and this could simply be the reflection of a historical pattern, as /ʉ/ derives from earlier /u/.

Phonologically, it makes sense to treat /ʉ/ as a central vowel, or else one must introduce another distinction in the high front area. The phonetic location of /ʉ/ varies noticeably between the Scandinavian dialects that have it.

In stressed syllables, there is only one short allophone, namely [ʊ], as in *bulle* /bʉlᵘ-e$_2$/ [^{2}ˈbʊlːɛ̠] ‘bun’, *buss* /bʉsᵘ/ [bʊsː] ‘bus’. We shall use the IPA symbol [ʊ] for this vowel. Because of the quantitative requirement of weight in Swedish stressed syllables, short stressed [ʊ] will always occur in a closed syllable. The main distributional generalization for [ʊ] is in fact ‘a closed syllable’, whether stressed or not, although sometimes it occurs also in open unstressed syllables.

In unstressed syllables, there are two short allophones of /ʉ/: [ʉ̞] and [ɵ]. The distribution is as follows:

– Unstressed [ʉ̞] is the obligatory allophone of /ʉ/ in hiatus: *duellera* /dʉɛlᵘ-er-ɑ$_2$/ [dʉ̞ɛ^{1}ˈleːra] ‘to duel’, *dualism* /dʉɑl-ism/ [dʉ̞aˈlɪsːm] ‘id.’, *guava* /gʉɑv-ɑ$_2$/ [gʉ̞^{2}ˈɑːva] ‘id.’.
– Unstressed [ʉ̞] occurs only in open syllables (but may alternate with [ɵ]): *känguru* /ɕɛŋgʉrʉ/ [^{1}ˈɕɛ̝ŋːgʉ̞rʉ̞] ‘kangaroo’, *musik* /mʉs-ik/ [mʉ̞ˈsiːk] or [mɵˈsiːk] ‘music’, *furage* /fʉr-ɑʂ/ [fʉ̞ˈrɑːʂ] ‘forage’, *furiös* /fʉri-øs/ [fʉ̞rɪˈøːs] or [fɵrɪˈøːs] ‘furious’, *buddism* /bʉdᵘ-ism/ [bʉ̞ˈdɪsːm] or [bɵˈdɪsːm] ‘buddhism’.
– Unstressed [ɵ] is the obligatory allophone of /ʉ/ in closed syllables: *kultur* /kʉltʉr/ [kɵlˈtʉ̞ːr] ‘culture’, *fundament* /fʉndɑ-mɛnt/ [fɵndaˈmɛ̝ːnːt] **(p.29)** ‘foundation’, *publicitet* /pʉblis-itet/ [pɵblɪsɪˈteːt] ‘publicity’, *burgunder* /bʉrgʉnd-•r/ [bɵr^{1}ˈgɵnːdɛ̝r] ‘Burgundian; wine from Bourgogne’. This includes cases where retroflexion has applied, and resyllabification has taken place, in effect making the syllable open: *burdus* /bʉrdʉs/ [bɵˈɖʉ̞ːs] ‘brusque’, *furnera* /fʉrn-er-ɑ$_2$/ [fɵ^{1}ˈɳeːra] ‘to furnish’, *kurtisan* /kʉrtis-ɑn/ [kɵʈɪˈsɑːn] ‘courtesan’.
– Where syllabification is ambiguous, there is some variation, e.g. *muslim* /mʉslim/ [mʉ̞.ˈsliːm] or [mɵs.ˈliːm] ‘moslem’; cf. also *buddism* /bʉdᵘ-ism/ [bʉ̞ˈdɪsːm] or [bɵˈdɪsːm] ‘Buddhism’. This variation could be analogically connected to whether or not the basic form *Budda* /bʉdᵘ-ɑ$_2$/ [^{2}ˈbɵdːa] is seen as relevant for the derived forms.[8]
– Unstressed [ɵ] also occurs in open syllables: *tussilago* /tʉsilɑgu/ [tɵsɪ^{1}ˈlɑːgʊ] ‘coltsfoot’, *musikal* /mʉs-ik-ɑl/ [mɵsɪˈkɑːl] ‘musical’, *pullover* /pʉlov•r/ [pɵ^{1}ˈloːvɛ̝r] ‘id.’, *bumerang* /bʉmɛrɑŋᵘ/ [bɵmɛ̝ˈraŋː] ‘boomerang’. These cases appear to depend in part on the distance to the stressed vowel, where the closer the vowel /ʉ/ is to the stressed syllable, the greater the likelihood of the central allophone. Wenner (2010: ch. 6), in her discussion of the tendency for short [œ] to merge with [ɵ], finds that coronals and retroflexes following the vowel covary with the [ɵ] pronunciation. One interpretation of this is that these segments have a centralizing effect, given the right circumstances. Possibly, the tendency to employ [ɵ] over [ʉ̞] in open unstressed syllables could be related to the following consonantal context, as most examples found are followed by /s/: *bussarong* [bɵsaˈrɔŋː] ‘jumper’, *hussitisk* [hɵ^{1}ˈsiːtɪsk] ‘Hussite’, *musette* [mɵˈsɛ̝ːt] or [mʉˈsɛ̝ːt] ‘id.’, *muskulär* [mɵskɵˈlæːr] or [mɵskʉˈlæːr] ‘muscular’, *musketör* [mɵskɛ̝ˈtœːr] ‘musketeer’.

2.2.8 */u/ [uː] ~ [ʊ] [ɔ] ‹o›*

Featural characterization of /u/: high, back, rounded. The short allophone [ɔ] is mid, back, rounded, and only occurs in unstressed syllables.

The long allophone of the high back vowel is greatly rounded and often ends in a glide, especially when stressed, and when in hiatus. We use the IPA symbol [uː] for the long vowel. Some older works use the symbol [ɷː].

(15) Gliding of the high back vowel

bok	/buk/	['buːᵝk], ['buːů̯k]	'book'
mosa	/mus-ɑ$_2$/	[^{2}'muːᵝsa], [^{2}'muːů̯sa]	'to mash'
hoar	/hu-ɑr$_2$/	[^{2}'huːᵝar], [^{2}'huːů̯ar]	'troughs'

(p.30)

The short allophone in stressed syllables is [ʊ] as seen in morphophonological alternations: *ko* /ku/ [kuː] 'cow', *kossa* /ku-sɑ$_2$/ [^{2}'kʊsːa] 'cow (hypocoristic)'; *sno* /snu/ [snuː] 'to twist; pinch', *snodde* /snu-de$_2$/ [^{2}'snʊdːɛ̯] 'twisted; pinched'; *bror* /brur/ [bruːr] 'brother', *brorsa* /brur-sɑ$_2$/ ['brʊʂːa] 'bro (hypocoristic)'; *glo* /glu/ [gluː] 'to stare', *glott* /glu-t/ [glʊtː] (perfect). There is also a stressed variant [ɔ] in *gott* /gɔt/ [gɔtː] 'good, neut.', cf. *god* /gud/ [guːd] 'good, c.g.', but [uː]~[ɔ] is not a regular phonological alternation in Swedish, and so *god~gott* is best seen as suppletive (as indicated in the phonemic transcriptions).

In unstressed, prestress syllables, there is sometimes a choice between [ʊ] and [ɔ] in alternation with long [uː]: *auktion* /ɑʉk-ʂun/ [ɑʉk'ʂuːn] 'auction', *auktionist* /ɑʉk-ʂun-ist/ [ɑʉkʂʊ'nɪsːt] or [ɑʉkʂɔ'nɪsːt] 'auctioneer'; *ranson* /rɑnsun/ [ran'suːn] 'ration', *ransonering* /rɑnsun-er-iŋ$_2$/ [ransʊ'neːrɪŋ] or [ransɔ'neːrɪŋ] 'rationing'. Cases like this are discussed in 2.2.10.

Forms with stressed [ʊ] are few (see (16)), but increasing in number (see (17)). A couple of these occur before an /st/ coda. Other phonotactically similar forms tend to be pronounced with [ɔ], hence have underlying /o/ rather than /u/ (16a). Most of the cases with stressed [ʊ] involve the retroflexion rule (16b), and that goes also for the single alternating form found (16c). But for both these cases there are, again, similar forms pronounced with [ɔ].

(16) [ʊ] and [ɔ]

a.	ost /ust/ [ʊsːt] 'cheese'	post /post/ [pɔsːt] 'mail'
	prost /prust/ [prʊsːt] 'dean'	kost /kost/ [kɔsːt] 'diet'
		frost /frost/ [frɔsːt] 'id.'
		rost /rost/ [rɔsːt] 'corrosion'
b.	skjorta /ʂurt-ɑ$_2$/ [^{2}'ɧʊʈːa] ([^{2}'ɧuːʈa]) 'shirt'	bort /bort/ [bɔʈː] 'away'

	kort /kurt/ [kʊʈː] ([kuːʈ]) ‘card’	sport /sport/ [spɔʈː] ‘sports’
c.	port /purt/ [pʊʈː] ([puːʈ]) ‘front door’	portal /purt-ɑl/ [pʊˈʈɑːl] or [pɔˈʈɑːl] ‘id.’

For many speakers of varieties close to the Central Swedish standard, the vowel is long [uː] in the stressed form, as marked in parenthesis. These patterns indicate that short, stressed [ʊ] and [ɔ] do not comfortably maintain the phonemic contrast. The tendency to alternate in unstressed position points in the same direction, see 2.2.10.

There is an ongoing process of *u*-shortening in Central Swedish.[9] The process shortens a long /uː/ to [ʊ]. Long /uː/ only occurs in stressed syllables, and due to the requirement of syllable weight, the following consonant lengthens simultaneously with the vowel shortening. The exact patterning of this incipient **(p.31)** change is not known, but the position before a voiceless stop seems clearly favourable.

(17) /uː/-shortening[10]

ropa	/rup-ɑ$_2$/	[^{2}ˈruːpa]	>	[^{2}ˈrʊpːa]	‘to call’
sophantering	/sup+hɑnt-er-iŋ$_2$/	[^{2}ˈsuːphanˌteːrɪŋ]	>	[^{2}ˈsʊpːhanˌteːrɪŋ]	‘refuse management’
mota	/mut-ɑ$_2$/	[^{2}ˈmuːta]	>	[^{2}ˈmʊtːa]	‘to ward off’
fotsvett	/fut+svɛtᵘ/	[^{2}ˈfuːtˌsvɛ̯tː]	>	[^{2}ˈfʊtːˌsvɛ̯tː]	‘sweat of feet’
koka	/kuk-ɑ$_2$/	[^{2}ˈkuːka]	>	[^{2}ˈkʊkːa]	‘to boil; to cook’
lokföraren	/luk+før-ɑre$_2$-n/	[^{2}ˈluːkˌfœːrarɛ̯n]	>	[^{2}ˈlʊkːˌfœːrarɛ̯n]	‘engine driver’

The result of the shortening harmonizes with the preference for short [ʊ] in Central Swedish in forms that are targeted by retroflexion, and where there is length variation between speakers of dialects spoken in the Central Swedish area, see (16b, c).

2.2.9 */o/ [oː] ~ [ɔ] [ʊ] ‹å›*

Featural characterization of /o/: mid-high, back, rounded. The short allophone [ɔ] is mid, back, rounded.

The long allophone [oː] is higher than the main short allophone [ɔ] and the phonetic distance is quite noticeable, much as with the heightwise corresponding long and short allophones of /e/.

(18) Morphophonemic alternation with /o/

gå	/go/	['goː]	‘to go; to walk’	gått	/go-t/[11]	['gɔtː]	(p.ptcp.)
må	/mo/	['moː]	‘to feel’	mått	/mo-t/	['mɔtː]	(p.ptcp.)
blå	/blo/	['bloː]	‘blue’	blått	/blo-t/	['blɔtː]	(neut.)
grå	/gro/	['groː]	‘grey’	grått	/gro-t/	['grɔtː]	(neut.)

In unstressed, prestress syllables, there is sometimes a choice between [ʊ] and [ɔ] in alternation with long [oː]: *elektron* /elektr-on/ [ɻlɻkˈtroːn] ‘electron’, *elektronik* /elektr-on-ik/ [ɻlɻktrɔˈniːk] or [ɻlɻktrʊˈniːk] ‘electronics’; *dekor* /dekor/ [dɻˈkoːr] ‘décor’, *dekorera* /dekor-er-ɑ$_2$/ [dɻkɔ^{1}ˈreːra] or [dɻkʊ^{1}ˈreːra] ‘to decorate’. Cases like this are discussed in 2.2.10.

The higher short allophone [ʊ] also shows up in unstressed syllables as alternant to the short stressed [ɔ].

(p.32) (19) The high short allophone of /o/

norr /nor$^{\mu}$/ [ˈnɔrː] ‘north’	Norrtälje /nor$^{\mu}$+tɛlj-e$_2$/ [nɔ^{2}ˈʈɻlːjɛ] or [nʊ^2 ˈʈɻlːjɛ]
	Norrtull /nor$^{\mu}$+tʉl$^{\mu}$/ [nɔˈʈɵlː] or [nʊˈʈɵlː] (place names)[12]
sold /sold/ [ˈsɔlːd] ‘pay’	soldat /sold-ɑt/ [sɔlˈdɑːt] or [sʊlˈdɑːt]
(Bordeaux, French [bɔʁˈdoː])	bordeaux [bʊˈɖoː]

This is a minor rule and in the last form the connection between base and derived form is at best tenuous.[13] However, it fits into a general pattern of [ʊ]~[ɔ]-alternation in unstressed syllables, for underlying /u/ as well as for underlying /o/, see (16) above and 2.2.10.

2.2.10 Notes on the alternation of *[ɔ]* and *[ʊ]*

There is some variation in vowel quality between [ɔ] and [ʊ] in unstressed syllables. The alternation is mostly in evidence in positions preceding the stressed syllable (though this may be an accidental fact, in view of data like that in (22)). The phonemes /u/ and /o/ can both yield either [ɔ] or [ʊ] in the unstressed condition. Alternations with a stressed vowel are given in (20).

(20) Alternating stressed/unstressed vowels[14]

/o/	/elektr-on/ [ɻlɻkˈtroːn] ‘electron’	/elektr-on-ik/ [ɻlɻktrɔˈniːk], [ɻlɻktrʊˈniːk] ‘electronics’
	/symfon-iker/ [sʏɱ^{1}ˈfoːnɪkɻr] ‘symphonist’	/symfon-i/ [sʏɱfɔˈniː], [sʏɱfʊˈniː] ‘symphony’
	/tele-fon/ [ʈɵlɻˈfoːn] ‘telephone’	/tele-fon-ist/ [ʈɵlɻfɔˈnɪsːt], [ʈɵlɻfʊˈnɪsːt], ‘operator’
	/dekor/ [dɻˈkoːr] ‘décor’	/dekor-er-ɑ$_2$/ [dɻkɔ^{1}ˈreːra], [dɻkʊ^{1}ˈreːra] ‘to decorate’

/u/	/hɑrmun-•sk/ [har[1]ˈmuːnɪsk] ‘harmonic’	/hɑrmun-i/ [harmʊˈniː], [harmɔˈniː] ‘harmony’
	/miljun/ [mɪlˈjuːn] ‘million’	/miljun-ɛr/ [mɪljʊˈnæːr], [mɪljɔˈnæːr] ‘millionaire’
	/kɑnun/ [kaˈnuːn] ‘cannon’	/kɑnun-ɑd/ [kanʊˈnɑːd] ‘cannonade’

(p.33)

This pattern shows that both allophones [ʊ] and [ɔ] are available in unstressed correspondents of the stressed vowels [oː] and [uː]. The pattern in (19) further shows that [ɔ]/[ʊ] may correspond with short [ɔ] in the stressed counterpart.

We also find alternation of [ɔ] and [ʊ] in syllables that are always unstressed, i.e. do not alternate with stressed syllables in some morphophonological patterning. There is variation between forms, as well as between speakers, and no study has been carried out to investigate the full details of the patterning. The syllable that the alternants occur in is always open.[15]

(21) Alternating vowels in syllables that are always unstressed (preceding stress)

motion [mɔtˈɧuːn], [mʊtˈɧuːn] ‘exercise’
motionera [mɔtɧʊ[1]ˈneːrɑ], [mʊtɧʊ[1]ˈneːrɑ] ‘to exercise’
portion [pɔʈˈɧuːn], [pʊʈˈɧuːn] ‘id.’
portionera [pɔʈɧʊ[1]ˈneːrɑ], [pʊʈɧʊ[1]ˈneːrɑ] ‘to portion out’
imponera [ɪmpɔ[1]ˈneːra], [ɪmpʊ[1]ˈneːra] ‘to impress’
memorera [mɛ̧mɔ[1]ˈreːra], [mɛ̧mʊ[1]ˈreːra] ‘to memorize’

The alternation could be interpreted as being due to variable underlying forms (i.e. /u/ or /o/), but the impression is that one and the same speaker could vary in pronunciation of the same form.

In poststress syllables, there is also some variation between [ʊ] and [ɔ].

(22) [ʊ] and [ɔ] in unstressed, open syllables (following stress)

postposttonic:	Mexiko	[[1]ˈmɛ̧kːsɪkʊ], [[1]ˈmɛ̧kːsɪkɔ]	‘Mexico’
	gigolo	[[1]ˈʝɪgːʊlʊ], [[1]ˈʝɪgːʊlɔ], [[1]ˈʝɪgːɔlɔ]	‘gigolo’
	pickolo	[[1]ˈpɪkːʊlʊ], [[1]ˈpɪkːʊlɔ], [[1]ˈpɪkːɔlɔ]	‘piccolo’
	tremolo	[[1]ˈtrɛ̧mːʊlʊ], [[1]ˈtrɛ̧mːʊlɔ], [[1]ˈtrɛ̧mːɔlɔ]	‘tremolo’

	domino	[^{1}ˈdɔmːɪnʊ], [^{1}ˈdɔmːɪnɔ]	‘domino’
	indigo	[^{1}ˈɪnːdɪgʊ], [^{1}ˈɪnːdɪgɔ]	‘indigo’
posttonic:	kasino	[ka^{1}ˈsiːnʊ], [ka^{1}ˈsiːnɔ]	‘casino’
	pianino	[pɪa^{1}ˈniːnʊ], [pɪa^{1}ˈniːnɔ]	‘pianino’
	cappuccino	[kapʊ^{1}ˈtɕiːnʊ], [kapʊ^{1}ˈtɕiːnɔ]	‘cappuccino’
	disko	[^{1}ˈdɪsːkʊ], [^{1}ˈdɪsːkɔ]	‘disco’

From the phonemic point of view, it is unclear which phoneme to assume as underlying. In this final position there is a test available, namely by placing the **(p.34)** vowels in closed syllables. Just as in the other cases of variation, [ʊ]~[ɔ] in the same form is only in evidence in open syllables. A closed syllable should potentially reveal the underlying quality. Closed syllables are attained by adding the definite suffix, common gender *-n* or neuter *-t*. My own pattern is as in (23), where intuition is the strongest for the first group.

(23) [ʊ] and [ɔ] in unstressed, closed syllables (following primary stress)

[ʊ]	[kapʊ^{1}ˈtɕiːnʊn] ‘the cappuccino’, [ka^{1}ˈsiːnʊt] ‘the casino’, [pɪa^{1}ˈniːnʊt] ‘the pianino’, [^{1}ˈdɪsːkʊt] ‘the disco’
[ɔ]	[^{1}ˈjɪgːɔlɔn] ‘the gigolo’, [^{1}ˈpɪkːɔlɔn] ‘the piccolo’, [^{1}ˈtrɛ̯mːɔlɔt] ‘the tremolo’
[ʊ/ɔ]	[^{1}ˈdɔmːɪnʊt], [^{1}ˈdɔmːɪnɔt] ‘the domino’

The pattern remains variable and requires more study. A possible generalization would be that [ʊ] is favoured in the immediately posttonic position. The variation resembles that of the phoneme /e/ in prestress position, see 2.2.4.

In closed syllables, whether stressed or unstressed, short /o/ is invariably pronounced as [ɔ]: ˈ*bl*[ɔ]*nd* ‘blonde, adj.’, *bl*[ɔ]*n*ˈ*din* ‘(a) blonde’; *b*[ɔ]*lsje*ˈ*vik* ‘Bolshevik’; ^{2}ˈ*p*[ɔ]*mpa* ‘pomp’, *p*[ɔ]*m*ˈ*pös* ‘pompous’.[16] The fixation of a vowel quality in a closed syllable also holds for other vowels where there is alternation, namely /ɛ/ (see 2.2.4) and /ʉ/ (see 2.2.7).

Finally there are some cases where the unstressed vowel belongs in the basic form and the stressed vowel in the derived form, e.g. ^{1}ˈ*Plat*[ɔ]*n* ‘Plato’, *plat*[^{1}ˈuː]-*nisk* ‘Platonic’; ^{1}ˈ*Babyl*[ɔ]*n* ‘id.’, *babyl*[^{1}ˈuː]*nisk* ‘Babylonian’; ^{1}ˈ*kan*[ɔ]*n* ‘canon’, *kan*[^{1}ˈuː]*nisk* ‘canonic’; ^{2}ˈ*dokt*[ɔ]*r* ‘doctor’, *dokt*[^{1}ˈuː]*rer* ‘doctors’.

For the type of word where the unstressed vowel is basic (ˈ*Babyl*[ɔ]*n, Mong*[ɔ/ʊ]ˈ*liet* ‘Mongolia’, *pros*[ɔ/ʊ]ˈ*di* ‘prosody’, *kat*[ɔ/ʊ]ˈ*lik* ‘catholic’, one sometimes hears derived forms with stressed long [oː] beside [uː] (which is the normative pronunciation), e.g. *babyl*[ˈoː]*nisk* ‘Babylonian’, *mong*[ˈoː]*lisk* ‘Mongolian’, *pros*[ˈoː]*disk* ‘prosodic’, *kat*[ˈoː]*lsk* ‘catholic’. This could possibly be a phonology-driven pronunciation, deriving from underlying /o/ in the unstressed condition.[17] Alternatively, it might be due to orthographic influence in relatively infrequent words, where ‹o› is associated with /o/ in learned words more than /u/, otherwise the typical phoneme associated with the ‹o› spelling. The latter hypothesis is supported by pronunciations like *g*[ˈoː]*tisk* ‘Gothic’, normatively pronounced *g*[ˈuː]*tisk*.

We have found that the vowel variation in unstressed syllables is not fully traceable to the quality of corresponding vowels in stressed syllables. A summary **(p.35)** of the alternations involving the high and mid back vowels is given in (24), demonstrating the stressed/unstressed vowel variation, and the variation within unstressed syllables.

(24) Alternation involving long and short, high, mid-high, and mid back vowels

[uː]	[ʊ]	[ɔ]	[oː]	Vowel of basic form
		gått blått	gå blå	basic long [oː] closed σ for alternant
	elektro'nik deko'rera	elektro'nik deko'rera	elek'tron de'kor	basic long [oː] open σ for alternant
bo ko	'bodde 'kossa			basic long [uː] closed σ for alternant
ran'son por'tion mil'jon	ranso'nering portio'nera miljo'när	ranso'nering portio'nera		basic long [uː] open σ for alternant
		blond blon'din		basic short [ɔ] closed σ for alternant
	Norr'tälje	norr Norr'tälje		basic short [ɔ] open σ for alternant
	port por'tal	por'tal		basic short [ʊ] open σ for alternant
	impo'nera mo'tion	impo'nera mo'tion		basic unstressed, pre-stress [ʊ/ɔ] in open σ
	'indigo 'gigolo	'indigo 'gigolo		basic unstressed, post-stress [ʊ/ɔ] in open σ
baby'lon-isk profes'sor-er		'babylon pro'fessor	(baby'lon-isk)	basic unstressed [ɔ] open σ for stressed alternant

2.2.11 */ɑ/ [ɑː] [ɒː] ~ [a] ‹a›*

Featural characterization of /ɑ/: low, central. The long allophone is [ɑː] low, back, or [ɒː] low, back, and slightly rounded. The short allophone [a] is low, central.

(p.36) The long allophone of the vowel /ɑ/ is low and back, where the degree of backness correlates with slight rounding in CSw. In other varieties the rounding may be more prominent (Göteborg), or less so (most North Swedish varieties). We use the IPA symbol [ɑː] throughout for this vowel, as the rounding of this vowel is very slight in Central Standard Swedish. The other alternative is to use the symbol [ɒː] (e.g. Kuronen 2000).

The short allophone of /ɑ/ is central, and we shall represent it as [a], following the pronunciation dictionaries. This does not mean we consider this vowel as fully front (that position is here marked [æ]). Some authors use [ɐ] to mark the central position of this vowel, especially in unstressed position (e.g. Helgason 2002).

The phonetic distance between the long and short allophones is large and clearly noticeable in morphophonological alternations of vowel quality and quantity in forms like *drama* /drɑm-$ɑ_2$/ [^{2}'drɑːma] ‘id.’, *dramatisk* /drɑmɑt-•sk/ [dra^1'mɑːtɪsk] ‘dramatic’; *glad* /glɑd/ ['glɑːd] ‘happy’, *glatt* /glɑd-t/ ['glatː] ‘happy (neut.)’; *parad* /pɑrɑd/ [pa'rɑːd] ‘parade’, *paradera* /pɑrɑd-er-$ɑ_2$/ [para^1'deːra] ‘to parade’.

2.3 The vowel phoneme system

The phonemic organization of vowels in Central Swedish offers some challenges. The phoneme system should express natural classes, predict the allophonic rules, and relate the sets of long and short vowels to each other in a natural way, even when the phonetic distance is large. At the same time, it should be coherent and economic.[18]

There are a few modern treatments of the CSw vowel system. The most ambitious are Hellberg (1971), Linell, Svensson, and Öhman (1971: 88ff.), and Linell (1973), and the system proposed here builds directly on these, with some modifications, such as the placement of the vowel /ɛ/ as [mid] rather than [low] (Malmberg 1971: 18ff.; Engstrand 2004: 115).

In constructing a phonemic system, we can draw on some allophonic alternations, primarily the following:

1 The long and short allophones of both /ɛ/ and /ø/ in the position before a retroflex as opposed to elsewhere (see 2.2.3, 2.2.6): [ɛː]~[æː], [ɛ]~[æ] and [øː]~[œː], [ø]~[œ].
2 The phonetic distance between the long and short allophone of /ʉ/ in stressed syllables (see 2.2.7): [ʉ̟ː]~[ʊ].
3 The short allophone of /ʉ/ in open vs. closed unstressed syllables (see 2.2.7): [ʉ̟]~[ʊ].

(p.37) 4 The widespread tendency in the CSw-speaking area to neutralize the short allophone of /ø/ with that of /ʉ/ (see 4.3), as [ɵ].
5 The large phonetic distance between the long and short allophone of /ɑ/ (see 2.2.11): [ɑː]~[a].
6 The long and short allophones of both /e/ and /o/ (see 2.2.2, 2.2.9): [eː]~[ɛ] and [oː]~[ɔ].
7 The marked offgliding of [iː] and [yː], and similarly, the offgliding of [ʉ̟ː] and [uː].

To these could be added ablaut alternations and velar softening, discussed in Linell (1973), but these do not make strong synchronic arguments and are therefore put aside here.

The common arguments that relate to internal coherence of the system will require some theoretical assumptions. I will assume that features are monovalent (e.g. Gnanadesikan 1994, Lahiri and Reetz 2010). Features are phonologically marked to different degrees. The markedness status of these specifications shows up in different ways in the phonology (e.g. the epenthetic use of /e/).

(25) Phonemic vowel system

	[front]		[central]	[back]	
[high]	/i/	/y/	/ʉ/	/u/	[rounded]
[mid-high]	/e/			/o/	
[mid]	/ɛ/	/ø/			
[low]			/ɑ/		

Arguments:

1 The marked, sometimes fricative, offgliding of [iː] and [yː] as [iːj] and [yːj], as well as their similarly short phonetic distance between long and short allophones ([iː]/[ɪ] and [yː]/[ʏ]) warrants the categorization of them as [high] (Engstrand 2004: 113). The same offgliding tendency often targets [uː] (as [uːᵝ] or [uːw̟]) and [ʉ̟ː] (as [ʉ̟ːᵝ]), and the phonetic distance between the long and short allophones ([uː]/[ʊ]) is also small. All four of these phonemes are [high]. The vowels /i/ and /y/ are [front], /u/ is [back], and /ʉ/ is neither, and we categorize it as [central]. The last point is not phonetically obvious for all allophones of /ʉ/, the long vowel [ʉ̟ː] being rather front. We take the fact that the short allophone [ɵ] is clearly central as an indication of a different, non-front categorization of the whole phoneme.

2 The alternations between the long and short allophones of /e/ and /o/, respectively, are parallel. The phonetic distance between [eː]/[ɛ] and [oː]/[ɔ] is larger **(p.38)** than for the allophones of the high vowels /i/, /y/, and /u/ (Engstrand 2004: 113). These facts justify sorting /e/ and /o/ in the same natural class with respect to height. The height alternation is in the mid region, and I take this to mean that the short allophones are specified with the feature [mid]. For /e/ this amounts to neutralization with /ɛ/, which is phonemically specified as [mid].The argument, then, is that the neutralization of short /e/ and /ɛ/ as [ɛ̝] provides support for the higher placement of /e/ in relation to /ɛ/, while the parallel long/short allophony of /e/ and /o/ puts these two vowels at the same height. I have put this height down as [mid-high] for three reasons. First, three vowel heights are of relevance in the back series, namely the two phonemic back vowels, /u/ and /o/, and the low vowel /ɑ/, whose long allophone is [back]. If /e/ behaves in parallel with /o/, that would be an argument for classifying these two vowels as equally unmarked on the height dimension. Second, the epenthetic vowel is [ɛ̝], or in some varieties [ə]. This could be seen as the short allophone of /e/, which is often taken to be the least marked vowel. The variation between [ɛ̝] and [ə] (also in pronunciation dictionaries) represents two different ways to go in the unstressed position. Third, the phoneme below /e/, i.e. /ɛ/, enters into a lowering rule that neither of the allophones of /e/ takes part in. The lowering, which is phonetically significant, indicates that /ɛ/ is not likely phonemically [low], but rather [mid]. This in turn warrants our placement of /e/ above [mid] within the system.There is another possible argument that might support putting /e/ and /o/ at the same height, and that is the behaviour of the allophones in unstressed (mostly prestress) position. We noticed earlier that there is a lot of variation between [e] and [ɛ] (2.2.4), and [ʊ] and [ɔ] (2.2.10), in that position. While the allophonic variation is at different heights, they both emanate primarily from /e/ and /o/.

3 The vowels /ɛ/ and /ø/ are both [mid] by virtue of being the joint target of vowel lowering before retroflex (see 4.2), whereby they become [low]. We take the very fact that the rule has a clear lowering effect to rule out [low] as specification for either of these vowels (see Hellberg 1971: 5). As mentioned, the low allophones are in the process of becoming the unmarked allophones in younger age groups in Stockholm, where one hears pronunciations like [^{2}'læːsa] for *läsa* 'to read', beside standard [^{2}'lɛːsa], and [^{2}'ɕœːpa] for *köpa* 'to buy' beside standard [^{2}'ɕøːpa]. Also, the low allophone of /ø/, that is in the position before /r/, is often pronounced as lower than in the older generation, i.e. as [œ], especially the long allophone [œː]. This sometimes leads to difficulties in distinguishing this sound from [ɑː], the long allophone of /ɑ/, a sign that these vowels are phonetically very close. At any rate, there may well be phonemic changes in the making, such as reducing the four heights for front vowels, to three.

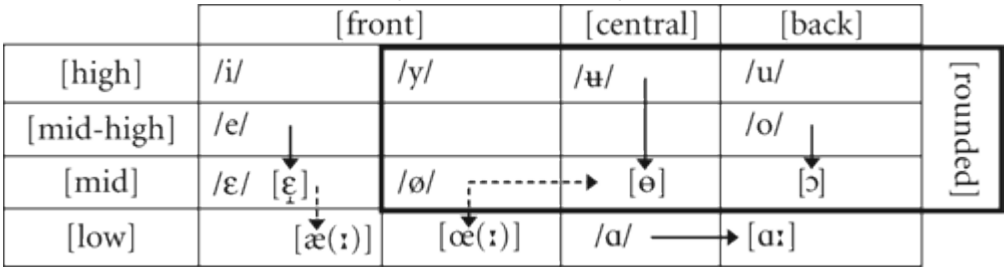
The short allophone of /ø/ is [ø̞], or [œ] (before retroflex). This allophone has a tendency to neutralize with one of the short allophones of /ʉ/, i.e. [ɵ]. This **(p.39)** phenomenon is widespread in Central Swedish and while it is considered non-standard, it indicates that these allophones are near one another (Wenner 2010, and phonetic chart in Fig. 2.2). The attraction goes both ways depending on speaker and surrounding context, where the presence of a retroflex is considered to be the main context for the backing of [ø̞] or [œ] to [ɵ]. Phonologically, this process could not depend on the feature [low], even though the context before retroflex is favourable for it.

As observed by Hellberg (1971: 5), the vowels /ɛ/ and /ø/ need to be distinguished heightwise from /e/. For reasons given already, we express this contrast with the [mid] (/ɛ/ and /ø/) vs. [mid-high] (/e/) distinction.

4 The phoneme /ɑ/ is distinct from all other vowels by virtue of being specified as [low]. In addition, we specify this vowel as [central]. The long and short allophones [ɑː] and [a] are qualitatively very distinct, where the long allophone is clearly [back], while the short one is not. The short allophone is however not phonologically [front], since the [low] allophones of /ɛ/ and /ø/ occupy this position (and there is no neutralization). The long allophone of /ɑ/ is sometimes transcribed as [ɒː] (e.g. Kuronen 2000), which indicates that rounding accompanies backing, though the rounding is far less pronounced with [ɑː] than the other non-front vowels, and short [a] is not rounded at all. The analysis of /ɑ/ as [low] and [central] is thus taken to be the phonemic basis, while the long allophone is derived by adding the feature [back].

5 The phoneme /ʉ/ is specified as [high], [rounded], and [central].[19] This expresses the fact that it is neither [front] nor [back], and also the fact that the phonetic distance between the allophones of /ʉ/ is pretty big. There is a long [ʉ̟ː] (invariable) and a short unstressed [ʉ̟] which alternates with stressed and unstressed [ɵ], a central mid vowel. The vowel /ʉ/ thus occupies a fairly large phonetic space. The allophony between [ʉ] and [ɵ] can now be expressed as /ʉ/ acquiring the feature [mid] in closed syllables (stressed or unstressed). The [mid] specification, in turn, puts this allophone in the same phonological category as /ø/, with which it frequently neutralizes as [ɵ] (see earlier point 3).
Leinonen (2010: 165f.) finds that the younger generation generally has lower placement of the front vowels in comparison with the older generation. This is particularly clear for the /ɛ/ and /ø/ phonemes (irrespective of length and context). This can be taken as support for the system proposed here, where the front low positions are left open in the phonological analysis.

(p.40) (26) Some allophony in the vowel system



The chart in (26) exhibits the vowel allophony where the long and short allophone of a given vowel is seen to occupy different cells in the chart (shown by the arrows). There are lowerings of short allophones to [mid] of higher vowels (/e/, /ʉ/, /o/), and the central to back allophony for short and long /ɑ/. The dotted arrows mark context sensitive alternations, like the lowering to [low] of front mid vowels in the position before /r/ and other retroflexes (see 4.2), and the dialectal/sociolectal conflation of short /ø/ and short /ʉ/ as [ɵ] (see 4.3).

The phonological height distinctions proposed are indicated in the allophone chart in Fig. 2.5.

(p.41) 2.4 Diphthongization

Most Central Swedish long vowels are regularly diphthongized to different degrees. This is demonstrated by Eklund and Traunmüller (1997: 11), where only [ɑː]/[ɒː] and [æː] proved to be real monophthongs, the mid [oː], [øː], [eː] and high vowels [uː], [ʉ̟ː] being variably diphthongized.[20] Diphthongization is present far beyond the core area to the west of Stockholm, where it has been described many times (Bleckert 1987).[21]

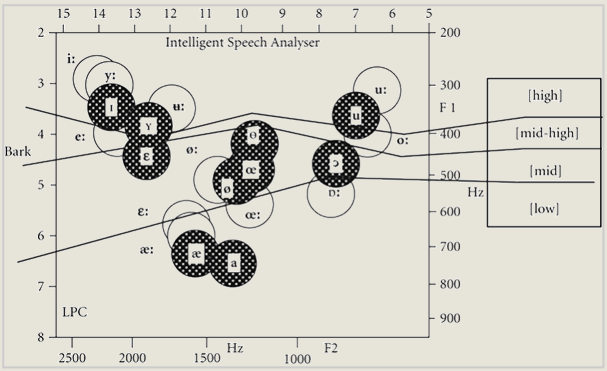
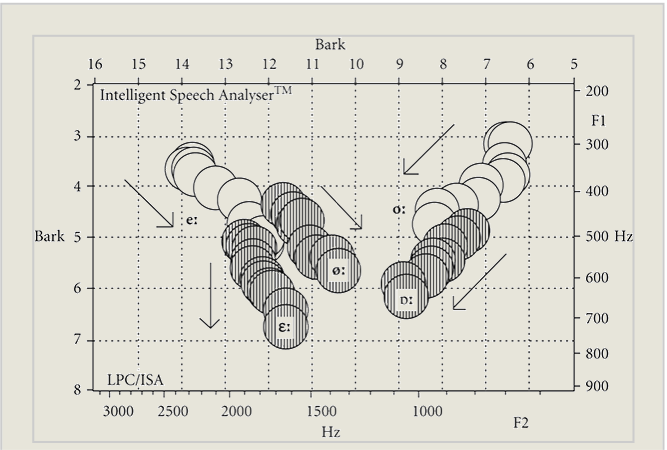


Fig. 2.5. Phonetic height organization of Swedish long and short vowel allophones in sentence stressed position The short vowel represented as [œ] is here in the [mid] group, yet we categorize it as [low] in chart (26), based on the position of long [œː].

Adapted from Kuronen (2000: 119)

We will exemplify the diphthongization by looking at the Central Swedish variety of Nyköping (100 km south of Stockholm) as described by Kuronen (2000: 72ff.), where the author also finds his results largely compatible with those of Stockholm and Eskilstuna (110 km west of Stockholm), as described in the literature. These are all varieties of Central Swedish. Fig. 2.6 is a reproduction of average diphthongization for five vowels (including [ɛː]) of a male speaker.



(p.42) 2.5 Diphthongs

There are three diphthongs, written ‹au›, ‹eu›, and ‹ou› or ‹oa›. They occur almost exclusively in loans and have marginal distribution. Their status in the vowel system is unclear. They could be analysed as combinations of single short vowels, but it would then not be obvious which two vowels combine in each of them. The pronunciation dictionaries are not fully agreed in their phonetic transcriptions. The transcriptions in (27) show the pronunciations from NSU and SSU, and retain the vowels from the sources, but adapt other information to the analysis presented in this book.

Fig. 2.6. Formant traces of the pronunciation of Swedish long vowels by one male speaker from Nyköping

From Kuronen (2000: 88)

(27) Diphthongs

		NSU	SSU	
stressed	kautschuk	['kaʊ̯tʃøk][22]	['kaɵ̯tʃøk]	‘eraser’
	paus	['paʊ̯s]	['paɵ̯s], ['pɑːøs]	‘pause’
	aula	['aʊ̯la]	['aɵ̯la]	‘assembly hall’
	autoimmun	['aʊ̯tɔɪˌmʉ̥ːn]	['aɵ̯tɔɪˌmʉ̥ːn]	‘auto immune’
	rauk	[raʊ̯k]	[raɵ̯k]	‘stack’
unstressed	autentisk	[aʊ̯'tɛ̥nːtɪsk]	[aɵ̯'tɛ̥nːtɪsk]	‘authentic’
	australier	[aʊ̯'strɑːlɪɛ̥r]	[aɵ̯'strɑːlɪɛ̥r]	‘Australian’
stressed	neutrum	['neːʉ̥trøm]	['nɛɵ̯trøm]	
		['neːøtrøm]	['neːʉ̥trøm]	‘neuter’
	reuma	['rɛʊ̯ma]	['rɛɵ̯ma]	
		['rɛ̥vma]	['rɛvːma]	‘fluid thought to cause rheumatism’
unstressed	Europa	[ɛʊ̯'ruːpa]	[ɛɵ̯'ruːpa]	
		[ɐ̥'ruːpa]	[ɛv·'ruːpa]	‘Europe’
	leukemi	[le·ʉ̥kɐ̥'miː]	[lɛɵ̯kɐ̥'miː]	
		[lɛ̥fkɐ̥'miː]	[lɛv·kɐ̥'miː]	‘leukaemia’
	eunuck	[ɛʊ̯'nøkː]	[ɛɵ̯'nøkː]	
		[ɛ̥v'nøkː][23]	[ɛv'nøkː]	‘eunuch’

		NSU	SSU	
stressed	soul	[sə͡ul]	[suːl]	‘soul (music)’
	coach	[kə͡utʂ]	[kuːtɕ]	
		[kuːtʂ], [kuːtɕ]		‘id.’

As seen, there are variable pronunciations for these words, within and across the pronunciation dictionaries. Some of this is naturally due to transcription conventions, whereas other variation is real. Note that there is disagreement on what sound the written ‹u› corresponds to, making an analysis in terms of **(p. 43)** combinations of single vowels quite different for the two dictionaries: NSU /ɑu/, /eu/; SSU /ɑʉ/, /eʉ/. For *neutrum* there is the question of whether this is a true diphthong as the first vowel may be pronounced long. Nevertheless, this is the one word that Sigurd (1965: 142) considers to be the best example of stressed /eu/. The third diphthong is possibly not assimilated into Swedish phonology. The pronunciation indicated by NSU points to an English pronunciation, both as regards the schwa, which otherwise does not occur in stressed syllables in Central Swedish (and in many people’s speech not in unstressed syllables either), and in view of the monophthongal pronunciation which is an adjustment to Swedish phonology.

The alternative pronunciations indicate the lack of stability for diphthongs in Swedish. The set of words that has these diphthongs indicates that they may (still) be considered foreign or at least marginal to the system.

Notes:

([1]) The analysis of the vowel system assumes a variant of absolute neutralization (Kiparsky 1968). The vowels are unspecified for quantity, and are given one or two moras depending on syllable structure, consonant specifications nearby, and stress. There is no basic sense in which long vowels are derived from short vowels or the other way around, much like in the case of allophones in vowel harmony, where there is no precedence of one allophone over the other. It would not work to have the short vowels be underlying, since that would make for an abstract analysis, where the main allophone [e] of the phoneme /e/ would only occur in the lengthened form [eː], as the short allophone occurs as [ɛ].

([2]) Eliasson (2010: 9) assumes nine short vowels for Central Swedish, too, with a difference in quality between short [e̝] and [ɛ̝] (thus marked in the source).

([3]) The same phenomenon is reported in a more striking form, with clearly centralized pronunciation for both [iː] and [yː] from various areas in Sweden (Bohuslän, Närke). This sound, known as “Viby-*i, -y*”, is investigated in Björsten and Engstrand (1999) and Engstrand et al. (2000).

([4]) In some of these, /e/ may be further back, approaching [ɔ] before /r/ ([ʁ]).

([5]) Staffan Hellberg (p.c.), who speaks a Göta variety which has distinct short allophones for /e/ and /ɛ/, suggests that in prestress position the quality variation is correlated with the status of syllables as open and closed, hence [e] in *m*[e̝]'*tod* ‘method’, and [ɛ] in *m*[ɛ̝]*n*'*tol* ‘menthol’.

([6]) Besides the position before /r/, the low pronunciation is also used for naming the letter ‹ä›, i.e. as [æː], and in swear words: *jävlar* [ˈ[2]jæːvlar] ‘lit. devils’, *jäkel* [ˈ[2]jæːkɛ̰l] ‘lit. devil’.

([7]) In the standard variety of Finland-Swedish lowering is manifest, however, in corresponding forms: *springer* [ˈsprɪŋːær] ‘runs’, *dikter* [ˈdɪkːtær] ‘poems’.

([8]) This name is often spelled ‹Buddha›.

([9]) Thanks to Martin Persson who drew my attention to this, and who also supplied the data in (17).

([10]) These examples have been tested against intuition and have also been found on Internet sites, with spellings like ‹roppa›, ‹motta›, ‹kocka› (Google™ searches in November 2010).

([11]) For the analysis of the suffix as /-t/ rather than /-tᵘ/, see 8.4.4.

([12]) In the longer compound *Norrtullsgatan* ‘Norrtull Street’ primary stress may occur on the initial syllable, in which case the most idiomatic pronunciation is [ˈ[2]nɔʈːɵlsˌgɑːtan].

([13]) An analysis starting from underlying /u/ would also work for the forms containing *norr* ‘north’, in view of the related forms with a long vowel *nord* [ˈnuːɖ] ‘north’, *nordlig* [ˈ[2]nuːɖlɪg] ‘northern’.

([14]) More examples are given in Linell (1973: 32ff.). The variability appears a little more accessible with /o/ than with /u/. The pronunciation dictionaries normally propose only one pronunciation.

([15]) For *portion* this presupposes the application of the retroflexion rule, see 4.1.

([16]) Thanks to Anders Lindström for pointing this out to me.

([17]) Thanks to Jan-Olof Svantesson for drawing my attention to this fact.

([18]) In an optimality grammar, underspecification is not available. Instead the relative markedness of segments is expressed as ranked constraints (McCarthy 2005), or as distinctive violations (Golston 1996).

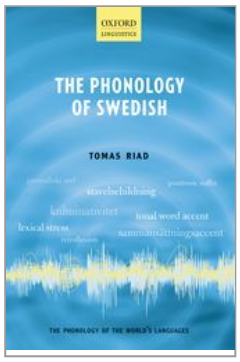
([19]) This vowel could also be specified as [mid-high] and [central], on a par with /e/ and /o/. It would not affect much of the argumentation here. Certainly, the height behaviour for the long and short main allophones is in parallel with that of /e/ and /o/. Phonetically, however, the distance between [ʉ̟ː] and [ɵ] is larger.

([20]) The vowel quality [ɛː] was not included in the investigation.

([21]) The term for this is diphthongization in the Mälardal area (Swedish *mälardalsdiftongering*), i.e. the area around lake Mälaren, which flows into the Baltic in Stockholm.

([22]) The combination sign is set underneath the vowels in the source.

([23]) The informal pronunciation [ɐ̣'nøkː] is also provided in NSU.



The Phonology of Swedish
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Print publication date: 2013
Print ISBN-13: 9780199543571
Published to Oxford Scholarship Online: January 2014
DOI: 10.1093/acprof:oso/9780199543571.001.0001

Consonants

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DOI:10.1093/acprof:oso/9780199543571.003.0003

Abstract and Keywords

There are eighteen consonant phonemes in Swedish. Sixteen of these occur in both a short and a long variant, and that distinction is phonemic. This is to say that consonants may be lexically specified with a mora. Among the most interesting properties of the consonant system is the double specification of aspiration and voicing in the obstruents, an instance of overspecification. Swedish also has crowd of palatal and velar voiceless fricatives: /s/, /ʂ/ and /ɕ/. The phoneme /ʂ/ exhibits a lot of allophonic variation, where the typical prevocalic realization is [ʃ] and the postvocalic is [ʂ].

Keywords: consonants, aspiration, voicing, consonant chart, moraic consonant

If we focus on the qualitative contrasts, the consonant system of Swedish consists of 18 phonemes, arranged according to place of articulation, manner of articulation and phonation in (28).

(28) Main articulations of the Central Swedish consonants

		labial,	dental,	alveolar,		
		labiodental	alveolar	palatal	velar	glottal
oral stop	s.g.	p pʲ	t tʲ		k kʲ	
	voice	b bʲ	d dʲ		g gʲ	
fricative	s.g.	f fʲ	s sʲ	ɕ		h
fric./retroflex			ʂ ʂʲ			
fric./approx.	voice	v vʲ		ʝ ʝʲ		
nasal stop		m mʲ	n nʲ		ŋ ŋʲ	
lateral			l lʲ			
apical trill			r rʲ			

Nearly all consonants occur as both a long and a short phoneme. We assume that contrastive quantity resides with the consonants, whereas length in vowels is purely allophonic, and driven by Stress-to-Weight, an undominated constraint in Swedish (see chapter 8). We represent the phonemic length here with a raised mora (e.g. /kɑtᵘ/ [kaːt] ‘cat’).[1] Phonetically this always comes out as increased duration relative to the non-moraic variant. This is worth emphasizing, since Swedish (and Norwegian) differ from most other varieties of Germanic by having a direct quantitative correlate to a moraic consonant. The two consonants /h/ and /ɕ/ are never long, which means that they cannot occur as mora-bearers in coda position.

The phoneme /ʂ/ is often rendered with other symbols. The most common symbol found nowadays is /ɧ/ (Garlén 1984; Malmberg 1971; Elert 1997; Engstrand 2004). In somewhat older analyses of Swedish, the symbol /ʃ/ is also used (Linell, Svensson, and Öhman 1971: 95; Danell 1937, but see **(p.46)** Lindblad 1980: 122ff.). /ʃ/ is also used in some dictionaries, e.g. *Svensk Ordbok*. We shall argue that /ʂ/ is probably a better choice for Central Swedish, the implication being that [ʂ] is also the main allophone. A first possible argument for this would be that [ɧ] only occurs as short (in CSw), while [ʂ] occurs in both quantities in CSw. For most speakers, the two sounds are in complementary distribution, a matter that we return to in 3.3.5.

Below, we discuss the phonemes of this system groupwise, in the following order: oral stops, nasals, fricatives and approximants, and finally liquids. We then return to the phonological representation in section 3.5.

3.1 Oral stops

There are obstruent stops at three places of articulation, labial, coronal (dental/alveolar), and dorsal.

(29) Places of articulation for stops

Labial	Coronal	Dorsal
/p, pᵘ/	/t, tᵘ/	/k, kᵘ/
/b, bᵘ/	/d, dᵘ/	/g, gᵘ/
/m, mᵘ/	/n, nᵘ/	/ŋ, ŋᵘ/

Like nearly all other consonants, these stops have a phonemic distinction between non-moraic and moraic which is phonetically expressed as duration.

The labials /p, b/ are straightforwardly bilabial. The quantitative distinction, /p, p^{μ}/ and /b, b^{μ}/, is normally expressed as duration, i.e. [p], [pː] and [b], [bː]. In addition there is a difference between aspirated [p^{h}], [^{h}p], and unaspirated [p]. The phoneme /b/ is unaspirated and voiced, and varies in pronunciation between voiced and prevoiced, both annotated as [b]. We return to /m/ in 3.2.2.

As for the coronals, /t/ is always dental [t̪], while /d/ varies between dental [d̪] and alveolar [d], and there is alternation between the two across dialects (Livijn 2010). The /n/ is dental [n̪] or alveolar [n], but can only be alveolar if [d], too, is alveolar. In the Central Swedish variety, dental pronunciation dominates for all three coronal stops. The quantitative distinction is expressed as duration, i.e. [t], [tː] and [d], [dː]. In addition there is a difference between aspirated [t^{h}], [^{h}t], and unaspirated [t]. The phoneme /d/ is unaspirated and voiced, varying in pronunciation between voiced and prevoiced, both annotated as [d].

The dorsals /k, g/ vary the placement of the constriction in the palatal to velar region, according to vocalic environment, where front vowels cause a dorso-palatal constriction and back vowels a dorsovelar one. The low vowel /ɑ/ will place the velar constriction somewhere between the extremes (Malmberg 1971: 78). The constriction of /ŋ/ is less flexible and located in the velar area (Bruce 2010: 145). The quantitative distinction is regularly expressed as duration, i.e. **(p.47)** [k], [kː] and [g], [gː]. There is also the difference between aspirated [k^{h}], [^{h}k], and unaspirated [k]. The phoneme /g/ is unaspirated and voiced, with variation between voiced and prevoiced pronunciation, both annotated as [g].

The long oral stops either have their length underlyingly (a lexical mora: *grotta* / $grot^{\mu}$-$ɑ_2$/ [^{2}'grɔtːa] ‘cave’), or get length from their syllabic position (weight by position: *hets* /hɛts/ [hɛ̟tːs] ‘frenzy’). A consonant may also end up long as the result of total assimilation (*bytte* /byt-de_2/ [bʏtːɛ̟] ‘changed’). Distributionally, these contexts all come together as the postvocalic position in a stressed syllable, where the vowel is short (see (169)). The short oral stops occur in all positions (for general phonotactic patterns see Sigurd 1965, and chapter 13).

For each place of articulation there is a phonation distinction (neutrally marked as fortis and lenis by Iverson and Salmons 1995, and Helgason and Ringen 2008a), and also a nasal correspondent. Nasal stops are discussed in 3.2.

The phonation distinction has some interest in that Swedish here appears to part ways with most of the other Germanic languages by requiring *both* voicing and aspiration in a reasonably non-abstract account for the distinction (Helgason and Ringen 2008a). Indeed, the system represents a case that is claimed to be typologically unusual (Jansen 2004; Keating 1984; Lisker and Abramson 1964). The unexpected pattern is that Swedish seems to rather maximize the phonetic distinction made within the voice onset time continuum, even though there are only two phonological categories to distinguish.

In utterance-initial position the fortis stops (/p, t, k/) are postaspirated and the lenis stops (/b, d, g/) are prevoiced (i.e. voiced during closure in word-initial position). In medial, postvocalic position there is a tendency to contrast preaspirated fortis stops with fully voiced lenis stops. In final, prepausal position the distinction is voiceless fortis stops (with varying degree of aspiration) vs. fully voiced lenis stops. These contrasts are illustrated in Fig. 3.1.

The phonetic patterning of Swedish stops led Helgason and Ringen (2008a) to suggest that both voicing (i.e. [voice]) and aspiration (i.e. [spread glottis]) are needed as phonological features to non-abstractly characterize the stop system. In a follow-up study to these findings, Beckman et al. (2011) found phonological evidence for the fact that the realistic phonological representation is indeed overspecified in this way. In languages that have only one of the features (French for [voice]/Ø, English for [spread glottis]/Ø) to express a two-way distinction, it has been shown that changing the speech rate yields a selective increase of the phonetic cue for the specified feature. For languages with a threeway distinction and two phonological features (Thai), both properties are affected by speech rate changes (Kessinger and Blumstein 1997). If only one of the features were relevant in the Swedish two-way distinction, Beckman et al. (2011) argue, then only the phonetic cues corresponding to that feature should increase, as speech rate is decreased. The finding, however, **(p.48)**

was that both prevoicing and aspiration increased for lenis and fortis stops, respectively, as speech rate was decreased. This indicates that both aspects are indeed phonologically relevant and that the phonological specification consequently is rather richer than economy would dictate. The study only looked at initial position, where the distinction appears to be best profiled. We adopt this description in the feature analysis in (30).

(30) Features and patterns of aspiration of fortis and lenis stops

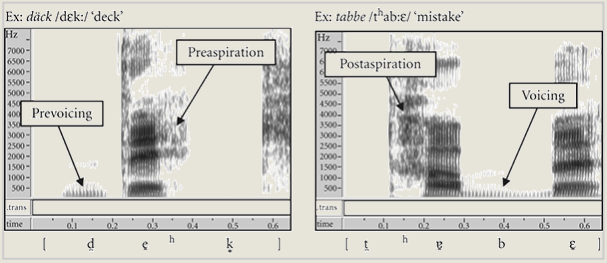


Fig. 3.1. Phonetic realization of phonation contrasts in SwedishThe contrasts between /d, b, g/ and /t, p, k/ are realized as prevoicing vs. postaspiration in initial position, and as voicing vs. preaspirated/unaspirated in medial and final position. Example words are *däck* 'deck; tyre' and *tabbe* 'mistake'.

From Helgason and Ringen (2008b).

			fortis /p, t, k/	lenis /b, d, g/	
#	C		[spread glottis] (postaspirated)	[voice] (prevoiced)	initial
V	C	V	[spread glottis] (preaspirated)	[voice] (fully voiced)	medial
	C	#	[spread glottis] (variably asp.)	[voice] (fully voiced)	final

Degree of preaspiration in medial and final position varied between speakers in Helgason and Ringen's study, as it does across Sweden (Helgason 2002). It is, however, present both in northern and southern varieties and the average duration levels for the informants exceeded or approached those that would trigger a preaspiration percept in Icelandic listeners, strongly suggesting that preaspiration is perceptually salient (Helgason and Ringen 2008a: 621).

In the position after /s/ the aspirated stops typically become unaspirated, see 13.4.1.

Voicing is very stable as indicated by frequent prevoicing in initial position and frequent epenthetic vocoids following the release of lenis stops, e.g. in words like *bädd* [bɛdːᵊ] 'bed'. This is shown in Fig. 3.2.

(p.49)

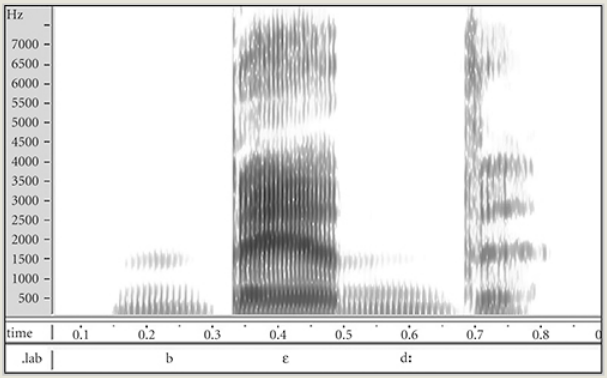


Fig. 3.2. Prevoicing of initial lenis stop and epenthetic vocoid following pre pausal lenis stop release in the word *bädd* 'bed' (Speaker MP)

From Helgason and Ringen (2008a: 614)

There are also some place-dependent differences between the stops with regard to voicing and aspiration. Prevoicing is longer for bilabials and dentals than for velars, and postaspiration of utterance-initial fortis stops is longer the further back the articulation of the stop is. Preaspiration, too, follows this pattern. Thus, aspiration is longer adjacent to a velar stop than to a dental stop, and longer near a dental stop than near a bilabial stop. These patterns have been observed for Icelandic (Indriðason, Eyþórsson, Halldórsson, Jónsson, and Bjarnadóttir 1991) and elsewhere (Cho and Ladefoged 1999).

If the phonological feature analysis is rich in the way suggested by the implementation data, then both features would potentially be active in the phonology. For instance, one could envision voicing assimilation (not attested) beside spread glottis assimilation (attested). The latter process is discussed in 4.9.

There is also a significant difference between male and female speakers in the treatment of voicing, where female Swedish informants tend to have less voicing than male. Corresponding patterns for initial lenis stops have been observed for German and Dutch (Jessen and Ringen 2002; van Alphen and Smits 2004), and it has been suggested that the difference is due to vocal tract size. However, for Umeå Swedish, a northern variety, the opposite pattern has been observed, at least regarding prevoicing (Karlsson, Zetterholm, and Sullivan 2004). Helgason **(p.50)** and Ringen (2008a: 266) note that both Russian and Hungarian women tend to have longer voicing than do men. This could be explained by a combination of distinctiveness and overall clearer speech on the part of women. This still leaves the Umeå pattern unexplained for Swedish in general. For preaspiration, too, there is a gender-related pattern, where females tend to have more of it. One possible explanation is the generally higher degree of breathiness in female voice sources (Hanson 1997; Hanson and Chuang 1999; Fant, Kruckenberg, and Nord 1991).

Orthographic representation for the labial and coronal phonemes is straightforward. The graphemes for the short sounds are ‹p, t, b, d› and for the long allophones ‹pp, tt, bb, dd›. For the velar sounds, /g/ is represented as ‹g› and ‹gg›, respectively. The phoneme /k/, however, is represented in a few different ways. Short /k/ is normally ‹k›, sometimes ‹c›. Long [k:] is represented as ‹ck›, and in two words (beside names) as ‹ch›. For each oral stop, the long allophone is sometimes represented by a single grapheme, either according to some orthographic rule, or simply as a result of borrowing. Normalized spelling sometimes occurs and usually includes a correct representation of segmental length. A set of examples is given in (31). Stress is indicated in polysyllabic forms. WBP is used as an abbreviation for weight by position, the case where a consonant is long because of its position in the syllable rather than by underlying specification (see 8.4.3).

(31) Orthographic representation of stops

[t]	‹t›	ˈlita ‘to trust’	[tː]	‹tt›	ˈpotta ‘potty’
	‹tt›	aˈttack ‘id.’		‹t›	shot ‘id.’; Kamˈtjatka (WBP) (name)
[p]	‹p›	ˈlipa ‘to weep’	[pː]	‹pp›	ˈloppa ‘flea’
	‹pp›	aˈpplåd ‘applause’		‹p›	ˈtapto (WBP) ‘tattoo (mil.)’
[k]	‹k›	klart ‘done’	[kː]	‹ck›	ˈhicka ‘to hiccup’
	‹c›	ˈcowboy, caˈfé		‹ch›	och ‘and’, mach ‘id.’; Koch (name)
	‹ck›	aˈckord ‘chord’		‹k›	vikt (WBP) ‘weight’
[d]	‹d›	ˈluden ‘hairy’	[dː]	‹dd›	ˈpudding ‘id.’
	‹dd›	addiˈtion ‘id.’		‹d›	Triniˈdad (name)
[b]	‹b›	bunt ‘batch’	[bː]	‹bb›	ˈklubba ‘lollipop’
	‹bb›	tabbeˈras ‘party’		‹b›	keˈbab ‘id.’
[g]	‹g›	ˈgroda ‘frog’	[gː]	‹gg›	tagg ‘thorn’
	‹gg›	aggreˈssion ‘id.’		‹g›	bygd (WBP) ‘district’

This looks less systematic than it is, as only examples are given here, not frequencies. The basic correspondence between short sound and single graph, and (distinctively) long sound and double graph stands very firm. It is just that there are exceptions in both directions, for each and every sound/graph.

(p.51) 3.2 Nasals

The distributions of the coronal and the labial nasals are parallel, while the dorsal nasal exhibits some characteristic peculiarities. Length in the long nasals restrict their distribution to the position right after a stressed short vowel, since that is where a mora can legitimately occur. Stressed syllables must be bimoraic, neither more nor less, while unstressed syllables cannot ever be more than monomoraic. Hence, the only permitted position where a long consonant can show up is postvocalically in a stressed syllable. The sources for length may vary, see (169).

3.2.1 */n, nᵘ/ [n̪] [n] [n̪ː] [nː] [ŋ] [m] [ɱ] [ɲ] [~] ([ɳ]) ‹n›*

The coronal nasal [n] is subject to retroflexion and to nasal assimilation (see 4.1 and 4.4). This separates /n/ from the other nasals in a characteristic manner, which suggests that it is phonologically relatively unmarked. The main allophone is [n̪] used before coronals (except /r/), vowels, and in final position. Other allophones are used before dorsals ([ŋ]), labials and labiodentals ([m], [ɱ]), and palatals ([ɲ]). Before the fricatives /s/ and /ʂ/, /n/ may be realized as nasalization on the preceding vowel. In the case of [ɧ] (an allophone of /ʂ/) it may also be realized as [ŋ], depending in part on the articulation of the fricative (see 4.4.2).

The allophone [ɳ] occurs as the output of the retroflexion rule (see 4.1), either as the output of /r+n/ coalescence or spreading from a following retroflex (*svartna* /svɑrt-nɑ$_2$/ [^{2}'svaʈːɳa] ‘to blacken’).

3.2.2 */m, mᵘ/ [m] [mː] [ɱ] ‹m›*

The labial nasal [m] mostly has the bilabial pronunciation, and the two main allophones are the short and long ones. In the position before the labiodental fricatives /f, v/ there is a labiodental allophone [ɱ], e.g. *fem fingrar* /fɛmᵘ fiŋr-ɑr$_2$/ ['fɛ̝ɱː^2'fɪŋːrar] ‘five fingers’. Besides constituting a phoneme, the labial nasal is also the output of nasal assimilation of /n/ to a labial or labiodental.

3.2.3 */ŋ, ŋᵘ/ [ŋ] [ŋː] [ŋg] ‹ng, n, g›*

In Swedish, the dorsal nasal is both a phoneme and the result of nasal assimilation of /n/ (Garlén 1984: 35). In much of the generative tradition of phonological analysis, the [ŋ] of the Germanic languages has been analysed as derived exclusively by assimilation and under the assumption that there is regular deletion of postnasal /g/, (hence /ng/ > [ŋg] > [ŋː]). The type of arguments that would support the derived analysis is alternations between [ŋ] and [ŋg] in the same paradigm, and the quantity of [ŋ], which triggers much the same behaviour as consonant clusters. Borowsky (1993) and Wiese (1996) analyse English and **(p.52)** German [ŋ] as underlyingly /ŋg/, whereas Kristoffersen (2000) takes Norwegian /ŋ/ to be underlying. The main reason is that the alternations between [ŋ] and [ŋg] are few in Norwegian. Where they do occur, Kristoffersen (2000: 39f.) proposes to analyse them as allomorphic. For a general evaluation of the two approaches in earlier generative studies, see Smith (1982).

For Swedish we will take a similar standpoint as Garlén (1984) and Kristoffersen (2000). However, we will also introduce a rule of g-excrescence (see 4.5) which derives [ŋg] from underlying /ŋ/ in foot-initial position.

In stressed syllables, where the whole syllable belongs to the same morpheme, /ŋ/ is always preceded by a short vowel, and is then always phonetically long. The quantitative conditions of Swedish require stressed syllables to be heavy (Vː or VCː), and in the case of /ŋ/ only one of the alternatives is available. Therefore, /ŋ/ could be considered inherently long, i.e. underlyingly moraic. However, there are two contexts that challenge this view. Unstressed syllables in Swedish are invariably light and /ŋ/ can occur in unstressed syllables (*niding* /nid-iŋ$_2$/ [^{2} ˈniːdɪŋ] ‘vandal’, *vandringen* /vɑndr-iŋ$_2$-n/ [^{2}ˈvanːdrɪŋɛn] ‘the hike’). Also, in polymorphemic forms, a derived [ŋ] (from /n/ by nasal assimilation) may occur after a long vowel (*bangård* /bɑn+gord/ [^{2}ˈbɑːŋˌgoːɖ] ‘railway yard’). Both these cases make it clear that any assumption of inherent length for /ŋ/ (or derived [ŋ]) must be separated from its potential contribution to syllable weight.

The obligatory length of [ŋː] in stressed syllables has sometimes been taken to mean that it is really two segments, /ng/, that assimilate (in two steps: /ng/ > [ŋg] > [ŋŋ]) into [ŋː] (Sigurd 1970: 490; Linell et al. 1971: 95). Such an analysis is rather abstract, and leaves unexplained not only why it may occur in light syllables, but also why [ŋː] (e.g. *finger*) and [ŋːg] (e.g. *tango*) both occur on the surface, without any addition of an extra /g/ in the latter case (see 4.5).

3.2.4 Distribution of /ŋ, ŋ$^{\mu}$/

The dorsal nasal can occur both as coda and onset. However, as onset it is always ambisyllabic, leading into an unstressed syllable.[2] Thus, the dorsal nasal can never occur in word-initial position. In cases where stress occurs on a syllable following /ŋ/, g-excrescence (4.5) takes place.

(p.53) (32) Distribution of /ŋ/

coda	lång /loŋᵘ/ ['lɔŋː] ‘long’, Bengt /bɛŋt/ ['bɛ̯ŋːt] (name), Kongo / koŋgu/ [^{1}'kɔŋːgʊ] (name)
coda-onset	hunger /hʉŋᵘr/ [^{1}'hɵŋːɛ̯r] ‘id.’, lingon /liŋᵘ-on$_2$/ [^{2}'lɪŋːɔn] ‘lingonberry’, langa /lɑŋᵘ-ɑ$_2$/ [^{2}'laŋːa] ‘to peddle’
cf.	diftong /diftoŋᵘ/ [dɪf'tɔŋː] ‘diphthong’; diftongera / diftoŋᵘ-er-ɑ$_2$/ [dɪftɔŋ^{1}'geːra] ‘to diphthongize’

It is rather difficult to find good examples of intervocalic [ŋ] in prestress position. Putative candidates spelled with ‹ng› are pronounced [ŋg], for example *longitud* [lɔŋgɪ'tʉːd] ‘longitude’, *orangutang* [ʊraŋgʉ'taŋː] ‘orang-utan’. These cases are best analysed as bisegmental, i.e. as underlying /ng/ or /ŋg/, as they contrast marginally with rule-induced [ŋ] in the position before a stressed syllable. This can be seen in formations with the derivational suffix *-eri*, which occasions stress shift to the right, admitting [ŋ] between prestress syllables: *kränga* /krɛŋᵘ-ɑ$_2$/ [^{2}'krɛ̯ŋːa] ‘to sell (sl.)’, *krängeri* /krɛŋᵘ-eri/ [$_{0}$krɛ̯ŋɛ̯'riː] ‘(repeated) selling’, *lagvrängare* /lɑg+vrɛŋᵘ-ɑre$_2$/ ['lɑːgˌvrɛ̯ŋːarɛ̯] ‘law bender, lawyer’; *lagvrängeri* /lɑg+vrɛŋᵘ-eri/ ['lɑːg$_{0}$vrɛ̯ŋɛ̯ˌriː] ‘law bending’ (see (197)).

The occurrence of /ŋ/ within morphemes is further constrained with regard to a following consonant, which generally is either dorsal or coronal (Garlén 1984: 36).

(33) Permitted consonants following /ŋ/

dorsal	/k/	bank [baŋːk] ‘id.’, tanka [^{2}'taŋːka] ‘to fill up with petrol’
	/g/	tango [^{1}'taŋːgʊ] ‘id.’, manga [^{2}'maŋːga] ‘id.’
coronal	/t/	längta [^{2}'lɛ̯ŋːta] ‘to long’, strongt [strɔŋːt] ‘strong’
	/d/	mängd [mɛ̯ŋːd] ‘amount’, tyngda [^{2}'tʏŋːda] ‘burdened’
	/n/	vagn [vaŋːn] ‘carriage’, agna [^{2}'aŋːna] ‘to bait’
	/l/	mangla [^{2}'maŋːla] ‘to mangle’, krångla [^{2}'krɔŋːla] ‘to make a fuss’
	/r/	hungra [^{2}'hɵŋːra] ‘to hunger’, ångra [^{2}'ɔŋːra] ‘to regret’

The forms with a following /l/ or /r/ necessarily precede another vowel, for phonotactic reasons. The permissible, morpheme-internal contexts for /ŋ/ can be expanded by taking into account the pattern of idiolectally-based alternation between /n/ and /ŋ/ in the position before /ʂ/ and /s/ in French loanwords.

(34) Alternation of /n/ and /ŋ/ in French loanwords

dorsal	/ʂ/	tranchera [tran[1]ˈɧeːra] or [traŋ[1]ˈɧeːra] ‘to slice (meat)’, revansch
		[rɛ̟ˈvanːʂ] or [rɛ̟ˈvaŋːʂ] ‘revenge’[3]
coronal	/t/	intressant [ɪntrɛ̟ˈsanːt] or [ɪntrɛ̟ˈsaŋːt] ‘interesting’, briljant [brɪlˈjanːt] or [brɪlˈjaŋːt] ‘brilliant’
	/s/	nyans [nʏˈanːs] or [nʏˈaŋːs] ‘nuance’, annons [aˈnɔnːs] or [aˈnɔŋːs] ‘advertisement’, chansa [[2]ˈɧanːsa] or [[2]ˈɧaŋːsa] (also [[2]ˈɕaŋːsa]) ‘to take a chance’

(p.54)

These alternations occur in forms containing the vowel /ɑ/ and for /s/, a few cases of /o/. In the position before labials, /ŋ/ is highly restricted, a [g] typically being inserted (but not obligatorily so). The variation would seem to be idiolectal in distribution but should be more fully investigated.

(35) /ŋ/ before labial

labial	/b/	sangban [[1]ˈsaŋːban] (kind of dundun drum)
labiodental	/v/	lingvist [lɪŋˈvɪsːt] (or [lɪŋgˈvɪsːt]) ‘linguist’, pingvin [pɪŋˈviːn] (or [pɪŋgˈvɪːn]) ‘penguin’, sangvinisk [saŋˈviːnɪsk] (or [saŋgˈviːnɪsk]) ‘sanguine’

The presence of [g] could possibly be taken to follow from *g*-excrescence (see 4.5), besides being analysed as underlying.

3.2.5 Orthography of nasals

The spelling of /n/ and /m/ is straightforward and parallel to the other stops. There are exceptional spellings in borrowed forms and also due to orthographic rules.

(36) Phonographematics of nasals

[n]	‹n›	'fnysa ‘to frown’	[nː]	‹nn›	penna ‘pen’
	‹nn›	annek'tera ‘to annex’		‹n›	vän ‘friend’, kan ‘can’ (word-final)
[m]	‹m›	mat ‘food’	[mː]	‹mm›	'timme ‘hour’
	‹mm›	am'moniak ‘ammonia’		‹m›	bom ‘bar’, dum ‘stupid’ (word-final)
[ŋ]	‹ng›	ping'vin ‘penguin’	[ŋː]	‹ng›	'tunga ‘tongue’
	‹g›	mag'net ‘id.’		‹g›	lugn ‘calm’ (position before ‹n›)

Several spellings correspond to [ŋ]. The most common spelling is the digraph ‹ng› as in *finger* ['fɪŋːɛ̯r] ‘id.’ and *falang* [fa'laŋː] ‘wing, faction’. Where the pronunciation is [ŋg], that is, under g-excrescence (*falangist* [falaŋ'gɪsːt] ‘factionist’, 4.5), or by virtue of an underlying sequence /ŋg/ (*tango* [^{1}'taŋːgʊ] ‘id.’), spelling is ‹ng›, too. The spelling ‹n› refers to the cases where nasal assimilation applies to /n/ before dorsal consonants, e.g. *kan gå* [kaŋː'go] ‘can go’, see 4.4. Finally, there is a set of words where the dorsal nasal is spelled ‹g›, namely in position before ‹n› (which is also pronounced as [n]). Some cases are given in (37).

(p.55) (37) ‹gn› pronounced [ŋːn] or [ŋn] following a short stressed or unstressed vowel

> dygn [dʏŋːn] ‘day’, gagn [gaŋːn] ‘use’, ägna [^{2}'ɛ̯ŋːna] ‘to devote’, lugn [løŋːn] ‘calm’, lugna [^{2}'løŋːna] ‘to calm’, regn [rɛ̯ŋːn] ‘rain’, regna [^{2}'rɛ̯ŋːna] ‘to rain’, ugn [ʊŋːn] ‘oven’, vagn [vaŋːn] ‘wagon’ magnet [maŋ'neːt] ‘id.’, magnesium [maŋ^{1}'neːsɪʊm] ‘id.’, magnolia [maŋ^{1}'nuːlɪa] ‘id.’, magnifik [maŋnɪ'fiːk] ‘magnificent’, magnitud [maŋnɪ'tʉːd] ‘magnitude’

Not all spellings ‹gn› are pronounced this way. For a discussion of the ramifications, see the discussion of the regressive spreading of nasality in 4.12.3.

3.3 Fricatives

There are seven fricative phonemes: /f/, /v/, /s/, /ɕ/, /j̡/, /ʂ/, and /h/. This amounts to some richness, especially with regard to the fricatives in the alveolar/palatal region, where there are three phonemes /ɕ/, /ʂ/, and /j̡/, and some interesting allophony. The allophones of /ʂ/, that is, mainly [ʂ] and [ɧ], are produced both in front of [ɕ] (i.e. [ʂ]), and behind it (i.e. [ɧ], [x]), in the sagittal plane. Furthermore, there is neutralization of /ʂ/ and the output of the retroflexion rule applying on /r+s/, as [ʂ]. We discuss these things exhaustively in 3.3.5 and 4.1. The voiced fricatives are few (/v/, /j̡/), and, unlike English and German, there is no /z/ in the system, and there are no affricates in the standard variety.[4] Pronunciation varies between fricative and approximant for some of these phonemes, primarily /j̡/ and /v/ (Lindblad 1998: 139) and they are treated together here. We use the symbol /j̡/ for the phoneme, to mark that it is basically a fricative. The pronunciation is however typically [j] and that will mostly be used in phonetic transcription.

3.3.1 */f, fʷ/ [f] [fː] ‹f, ph› /v, vʷ/ [ʋ] [ʋː] [ʏ] ‹v, w›*

There are two labiodental fricatives, spread glottis /f/ and voiced /v/, where the latter may also be categorized as approximant. The difference between them is one of aspiration/voicing just as with the oral stops. There is no significant allophony of /f/, beyond the length distinction which occurs with nearly all consonants. In our account this difference is distinctive for consonants in certain positions, but allophonic for vowels.

(p.56) The phoneme /v/ is nearly always realized as short. The long variant occurs only in a handful of forms, e.g. the native *stövel* /støvl/ or /støv-el$_2$/ [^{1}ˈstœvːɛ̯l] or [^{2}ˈstœvːɛ̯l] ‘boot’ (which alternates with less common [^{1}ˈstøːvɛ̯l]), borrowings like *bowling* /bovliŋ/ [^{1}ˈbɔvːlɪŋ] ‘id.’ and *Labov* /lɑbovᵘ/ [laɑˈbɔvː], and the onomatopoeic *vov* /vuvᵘ/ [vʊvː] ‘bow-wow’ and *vovve* /vuvᵘ-e$_2$/ [^{2}ˈvʊvːɛ̯] ‘doggie’. The long consonant only occurs directly following a short stressed vowel.

There is also a devoiced allophone [v̥], which occurs next to voiceless segments. The devoicing is not sufficiently strong to cause neutralization with [f], though this is likely to vary idiolectally in some of the forms. The clearest cases where the devoiced [v̥] is in contrast with [f] are given in (38). The rareness of long [vː] and phonotactic restrictions limit the environments for contrast.

(38) Devoicing of /v/

ulvs	/ʉlv-s/	[ɵlːʏs]	‘wolf, gen.’	Ulfs	/ʉlf-s/	[ɵlːfs]	‘Ulf, gen.’
uvs	/ʉv-s/	[ʉːʏs]	‘eagle owl, gen.’	kufs	/kʉf-s/	[kʉːfs]	‘odd customer, gen.’
ljuvt	/ʝʉv-t/	[ʝʉːʏt]	‘delightful, neut.’	–			
svär	/svɛr/	[sʏæːr]	‘swear, imp.’	sfär	/sfɛr/	[sfæːr]	‘sphere’
tvinga	/tviŋᵘ-α$_2$/	[^{2}'tʏɪŋːa]	‘to force’	–			
kväsa	/kvɛs-α$_2$/	[^{2}'kʏɛːsa]	‘to humble’	–			

There are a few forms where a normally long vowel has shortened before a genitive /s/, yielding fossilized alternations (see discussion in 8.4.4). Where [v] participates, it appears to come out as an [fː], rather than a long [ɣ̥ː], after the shortened vowel. This indicates that there is no *long* devoiced allophone of /vː/ which is not also [spread glottis].

(39) Vowel length alternation with middle and old genitive *-s*

riva [^{2}'riːva] 'to scratch'	rivs [riːɣ̥s] (passive)	rivs [rɪfːs] (middle)	
hav [hɑːv] 'sea'	havs [hɑːɣ̥s] (genitive)	havs [hafːs] (old genitive)	cf. hafs [hafːs] 'slovenliness'
liv [liːv] 'life'	livs [liːɣ̥s] (genitive)	livs [lɪfːs] (old genitive)	cf. biffs [bɪfːs] 'steak (genitive)'

The pattern seen in (38) and (39) might provide a reason for the double specifications that seemed necessary to understand the aspiration and voicing patterns in the stops. With specifications of both [voice] and [spread glottis], the prediction is that both could be active in the phonology. In the light of this, the remaining contrast between [ɣ̥] and [f] could be interpreted as loss of [voice] on the part of /v/, but no assimilation of [s.g.] from the following aspirated segment. The constraint would then target the sequencing of voiced and aspirated segments **(p.57)** (say *[voice][s.g.]), where the faithfulness towards [voice] would be lower ranked than that of [s.g.]. If the voiced segment is outside of the moraic positions, then the remedy is to lose [voice]. If the voiced segment is in the moraic position (hence phonetically long), then spreading of [s.g.] takes place. An analysis in this spirit (but under slightly different assumptions) is given in Round (2007: 28). Voicing and spread glottis assimilation is further discussed in 4.9.

The distribution of /v/ in syllable onsets suggests that it varies between an approximant/glide and a fricative, giving rise to alternative categorizations (Garlén 1984: 39; Round 2007). Round notes that voiced and voiceless obstruents do not occur in sequence in simple words, if the voiceless segment precedes the voiced one. The systematic, ostensible exception to this generalization involves /v/, i.e. *tvär* /tvɛr/ [tʏæːr] ‘steep; sharp’, *kvinna* /kvinᵘ-α$_2$/ [^{2}'kʏɪnːa] ‘woman’, *skvadron* /skvɑdrun/ [skʏa'druːn] ‘squadron’, *svin* /svin/ [sʏiːn] ‘pig’ (*dvärg* /dvɛrj̩/ [dværːj] ‘dwarf’ would be within the rule). If /v/ in these cases could be understood as a glide rather than as an obstruent (fricative), then the generalization would hold. Looking at the other parallel clusters there is some support for this. For instance, in triconsonantal onset clusters, the initial consonant is invariably /s/, the second is one of the set /p, t, k/, and the last consonant is one of the set /j̩, v, l, r/: *spjuver* /spj̩ʉvr/ [spj̩ʉːvɛr] ‘rogue’, *skvätta* /skvɛtᵘ-α$_2$/ [^{2}'skʏɛ̝tːa] ‘to splash’, *splittra* /splitᵘr-α$_2$/ [spl̩ɪtːra] ‘to splinter’, *strut* /strʉt/ [str̩ʉːt] ‘cone’. Thus, /v/ and /j̩/ here form a natural class with the liquids /l, r/, i.e. as approximants. In other clusters, /v/ precedes liquids, primarily /r/ but marginally also /l/ in borrowed forms: *vrak* /vrɑk/ [vrɑːk] ‘wreck’, *vrist* /vrist/ [vrɪsːt] ‘ankle’, *Vladic* /vlɑditɕ/ [^{1}'vlaːdɪtɕ]. In these forms, /v/ must rather be an obstruent, i.e. classified as a fricative. In that position /v/ forms a natural class with the other obstruents, and in contrast with the other approximants. There is no study of phonetic differences in pronunciation in the two conditions that correlate with this distribution, but the distribution as such is striking (see 3.5).[5]

The spelling of /f/ is nearly universally ‹f›. The spelling with ‹ph› is limited to borrowed names, e.g. ‹Philip, Joseph, Stephan, Phaidon›.

The spelling of /v/ is normally ‹v›, but one finds also ‹w› in many names —‹Wennergren, Willy, William, Wanne, Wanås, Würth›. The rare cases of long /v/ are not represented in orthography, the exception being child language ‹vovve› ‘doggie’.

3.3.2 */s, sᵘ/ [s] [sː] ‹s, c, sc, t›*

There are three sibilant phonemes in Swedish, /s/, /ʂ/, and /ɕ/. The phoneme /ʂ/ has rather varied allophony in most Central Swedish speakers’ pronunciation, **(p.58)** beside [ʂ], the non-sibilant [ʃ̞], and [x]. In some speakers’ pronunciation, all realizations of /ʂ/ are [ʂ].[6] The phoneme /s/ is either an apicodental, whereby the friction is created by a lifted apex close to the upper teeth, or a predorsoalveolar, whereby the friction is made between the corona and the alveolar ridge. The sounds are auditorily very similar and represented by the same IPA symbol [s].

The main orthographic sign is ‹s›. In the position before ‹e, i, y› the grapheme ‹c› also represents [s], e.g. ‹cell› [sɛ̝̈lː] ‘id.’, ‹cirkel› [^{2}'sɪrːkɛ̝̈l] ‘circle’, ‹cykel› [^{1}'sʏkːɛ̝̈l] ‘bicycle’. Another couple of spellings occur in scattered forms, e.g. ‹scen› [seːn] ‘scene’, ‹potential› [pʊtɛ̝̈nsɪ'ɑːl] ‘id.’

3.3.3 */ɕ/ [ɕ] [ç] ‹k, kj, tj, c›*

The phoneme /ɕ/ is a sibilant fricative, the other sibilants being /s/ and /ʂ/. There is very little allophony of /ɕ/ within any one idiolect. The pronunciation of [ɕ] is usually characterized as alveolo-palatal in the IPA chart and as predorsoalveolar in Swedish phonetic literature, like /s/, but with a larger front cavity (Lindblad 1980: 65). This sound is very close to English [ʃ]. The recently borrowed exclamative *shit!* is typically pronounced as [ɕɪtː], homophonic to *kitt* /ɕitᵘ/ ‘putty’. In cognate forms between the languages, the usual match is otherwise English /ʃ/ to Swedish /ʂ/ (variably pronounced as [ʂ], [ʃ], or even [x]), where both languages have developed fricatives: *skjuta* /ʂʉt-ɑ$_2$/ [^{2}ˈʂʉːta], [^{2}ˈʃʉːta] ‘to shoot’, *skina* /ʂin-ɑ$_2$/ [^{2}ˈʂiːna], [^{2}ˈʃiːna] ‘to shine’, etc.

In Central Swedish there is also a non-coronal pronunciation [ç], which is dorsoalveolar. Impressionistically, this pronunciation is associated with an older generation of speakers (e.g. that of Ingmar Bergman). In some varieties, notably older Central Swedish and in present-day Finland-Swedish, the main allophone is an affricate [tɕ].[7] The change from [tɕ] to [ɕ] in Central Swedish is no more than a couple of generations old. The phoneme /ɕ/ is limited to morpheme-initial position, most often as onset of a stressed syllable, and it does not normally combine with any other consonant (Sigurd 1970: 482).[8] As a consequence of this, there is no long allophone, caused by weight by position (see 8.4.3), as that would minimally require occurrence in coda position.

(p.59) The sound /ɕ/ is spelled in three main ways that reflect the historical sources for the present-day phoneme, where *j*-insertion and palatalization, as well as cluster simplification, are part of the historical reconstruction (see Ralph 1977, who discusses the full set of alleged palatalizations).

(40) Spellings and distributions

‹k›	kikare /ɕik-ɑre$_2$/ [^{2}ˈɕiːkarɛ̟] ‘binoculars’, kök /ɕøk/ [ɕøːk] ‘kitchen’, kinuski /ɕinʉski/ [ɕɪ^{1}ˈnʊsːkɪ] ‘caramel sauce’
‹kj›	kjol /ɕul/ [ɕuːl] ‘skirt’, kjusa /ɕʉs-ɑ$_2$/ [^{2}ˈɕʉːsa] ‘small, narrow valley’ (few)
‹tj›	tjock /ɕokᵘ/ [ɕɔkː] ‘fat’, tjata /ɕɑt-ɑ$_2$/ [^{2}ˈɕɑːta] ‘to nag’, tjenixen /ɕeniks-en/ [ɕɛ̟^{1}ˈnɪkːsɛ̟n] ‘bye (hypocoristic)’
‹c›	cembalo /ɕɛmbɑl-o/ [^{1}ˈɕɛ̟mːbalɔ], [^{1}ˈɕɛ̟mːbalʊ] ‘harpsichord’

The phonemes /ɕ/ and /ʝ/ would seem to form a natural class in the phonological description of Swedish, as the voiceless and voiced variants of the same place of articulation. At the same time, this is probably a simplification in the interest of symmetry. The major differences in their phonetic characterization involve the fact that /ɕ/ is a sibilant fricative, while /ʝ/ is a palatal fricative or approximant. Due to the difference in voicing there is a natural difference of airflow, but the place of constriction also differs, where [ɕ] is more front and coronal, and [j] is dorsal. Nevertheless, the historical development mentioned is a natural one and we try to retain them as a class in the phonological description.

There is no context of neutralization between /ɕ/ and /ʝ/, unlike the case with /f/ and /v/, where /v/ neutralizes with /f/ in the position between a short stressed vowel and a following /s/. The phonemes /f/ and /v/ also exhibit their joint membership in the same natural class by triggering the labiodental allophone [ɱ] in a preceding /n/. The phonemes /ɕ/ and /ʝ/ might exhibit parallel behaviour here, in that they would seem to trigger the same allophony in a preceding /n/, i.e. *en kjol* /en ɕul/ [ɛn̟'ɕuːl], [ɛn̟'ɕuːl], or [ɛ̃'ɕuːl] ‘a skirt’ and *en joule* /en ʝul/ [ɛɲ 'juːl], [ɛn'juːl], or [ɛ̃'juːl] ‘one joule’.

3.3.4 */ʝ, ʝʷ/ [j] [jː] [ʝ] [ʝ] [ʝ]* ‹*j, g, y, i*›

The phoneme /ʝ/ is a palatal approximant [j] or a palatal fricative [ʝ]. Both occur in idiolectal variation in onset position. Factors that seem to have a positive influence on frication are stress, initial position, and vowel height. When non-initial, it also seems to matter if the /ʝ/ is preceded by a vowel or a consonant, a consonant typically inhibiting frication somewhat. In (41), the upper left represents relatively favourable contexts for frication (among those who have it in their idiolect), while the bottom right is unfavourable. The phonetic symbols in (41) give an indication of the tendencies.

(p.60) (41) Fricative [ʝ] and approximant [j]—some tendencies in onset position

		Initial	Non-initial	
stressed, high	[ʝ]	jubel [[1]ˈʝʉːbɛ̟l] ‘rejoicing’	bejublad [bɛ̟[1]ˈjʉːblad] ‘acclaimed’	[j]
		gissa [[2]ˈʝɪsːa] ‘to guess’	androgyn [andrɔˈjyːn] ‘androgynous’	
stressed, low		jaga [ˈʝɑːga] ‘to hunt’	bejaka [bɛ̟[1]ˈjɑːka] ‘to accept’	
		gärna [[2]ˈʝæːɳa] ‘gladly’	pekuniär [pɛ̟kʉnˈjæːr] ‘pecuniary’	
unstressed, high		jubileum [jʉbi[1]ˈleːʊm] ‘jubilee’	lejoninna [lɛ̟jɔ[2]ˈnɪnːa] ‘lioness’	
		gigant [jɪˈganːt] ‘giant’	pyjamas [pʏ[1]ˈjɑːmas] ‘id.’	
unstressed, low		jakobin [jakʊˈbiːn] ‘Jacobin’	pajaseri [pajasɛ̟ˈriː] ‘buffoonery’	
	[j]	djävulusisk [jævʊ[1] ˈlʉːsɪsk] ‘devilish’	bollgehör [[2]ˈbɔlːjɛ̟ˌhœːr] ‘(perfect) ball pitch’	[j]

Intervocalically and in coda position after a short stressed vowel, /ɻ/ is always long and pronounced chiefly as the voiced approximant: *skoja* /skojᵘ-ɑ$_2$/ [^{2}ˈskɔjːa] ‘to joke’, *tjej* /ɕejᵘ/ [ɕɛ̟jː] ‘girl’. If there is frication it occurs only just at the very end of the segment (before a following vowel).

Spelling of this sound is mostly rendered as ‹j› or ‹g›, the latter only in position before a sign representing a front vowel. Spellings with ‹y› are rare and only occur in borrowings (e.g. ‹yoga› /ɻog-ɑ$_2$/ [^{1}ˈjoːga] ‘id.’, ‹yacht› /ɻotᵘ/ [jɔtː] ‘id.’). Spellings with ‹i› may alternate between syllabic [ɪ] and nonsyllabic [j], e.g. ‹piano› /piɑn-u/ [pɪ.^{1}ˈɑː.nʊ], [^{1}ˈpjɑː.nʊ] ‘id.’, ‹premiär› /premiɛr/ [pr̟ɛ̟.mɪ.ˈæːr], [pr̟ɛ̟m.ˈjæːr] ‘opening night’.

3.3.5 */ʂ, ʂᵘ/ [ʂ] [ʃ] [ɦ~ɦʲ~ɦʲʷ] [ɦˣ~x] [ʂː] [ʃː] ‹sj, sk, skj, stj, stg, ssj, sch, sh, shi, sc, ch, che, si, ssi, sti, ti, ti (=[tɦ]), xi* and *xj (=[kɦ]), g, j, ge, gi, ige, je›*

This phoneme exhibits several allophones, both across dialects and within idiolects. Some of this variation is conditioned by phonological distribution, where the pre- and postvocalic positions are the main parameters. The phoneme is also often usurped for sociolinguistic purposes, where the more front realizations tend to carry more prestige than the more back realizations (Lindblad 1978).

(p.61) There are two main types of allophone, the front, prepalatal, retroflex [ʂ], and the back, postpalatal or velar [ɧ]. Garlén calls these ‘light’ and ‘dark’, respectively, which are handy terms that we shall adopt.

The light allophone [ʂ] allegedly occurs in variation with non-retroflex [ʃ] for some speakers (Garlén 1984: 71f.).[9] The use of the allophone [ʂ] means that speakers have neutralization between the output of the retroflexion rule (see 4.1) and the regular pronunciation of the /ʂ/ phoneme. For speakers of Central Swedish, then, *kurs* /kʉrs/ [kʊ̟ʂː] ‘course’ and *dusch* /dʉʂᵘ/ [dʊ̟ʂː] ‘shower’ rhyme perfectly. It remains to be investigated if there is any systematicity to the [ʂ]~[ʃ] alternation in the speakers who have both, and to what extent there are varieties where there is a consistent contrast, postvocalically, between [ʂ] and [ʃ] or some variant of [ɧ].

The dark allophone [ɧ] is a dorsovelar or dorsopostpalatal fricative, typically with a concomitant labiodental constriction [ɧ^{f}], which is accompanied by lip rounding (i.e. strictly speaking [ɧ^{fw}]).[10] The degree of labiality would seem to be an idiolectal feature, but some lip-rounding always occurs when there is a labiodental constriction. For those who have it, the labiodental constriction easily becomes the primary source of frication.[11] The primacy of the labiodental constriction does not warrant a concomitant change in the phonological representation or categorization. Speakers will most often have variable pronunciation of [ɧ] and, for example, alternate between velar or postpalatal and doubly constricted articulation. An exclusively (rounded) labiodental pronunciation has not been reported.[12] Rosenqvist (2007) and others use the symbol [ɧ^{f}] to explicitly mark the labiodental constriction.

In typical present-day Central Swedish pronunciation, speakers will have both light and dark pronunciations, where the regular distribution is to have [ʂ(ː)] (or sometimes [ʃ(ː)]) in postvocalic and intervocalic position, and (some variant of) [ɧ] in onsets, except in complex onsets, where [ʂ] is used (*Schweiz* [ʂvɛjːts] ‘Switzerland’, *schlager* [^{1}ˈʂlɑːgɛ̝r] ‘song hit’, *schnitzel* [^{2}ˈʂnɪtːsɛ̝l] ‘id.’, *Schmidt* [ʂmɪtː]). As a consequence, only the light pronunciations occur as both long and short in Central Swedish. This means that every speaker has [ʂ(ː)]/[ʃ(ː)] in the postvocalic and intervocalic position in stressed syllables: *gulasch* /gʉlɑʂᵘ/ [gʉˈlaʂː] ‘goulash’, *prestige* /prɛstiʂ/ [prɛ̝sˈtiːʂ] ‘id.’, *pascha* /pɑʂᵘ-ɑ$_{2}$/ [^{2}ˈpaʂːa] **(p.62)** ‘pasha’. The dark pronunciations [ɧ] (or [x], etc.) are hence never long in Central Swedish: *position* /pusiʂun/ [pʊsɪˈɧuːn] ‘id.’, *schalett* /ʂɑlɛtᵘ/ [ɧaˈlɛ̝tː] ‘kerchief’. Some speakers of Central Swedish use either of the light allophones also in onset position, regularly or variably. This is part of a former prestige pronunciation.

These distributional facts provide the grounds for making [ʂ] the main qualitative allophone. Everybody has it somewhere, and it is the only pronunciation that can be generalized to all positions in Central Swedish speech. The traditional assumption is however to set up [ɧ] (sometimes using another symbol) as the main allophone (Garlén 1984: 18; Engstrand 2004: 167; Elert 1997: 29).

In the broader perspective of Swedish dialects, there are three main types of allophonic distribution for the phoneme /ʂ/ (Garlén 1984: 71f.). The types have rough geographic correspondents, as indicated. Central Swedish exhibits mainly (42c), otherwise b (formerly the prestige pronunciation).

(42) Distribution types (after Garlén 1984: 71f.)

a. Only [ɧ], [x], i.e. dark realizations; Southern Swedish varieties

b. Only [ʂ], [ʃ] i.e. light realizations; Northern Swedish varieties (primarily coastal), certain types of Stockholm Swedish, Finland-Swedish
c. Both light and dark realizations of /ʂ/, often in complementary distribution: dark [ɧ], [x] occur before stressed vowels and in morpheme-initial position (*variation* /vɑriɑ-ʂun/ [varɪaˈɧuːn] ‘id.’, *skiva* /ʂiv-ɑ$_2$/ [^{2}ˈɧiːva] ‘record’); light [ʂ], [ʃ] in other positions, e.g. in morpheme-final position, after stressed vowels (*dusch* /dʉʂᵘ/ [dɵʂː] ‘shower’, *hyssja* /hyʂᵘ-ɑ$_2$/ [^{2}ˈhʏʂːa] ‘to hush’). This pattern is the rule in Central Swedish (except for some speakers in the Stockholm region, who abide by b).

There is a twist to the pattern in (42c), in that three forms appear to actually have [ɧ] in codas where they are derived by assimilation. The forms are *östgöte* /øst+ɻøt-e$_2$/ [ˈœɧːˌøːtɛ̟] (or [ˈœsːtɻøːtɛ̟]) ‘person from Östergötland’, *västgöte* /vɛst+ɻøt-e$_2$/ [^{2}ˈvɛ̟ɧːˌøːtɛ̟] (or [^{2}ˈvɛ̟sːtɻøːtɛ̟]) ‘person from Västergötland’, *gästgivargård* /jɛst+ɻiv-ɑr$_2$+gord/ [^{2}ˈjɛ̟ɧːˌɪvarˌgoːɖ] (or [^{2}ˈjɛ̟sːtɻiːvarˌgoːɖ]) ‘inn’. In comparable forms where /ʂ/ is intervocalic, pronunciation is [ʂ], e.g. *duscha* /dʉʂᵘ-ɑ$_2$/ [^{2}ˈdɵʂːa] ‘to shower’. In addition to this, the interjection *Usch!* /ʉʂᵘ/ ‘phew, ugh’ might get pronounced as [ɵɧː], contra the normal distribution and length conditions.

There is quite some variation relating to region, idiolect, and sociolinguistics. Lindblad (1978) is a study of this in northern Swedish varieties, where [ʂ] dominates but the dark variants occur, according to a classic sociolinguistic pattern. One and the same word may be given different variants by the same speaker. One tendency in the Stockholm region is to overuse [ʂ] in formal **(p.63)** contexts as this light pronunciation is still associated with prestige. In Lindblad (1980: 139ff.) a geographic overview of the variants is given, including the pronunciations in Finland, which constitute a fourth type. Leinonen (2004) makes a systematic comparison of /ʂ/, /ɕ/, and /s/ in Finland-Swedish and Sweden-Swedish, with some remarks on other languages, too. The distinction between /ʂ/ and /ɕ/ typically develops late in children, in Sweden as in Norway (Vanvik 1979). Tendencies for the two sounds to merge have been observed (Simonsen and Moen 2004; Akselberg 2005: 1713, and references given there).

3.3.6 Notes on the spelling of /ʂ/

The phoneme /ʂ/ has by far the highest number of different spellings, without competition. Garlén (1984: 161f.) provides a list of the large number of different spellings that all represent /ʂ/ in at least a few words. In the list below, the truly marginal spellings (the last seven), represented by fewer than three words, are given at the end of the list.

(43) Spellings and examples

ge	garage /gɑraɻ/ [gaˈrɑːɻ] ‘id.’, bagage /bɑgɑɻ/ [baˈgɑːɻ] ‘baggage’, prestige /prɛstiɻ/ [prɻsˈtiːɻ] ‘id.’
che	touche /tuɻᵘ/ [tʊɻː] ‘touch’, apache /ɑpɑɻᵘ/ [aˈpaɻː] ‘id.’
ch	chef /ʂef/ [ɧeːf] ‘boss’, chans /ʂɑns/ [ɧanːs], [ɧaŋːs] ‘chance’, attaché /ɑtɑʂe/ [ataˈɧeː] ‘id.’
g	generad /ʂɛner-ɑd$_2$/ [ɧɻ^{1}ˈneːrad] ‘embarrassed’, giraff /ʂirɑfᵘ/ [ɧɪˈrafː] ‘giraffe’
j	juste /ʂyst/ [ɧʏsːt] ‘alright’, jour /ʂur/ [ɧuːr] ‘(on) duty’, jetong /ʂɛtoŋᵘ/ [ɧɛˈtɔŋː] ‘jetton’
sc	crescendo /kreʂɛnd-u/ [kreɻ^{1}ˈɧɻnːdʊ] ‘id.’, fascist /fɑʂist/ [faˈɧɪsːt] ‘id.’
sch	schack /ʂɑkᵘ/ [ɧakː] ‘chess’, schottis /ʂotᵘis/ [^{1}ˈɧɔtːɪs] ‘Scottish (dance)’
sh	shah /ʂɑ/ [ɧaː] ‘id.’, shoppa /ʂopᵘ-ɑ$_2$/ [^{2}ˈɧɔpːa] ‘to shop’, shunt /ʂʉnt/ [ɧɵnːt] ‘id.’
si	kollision /koli-ʂun/ [kɔlɪˈɧuːn] ‘collision’, division /divi-ʂun/ [dɪvɪˈɧuːn] ‘id.’
sj	sjunka /ʂʉŋk-ɑ$_2$/ [^{2}ˈɧɵŋːka] ‘to sink’, sjö /ʂø/ [ɧøː] ‘lake’
sk	skiva /ʂiv-ɑ$_2$/ [^{2}ˈɧiːva] ‘record’, skön /ʂøn/ [ɧøːn] ‘comfortable’
skj	skjorta /ʂurt-ɑ$_2$/ [^{2}ˈɧʊʈːa] ‘shirt’, skjuts /ʂʉsᵘ/ [ɧɵsː] ‘ride’
ssi	passion /pɑ-ʂun/ [paˈɧuːn] ‘id.’, mission /mi-ʂun/ [mɪˈɧuːn] ‘id.’
ssj	hyssja /hyʂᵘ-ɑ$_2$/ [^{2}ˈhʏʂːa] ‘to hush’, ryssja /ryʂᵘ-ɑ$_2$/ [rʏʂːa] ‘fish trap’
sti	suggestion /sʉgɛ-ʂun/ [sɵgɻˈɧuːn] ‘id.’, kongestion /konɻɛ-ʂun/ [kɔnjɻˈɧuːn] ‘congestion’
stj	stjärna /ʂɛrn-ɑ$_2$/ [^{2}ˈɧæːɳa] ‘star’, stjäl /ʂɛl/ [ɧɛːl] ‘steal’
ti	position /posi-ʂun/ [pʊsɪˈɧuːn] ‘id.’, kreation /krea-ʂun/ [kreˌaˈɧuːn] ‘creation’
(t)i (=[tɧ])	motion /mot-ʂun/ [mɔtˈɧuːn] ‘exercise’, nation /nɑt-ʂun/ [natˈɧuːn] ‘id.’
gi	religiös /rɛliɻ-øs/ [rɻlɪˈɧøːs] ‘religious’
ige	beige /bɛʂ/ [bɛːʂ] ‘id.’
je	damejeanne /dɑmeʂɑn/ [damɻˈɧanː] ‘carboy’, Jeanette /ʂɑn-ɛtᵘ/ [ɧaˈnɻtː] (personal name)

shi	fashionabel /fɑʂun-ɑbel/ [faɧʊ^{1}'nɑːbɛ̟l] ‘fashionable’
stg	östgöte /øst+ˌjøt-e$_2$/ [^{2}'œɧːˌøːtɛ̟] ‘person from Östergötland’, västgöte /vɛst+ˌjøt-e$_2$/ [^{2}'vɛ̟ɧːˌøːtɛ̟] ‘person from Västergötland’, gästgivargård /ˌjɛst+ˌjiv-ɑr$_2$+gord/ [^{2}'jɛ̟ɧːˌɪvarˌgoːɖ] ‘inn’
xi (=[kɧ])	reflexion /rɛflɛk-ʂun/ [rɛ̟flɛ̟k'ɧuːn] ‘id.’, annexion /ɑnɛk-ʂun/ [anɛ̟k'ɧuːn] ‘annexation’
xj (=[kɧ])	Växjö /vɛkʲ+ʂø/ [^{2}'vɛ̟kːˌɧøː] (place name)

(p.64)

In addition to these spellings, there is the ‹rs› spelling for the same sound when produced as the output of retroflexion.

The many spellings in (43) are partly the result of borrowing from French and several historical sound changes that have fed into this state of affairs. No radical spelling reform in this area has been carried out. One can compare with Norwegian where this sound is mostly spelled with ‹sj› in French and Latinate loans, compare Swedish ‹chef, apache, garage, generad, jetong, shah, position, passion›, etc., with ‹sjef, apasje, garasje, sjenert, sjetong, sjah, posisjon, pasjon›, etc.

3.3.7 Distributional and morphophonemic patterns involving /ʂ/ and /ɕ/

The phonemes /ʂ/ and /ɕ/ enter into morphophonemic relations with other sounds or sequences of sounds. In (44) are most of the alternations, cited from Eliasson (1973: 203f.) who makes a general assessment of the synchronic situation and the consequences for phonemic analysis.

(44) Morphophonemic alternations

ʂ~s	sjung [ɧʉŋː], sjöng [ɧøŋː] ‘sing; sang’	sång [sɔŋː] ‘song’
	sjunk [ɧʉŋːk], sjönk [ɧøŋːk] ‘sink intr.; sank’	sänk [sɛ̟ŋːk] ‘sink tr.’
	sjätte [^{2}'ɧɛ̟tːɛ̟] ‘sixth’	sex [sɛ̟kːs] ‘six’
ʂ~st	stjäla [^{2}'ɧɛːla] ‘steal’	stal [stɑːl], stulit [^{2}'stʉːlɪt],
		stöld [stø̟lːd] ‘stole; stolen; theft’
ʂ~st+j	östgöte [^{2}'œɧːˌøːtɛ̟] ‘from Östergötland’	Östergötland [^{2}'øsːtɛ̟r ˌjøːtland] (name of region)

	västgöte [^{2}ˈvɛɧːˌøːtɛ̟] ‘from Västergötland’	Västergötland [^{2}ˈvɛ̟sːtɛ̟r ˌjøːtland] (name of region)
ʂ~sk	skämmas [^{2}ˈɧɛ̟mːas] ‘be ashamed’	skam [skamː] ‘shame’
	skälla [^{2}ˈɧɛ̟lːa] ‘to bark’	skall [skalː] ‘bark (n.)’
	skälva [^{2}ˈɧɛ̟lːva] ‘to shake’	skalv [skalːv] ‘quake’
	skär [ɧæːr] ‘cut’	skar [skɑːr] (pret.), skurit
		[^{2}ˈskʉːrɪt] (p.ptcp.), skåra
		[^{2}ˈskoːra] ‘groove’
	skärp [ɧærːp] ‘sharpen imp.’	skarp [skarːp] ‘sharp’
	skymma [^{2}ˈɧʏmːa] ‘to get dark’	skum [skɵmː] ‘obscure’
	skylla [^{2}ˈɧʏlːa] ‘to blame’,	skuld [skɵlːd] ‘guilt’
	skyldig [^{2}ˈɧʏlːdɪg] ‘guilty’	
	skyldra [^{2}ˈɧʏlːdra] ‘to present (arms)’	skuldra [^{2}ˈskɵlːdra] ‘shoulder’
	skjuta [^{2}ˈɧʉːta] ‘to shoot’, sköt [ɧøːt] (pret.), skytt [ɧʏtː] ‘shooter’	skott [skɔtː] ‘shot’
	människa [^{2}ˈmɛ̟nːɪɧa] ‘human being’	mänsklig [^{2}ˈmɛ̟nːsklɪg] ‘human’
ɕ~k	kyla [^{2}ˈɕyːla] ‘chill’, köld [ɕœlːd] ‘cold (n.)’	kall [kalː] ‘cold (adj.)’
	kämpa [^{2}ˈɕɛ̟mːpa] ‘to fight’, kämpe [^{2}ˈɕɛ̟mːpɛ̟] ‘fighter’	kamp [kamːp] ‘fight’
	kittla [^{2}ˈɕɪtːla] ‘to tickle’	killa [^{2}ˈkɪlːa] ‘tickle’
	kök [ɕøːk] ‘kitchen’, köksa [^{2} ˈɕø̟kːsa] ‘cook’	kock [kɔkː] ‘chef’, koka [^{2} ˈkuːka] ‘to cook’, dekokt [dɛ̟ ˈkɔkːt] ‘decoction’

(p.65)

The list of alternating forms is quite short, yet split into all of four different categories. The synchronic relations are due to the historical developments of lenition and assimilation.[13]

Early generative studies of the Swedish phonemic system tended to relate the forms in (44) and derive the output forms via a set of rules (Sigurd 1970; Teleman 1970; Allén 1971; Linell et al. 1971: 99ff. Hellberg 1972a.). The reason for this is the near-complementary distribution. The allophones [sk] and [k] occur before non-front vowels (*skola* ‘school’, *kula* ‘marble’), while [ɧ] and [ɕ] occur before front vowels (*skir* ‘airy, ethereal’, *kök* ‘kitchen’). Forms that do not fit into this general patterning can be explained as being due to palatalization before [j], e.g. *skjuta* /skjʉt-ɑ$_2$/ [^{2}'ɧʉ:ta] ‘to shoot’ and *kjol* /kjul/ [ɕu:l] ‘skirt’, where [j] must necessarily be deleted. But this type of analysis must also be extended to the numerous cases that do not alternate morphophonologically (e.g. *skön* [ɧø:n] ‘nice’, *skidor* [^{2}'ɧi:dʊr] ‘skis’, *kind* [ɕɪn:d] ‘cheek’, *kön* [ɕø:n] ‘sex, gender’). This creates unnecessary abstractness, as Eliasson (1973) shows. The latter type of forms are in the great majority—around 95% of all [ɧ]’s and [ɕ]’s do not alternate with another sound morphophonologically, by Eliasson’s count (1973: 204)—and the psychological reality of the alternations is highly questionable, and sloping into entirely opaque relations.[14]

There are also weaknesses in the alleged complementary distribution. Linell et al. (1971: 99) initially dismissed apparent contrasts because they relied on borrowings (*kilt* /kilt/ [kɪl:t] ‘id.’, *keps* /keps/ [kɛ̟p:s] ‘cap’, *kymrisk* /kymr-sk/ [^{1}'kʏm:rɪsk] ‘Welsh’), and slang (*kille* /kil$^{\mu}$-e$_2$/ [^{2}'kɪl:ɛ] ‘bloke’, *kis* /kis/ [ki:s] ‘guy’, *kymig* /kym-ig$_2$/ [^{2}'ky:mɪg] ‘nasty’). But this is a growing body of forms, many of which are clearly normalized and not obviously borrowed (*kick* ‘id.’, *kidnappare* ‘kidnapper’, *Kiruna* (city in northern Sweden), *skiss* /skis$^{\mu}$/ [skɪs:] ‘sketch’). We take all this to mean that we should not try to derive all instances of [ɧ] (or [ʂ]) and [ɕ] in the grammar, but rather set up separate phonemes.

As mentioned, there are tendencies in parts of Scandinavia for /ɕ/ and /ʂ/ to merge into one phoneme. Some words have established alternative pronunciation in the standard language (*chans* ['ɕaŋ:s], ['ɧaŋ:s] ‘chance’, *choke* ['ɕo:k], ['ɧo:k] ‘id.’, *match* [mat:ɕ], [mat:ʂ] ‘id.’). Others vary individually (e.g. *försöka* [fœ'ʂø:ka], [fœ'ɕø:ka] ‘to try’, and other stems beginning in /s/ that have the prefix *för-*). These things have been noted and discussed in blogs in Sweden, and researched in Norway (see Simonsen and Moen 2004, and references given in Akselberg 2005). The distinction between the two phonemes /ɕ/ and /ʂ/ is particularly vulnerable because it is relatively marked and acquired late.

3.3.8 */h/ [h] [ɦ] ‹h›*

The phoneme /h/ is a glottal approximant. Its distribution is largely limited to the initial position of prosodic words and of prosodic feet (i.e. stressed syllables). **(p.67)** Some examples are given in (45), where legitimate forms are seen to be either word-initial or onsets to stressed syllables (or both).

(45) [h] is admitted prosodic word- and foot-initially (a), prosodic word- but not foot-initially (b), foot- but not prosodic word-initially (c). Optionally [h] may surface between two unstressed vowels (d)[15]

a.

$([_{Ft}$'huckle$)_{\omega}$	[^{2}'hɵkːlɛ̟]	‘kerchief’
$([_{Ft}$'hemlig$)_{\omega}$	[^{2}'hɕ̟mːlɪg]	‘secret’
$([_{Ft}$'mä$)_{\omega}([_{Ft}$ˌhä$)_{\omega}$	[^{2}'mɛːˌhɛː]	‘milksop’

b.

(his$[_{Ft}$'toria$)_{\omega}$	[hɪs^{1}'tuːrɪa]	‘history’
(heral$[_{Ft}$'dik$)_{\omega}$	[hɛ̟ral'diːk]	‘heraldry’

c.

(ma$[_{Ft}$'hogny$)_{\omega}$	[ma^{1}'hɔŋːnʏ]	‘mahogany’
(Kanda$[_{Ft}$'har$)_{\omega}$	[kandaˈhɑːr]	(place name)

d.

(maha$[_{Ft}$'radja$)_{\omega}$	[ma(h)a^{2}'radːja]	‘maharaja’
(kohe$[_{Ft}$'rens$)_{\omega}$	[kʊ(h)ɛ̟'rɛ̟nːs]	‘coherence’

In voiced environments such as (45c, d), /h/ may be voiced, hence [ɦ] (Garlén 1984: 39; Engstrand 2004: 168). With the exception of (d), where the pronunciation of /h/ seems optional rather than prohibited, this distribution is by and large the same as in American English (Davis and Cho 2003, and references given there). Davis and Cho (2003) pursue an analysis where the distributional regularity is ‘initial in the foot’, where a fairly elaborate foot structure is assumed. For Swedish, there is no evidence for feet beyond the stressed syllable, and in a way the possible presence of /h/ in the second syllable (d) testifies to this. At this point, then, the formulation of the distribution will have to be broken up into a number of statements.

3.4 Liquids

There are two liquids in Central Swedish, /r/ and /l/.

3.4.1 */l, l ᵘ / [l] [lː] ‹l›*

The lateral phoneme /l/ has dental [l] as its main allophone, certainly in careful standard speech. At the same time, the traditional dialects of the area from which CSw emerges, however, have the flap [ɽ] (Sw *kakuminalt* [l] ‘cacuminal [l]’, **(p.68)** *l-med-slag* ‘l-with-a-flap’, Bruce 2010: 156) as an important allophone in some positions. This flap tends to occur in non-initial positions where the /l/ is short, hence in forms like *flitig* /flit-ig$_2$/ [^{2}'fɽi:tɪg] ‘diligent’, *ful* /fʉl/ [fʉ:ɽ] ‘ugly’, and *kela* /ɕel-ɑ$_2$/ [^{2}'ɕe:ɽa] ‘to pet’, but not in forms like *leta* /let-a$_2$/ [^{2}'le:ta] ‘to look for’, *full* /fʉl$^{\mu}$/ [fʊl:] ‘id.’, *guld* /gʉld/ [gʊl:d] ‘gold’ or *hälla* /hɛl$^{\mu}$-ɑ$_2$/ [^{2}'hɛ̧l:a] ‘to pour’. In these dialects, the [ɽ] participates in the retroflexion rule, alongside /r/. Thus, we find forms like *gult* /gʉl-t/ [gʉ:ʈ] ‘yellow, neut.’ rhyming with *surt* /sʉr-t/ [sʉ:ʈ] ‘sour, neut.’, where the standard has [gʉ:lt] and [sʉ:ʈ], respectively.

3.4.2 */r, r$^{\mu}$/ [r] [r:] [ʐ] ‹r›*

The /r/-phoneme is an apical trill [r] in Central Swedish. We characterize it phonologically as a retroflex coronal, where the retroflex property of the trill is taken to be central. The trill is pronounced in the alveolar region. The feature [retroflex] expresses the similarity between /r/ and /ʂ/, on the one hand, and the difference between /r/ and the other coronals /s, t, d, n, l/, with which /r/ merges in the retroflexion rule.

In some local varieties in the Stockholm area, an onset /r/ may be pronounced as an apical fricative or approximant [ʐ], i.e. *roligt* /ru-lig$_2$-t/ [^{2}'ʐu:lɪt] ‘fun’. In many South Swedish dialects, the /r/ is a uvular trill [ʀ] or a uvular fricative [ʁ].[16] There are also variants of Swedish, where /r/ is vocalized postvocalically much as in standard German, and where it is vocalized prevocalically (northeastern Småland and parts of Östergötland). In varieties of Finland-Swedish, /r/ is either very clearly an apical trill, or vocalized and rhotic postvocalically, featuring pronunciations like *barnen* /bɑrn-n/ [^{1}'bɑɻnɛn] ‘the kids’. The geographic distribution of the different pronunciations of /r/ are illustrated by maps in Torp (2007: 76, 144) and Dahl and Edlund (2010: 66).

The isogloss between the two main variants, apical and uvular /r/, is quite sharp, although there are pockets of uvular /r/ in the apical area and vice versa. There is one region, located on the boundary between the two types where both types combine in complementary distribution (Landtmanson 1905: 77ff.).

(46) Göta apico-uvular /r/-alternation (Sw *Götamåls*-r, *Götamålsskorrning*)

a. Foot-initial, initial in stressed syllable:
['ʁ]olig ‘fun’, toke['ʁ]i ‘craziness’, 'vind-[ˌʁ]iktning ‘wind direction’
b. Prosodic word-initial, but not stressed:
[ʁ]e'jäl ‘reliable; proper’, [ʁ]e'gera ‘to reign’, be'värings-[ʁ]eˌkryt ‘conscript’
(p.69) c. Moraic intervocalic or moraic word-final:

ˈkli[ʁː]a ‘to jingle’, to[ʁː] ‘dry’

d. Elsewhere (clusters, non-moraic coda, onset to unstressed, non-initial syllables):

ˈmo[rː]gon-[ˌʁ]odnad ‘aurora’, ˈvind-ˌsty[rː]ka ‘wind-force’, ˈk[r]ånglig ‘awkward’, sto[r] ‘large’, funˈde[r]a ‘to ponder’

This phenomenon appears to correlate distributionally with retroflex coronals and flapped /l/. For discussion, see Sjöstedt (1936), Teleman (2005), Torp (2007), Dahl and Edlund (2010).

3.5 The consonant phoneme system

Let us now turn to an overview of the CSw consonantal system in terms of features. The articulatory chart in (28) is repeated in (47). Distinctive length is marked with a raised mora for those consonants that have it.

(47) Main articulations of the Central Swedish consonants

		labial,	dental,	alveolar,		
		labiodental	alveolar	palatal	velar	glottal
oral stop	s.g.	p pʲ	t tʲ		k kʲ	
	voice	b bʲ	d dʲ		g gʲ	
fricative	s.g.	f fʲ	s sʲ	ɕ		h
fric./retroflex			ʂ ʂʲ			
fric./approx.	voice	v vʲ		ʝ ʝʲ		
nasal stop		m mʲ	n nʲ		ŋ ŋʲ	
lateral			l lʲ			
apical trill			r rʲ			

The account in terms of features given below is primarily based on the standard definitions and characterizations of features summarized in Hall (2007) with some modification and accommodation to Swedish. For instance, we shall treat the lateral [l] as [continuant], and we shall use the feature [retroflex] (for /r/) instead of the combination of [anterior] and [distributed] to capture the retroflexion rule. The feature [retroflex] is articulatorily warranted as part of the apical trill, and represents a property that resides in the active articulator, rather than a place on the palate (Harvey and Baker 2005). [retroflex] is the feature that we will take to be contributed by /r/ in the phonological analysis of retroflexion. The value chart given in Hall (2007: 332) does not clearly identify the set of laminals as a natural target class for retroflexion in Swedish, but with [retroflex] for /r/ we can identify the laminals as coronals pure and simple. We take it that the **(p.70)** unmarked properties of coronals are that they are laminal and anterior. This holds for all coronals except /r/ and /ʂ/, and so we leave these properties unspecified.

Note that Swedish aspirated stops are distinctively [spread glottis], and voiced stops are distinctively [voice]. We extend these features also to the set of fricatives. There is no phonetic study of fricatives that compares with Helgason and Ringen (2008a) and Beckman et al. regarding stops (2011) (see 3.1), but there are perhaps some indications in the assimilatory behaviour that can provide evidence of these features, beyond the expected generality across obstruents.

This brings us to the interesting question of the characterization of /v/ and to some extent /ɻ/. Round (2007) argues that /v/ is two-faced. It is a glide if one looks at some of its phonotactic distribution (after obstruents in onsets: *skvalpa* ‘to ripple’, *tvål* ‘soap’, *dvärg* ‘dwarf’, *kvinna* ‘woman’), but it is an obstruent fricative in other positions (before liquid in onset and after liquid in coda: *vråk* [vroːk] ‘buzzard’, *vresig* ‘peevish’, *torv* ‘turf’). This two-facedness places /v/ right on the border between sonorants and obstruents. Something similar can be said for /ɻ/ which is usually taken to be an approximant [j] based on its articulation and distribution (*spjuver* [ˈspɻʉːvɐ̯r] ‘rogue’, *pjäxa* [ˈpɻɕ̟kːsa] ‘ski-boot’), but there are positions where this segment is not next to a vowel (*kampanj* [kamˈpanːj] ‘campaign’, *kastanj* [kasˈtanːj] ‘chestnut’, *vänj* [vɛ̝nːj] ‘get used to’; *smörj* [smœrːj] ‘grease, vb’, *berg* [bæ̝rːj] ‘mountain’). We are going to take the obstruent property to be basic and therefore specify /v/ and /ɻ/ as fricatives carrying a value for [voice]. In the position next to an aspirated segment, voicing is lost, as seen in the examples above (see 4.9).

(48) Phonemic consonant system

		SUPRALARYNGEAL PLACE				LARYNGEAL	
		LABIAL	CORONAL	[retr.]	DORSAL		
[obst.]	[stop]	p	t		k		[s.g.]
[obst.]	[stop]	b	d		g		[voice]
[obst.]	[cont.]	f	s	ʂ	ɕ	h	[s.g.]
[obst.]	[cont.]	v			j̈		[voice]
[son.]	[stop]	m	n		ŋ		[nasal]
[son.]	[cont.]		l				[lateral]
[son.]	[cont.]			r			

(p.71) We take this to be the basic consonant system regarding quality. For many speakers, the allophone [ɧ] is used in onset realizations of /ʂ/. This segment does not have a fixed place of articulation, in that it is both dorsal and to some extent labial, with main place of articulation shifting between them. Moreover, many speakers vary the realization of /ʂ/ also in onset position. This is largely due to sociolinguistic factors (Lindblad 1978).

Notes:

(1) If we factor in the quantitative contrast, the language thus has 34 consonant phonemes.

(2) The ambisyllabicity of segments in Germanic languages has been contested by Jensen (2000). However, his critique concerns the narrow use of this term for *short* articulations, not for long ones, where the segment is depicted as ‘long’ or ‘geminate’. Swedish and Norwegian (but not Danish) have the long articulations, where the segment can form coda in one syllable, and onset in the next. That said, we will still consider [ŋ] in forms like *vandringen* as ambisyllabic, even without the phonetic length. The alternative would be to say it is coda before an onsetless syllable (^{2}'van.driŋ.en), a less attractive idea. Incidentally, Jensen’s foot-based approach will not work for these cases as no stress is involved. We could not say that such an [ŋ] were exclusively the onset either, since there are no cases of word-initial [ŋ], in any Germanic language.

(3) Regarding the allophony of /ʂ/, see 3.3.5.

(4) Affricates are found in Finland-Swedish and also in many southern varieties. It is not uncommon in older speakers also in the Stockholm area.

(5) A similar alternation occurs in Gothic *sweins* ‘pig, swine’ vs. *wrak* ‘he persecuted’.

(6) Earlier on, the pronunciation [ʂ] enjoyed higher prestige in the capital. It is the main allophone of /ʂ/ in several northern varieties.

(7) The neighbouring phoneme to [tɕ] in Finland-Swedish is /ɕ/, corresponding to Central Swedish /ʂ/. For a detailed phonetic study, see Leinonen (2004).

(8) The word *match* ‘id.’ would be an exception in the variant pronunciation [matːɕ], beside the regular [matːʂ]. In the form *lattjo* [^{1}ˈlatːɕʊ] ‘amusing; odd’ the onset to the second syllable is arguably [tɕ].

(9) Lindblad (1980: 122ff.) proposes that /ʃ/ should be used as the symbol for this sound, based on the fact that the auditory difference between retroflex and non-retroflex pronunciations is negligible.

(10) The place of articulation for the realization of [ɧ] can be established by looking at the assimilatory behaviour of the /n/ to a following [ɧ], where the dorsal allophone [ŋ] may be triggered: *en skjorta* /en ʂurt-ɑ$_{2}$/ [ɛ̟ŋ^{2}ˈɧʊʈːa] ‘a shirt’. The conditions for nasal assimilation are discussed in 4.4.

(11) Garlén (1984: 72) mentions that some second language learners have difficulties separating [f] from [ɧ^{f}].

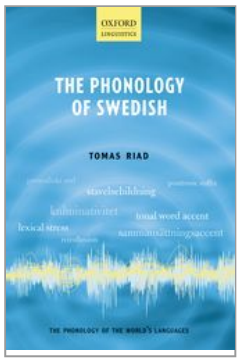
(12) Thus, there is then no need, at this point, to introduce another IPA symbol [f^{ɧ}].

(13) There is the same kind of relationship between /k/~/ɕ/ and /g/~/ʝ/ (see 4.12.1).

(14) Thus, Eliasson excludes alternations like *kunna* [^{2}ˈkɵnːa] ‘can’ and *känna* [^{2} ˈɕɛ̟nːa] ‘to feel; to know’ (see 4.12.1).

(15) The form *prohibitiv* ‘forbidding’ does not have self-evident structure as it may be realized with primary stress in two places, either [prʊɦɪbɪ^{1}ˈtiːv] or [prʊ^{1} ˈhɪbːɪˌtiːv]. In either case, however, the /h/ is pronounced. The structure of this form is in fact either one or two minimal prosodic words, that is (prohibi'tiv)$_{ω}$ or (pro'hibi)$_{ω}$('tiv)$_{ω}$. For this type of structure, see 6.3.6.

(16) Muminovic and Engstrand (2002) find four distinct pronunciations in a study of nine dialects, all south of the CSw area. The commonest pronunciation is fricative in initial position and approximant intervocalically.



The Phonology of Swedish
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Print publication date: 2013
Print ISBN-13: 9780199543571
Published to Oxford Scholarship Online: January 2014
DOI: 10.1093/acprof:oso/9780199543571.001.0001

Segmental processes

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DOI:10.1093/acprof:oso/9780199543571.003.0004

Abstract and Keywords

This chapter contains a discussion of the most important synchronic processes that are primarily segmental in character, though very often there is a prosodic component, too, in the environment for the application of some segmental rule. Some of the minor regular processes are discussed already in the vowels and consonants chapters. One of the most interesnting rules is retroflexion, where an /r/ coalesces with a following laminal coronal consonant. The chapter also discusses vowel lowering (of /e/ and /ɛ/), vowel centralization of short /ø/, nasal assimilation, excrescence of /g/, and a set of rules relating to /d/: postnasal d-deletion, assimilation of /d/, and continuization of /d/. Furthermore, there is the spread glottis assimilation (also known as devoicing in the literature), and another couple of small rules. The last sections of the chapter take up rules that are no longer fully productive, but which describe large generalizations in the lexicon, e.g. palatalization of velar consonants, ablaut and umlaut, and regressive spreading of nasality.

Keywords: segmental rules, assimilation, retroflexion, continuization, excrescence, palatalization

This chapter presents both major and minor phonological rules that are segmental in character. However, very often part of the conditioning is prosodic in nature. Some rules like the retroflexion rule and nasal assimilation are likely to be better known than rules like *g*-excrescence and *d*-continuization.

4.1 Retroflexion

Swedish dialects that have an apical articulation of /r/ as main allophone, very often also have a sandhi rule whereby the [r] coalesces with a following coronal consonant, i.e. /s, t, d, n, l/ to [ʂ, ʈ, ɖ, ɳ, ɭ]. In this process, the resulting, fused segment inherits the retroflex property of /r/, while all other features are retained from the combining coronal. The several southern dialects that have velar or uvular [ʁ] do not have this process, but otherwise, most of the Swedish dialects spoken in Sweden have it, whereas those spoken in Finland do not.

There are several terms for this phenomenon: apicalization, supradentalization, supraalveolarization, postalveolarization, and retroflexion. Simonsen, Moen, and Cowen (2008) show that for /t, d/ (in Norwegian) the single distinctive articulatory parameter with respect to [ʈ, ɖ] is apicality, as opposed to the otherwise regular laminal pronunciation of [t, d]. I will follow Kristoffersen (2000) in referring to this sandhi phenomenon as retroflexion, and the output of the process as retroflexes. Indeed, we have assumed that a distinctive property of two phonemes, /r/ and /ʂ/, is the feature [retroflex]. In the coalescence that results from the combination of /r/ and a laminal coronal, no features are lost beyond [continuant] on the part of /r/. Depending on one's model of features, the coalescence might be possible to cast as a purely feature filling process. In the coalescence, one segment is lost, but no mora, as we shall see.

The data in (49) illustrate the pervasive application of retroflexion: morpheme-internally, across inflectional and derivational morphemes, in compounds, and across word boundaries (Riad 2010). I will assume that there are no underlying retroflex consonants, besides /r/ and /ʂ/. This means that the rule is taken to apply **(p.74)** also morpheme-internally, even though there is little alternation within the lexical set. The obvious alternative here is to assume underlying retroflex phonemes in the cases where there is no alternation, and that may well be a viable solution. However, once we look at all aspects of this phenomenon and identify the various factors that influence the output, it will emerge that the distribution is highly rule governed, including alternation within mono-morphemes (see 4.1.4). This means that we get a better description by formulating the process in as general a manner as possible.[1] In (49), and throughout, long consonants are marked with a raised mora in phonemic representation (see 1.8).

(49) Pervasive application of retroflexion

	morpheme-internal	inflection, derivation
[ʂ]	kors /kor$^{\mu}$s/ [kɔʂː] 'cross'	mors /mur-s/ [muːʂ] 'mother's'
	torsk /torsk/ [tɔʂːk] 'cod'	försenad /før-sen-ɑd$_2$/ [fœ^1'ʂeːnad] 'delayed'

	morpheme-internal	inflection, derivation
[ʈ]	kort /kor$^{\mu}$t/ [kɔʈː] ‘short’	stort /stur-t/ [stuːʈ] ‘large, neut.’
	smärta /smɛr$^{\mu}$t-ɑ$_2$/ [^{2}ˈsmæʈːa] ‘pain’	bart /bɑr-t/ [bɑːʈ] ‘bare, neut.’
[ɖ]	mjärde /mjɛrd-e$_2$/ [^{2}ˈmjæːɖɛ] ‘fish trap’	förd /før-d/ [fœːɖ] ‘led’
	fordra /furdr-ɑ$_2$/ [^{2}ˈfuːɖra] ‘to demand’	hörde /hør-de$_2$/ [^{2}ˈhœːɖɛ] ‘heard’
[ɳ]	barn /bɑrn/ [bɑːɳ] ‘child’	lagern /lɑg•r-n/ [^{1}ˈlɑːgɛɳ] ‘the laurel’
	värna /vɛrn-ɑ$_2$/ [^{2}ˈvæːɳa] ‘to protect’	förnya /før-ny-ɑ$_2$/ [fœ^{1}ˈɳyːa] ‘to renew’
[ɭ]	sorl /sorl/ [soːɭ] ‘murmur’	varlig /vɑr-lig$_2$/ [^{2}ˈvɑːɭig] ‘careful’
	pärla /pɛrl-ɑ$_2$/ [^{2}ˈpæːɭa] ‘pearl’	förlänga /før-lɛŋ$^{\mu}$-ɑ$_2$/ [fœ^{1}ˈlɛ̟ŋːa] ‘to lengthen’
	compound	word boundary
[ʂ]	barskrapad /bɑr+skrɑp-ɑd/	går Sven /gor sven/
	[^{2}ˈbɑːˌʂkrɑːpad] ‘destitute’	[go(ː) ˈʂvɛ̟nː] ‘goes Sven’
[ʈ]	svårtydd /svor+tyd-d/	får Tom /for tom$^{\mu}$/
	[^{2}ˈsvoːˌʈʏdː] ‘hard to interpret’	[fo(ː) ˈʈɔmː] ‘gets Tom’
[ɖ]	pardans /pɑr+dɑns/	ser Dan /ser dɑn/
	[^{2}ˈpɑːˌɖɑanːs] ‘couple dancing’	[se(ː) ˈɖɑːn] ‘sees Dan’
[ɳ]	tvärnit /tvɛr+nit/	syr Nils /syr nils/
	[^{2}ˈtvæːˌɳiːt] ‘sudden braking’	[sy(ː) ˈɳɪlːs] ‘sews Nils’
[ɭ]	farled /fɑr+led/	ger Lars /jer lars/
	[^{2}ˈfɑːˌɭeːd] ‘track, channel’	[je(ː) ˈlɑːʂ] ‘gives Lars’

(p.75) One might speculate on what factors might lie behind this phonological process, but it is worth mentioning that most Germanic languages appear to, one way or the other, avoid the sequence [retroflex][anterior]. In some English varieties the /r/ is deleted in this position (*guard* [gɑːd], *girl* [gəːl]), in others it is vocalized ([gɑɹd]) or even merged with the vowel ([gɚːl]). Some varieties of Finland-Swedish also vocalize the /r/ (*gård* [goɹd] 'yard', *kort* [kɔɹt] 'short'), while the Finland-Swedish standard actually pronounces the sequence faithfully ([goːrd], [kɔrːt]). In East Norwegian, we sometimes find deletion of /d/ ([goːr]), but not of /t/ ([kɔʈː]). Whatever the articulatory basis may be, the issue clearly goes beyond Central Swedish.

4.1.1 Retroflexion by coalescence

Retroflexion in Central Swedish involves two cases that can be characterized as coalescence and spreading. The patterning depends on the correspondence of features in the segments involved. Coalescence only concerns the combination of /r/ + laminals, yielding a single segment as output, i.e. [ʂ, ʈ, ɖ, ɳ, ɭ]. Spreading occurs when the phoneme /ʂ/ or the output of coalescence is followed by one or more coronals which are anterior and laminal, yielding a sequence of retroflex segments.[2]

Anteriority and laminality are commonly assumed to be unmarked properties for the Swedish coronals /s/, /t/, /d/, /n/, and /l/. The two coronal phonemes that are retroflex are /r/ and /ʂ/. The phoneme /ʂ/ is special here because of its extensive allophony (see 3.3.5). Also, the phoneme /ʂ/ does not coalesce with a following laminal.

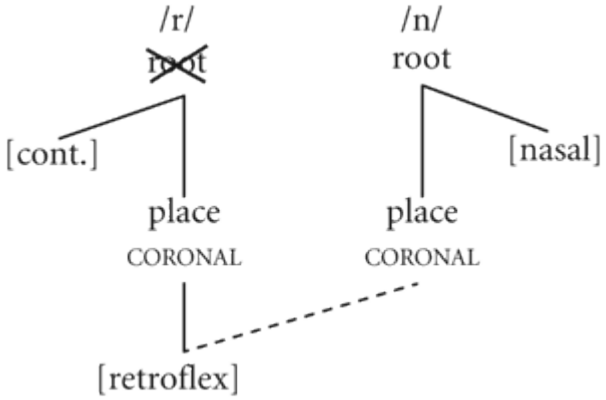
We express the coalescence of /r/ with one of the other coronals as a merger of [retroflex] with whatever other features the coronal in question has. This fills a number of boxes in the consonant chart, and also predicts the neutralization between the phoneme /ʂ/ and the output of retroflexion of /rs/, as [ʂ]. This is indicated in (50).

(p.76) (50) Phonemes (white cells) and output of retroflexion (shaded cells)

		SUPRALARYNGEAL PLACE				LARYNGEAL	
		LABIAL	CORONAL	[retr.]	DORSAL		
[obst.]	[stop]	p	t	ʈ	k		[s.g.]
[obst.]	[stop]	b	d	ɖ	g		[voice]
[obst.]	[cont.]	f	s	ʂ	ɕ	h	[s.g.]
[obst.]	[cont.]	v			ʝ		[voice]
[son.]	[stop]	m	n	ɳ	ŋ		[nasal]
[son.]	[cont.]		l	ɭ			[lateral]
[son.]	[cont.]			r			

Retroflex segments are apical (often expressed as [–distributed]) and non-anterior by virtue of the tipped-back apex (often expressed as [–anterior]). We shall use a more direct representation, focusing on properties that reside in the active articulator (Harvey and Baker 2005). We use the single feature [retroflex] (see Engstrand 2004: 307) for this purpose and assume that this property is what spreads/merges in the retroflexion rule.[3] The coronal with which /r/ coalesces is unmarked for retroflexion at the outset, as seen in (50). The differences between /s, t, d, n, l/ are either laryngeal (aspirated, voiced), or relating to manner (continuant, nasal, lateral).

(51) Retroflexion in autosegmental terms, /bɑrn/ > [bɑːɳ]



Retroflexion with /r/ involves the complete coalescence of /r/ and the following coronal. This could be viewed in a couple of different ways. We could express the fusion as the joint spreading of the retroflex feature, and the deletion of the /r/ **(p.77)** phoneme, as marked with the cross over the root node of /r/. Alternatively, we could view the coalescence as the matching of compatible features and loss of the incompatible ones (in this case [continuant]). The only property of /r/ that is retained in the output is [retroflex]. The output is one single segment, which may be long or short depending on a number of factors: segmental, quantitative, and morphological, which we turn to below. This means that putative deletion of /r/ will not affect a mora attached to it. First, we look at the further spreading of the retroflex feature, from the output segments of retroflexion (and /ʂ/) and onwards.

4.1.2 Retroflexion by spreading

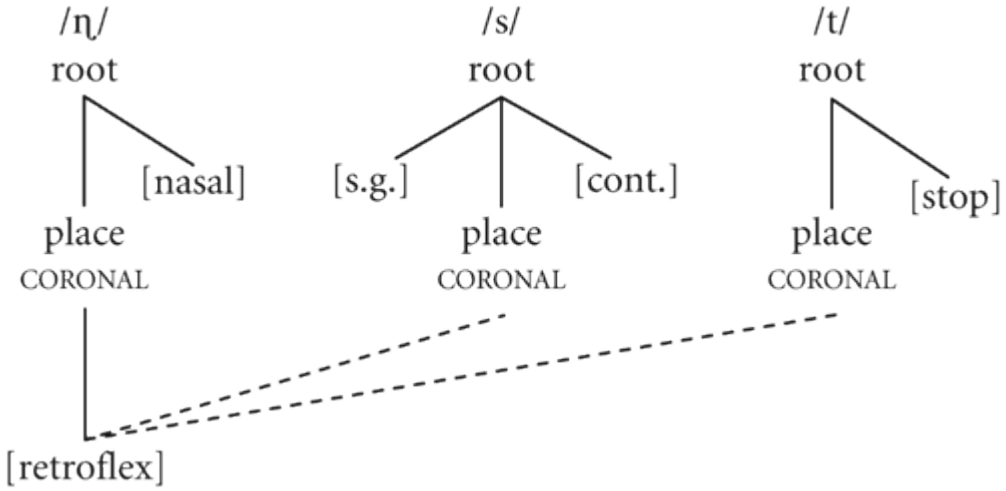
Retroflexion is also applicable with the output of retroflexion in the first position, as illustrated in (52).

(52) Spreading of retroflexion

a. Var står smorlädersstövlarna?
/vɑr stor smur+lɛdɛr+støvl-ɑr$_2$-nɑ/ > [vɑ(ː)ʂʈo(ː)^{2}ˈʂmuːˌɭɛ·dɛ ˌʂʈøvːlaɳa]
‘Where are the stout grained-leather boots?’ (example from Eliasson 1986: 277)
b. barnstrumpa /bɑrn+strʉmp-ɑ$_2$/ > [^{2}ˈbɑːɳˌʂʈrʊmːpa] ‘kid’s sock’
kortnäst /kort+nɛst/ > [^{2}ˈkɔʈːˌɳɛːst] ‘shortnosed’
horststrand /horst+strɑnd/ > [^{2}ˈhɔʂːʈˌʂʈranːd] (or reduced [hɔʂːʈranːd]) ‘horst beach’
c. pärltråd /pɛrl+trod/ > [^{2}ˈpæːɭˌtroːd] ‘pearl string’
pärlnål /pɛrl+nol/ > [^{2}ˈpæːɭˌnoːl] ‘pearl needle’
d. pärllist /pɛrl+list/ > [^{2}ˈpæːɭˌlɪsːt] ‘pearl moulding, pearl strip’
e. lunch /lʉnʂ/ > [lʊɳːʂ] ‘id.’
klatscha /klɑtʂ-ɑ$_2$/ > [^{2}ˈklaʈːʂa] ‘to crack’[4]

The retroflex property spreads to all following coronals in a sequence (a, b), except from [ɭ] (c), unless the following segment is /l/ (d) (Eliasson 1986: 280). There is also spreading to the left (e), although the situation where spreading could happen is limited (Elert 1997: 30). Speakers must have the same [ʂ] pronunciation both for the output of retroflexion of /rs/ and for the phoneme /ʂ/ in certain or all positions, for this regressive spreading to take place. The bidirectional property of retroflexion is better understood as a requirement on adjacent segments to share the retroflex property (i.e. a type of harmony), rather **(p.78)** than recursive application of a rule (Engstrand 2004: 308). The feature [retroflex] thus spreads to any adjacent laminal segment.

(53) Barnstrumpa /bɑrn+strʉmp-a$_2$/ ['bɑːɳ˛ʂtrʊmːpa] ‘kid’s sock’



Note that we classify /r/ as a [retroflex] trill and hence it remains largely unaffected by preceding retroflex segments in *barnst̲r̲umpa* and *horststr̲and*. If anything, it is a little further back.

The spread of retroflexion does not entail coalescence except with /r/ and the immediately following segment. In cases of further spreading no coalescence occurs except in the case of coronal assimilation (see 4.7). Thus, *hård* /hord/ [hoːɖ] ‘hard’ becomes *hårt* /hord-t/ [hoːʈ] when suffixed with neuter -*t*.[5]

4.1.3 Distribution of retroflexion

Even if retroflexion applies in many contexts, there are systematic constraints on this process, relating to phonation, quantity, and morphological structure. In addition, there is a sociolinguistic restriction on applying retroflexion to any new form or name that meets the phonological conditions of the rule. Finally, there is a small number of words that exhibit unexpected retroflexion.

Phonation. The phonation divide between voiceless /s, t/ and voiced /d, n, l/ affects the application of retroflexion. The voiceless retroflexes can be long or short, whereas the voiced ones are in general only short (however, excluding simple long [rː]).[6] This constrains the application of retroflexion and results in a **(p.79)** pronunciation of [r] + coronal in many forms. In the examples below, we indicate underlying consonant length with the symbol of the mora (‘$^{\mu}$’) right after the consonant.

(54) The phonation constraint on retroflexion: voiced retroflexes cannot be long

/r($^{\mu}$)+s/	
[Vːʂ]	mors /mur-s/ [muːʂ] ‘mother’s’, bars /bɑr-s/ [bɑːʂ] ‘was carried’

[Vʂː]	borste /bɔrst-e$_2$/ [^{2}ˈbɔʂːtɛ̟] ‘brush’, härsken /hɛrsk-en$_2$/ [^{2}ˈhæʂːkɛ̟n] ‘rancid’
/r(ᵘ)+t/	
[Vːʈ]	snart /snɑrt/ [snɑːʈ] ‘soon’, fyrtorn /fyr+tʉrn/ [^{2}ˈfyːˌʈuːɳ] ‘lighthouse’
[Vʈː]	port /purᵘt/ [pʊʈː] ‘portal’, kvart /kvɑrᵘt/ [kvaʈː] ‘quarter’
/r(ᵘ)+d/	
[Vːɖ]	surdeg /sʉr+deg/ [^{2}ˈsʉ̟ːˌɖeːg] ‘leaven’, bard /bɑrd/ [ˈbɑːɖ] ‘id.’
[Vrːd]	kurd /kʉrᵘd/ [ˈkʊrːd] ‘Kurd’, urdu /ʉrᵘdʉ/ [^{1}ˈʊrːdʊ] ‘Urdu’, absurd /ɑbsʉrᵘd/ [abˈsʊrːd] ‘id.’, hird /hirᵘd/ [ˈhɪrːd] ‘retinue’, sard /sɑrᵘd/ [ˈsarːd] ‘Sard’, sefardisk /sefɑrᵘd-•sk/ [sɛ̟^{1}ˈfarːdɪsk] (or [sɛ̟^{1}ˈfɑːɖɪsk]) ‘Sephardic’, dardisk /dɑrᵘd-•sk/ [^{1}ˈdarːdɪsk] ‘Dardic’
/r(ᵘ)+n/	
[Vːɳ]	barn /bɑrn/ [bɑːɳ] ‘child’, värna /vɛrn-ɑ$_2$/ [^{2}ˈvæːɳa] ‘to protect’, Narnia /nɑrniɑ/ [^{1}ˈnɑːɳɻa] (sometimes [^{1}ˈnarːnɻ̟a] < /nɑrᵘniɑ/)
[Vrːn]	noktyrn /noktyrᵘn/ [nɔkˈtʏrːn] ‘nocturne’, Saturnus /sɑtʉrᵘnʉs/ [sa^{1}ˈtʊrːnʊs] ‘Saturn’, burnus /bʉrᵘnʉs/ [^{1}ˈbʊrːnʊs] ‘burnous’, firn /firᵘn/ [fɪrːn] ‘firn (type of snow)’
/r(ᵘ)+l/	
[Vːɭ]	pärla /pɛrl-ɑ$_2$/ [^{2}ˈpæːɭa] ‘pearl’, varlig /vɑr-lig$_2$/ [^{2}ˈvɑːɭɪg] ‘careful’ (alt. [^{2}ˈpæː(r)la], [^{2}ˈvɑː(r)lɪg])
[Vrːl]	Gurli /gʉrᵘli/ [^{1}ˈgʊrːlɪ] (name), Orla /orᵘl-ɑ$_2$/ [^{2}ˈɔrːla] (name)

The pattern of retroflexion above is in part dependent on quantity, in part on morphological structure. The application of the retroflexion rule with /l/ is less regular than with the other coronals. The tendency seems to be for common words to lose /r/ and retroflexion altogether: *pärla* [^{2}ˈpæːla], *Karl* [kɑːl] (name).[7] In less common words, the /r/ is less likely to be dropped in the non-retroflected alternants: *varlig* /vɑr-lig$_2$/ [^{2}ˈvɑːrlɪg] ‘careful’, *sorla* /sorl-ɑ$_2$/ [^{2}ˈsoːrla] ‘to murmur, buzz’.

(p.80) Morphology. Morphological make-up plays a role within the set of voiceless coronals. The basic generalization is that whenever the /r/ is long, hence /rᵘ/, it can only participate in retroflexion if the following coronal is tauto-morphemic. Otherwise, the result is [rː]+coronal. There are exceptions to this, all of which tend to be either really common words or derivations of bound roots.

(55) The morphological constraint on the retroflexion rule: /rᵘ/ does not assimilate across a morpheme boundary

/rᵘ/ + coronal, regular	exceptions
bisarr-t /bisɑrᵘ-t/ [bɪˈsarːt] ‘bizarre, neut.’	torr-t /torᵘ-t/ [tɔʈː] ‘dry, neut.; drily’
borr-s /borᵘ-s/ [bɔrːs] ‘drill’s’	vär-st /vɛrᵘ-st/ [væʂːʈ] ‘worst (suppletive stem värr-)’
borr-torn /borᵘ+tʉrn/ [ˈ²bɔrː ˌtuːɳ] ‘drill tower’	stör-st /størᵘ-st/ [stœʂːʈ] ‘biggest (suppletive stem störr-)’
borr-damm /borᵘ+dɑmᵘ/ [ˈ²bɔrː ˌdamː] ‘drill dust’	nor-sk /norᵘ-sk/ [nɔʂːk] ‘Norwegian’ (bound root norr-)
borr-ning /borᵘ-niŋ₂/ [ˈ²bɔrːnɪŋ] ‘drilling’	stur-sk /stʉrᵘ-sk/ [stɵʂːk] ‘refractory’ (bound root stur-)
borr-lås /borᵘ+los/ [ˈ²bɔrːˌloːs] ‘drill lock’	

Quantity. When the /r/ is non-moraic, the preceding vowel is long if stressed. In these cases the resulting retroflex is non-moraic too: *mör* /mør/ [mœːr], *mör-t* /mør-t/ [mœːʈ] ‘tender /neut.’, *vacker* /vɑkᵘ•r/ [ˈvakːɐ̯r], *vacker-t* /vɑkᵘr-t/ [ˈvakːɐ̯ʈ] ‘beautiful /neut.’. It is in the non-moraic contexts that retroflexion is general. When the /r/ is moraic, hence /rᵘ/, both the phonation constraint illustrated in (54) and the morphological constraint illustrated in (55) apply.

Within monomorphemic words, we may expect a distinction between forms where the /r/ is moraic or not, where the output would be either a long vowel followed by a short retroflex, or a short vowel followed by a long retroflex (in cases where the following coronal is voiceless), and a long [rː] (in cases where the following coronal is voiced). This holds true and constitutes an argument in favour of treating all instances of retroflexes as the result of phonological interaction, i.e. with no underlying retroflexes (beyond /r/ and /ʂ/). If we postulated underlying ⁺/ʂ, ʈ, ɖ, ɳ, ɭ/ this regularity would not be captured.

(56) Moraic and non-moraic /r/ in monomorphemes

fars	/fɑrᵘs/	[faʂː]	‘farce’	Lars	/lɑrs/	[lɑːʂ]	(name)
svart	/svɑrᵘt/	[svaʈː]	‘black’	smart	/smɑrt/	[smɑːʈ]	‘id.’
kort	/korᵘt/	[kɔʈː]	‘short’	vårta	/vort-ɑ$_2$/	[^{2}ˈvoːʈa]	‘wart’
kurd	/kʉrᵘd/	[kʉrːd]	‘Kurd’	bord	/bʉrd/	[buːɖ]	‘table’
firn	/firᵘn/	[fɪrːn]	‘id.’	barn	/bɑrn/	[bɑːɳ]	‘child’
Gurli	/gʉrᵘli/	[^{1}ˈgʉrːlɪ]	(name)	kärl	/ɕærl/	[ɕæːl]	‘vessel’

(p.81)

The picture that emerges here is one where the quantity is the highest controlling factor, with general retroflexion only with non-moraic, i.e. short, /r/. The phonation constraint creates a secondary divide, where only voiceless retroflexes may be long. Within the group of voiceless coronals, long retroflexes are limited to the tautomorphemic context, where, furthermore, there is a lexical distinction between long and short /r/.

Quality. There is a further constraining factor relating to vowel quality in the instances where variation occurs, that is, before the voiceless coronals /t, s/ (Loman 1967: 25). It is unclear how to capture this in the lexical representation. We shall simply mark the quantity selected by vowel quality on the following /r/.

(57) The front and central vowels /ɛ, i, y, ø, ʉ/ are short before [ʈ] and [ʂ]

/ɛ/	hjärta /jɛrᵘt-ɑ$_2$/ [^{2}ˈjæʈːa] ‘heart’, smärt /smɛrᵘt/ [smæʈː] ‘slim’, snärt /snɛrᵘt/ [snæʈː] ‘lash’, ärt /ɛrᵘt/ [æʈː] ‘pea’, expert /ekspɛrᵘt/ [ɛ̟ksˈpæʈː] ‘id.’, stjärt /ʂɛrᵘt/ [ɧæʈː] ‘butt’, Gert /jɛrᵘt/ [jæʈː] (name); färs /fɛrᵘs/ [fæʂː] ‘minced (meat)’
/y/	myrten /myrᵘten/ [^{1}ˈmʏʈːɛ̟n] ‘myrtle’; yrsel /yrᵘsl/ [^{1}ˈʏʂːɛ̟l] ‘dizziness’, tyrsusstav /tyrᵘsʉs+stɑv/ [^{2}ˈtʏʂːəˌstɑːv] ‘tyrsus’
/i/	hirs /hirᵘs/ [hɪʂː] ‘millet’
/ø/	bestört /be-størᵘt/ [bɛ̟ˈstœʈː] ‘dismayed’, körtel /ɕørᵘt-el$_2$/ [^{2}ˈɕœʈːɛ̟l] ‘gland’, mört /mørᵘt/ [ˈmœʈː] ‘roach’, pörte /pørᵘt-e$_2$/ [^{2}ˈpœʈːɛ̟] ‘hut’, skört /ʂørᵘt/ [ˈɧœʈː] ‘tail’, störta /størᵘt-ɑ$_2$/ [^{2}ˈstœʈːa] ‘to hurl; to fall’, vört /vørᵘt/ [ˈvœʈː] ‘wort’, ört /ørᵘt/ [ˈœʈː] ‘herb’; börs /børᵘs/ [ˈbœʂː] ‘purse’, törs /tørᵘ-s/ [ˈtœʂː] ‘dare’
/ʉ/	turturduva /tʉrᵘtʉr+dʉv-ɑ$_2$/ [^{2}ˈtʉʈːəˌḍ̟ʉ̟ːva] ‘turtle dove’, hurtig /hʉrᵘt-ig$_2$/ [^{2}ˈhʉʈːɪg] ‘sprightly’, Kurt /kʉrᵘt/ [ˈkʉʈː] (name); kurs /kʉrᵘs/ [ˈkʉʂː] ‘course’, resurs /resʉrᵘs/ [rɛ̟ˈsʉʂː] ‘resource’

(58) The back, non-high vowels /ɑ/ and /o/ vary in length before [ʈ] and [ʂ]

/ɑ/ short	kvart /kvɑrᵘt/ [kvaʈː] ‘quarter’, svart /svɑrᵘt/ [svaʈː] ‘black’, vart /vɑrᵘt/ [vaʈː] ‘where’; fars /fɑrᵘs/ [faʂː] ‘farce’, Cars /kɑrᵘs/ [kaʂː] (name)
/ɑ/ long	art /ɑrt/ [ɑːʈ] ‘species’, kart /kɑrt/ [kɑːʈ] ‘unripe fruit’, arta /ɑrt-ɑ$_2$/ [^{2}ˈɑːʈa] ‘to turn out’, karta /kɑrt-ɑ$_2$/ [^{2}ˈkɑːʈa] ‘map’, artig /ɑrt-ig$_2$/ [^{2}ˈɑːʈɪg] ‘polite’, part /pɑrt/ [pɑːʈ] ‘share’, fart /fɑrt/ [fɑːʈ] ‘speed’, urarta /ʉr-ɑrt-ɑ$_2$/ [^{2}ˈʉ̟ːrˌɑːʈa] ‘to degenerate’; Lars /lɑrs/ [lɑːʂ] (name)

/o/ short	bort /bor$^{\mu}$t/ [bɔʈː] ‘away’, porto /por$^{\mu}$to/ [^{2}'pɔʈːʊ] ‘postage’, borta /bor$^{\mu}$t-ɑ$_{2}$/ [^{2}'bɔʈːa] ‘away’, retort /retor$^{\mu}$t/ [rɛ̟'tɔʈː] ‘reply’, sort /sor$^{\mu}$t/ [sɔʈː] ‘kind’, eskort /eskor$^{\mu}$t/ [ɛ̟s'kɔʈː] ‘escort’, kort /kor$^{\mu}$t/ [kɔʈː] ‘short’, sport /spor$^{\mu}$t/ [spɔʈː] ‘sports’; kors /kor$^{\mu}$s/ [kɔʂː] ‘cross’
/o/ long	porter /port•r/ [^{1}'poːʈɛ̟r] ‘stout’, tårta /tort-ɑ$_{2}$/ [^{2}'toːʈa] ‘cake’, vårta /vort-ɑ$_{2}$/ [^{2}'voːʈa] ‘wart’

(p.82)

(59) The back, high vowel /u/ varies in length before [ʈ], within the same word (across speakers). The standard pronunciation (mostly short vowel) is placed first.

fjorton	/ɟjur($^{\mu}$)ton/	[fjuːʈɔn]/[fjʊʈːɔn]	‘fourteen’
fort	/fur($^{\mu}$)t/	[fʊʈː]/[fuːʈ]	‘quickly’
gjort	/fur($^{\mu}$)t/	[jʊʈː]/[juːʈ]	‘done’
hjortron	/ɟur($^{\mu}$)tron/	[jʊʈːrɔn]/[juːʈrɔn]	‘cloudberry’
kjortel	/ɕur($^{\mu}$)t•l/	[ɕʊʈːɛ̟l]/[ɕuːʈɛ̟l]	‘kirtle’
kort (n.)	/kur($^{\mu}$)t/	[kʊʈː]/[kuːʈ]	‘card’
mortel	/mur($^{\mu}$)t•l/	[mʊʈːɛ̟l]/[muːʈɛ̟l]	‘mortar’
port	/pur($^{\mu}$)t/	[pʊʈː]/[puːʈ]	‘front door’
skjorta	/ʂur($^{\mu}$)t-ɑ/	[ʃʊʈːa]/[ʃuːʈa]	‘shirt’
stort	/stur($^{\mu}$)t/	[stʊʈː]/[stuːʈ]	‘large, neut.’

Voiceless stops tend to be longer than voiced stops, in general. The pattern is universal and clearly applicable to Swedish, both synchronically (Elert 1964; 8.2) and diachronically in conjunction with the so-called quantity shift. The result of the quantity shift was the generalization of heavy weight in stressed syllables (Hesselman 1901, 1902; Riad 1992). When a light syllable was lengthened, either the vowel or the post-vocalic consonant was lengthened, and voicing of the consonant, as well as height of the vowel, were involved in the negotiation. Low vowels favoured vowel length, and we see some similarities in the patterning of quantity in the outputs of retroflexion. The high and mid vowels tend to be short, whereas the back and low vowels tend to be long. The main finding, however, is that there is considerable predictability based on vowel quality.

4.1.4 Notes on retroflexion[8]

There is no obvious, principled hindrance to pronouncing the long voiced retroflex consonants, with the possible exception of [ɭː] which is not attested in Scandinavia. Long [ɖː] is limited but extant in Swedish (*gjorde* /ɟur-de$_2$/ [^{2}'jʊɖːɛ] or [^{2}'juːɖɛ] ‘did’), and more common in Norwegian. Long [ɳː] occurs **(p.83)** in the differently derived, syncopated forms like *herrn* [hæɳː] (< *herren* /her$^{\mu}$-e$_2$-n/) ‘sir’, *morrn* [mɔɳː] (< *morron* < *morgon* /morg-on$_2$/) ‘morning’, *dörrn* [dœɳː] (< *dörren* /dør$^{\mu}$-•n/) ‘the door’. These are frequent individual forms, the syncopation not being a regular rule (*borren* ‘the drill’ > **borrn*).

Total assimilation of /d/ to /t/ applies with the neuter and adverbial suffix *-t*: *målad* /mol-ɑd$_2$/ [^{2}'moːlad] ‘painted’ comes out as *målat* /mol-ɑd$_2$-t/ [^{2}'moːlat], and *röd* /rød/ [røːd] ‘red’ comes out as *rött* /rød-t/ [rø̞tː], when suffixed with *-t*. When the suffix attaches to a stressed syllable, the consonant ends up long (*rött*). This process applies also with [ɖ], however *without* the quantitative effect in stressed syllables. Thus, in *rörd* /rør-d/ [rœːɖ] ‘moved’ the vowel stays long and the form comes out as *rört* /rør-d-t/ [rœːʈ] when suffixed with *-t*, rather than *[rœʈː] as one might have expected. In the Göta variety shortening does occur (to some extent) under coronal assimilation in monosyllables undergoing retroflexion. Thus, the neuter form of *hård* /hord/ [hoːɖ] ‘hard’ is *hårt* /hord-t/ [hɔʈː], in parallel with *röd* [røːd], *rött* [rø̞tː] ‘red /neut.’ and *vid* /vid/ [viːd], *vitt* /vid-t/ [vɪtː] ‘wide /neut.’.

Quantitative effects relating to retroflexion can only take place in stressed syllables. In cases where morphophonemically related forms have stress in different syllables, the conditions for retroflexion may change. In particular, as unstressed syllables are necessarily light in Swedish, retroflexion may become possible in a syllable as stress moves away. The pattern in (60) provides some evidence for the application of retroflexion within roots.

(60) Stress shift

/kʉr$^{\mu}$d/ [kʊrːd] ‘Kurd’, /kʉr$^{\mu}$d-•sk/ [^{1}'kʊrːdɪsk] ‘Kurdish’	/kʉr$^{\mu}$d-istɑn/ [kʊɖɪ'stɑːn] or [kʊrdɪ 'stɑːn] ‘Kurdistan’
/sɑtʉr$^{\mu}$nʉs/ [sa^1'tʊrːnʊs] ‘Saturn’, /sɑtʉr$^{\mu}$n-•sk/ [sa^1 'tʊrːnɪsk] ‘Saturnian’	/sɑtʉr$^{\mu}$n-ɑlier/ [satʊ^1'ɳɑːlɪɛ̯r] ‘saturnalia’, /sɑtʉr$^{\mu}$n-ɑl-•sk/ [satʊ 'ɳɑːlɪsk] ‘saturnalian’
Chili con /kɑr$^{\mu}$ne/ [^{2}'karːnɛ̯] ‘chilli con carne’	/kɑr$^{\mu}$ne-vɑl/ [kaɳɛ'vɑːl] ‘carnival’ (or [karnɛ'vɑːl])
/nor$^{\mu}$+sʉnd-ɑ$_2$/ [^{2}'nɔrːˌsʊnːda] (name), /nor$^{\mu}$+tʉn-ɑ$_2$/ [^{2}'nɔrːˌtʉːna] (name)	/nor$^{\mu}$-strøm$^{\mu}$/ [nɔ'ʂʈrømː] (name), /nor$^{\mu}$-tʉl$^{\mu}$/ [nɔ'ʈʊlː] (name)

Low frequency and sociolinguistic marking may inhibit retroflexion even where it would be phonologically expected. Thus, the names *Ursula* and *Silbersky* will tend not to undergo retroflexion. *Ursula* /ʉrᵘsʉlɑ/ can be pronounced [^{1}ˈørːsøla], [^{1}ˈørːsʉla], or [^{1}ˈøʂːøla]. The last pronunciation is sociolinguistically a little risky, as it sounds much like *usch* /ʉʂᵘ/ [øʂː] ‘phew, ugh’. However, even if there are no undesirable connotations or associations with the pronunciation, unfamiliar names are unlikely to be immediately subjected to the rule of retroflexion. Thus, *Silbersky* will mostly be pronounced [sɪl^{1}ˈbærːskʏ]. Similarly *katharsis* **(p.84)** ‘catharsis’ is pronounced [ka^{2}ˈtarːsɪs] rather than [ka^{2}ˈtaʂːɪs]. This is in line with relative frequency of forms.

Emphatic speech may also remove the effects of retroflexion from any context, though much more likely from external sandhi than internal. But one does hear, for example, sports commentators undoing the retroflexion rule. The influence of stress on /r+s/ sandhi in North Swedish has been studied by Lindblad (1999).

One more indication of the fact that even simplex forms are subject to synchronic retroflexion is nickname formation. Names like *Kurt* /kʉrᵘt/ [køʈː] and *Lars* /lɑrs/ [lɑːʂ] come out as *Kurre* and *Lasse*. The nicknames are formed by truncation of the root and addition of a suffix (*-e*), see 7.2. The truncation of *Kurt* selects *kur*, and the truncation of *Lars* selects *las* (where the less sonorous consonant is retained). If the underlying forms do not separate /r/ from a following laminal coronal, these nicknames cannot be analysed as synchronically derived from their bases.

4.2 Vowel lowering before [retroflex]

The vowels /ɛ/ and /ø/ undergo lowering whenever they occur before a tautomorphemic /r/ or any of the retroflex consonants that constitute the output of retroflexion. We will call this rule Vowel lowering before [retroflex].

The pattern is the clearest for the long vowels, where there is a contrast between /e/ and /ɛ/. Before /r/ only /ɛ/ lowers.

(61) Vowel lowering in the context before a retroflex

		Elsewhere	Before retroflex
/ɛ/	long	äta /ɛt-$ɑ_2$/ [^{2}ˈɛːta] ‘to eat’	ära /ɛr-$ɑ_2$/ [^{2}ˈæːra] ‘honour’
		trä /trɛ/ [trɛː] ‘wood’	pärla /pɛrl-$ɑ_2$/ [^{2}ˈpæːɭa] ‘pearl’
/ø/	long	möta /møt-$ɑ_2$/ [^{2}ˈmøːta] ‘to meet’	öra /ør-$ɑ_2$/ [^{2}ˈœːra] ‘ear’
		frö /frø/ [frøː] ‘seed’	hörn /hørn/ [hœːɳ] ‘corner’

/ɛ/, /e/	short	lätt /lɛtᵘ/ [lɛ̟tː] ‘light’	lärka /lɛrk-α$_2$/ [^{2}ˈlærːka] ‘lark’
		väcka /vɛkᵘ-α$_2$/ [^{2}vɛ̟kːa] ‘to wake’	smärta /smɛrᵘt-α$_2$/ [^{2}ˈsmæ̟ːa] ‘pain’
		fett /fɛtᵘ/ [fɛ̟tː] ‘fat’	verk /vɛrk/ [værːk] ‘work’
		veck /vɛkᵘ/ [vɛ̟kː] ‘fold’	expert /ekspɛrᵘt/ [ɛ̟ksˈpæ̟ːt] ‘id.’
/ø/	short	fötter /føtᵘ-r/ [ˈfø̟tːɛr] ‘feet’	dörr /dørᵘ/ [dœrː] ‘door’
		mössa /møsᵘ-α$_2$/ [^{2}ˈmø̟sːa] ‘hat’	störta /størᵘt-α$_2$/ [^{2}ˈstœ̟ːa] ‘to crash’

The pronunciation of retroflex sounds, including apical /r/, appears to have the effect of inducing a fairly open mouth in pronunciation. The lowering (or opening) of the vowels /ø/ and /ɛ/ is an assimilation to that openness. Vowel lowering treats /ø/ and /ɛ/ as a natural class, as [mid] vowels, to the exclusion of /e/. We interpret this as a systematic vowel height difference, where /e/ is higher than the other vowels. Vowel lowering involves the lowering to [low] of /ø/ and /ɛ/ (see vowel chart in 2.3). **(p.85)**

4.2.1 Distribution of vowel lowering

The chief factors influencing the application of vowel lowering are morphology and stress.

Morphology. The rule of vowel lowering applies tautomorphemically. We thus get a contrast between *öring* /ør-iŋ$_2$/ [^{2}ˈœːrɪŋ] ‘salmon trout’ and *näring* /nɛr-iŋ$_2$/ [^{2}ˈnæːrɪŋ] ‘nourishment’, where the rule applies, and *örike* /ø+rik-e$_2$/ [^{2}ˈøːˌriːkɛ̟] ‘island state’ and *träribba* /trɛ+ribᵘ-α$_2$/ [^{2}ˈtrɛːˌrɪbːa] ‘wooden lath’, where the rule does not apply.

Before an inflectional ending, the rule applies more reliably with /ø/ than with /ɛ/. There is a small set of verbs to illustrate this.

(62) Variation before inflectional endings

infinitive	present	infinitive	present
för-a ‘lead’	för /før/ [fœːr]	strö ‘strew’	strö-r /strø-r/ [strœːr]
kör-a ‘drive’	kör /ɕør/ [ɕœːr]	dö ‘die’	dö-r /dø-r/ [dœːr]
bär-a ‘carry’	bär /bɛr/ [bæːr]	spä ‘dilute’	spä-r /spɛ-r/ [spɛːr], [spæːr]
lär-a ‘learn’	lär /lɛr/ [læːr]	trä ‘thread’	trä-r /trɛ-r/ [trɛːr], [træːr]

klä ‘dress’ klä-r /klɛ-r/ [klɛːr], [klæːr]

Elert (1970: 61f.) and Hellberg (1978: 160ff.) note the allophony of long /ɛ/ as either [ɛː] or [æː] in *klär* ‘dresses’. The pronunciation of long /ø/ as either [øː] or [œː] is commented on in Hellberg (1971: 10; see also Linell 1973: 9). None of these sources however indicates that /ɛː/ and /øː/ should behave differently in the context above, but the data in (62) point to a minor asymmetry, where /ø/ has a slightly stronger tendency to lower than /ɛ/.[9]

Stress. In unstressed positions, /ɛ/ and /ø/ only occur in syllables preceding the stressed syllable, where they lower reliably at least in closed syllables. Examples with /ɛ/ were given in 2.2.4, e.g. *perfekt* /pɛrfekt/ [pær'fɛ̝kːt] ‘perfect’, *pergament* /pɛrgament/ [pærga'mɛ̝nːt] ‘parchment’. Examples with /ø/ are e.g. *törhända* /tør-hɛnd-α_2/ [tœr^2'hɛnːda] ‘perhaps’, *förvandla* /før-vɑndl-α_2/ [fœr^1 'vanːdla] ‘to transform’, *körsnär* /ɕørsnɛr/ [ɕœʂ'næːr] ‘furrier’.

(p.86) 4.2.2 Notes on vowel lowering

In the younger generation, there is a tendency to generalize the lower long allophones of /ø/ and /ɛ/ to all contexts. The process towards this state has been noticed in varieties within the Central Swedish area since the 1920s (Gjerdman 1927: 74; Nordberg 1975: 590f.; Andersson 1980: 30f.; Kotsinas 1991, 1994). The approach of the [ɛː] and [øː] allophones to the [æː] and [œː] allophones is clearly visible in Kuronen’s (2000: 119) description of Central Standard Swedish as spoken in Nyköping (see Fig. 2.2), and is extensively discussed and charted in Leinonen (2010). Leinonen finds that while the lowering is most noticeable with /ɛ/ and /ø/, it is in fact quite general and applies also to the other vowels.

4.3 Vowel centralization

In many dialects of Central Swedish, as well as in Göteborg and its surroundings, there is another change in short /ø/ where the quality of the short vowel is centralized to [ɵ]. Thus, while the long allophone is lowered, the short allophone is centralized. The chief context for both processes is the position before /r/, but for many speakers it is more general. The phenomenon was described by Ståhle (1965) and is the main topic of Wenner (2010). Illustration of vowel centralization is given in (63).

(63) Vowel centralization

Position before /r/ and other retroflexes			Lowering		Centralization/ neutralization
	mörker ‘darkness’	/mørk•r/	[^{2}ˈmœrːkɐ̯r]	or	[^{2}ˈmərːkɐ̯r]
	mörkna ‘to darken’	/mørk-nɑ$_{2}$/	[^{2}ˈmœrːkna]	or	[^{2}ˈmərːkna]
cf.	murkna ‘to decay’	/mʉrk-nɑ$_{2}$/			[^{2}ˈmərːkna]
	första ‘first’	/først-ɑ$_{2}$/	[^{2}ˈfœʂːta]	or	[^{2}ˈfəʂːta]

Before other consonants					
	rösta ‘to vote’	/røst-α_2/	[^{2}'rœs:ta]	or	[^{2}'rəs:ta]
cf.	rusta ‘to arm’	/r$\shortmid$st-α_2/			[^{2}'rəs:ta]
	föll ‘fell’	/føl$^{\mu}$/	['føl:]	or	['fəl:]
cf.	full ‘id.’	/f$\shortmid$l$^{\mu}$/			['fəl:]

The centralization leads to neutralization with the short [ɵ] allophone of /ʉ/. In the vowel chart given in Kuronen (2000: 119, reproduced as Fig. 2.2) it is clearly seen how close the [œ] and [ɵ] sounds are in the acoustic vowel space.

(p.87) 4.3.1 Distribution of vowel centralization

The most likely context for vowel centralization is the position before retroflex consonants, that is before /r/ and the outputs of retroflexion (Ståhle 1965; Bergström 2002; Wenner 2010). In this position, vowel centralization has a long history of neutralization or near neutralization at least within the Stockholm variety of CSw. The re-establishment of the distinction between /ø/–[œ] and /ʉ/–[ɵ] in short stressed vowels before /r/ and other retroflexes is due to the influence of orthography on pronunciation in the modern age (Ståhle 1965: 94). The rule is thus most productive in the same context as vowel lowering (see 4.2).

Vowel centralization may also apply before other consonants, with idiolectal variation. A few examples are given in (64).

(64) More examples of vowel centralization

dörr /dørᵘ/ [dœrː], [dɵrː] ‘door’	förr /førᵘ/ [fœrː], [fɵrː] ‘earlier on’
större /størᵘ-e/ [^{1}'stœrːɛ̯], [^{1}'stɵrːɛ̯] ‘bigger’	björk /bj̯ørk/ [bjœrːk], [bjɵrːk] ‘birch’
förti /førᵘti/ [^{2}'fœt̪ːɪ], [^{2}'fɵt̪ːɪ] ‘forty’	störst /størᵘ-st/ [stœʂːt], [stɵʂːt] ‘biggest’
mössa /møsᵘ-ɑ$_{2}$/ [^{2}'mø̞sːa], [møsːa] ‘hat’	
tröst /trø̞st/ [trøsːt], [trɵsːt] ‘consolation’	höst /hø̞st/ [hø̞sːt], [hɵsːt] ‘autumn’
trött /trø̞tᵘ/ [trøtː], [trɵtː] ‘tired’	dött /dø̞tᵘ/ [døtː], [dɵtː] ‘died’
mjölk /mj̯ø̞lk/ [mjølːk], [mjɵlːk] ‘milk’	
fönster /fø̞nst•r/ [^{1}'føn:stɛ̯r], [^{1} 'fɵn:stɛ̯r] ‘window’	sönder /sønd•r/ [^{1}'sø̞n:dɛ̯r], [^{1} 'sɵn:dɛ̯r] ‘broken’
lögn /løŋn/ [lø̞ŋːn], [lɵŋːn] ‘lie’	sjöng /ʂøŋᵘ/ [ɧø̞ŋː], [ɧɵŋː] ‘sang’
töm /tømᵘ/ [tø̞mː], [tɵmː] ‘rein’	öm /ømᵘ/ [ø̞mː], [ɵmː] ‘tender’
döma /dømᵘ-ɑ$_{2}$/ [^{2}'dø̞mːa], [^{2}'dɵmːa] ‘to sentence’	dömt /dømᵘ-t/ [dø̞mːt], [dɵmːt] ‘doomed’
gömt /j̯ømᵘ-t/ [jø̞mːt], [jɵmːt] ‘hidden’	
öppnas /øpᵘn-ɑs$_{2}$/ [^{2}'ø̞pːnas], [^{2}'ɵpːnas] ‘opens’	

högg /høgᵘ/ [høg̟ː], [høgː] ‘chopped’	ögla /øgᵘl-ɑ$_2$/ [^{2}ˈø̟gːla], [^{2}ˈøgːla] ‘loop’
böcker /bøkᵘ-•r/ [^{1}ˈbø̟kːɛ̟r], [^{1}ˈbøkːɛ̟r] ‘books’	

The short allophone of /ø/ is somewhat lower than the long allophone, hence *tröst* [trø̟sːt] ‘consolation’ vs. *söt* [søːt] ‘sweet; pretty’. Malmberg (1971: 64) transcribes it as [œ], but we reserve this sign for the short allophone in the position **(p.88)** before a retroflex consonant. Short [œ] is in fact slightly higher, on average, than short [ø̟], but also more central, which puts it close to the [ɵ] allophone of /ʉ/. For some speakers all instances of the short allophone [ø̟] undergo vowel centralization to [ɵ].

4.4 Nasal assimilation

By nasal assimilation, the coronal nasal assimilates to the place of articulation of a following segment. It is thus a case of a regressive place assimilation. The examples in (65) show the indefinite article *en* ‘a’, which is pronounced [ɛ̟n] before vowels, in the position before consonants with different places of articulation.

(65) Nasal assimilation

a.

___ vowel:	en apa /en ɑp-ɑ$_2$/ [ɛ̟n^{2}ˈɑːpa] ‘a monkey’
	en öken /en øken/ [ɛ̟n^{1}ˈøːkɛ̟n] ‘a desert’
	en iller /en ilᵘ•r/ [ɛ̟n^{1}ˈɪlːɛ̟r] ‘a ferret’

b.

___ labial:	en båt /en bot/ [ɛ̟mˈboːt] ‘a boat’
	en morgon /en morgon/ [ɛ̟m^{2}ˈmɔrːgɔn] ‘a morning’
	en påse /en pos-e$_2$/ [ɛ̟m^{2}ˈpoːsɛ̟] ‘a bag’

b.i.

___ labiodental:	en fara /en fɑr-ɑ$_2$/ [ɛ̟ɱ^{2}ˈfɑːra] ‘a danger’
	en vana /en vɑn-ɑ$_2$/ [ɛ̟ɱ^{2}ˈvɑːna] ‘a habit’

c.

___ dorsal:	en gång /en goŋᵘ/ [ɛ̟ŋˈgɔŋː] ‘once’
	en karl /en kɑr/ [ɛ̟ŋˈkɑːr] ‘a man’

d.

___ coronal:	en dag /en dɑg/ [ɛ̟n'dɑːg/ ‘a day’
	en näsa /en nɛs-ɑ$_2$/ [ɛ̟n^2'nɛːsa] ‘a nose’
	en tand /en tɑnd/ [ɛ̟n'tanːd] ‘a tooth’
	en säl /en sɛl/ [ɛ̝̄'sɛːl] or [ɛ̟n'sɛːl] ‘a seal’

d.i.

___ alveolar:	en sjukling /en ʂʉk-liŋ$_2$/ [ɛ̝̄^{2}'ʂʉːklɪŋ], [ɛ̝̄n^2'ʂʉːklɪŋ], [ɛ̝̄^{2} 'ɧʉːklɪŋ], [ɛ̝̄n^2'ɧʉːklɪŋ], or [ɛ̟ŋ^2'ɧʉːklɪŋ] ‘a sick person’

e.

___ palatal:	en julgran /en ʝʉl+grɑn/ [ɛ̟ɲ^2'jʉːlˌgrɑːn] or [ɛ̟n^2'jʉːl ˌgrɑːn] ‘a Christmas tree’
	en kelgris /en ɕel+gris/ [ɛ̟ɲ^2'ɕeːlˌgriːs], [ɛ̟n^2'ɕeːlˌgriːs] or [ɛ̝̄ ^{2}'ɕeːlˌgriːs] ‘a pet’

Before vowels the unmarked coronal place of articulation is assigned, (65a). Elsewhere, the coronal nasal takes over the place of articulation from the segment following it, if that segment has a place of articulation, (65b, c, d). The exact **(p.89)** nature of assimilation to fricatives is less clear, except for the labiodentals (65b.i). For the other fricatives there is some variation, where the coronal pronunciation of /n/ always seems to be an option, even in the prosodically fairly close context of an article+noun that we are looking at here.[10] Another option is to put nasality on the vowel, (65d.i, e) or produce a nasal approximant. Palatalization of the nasal is the clearest in the case of /ʝ/, less so with /ɕ/, (65e).

4.4.1 Distribution of nasal assimilation

Nasal assimilation between the phonologically distinct places of articulation (labial, coronal, dorsal) only applies to the coronal nasal, whereas the labial and dorsal nasals are unaffected by a following different place of articulation: *de* /dom/ ‘those’, [dɔm^2'gɔŋːɛ̟r] ‘those times’ (*[dɔŋ^2'gɔŋːɛ̟r); *nånting* /nontiŋ/ ‘something’, ['nɔnːtɪŋ'tənːt] ‘something thin’ (*['nɔnːtɪn'tənːt]). The labial nasal will however get labiodental pronunciation before a labiodental fricative (*de faror* [dɔŋ^2'fɑːrʊr] ‘those dangers’), but the dorsal nasal will not get assimilated to a palatal (*nånting julgransliknande* ['nɔnːtɪŋ ^{2}'jʉːlˌgrɑːnsˌliːknandɛ̟] ‘something Christmas tree-like’ (*['nɔnːtɪɲ'jʉːl…]).

Nasal assimilation applies between any two morphemes that are phrased together.

(66) Nasal assimilation

Compounds:	tenn+bägare	[^{2}ˈtɕmːˌbɛːgarɕ]	‘tin mug’
	tunn+pannn+kaka	[^{2}ˈtɵmːˌpaŋːˌkɑːka]	‘thin pancake’
	Finn+grundet	[^{2}ˈfɳːˌgrɵnːdɕt]	(place name)
Phrases:	jämnt mellan blocken ‘even between the blocks’		
	[…m b…]		
	samverkan mellan kommun och landsting ‘cooperation		
	[…m mɛ̟lːaŋ k…] between municipalities and county council’		

Speech rate influences the likelihood and degree of assimilation across larger morpheme boundaries. Careful pronunciations of *Danmark* /dɑnᵘ+mɑrk/ ‘Denmark’ and *svanpar* /svɑn+pɑr/ ‘swan couple’ are thus likely to escape nasal assimilation. Also, there is a slight intuitive difference between moraic /n/ and non-moraic /n/, where a moraic /n/ is more likely to clearly assimilate, cf. *finnbastu* ‘Finnish style sauna’ and *finbageri* ‘fine bakery’.

The coronal place of articulation is unmarked (Paradis and Prunet 1990), and that is the reason why only /n/ undergoes assimilation. The pressure for having a **(p.90)** shared place of articulation in a consonant sequence (nasal agreement) overrides the expression of [CORONAL] place. The other nasals are preserved by the higher ranking of faithfulness constraints preserving the place specifications [LABIAL] and [DORSAL]. This is the normal order of things in languages. Nothing prevents a wider nasal assimilation rule, of course.[11]

This arrangement of the grammar allows for all the variation expressed in (65), including the partial assimilations, while at the same time stopping /m/ and /ŋ/ from even partial assimilations, when these would entail a change in phonological specifications.

(67) Partial assimilation of /m/

a.

trettie/n/	trettie[ɱ f]ioler	tretti[ɛ̄ s]älar	trettie[ɲ j]ulgranar
‘31’	‘31 violins’	‘31 seals’	‘31 Christmas trees’

b.

trettife/m/	trettife[ɱ f]ioler	trettife[m s]älar	trettife[m j]ulgranar

‘35’	‘35 violins’	‘35 seals’	‘35 Christmas trees’

In the context of a labiodental, nasal assimilation of [LABIAL] applies to /n/, and both /n/ and /m/ assimilate to the labiodental articulation. In other cases, where there is a mismatch of place of articulation, /m/ is left unaffected by other assimilations.

4.4.2 Variable assimilation

Assimilation may apply variably under different prosodic conditions, though this has not been properly investigated as yet. A case where this is particularly clear is assimilation of /n/ to a following /ʂ/, which intuitively appears to vary with stress profile, when the pronunciation is [ɧ] rather than the alveolar [ʂ] (see 3.3.5). If the syllable containing [ɧ] is stressed, the tendency is for the nasal to lose its place of articulation and instead attach as nasalization on the vowel (68a, b). This can happen whether the syllable containing the nasal is stressed or not. But if the syllable containing [ɧ] is unstressed, assimilation to dorsal place of articulation seems possible, (68c).

(68) Variable assimilation of /n/ to [ɧ]

a.

en sked	/en ʂeːd/	[ɛ̱̃ˈɧeːd]	‘a spoon’

b.

tenn-sked	/tɛnᵘ+ʂeːd/	[²ˈtɛ̱̃ːˌɧeːd] or [²ˈtɛ̱nːˌɧeːd]	‘tin spoon’

c.

kanske	/kɑnʂe/	[²ˈkaŋːɧɛ̱] or [²ˈkanːɧɛ̱]	‘maybe’

A search on the Internet turns out spellings like ‹kangske› (for ‹kanske› ‘maybe’) indicating the perception of a dorsal articulation of the nasal.[12] The dorsal **(p. 91)** assimilation is one of the reasons for categorizing the allophone [ɧ] as dorsal (see 3.3.5). Another reason is the variation of pronunciations in the velar region, ranging from front dorsal fricative [ɧ] to proper ach-laut [x].

4.4.3 Interaction of nasal assimilation and retroflexion

Nasal assimilation interacts with *d*-deletion in forms like *Brandbergen* /brɑnd+bɛrɻ-•n/ (place name) becoming *Bra*[mːb]*ergen*, and *landgången* /lɑnd+goŋᵘ-n/ ‘the gangway’ becoming *la*[ŋːg]*ången*. This is discussed in 4.6.

Nasal assimilation can also apply to nasals that have participated in the retroflexion rule (see 4.1). Some examples are given below.

(69) Nasal assimilation and retroflexion

törnbuske /tørn+bʉsk-e$_2$/	[^{2}ˈtœːɳˌbøsːkɛ̯] or [^{2}ˈtœːmˌbøsːkɛ̯] ‘briar’
barngaloscher /bɑrn+gɑloʂᵘ-•r/	[^{2}ˈbɑːɳgaˌlɔʂːɛ̯r] or [^{2}ˈbɑːŋgaˌlɔʂːɛ̯r] ‘child galoshes’

In these cases, nasal assimilation typically overshadows the pronunciation of the retroflex. The movements of the tongue and the quality of the vowel preceding the retroflex, which is lowered in the applicable cases (e.g. /ø/ > [œ], see 4.2), make it clear that the retroflex remains a pronunciation target, albeit masked by nasal assimilation.

4.5 *g*-excrescence

The dorsal nasal /ŋ/ always occurs syllable-finally. In forms where /ŋ/ is underlying it is always long in stressed syllables: *tång* /toŋᵘ/ [tɔŋː] ‘seaweed, tang’, *langare* /lɑŋᵘ-ɑre$_2$/ [^{2}ˈlaŋːarɛ̯] ‘pusher’. Thus, short [ŋ] after a long vowel only occurs as the result of nasal assimilation: *bangård* /bɑn+gord/ [^{2}ˈbɑːŋˌgoːɖ] ‘railway yard’. The dorsal nasal may also be ambisyllabic, like most consonantal segments, but cannot constitute onset alone: *finger* /fiŋᵘr/ [^{1}ˈfɪŋːɛ̯r] ‘finger’. However, /ŋ/ cannot be ambisyllabic *into* a stressed syllable. Instead, such contexts exhibit a process of excrescence, whereby a [g] materializes after the [ŋ], ostensibly to become the onset of the following syllable, which is a foot. Eliasson (1986: 276) calls this rule Postnasal *g*-insertion. There are a few words that exhibit an alternation which may serve as a reason for describing this as a process, see (70).

(p.92) (70) Alternations between [ŋ] and [ŋg]

	sg.	pl.	*g*-excrescence
harang /hɑrɑŋᵘ/ ‘harangue’	[ha ˈraŋː]	[ha ˈraŋːɛ̯r]	[haraŋˈgeːra] ‘to harangue’
falang /fɑlɑŋᵘ/ ‘wing, faction’	[fa ˈlaŋː]	[fa ˈlaŋːɛ̯r]	[falaŋˈgɪsːt] ‘factionist’
diftong /diftoŋᵘ/ ‘diphthong’	[dɪf ˈtɔŋː]	[dɪf ˈtɔŋːɛ̯r]	[dɪftɔŋˈgeːra] ‘to diphthongize’

Elsewhere, *g*-excrescence is mostly in evidence as a static pattern, which makes it hard to ascertain the underlying form, see (71).

(71) Static pattern [ŋ] vs. [ŋg]

[ŋ]	slang /slɑŋᵘ/	[ˈslaŋː]	[1ˈslaŋːar]	‘tube /pl.’
	kupong /kʉpoŋᵘ/	[kʉ̟ˈpɔŋː]	[kʉ̟1ˈpɔŋːɛ̠r]	‘coupon /pl.’
	kalsong /kɑlsoŋᵘ/	[kalˈsɔŋː]	[kal1ˈsɔŋːɛ̠r]	‘underpants /pl.’
	hunger /hʉŋᵘ•r/	[1ˈhɵŋːɛ̠r]		‘hunger’
	finger /fiŋᵘ•r/	[1ˈfɪŋːɛ̠r]	[2ˈfɪŋːrar]	‘finger/pl.’

[ŋg]	hangar /hɑŋɑr/ or /hɑŋgɑr/	[haŋˈgɑːr]	[haŋˈgɑːrɐ̯r]	‘hangar /pl.’
	fungera /fʉŋer-$ɑ_2$/ or /fʉŋger-$ɑ_2$/	[fɵŋ[1]ˈgeːra]		‘to function’
	adjungera /ɑdʝʉŋer-$ɑ_2$/ or /ɑdʝʉŋger-$ɑ_2$/	[adjɵŋ[1]ˈgeːra]		‘to adjoin’
	angora /ɑŋor-$ɑ_2$/ or /ɑŋgor-$ɑ_2$/	[aŋ[2]ˈgoːra]		‘Angora (cat)’
	finger /fiŋer-$ɑ_2$/ or /fiŋger-$ɑ_2$/	[fɪŋ[1]ˈgeːra]		‘to feign’[13]

Excrescence is limited to syllable and foot-initial position. In cases where there is another consonant following the [ŋ], that consonant will be onset and no excrescence of /g/ takes place. Good examples are somewhat hard to come by, but a few are given in (72).

(72) No *g*-excrescence

magnolia /mɑgnuli-$ɑ_2$/ [maŋ^{1}ˈnuːlɪa]	*[maŋ^{1}ˈgnuːlɪa] ‘magnolia’
changera /ʂɑŋʂer-$ɑ_2$/ [ɧaŋ^{1}ˈɧeːra]	*[ɧaŋgˈɧeːra] ‘to alter, fade’
sjangsera /ʂɑŋser-$ɑ_2$/ [ɧaŋ^{1}ˈseːra]	*[ɧaŋgˈseːra] ‘to alter, fade’

Our analysis here, then, derives the surface [g] as a growth out of the /ŋ/ for the cases in (70). Homorganic insertion of [g] (reminiscent of the English stop insertion in e.g. *prince* yielding [pɹɪnts], beside [pɹɪns]) seems a less attractive analysis here as there is already such a process in nickname formation, where the segment inserted is not only homorganic, but also voiceless, hence less marked (e.g. *Tomas* > *Tompa, Sven* > *Svempa, Bengt* > *Benke*, see 7.2).

For the cases in (71), there is no real arbitration between an analysis with underlying /ŋ/ (and *g*-excrescence), or one with underlying /ŋg/ (and no *g*-excrescence). One might also entertain an analysis with underlying /ŋg/ for the cases in (70). If so, we should instead have a rule that deletes the /g/ when in a **(p.93)** coda. Such an analysis is however slightly problematic in view of the data in (73), where /g/ appears between /ŋ/ and /v/.

(73) /ŋ/ before labiodental

___ /v/	lingvist	/liŋv-ist/	[lɪŋˈvɪsːt]	or [lɪŋgˈvɪsːt]	‘linguist’
	pingvin	/piŋvin/	[pɪŋˈvɪːn]	or [pɪŋgˈvɪːn]	‘penguin’
	sangvinisk	/sɑŋvin-•sk/	[saŋˈviːnɪsk]	or [saŋgˈviːnɪsk]	‘sanguine’

If the main problem were that /ŋg/ would form an illegitimate coda, the occurrence of /g/ would be highly unexpected in the context before /v/. For one thing, it is by no means obvious that […gv…] should form an onset (*piŋ.gvin* or *piŋg.vin*?). No words in Swedish begin in the sequence [gv]. Rather, the presence of [g] here might be due to the articulatory transition from the dorsal nasal to the labiodental. Also, it might be worth noting that the prohibition against homorganic non-coronal nasal + stop in codas would seem to be less firm than in English. Indeed, there is no contrast between [ŋ] and [ŋg] in word-final position. But with the labials there is a contrast. Forms like *plomb* ‘filling’, *tromb* ‘tornado’, *bomb* ‘id.’, and *hekatomb* ‘hecatomb’ are pronounced with final [mb]. Thus, perhaps [ŋg] is phonotactically admitted in codas, in principle, but underused. We might take this as an argument for *g*-excrescence, over and above an analysis where [g] is underlying in all instances, and subsequently deleted in codas containing [ŋ].

In prestress position, intervocalic [ŋ] is hard to find, whereas there are some cases of [ŋg]. But in derived forms with the productive suffix *-eri* (see 10.2.2), [ŋ] can show up between prestress syllables.

(74) [ŋ] and [ŋg] in prestress position

a. longitud /loŋgitʉd/ [lɔŋgɪˈtʉːd] ‘longitude’, orangutang /urɑŋgʉtɑŋᵘ/ [ʊraŋgʉˈtaŋː] ‘orang-utan’
b. kränga /krɛŋᵘ-ɑ$_2$/ [^{2}ˈkr̟ɛŋːa] ‘to sell (sl.)’; krängeri /krɛŋᵘ-eri/ [$_0$kr̟ɛŋɛˈriː] ‘(repeated) selling’, lagvrängare /lɑg+vrɛŋᵘ-ɑre$_2$/ [^{2}ˈlɑːg ˌvr̟ɛŋːarɛ] ‘law bender, lawyer’; lagvrängeri /lɑg+vrɛŋᵘ-eri/ [^{2} ˈlɑːg$_0$vr̟ɛŋɛˌriː] ‘law bending’

The contrast here is best analysed as due to different underlying forms, namely /ŋg/ vs. /ŋ/.

The sequence [ŋg] also often shows up before central and back vowels in unstressed syllables in forms like *tango* ‘id.’ and *manga* ‘id.’. These cases are best analysed as underlying sequences of /ŋg/, as there is a contrast between /ŋ/ and /ŋg/ in that position in the lexicon. The contrast is also marginally present with front vowels.

(p.94) (75) Lexical distribution of /ŋ/ and /ŋg/.[14]

/ŋ/		/ŋg/	
a.			
fingo ‘received, pl.’	[^{2}ˈfɪŋːʊ]	bingo ‘id.’	[^{1}ˈbɪŋːgʊ]~[ŋː]

gingo ‘went, pl.’	[^{2}ˈjɪŋːʊ]	mango ‘id.’	[^{1}ˈmaŋːgʊ]~[ŋː]
många ‘many’	[^{2} ˈmɔŋːa]	tango ‘id.’	[^{1}ˈtaŋːgʊ]~[ŋː]
lingon ‘lingonberry’	[^{2}ˈlɪŋːɔn]	Kongo ‘Congo’	[^{1}ˈkɔŋːgʊ]~[ŋː]
langa ‘to peddle’	[^{2}ˈlaŋːa]	manga ‘id.’	[^{2}ˈmaŋːga]
gunga ‘to swing’	[^{2}ˈgʊŋːa]	Katanga ‘(State of) Katanga’	[ka^{2}ˈtaŋːga]
sjunga ‘to sing’	[^{2}ˈɧʊŋːa]	känguru ‘kangaroo’	[^{1} ˈɕɛ̟ŋːgʉ̟rʉ̟]~[ŋː]
hängig ‘out of sorts’	[^{2} ˈhɛ̟ŋːɪg]	Pingu (cartoon penguin)	[^{1}ˈpɪŋːgʉ̟]
pingis ‘table tennis’	[^{2}ˈpɪŋːɪs]	Hingis (personal name)	[^{1}ˈhɪŋːgɪs]
Angered (place name)	[^{2}ˈaŋe̟ ˌreːd]	merengue ‘id.’	[mɛ̟^{1}ˈre̟ŋːgɛ̟]

b.

orangutang ‘orang-utan’	[ʊraŋgʉ̟^{1}ˈtaŋː]
longitud ‘longitude’	[lɔŋgɪ^{1}ˈtʉ̟ːd]
Nangijala (place name)	[naŋːgɪ^{1}ˈjɑːla]

c.

langobard ‘Lombard’	[laŋːɔ ˈbɑːɖ]		[laŋːgʊˈbɑːɖ]
triangel ‘triangle’	[trɪˈaŋːɛ̟l]	triangulär ‘triangular’	[trɪaŋgʉ ˈlæːr]
rektangel ‘rectangle’	[rɛ̟k ˈtaŋːɛ̟l]	rektangulär ‘rectangular’	[rɛ̟ktaŋgʉ ˈlæːr]
singel ‘single’	[sɪŋːɛ̟l]	singuljär ‘singular’	[sɪŋgʉlˈjæːr]
		singular ‘singular’	[sɪŋgʉˈlɑːr]

For some of the forms in the right column there are alternative pronunciations with [ŋ] beside [ŋg], perhaps a signal that [ŋg] is not preferred in poststress position, but is preferred in prestress position.

Most of the forms in the left column have tonal accent 2 while those in the right column mostly have accent 1. To some extent, this testifies to the fact that many forms on the right are loans. However, it does not seem possible to reduce the presence of [ŋg] in these forms to loan status in view of the age of some of the loans. Clearly, these sequences are not problematic outside of foot-initial position.[15]

(p.95) 4.6 Postnasal *d*-deletion

Various cluster reductions occur in running speech. One of the most regular targets for such rules is /d/. In this section we look at a number of contexts for *d*-deletion. In careful speech, [d] may be pronounced.[16]

(76) Deletion of (non-moraic) /d/ in homorganic contexts

a. /n/ ___ /s/
landsväg /lɑnd-s+vɛg/ ['lanːsˌvæːg] 'country road', cf. land /lɑnd/ [lanːd] 'id.', ondska /und-skɑ$_2$/ [^{2}'ʊnːska] 'evilness', cf. ond /und/ [ʊnːd] 'evil', holländsk /hol$^{\mu}$+lɛnd-sk/ [^{2}'hɔlːˌɛ̨nːsk] 'Dutch', cf. Holland /hol$^{\mu}$+lɑnd/ [^{1}'hɔlːand] 'id.', gotländsk /got$^{\mu}$+lɛnd-sk/ [^{2}'gɔtːˌlɛ̨nːsk] 'Gutnish', cf. Gotland /got$^{\mu}$+lɑnd/ [^{1}'gɔtːˌland] 'id.'
b. /n/ ___ /t/
sandtag /sɑnd+tɑg/ [^{2}'sanːˌtɑːg] 'sandpit', cf. sand /sɑnd/ [sanːd] 'id.' blindtarm /blind+tɑrm/ [^{2}'blɪnːˌtarːm] 'appendix', cf. blind / blind/ [blɪnːd] 'id.'

These cases are analysed as deletion rather than assimilation (see 4.7), since the loss of /d/ interacts with nasal assimilation, and the behaviour of /t/ in corresponding positions, see (78).

(77) *d*-deletion before heterorganic stop; nasal assimilation

a. /n/ ___ dorsal
bondkaka /bund+kɑk-ɑ$_2$/ [^{2}'bʊŋːˌkɑːka] 'peasant cookie', cf. bonde / bund-e$_2$/ [^{2}'bʊnːdɛ̨] 'peasant'; handklaver /hɑnd+klɑver/ [^{2}'haŋːkla ˌveːr] 'accordion', cf. hand /hɑnd/ [hanːd] 'id.'; landgång /lɑnd+goŋ$^{\mu}$/ [^{2}'laŋːˌgɔŋː] 'gangway', cf. land /lɑnd/ [lanːd] 'id.'
b. /n/ ___ labial
bandpasta /bɑnd+pɑst-ɑ$_2$/ [^{2}'bamːˌpasːta] 'tagliatelle', cf. band / bɑnd/ [banːd] 'id.'; Brandbergen /brɑnd+bɛrj-•n/ [^{2}'bramːˌbærːjɛ̨n] (name), cf. brand /brɑnd/ [branːd] 'fire'; Lindblad /lind+blɑd/ [^{2}'lɪmː ˌblɑːd] (name), cf. lind /lind/ [lɪnːd] 'lime tree'

(p.96) c. /n/ ___ labiodental
handfast /hɑnd+fɑst/ [^{2}'haŋːˌfasːt] 'sturdy', cf. hand /hɑnd/ [hanːd] 'id.'; bandvagn /bɑnd+vɑŋn/ [^{2}'baŋːˌvaŋːn] 'tracked vehicle', cf. band /bɑnd/ [banːd] 'id.'

d-deletion may also take place between /n/ and /m/, in the limited context of names, e.g. *Lindman* /lind+mɑn/ [^{2}ˈlɪnːˌmanː]. In these instances, nasal assimilation is less likely to happen $^{?}$[lɪmːanː].

There is no corresponding deletion of /t/ in otherwise identical contexts and hence no application of nasal assimilation, see (78). This speaks for deletion rather than assimilation. If it were the question of assimilation, it is hard to see why /t/ should not be targeted where /d/ is.

(78) No deletion of /t/

a.

/n/ ___ /s/	pantsätta /pɑnt+sɛtᵘ-ɑ$_2$/ [^{2}ˈpanːtˌsɛ̟tːa] ‘to pawn’, *[^{2}ˈpanːˌsɛ̟tːa]

b.

/n/ ___ /d/	mintdoft /mint+doft/ [^{2}ˈmɪnːtˌdɔfːt] ‘mint smell’, *[^{2}ˈmɪnːˌdɔfːt][17]

c.

n/ ___	dorsal	mintkola /mint+kol-ɑ$_2$/ [^{2}ˈmɪnːtˌkʰoːla] ‘mint toffee’

d.

/n/ ___	labial	lantpaté /lɑnt+pɑte/ [^{2}ˈlanːtpʰaˌtʰeː] ‘country paté’

e.

/n/ ___ labiodental	pantflaska /pɑnt+flɑsk-ɑ$_2$/ [^{2}ˈpanːtˌflasːka] ‘return bottle’

In the context of a following identical coronal, there is assimilation: *mintte* /mint+te/ [ˈmɪnːˌteː] ‘mint tea’. In all other contexts where /d/ is deleted, /t/ is retained.

d-deletion applies after the homorganic nasal, but not easily after the dorsal and labial nasals.

(79) Questionable deletion of /d/ with other nasals

a. /ŋ/ ___ dorsal
längdgrad /lɛŋᵘ-d+grɑd/ [^{2}ˈlɛ̟ŋːdˌgrɑːd], $^{?}$[^{2}ˈlɛ̟ŋːˌgrɑːd] ‘longitude’;
längdkval /lɛŋᵘ-d+kvɑl/ [^{2}ˈlɛ̟ŋːdˌkvɑːl], $^{?}$[^{2}ˈlɛ̟ŋːˌkvɑːl] ‘long jump qualification’
(p.97) b. /m/ ___ labial

rymdpromenad /rymd+prumen-ɑd/ [^{2}ˈrʏmːdprʊmɛ̟ˌnɑːd], $^{?}$[^{2}ˈrʏmːprʊmɛ̟ˌnɑːd] ‘spacewalk’; rymdbas /rymd+bɑs/ [^{2}ˈrʏmːdˌbɑːs], $^{?}$[^{2}ˈrʏmːˌbɑːs] ‘space base station’

The other voiced stops /b/ and /g/ are not obviously deleted in their homorganic contexts. The case of /g/ is untestable in the context /ŋg/+homorganic consonant because /ŋg/ does not occur word-finally. For /b/ the situation is mixed. It remains before an /m/, and is at least partly fused with a following /p/.

(80) No deletion of /b/ in homorganic context

a.

/m/ ___ /b/	(lägga) bombmatta /bomb+mɑtᵘɑ/	[^{2}ˈbɔmːbˌmatːa] ‘(to) carpet bomb’

b.

/m/ ___ /p/	bombparty /bomb+pɑrty/	[^{2}ˈbɔmːˌpɑːʈʏ] ‘bomb party’

We find occasional *d*-deletion word-finally in a limited set of words. Only stressed syllables are targeted, and deletion applies after a long vowel or after /n/ (Janson 1977: 253). The rule is always optional and applies only in informal contexts.

(81) Context-free, optional *d*-deletion in informal style

				informal	*formal*
word-finally	med	/med/	‘with’	[me(ː)], [mɛ(ː)]	[meːd]
	bred	/bred/	‘spread’	[breː]	[breːd]
	sned	/sned/	‘askew’	[sneː]	[sneːd]
	glad	/glɑd/	‘happy’	[glɑː]	[glɑːd]
	hand	/hɑnd/	‘id.’	[hanː]	[hanːd]
but	sed	/sed/	‘custom’	[seːd] *[seː]	[seːd]
	besked	/be-ʂed/	‘answer’	[bɛˈɧeːd], *[bɛˈɧeː]	[bɛˈɧeːd]

The set of words that undergo this rule is best defined via language history. The much wider deletion and assimilation (*ld, nd*) of /d/, going back to the 16th and 17th centuries, which was subsequently followed by (middle class) reinsertion of /d/ in a couple of systematic contexts (participles, unstressed syllables). In the remaining forms, reinsertion is subject to reversed lexical diffusion, according to Janson (1977).

Today, reinsertion of /d/ is nearly complete, but there are some semantic and (by extension) lexical splits where the *d*-less forms deviate from the *d*-ful forms.

(82) Semantic and lexical split with -*d*.

ha råd	/rod/	[roː]	[roːd]	‘to afford’
råd	/rod/	*[roː]	[roːd]	‘advice’
synd	/synd/	[sʏnː]	[sʏnːd]	‘pity’
synd	/synd/	*[sʏnː]	[sʏnːd]	‘sin’
trä	/trɛ/	[trɛː]	*[trɛːd]	‘wood’
träd	/trɛd/	[trɛː]	[trɛːd]	‘tree’

(p.98)

We now turn to contexts where assimilation is a better analysis than deletion.

4.7 Assimilation of /d/

The phoneme /d/ is totally assimilated to a /t/ that is morphologically adjoined to the stem. This process is analysed here as assimilation and it applies in both moraic and non-moraic positions. If the /d/ fills or is pushed into a moraic position, the mora is preserved. If the /d/ remains outside of moraic position, no trace is left of the /d/. Depending on what context one looks at, the rule could be cast as assimilation or deletion, but it is important to recognize that this difference is not inherent to the process, but to the quantitative and phonotactic make-up of the syllable.

(83) Assimilation of /d/ (and [ɖ]) before /t/

a.

non-moraic	späna /spɛnd/ [spɛnːd] ‘tense’, neut. /spɛnd-t/ ['spɛnːt]
	korkad /kork-ɑd$_2$/ [^{2}'kɔrːkad] ‘stupid’, neut. /kork-ɑd$_2$-t/ [^{2}'kɔrːkat]

b.

non-moraic	glad /glɑd/ [glɑːd] ‘happy’, neut. /glɑd-t/ [glatː]
	röd /rød/ [røːd] ‘red’, neut. /rød-t/ [røtː]

c.

moraic	beredd /berɛdᵘ/ [bɛ'rɛdː] ‘prepared’, neut. /berɛdᵘ-t/ [bɛ'rɛtː]
	klädd /klɛdᵘ/ [klɛdː] ‘dressed’, neut. /klɛdᵘ-t/ [klɛtː]

d.

assimilated	hård /hord/ [hoːɖ] ‘hard’, neut. /hord-t/ [hoːʈ]
	åtråvärd /o+tro+vɛrd/ ['oːˌtroːˌvæːɖ] ‘desirable’, neut.
	/o+tro+vɛrd-t/ ['oːˌtroːˌvæːʈ]

(83a) illustrates the case where a non-moraic /d/ (in the coda) assimilates to a /t/, the neuter agreement morpheme. In (83b) adjectives that end in /d/ after a long vowel assimilate to neuter /t/, whereby the vowel shortens and the resulting coda consonant is long. The fact that vowel length is affected in these forms is often attributed to the assumption that vowel quantity is not underlying in Swedish, whereas consonant quantity is (Eliasson and LaPelle 1973). When we discuss the Swedish quantity system in chapter 8, we shall defend that view. An alternative analysis is to assume that the suffix *-t* has a long consonantal allomorph in the underlying form (i.e. /-tᵘ/), as it can be attached directly to a vowel-final adjective, too, e.g. *blå, blått* /blo-tᵘ/ [blɔtː] 'blue, neut.'; *ny, nytt* /ny-tᵘ/ [nYtː] 'new, **(p.99)** neut.' (see 8.4.4). This however, obviously fails to explain what looks like a phonological pattern.

In (83c) we have forms where the input already has a long /dᵘ/. These forms are, however, participials derived from verbs with non-moraic /d/: *bereda* 'to prepare' and *kläda* 'to dress'. Even though the synchronic relation can be questioned (e.g. the form *kläda* is more or less obsolete, *klä* being the modern form), it seems unsafe to assume true length of the underlying consonant here. The closest we get to an adjective ending in long [dː] is the form *rädd* [rɛdᵘ] 'scared', which is also originally derived from a verb (*räda, rädas* 'be scared of'). *Rädd*, however, does not even have a neuter form. This is part of a more general phenomenon of missing morphological forms. For discussion, and various suggestions for a resolution, see e.g. Raffelsiefen (2002: 45ff.), Pettersson (1990), and Löwenadler (2010).

4.8 *d*-continuization

Central Swedish (and possibly in other dialects that have the apical trill pronunciation of /r/) has a reduction rule where /d/ is weakened to [r] in mostly unstressed pronouns. We shall call the rule *d*-continuization.[18] The rule applies naturally in informal speech at a reasonable rate of speech.

(84) *d*-continuization exemplified

vad då då /vɑd do do/ 'what then'	[vɑˈdoːdɔ] > [vɑˈdoːrɔ], [vaˈdoːrɔ], [vaˈdoːrɑ]
ge dej iväg /je dɛj ivɛg/ 'go away'	[ˈjeːdɛ̟jɪˈvɛːg] > [ˈjeːrɛ̟jɪˈvɛːg]

d-continuization indeed turns the /d/ into a trill, fricative, or approximant rather than into a tap or a flap, as in the similar reduction known from varieties of Spanish (see Núñez Cedeño 1987). The main point of this process would seem to be the undoing of the stop, hence continuization. The obvious phonological feature to express this is [continuant]. If just the value of that feature is changed in the specification of a /d/, [r] should result, under the assumption that, on the one hand, change is minimal, on the other hand, new segments should preferably not be produced. Thus, neutralization of /d/ with /r/ in some contexts is more readily available than the continuization of /d/ into a fricative [ð] which would be foreign to the system.

(p.100) In the phonetic perspective we should also recognize the fact that *d*-continuization is only known from dialects that have an apical pronunciation of /r/ as main allophone ([r]), and not from those that have the uvular pronunciation [ʁ]. Minimal change thus also has a phonetic dimension.

(85) *d*-continuization

/d/ → [cont.]

The rule applies to a small set of lexical forms under particular conditions relating to prosodic type of morpheme, prominence conditions, and segmental environment.

The forms that undergo *d*-continuization are all function words (mostly pronouns) and all have an initial /d/ directly followed by the vowel. They lack lexical stress and do not spontaneously form prosodic words. Thereby, they do not obligatorily receive stress. Within the stress system proposed in this book, this means that these words will typically form part of a prosodic word nearby (see 12.3.1). *d*-continuization and the morphological delimitation of the class that is targeted actually form the strongest argument for their prosodic status as unspecified for stress (see 10.6).[19]

(86) Prosodically unspecified words targeted by *d*-continuization

du /dʉ/, dej /dɛj̵/	‘you, sg.nom./obl.’
de /de/, dom /dom/	‘they; them’
den /dɛn/, det /det/	‘it, c.g./neut.’
din /din/, ditt /dit/, dina /din-a/	‘your, sg., c.g./neut./pl.’
den-ˈhär /dɛn-hɛr/, det-ˈhär, de-ˈhär	‘this one, c.g./neut./pl.’

det-'där /det-dɛr/, den-'där, de-'där	'that one, neut./c.g./ pl.'
de-[1]'samma /de-sɑmᵘɑ/, den-[1]'samma,	'the same, pl./c.g.
det-[1]'samma,	/neut.'
då, da	'then'[20]

The words targeted by this rule are mostly pronouns, plus the adverb *då* 'then'.[21] The majority of forms are listed in (86). In all these cases, the morpheme beginning in *d* is unstressed. Stress is on the other morpheme in *denhär* [dɛ̯n' **(p. 101)** hæːr], *detsamma* [dɛ̯[1]'samːa], and so on. To illustrate the lexical bounds for this rule, consider (87).

(87) Non-targets of *d*-continuization

pronouns	denna 'this one, c.g.', detta 'this one, neut.', dessa 'these ones'[22]
adverbs	dit 'thither', där 'there', då (time adverbial) 'then'
content words	dag 'day', Dan (name), deg 'dough', dyr 'expensive'
prepositions	vid 'by', med 'with', medan 'while'

In the first row there are disyllabic pronouns with stress on the syllable beginning in *d*. Like *den'här*, *'denna* is a demonstrative pronoun, but the placement of stress is crucially different. The adverbs in the second row are stressed, although this fact is not as obvious as with the demonstratives (*denna*). These words could potentially be described by lexical category, i.e. as adverbs, and indeed, even *då* 'then' escapes *d*-continuization when functioning as a true time adverbial. Nevertheless, the most general analysis treats these forms as stressed, by virtue of forming prosodic words. In the third row we have monosyllabic content words which will be stressed (lexically or by rule, see chapter 10). In the last row, the prepositions contain a /d/ in non-initial position. They illustrate that a word-final or word-medial /d/ is not targeted.[23]

All targets of the rule are monosyllabic morphemes, and if there are more syllables in the graphic word, they are inflections (*din-a* 'your, pl. agr.') or just an orthographic convention; there would not be a prosodic difference between *densamma* and *den samma* 'the same'.

Whenever the words are targeted by this rule, they are in an unaccented context. If they are accented, contrastively or otherwise, *d*-continuization is out of the question, as the assignment of word accent entails stress (see 10.6). This is one reason why this rule should be seen as a reduction phenomenon.

(88) Stress/accent and no stress/no accent

GE mej den	['jeːmɛ̟rɛ̟n], ['jeːmɛ̟dɛ̟n]	‘give me it; give it to me’
ge mej DEN	[jemɛ̟'dɛ̟nː], *[jemɛ̟'rɛ̟nː]	‘give me THAT (one)’

There is no utterance-initial *d*-continuization. A preceding context is therefore obligatory and it should preferably be vocalic or sonorant. The rule is rare **(p. 102)** following voiceless stops, but people have different intuitions about what is an acceptable level of sonority in the preceding context for *d*-continuization.

(89) *d*-continuization following segments of different sonority

V	Vad bra den var! /vɑd brɑ dɛn vɑr/ [vɑ'brɑːrɛ̟ɱ'vɑː] ‘It’s really good.’
j	Vad vill du mig, då? /vɑd vilᵘ dʉ mɛ̟j do/ [vɑvɪldʉ̟'mɛ̟jːrɑ] ‘What do you want from me?’
r	Har du något i fickan? /hɑr dʉ not i fikᵘɑn/ ['hɑrʉ̟nɔtɪ'fɪkːan]
	‘Do you have something in your pocket?’
m	Kom då. /kom do/ ['kɔmːdɔ], ['kɔmːdɑ], ['kɔmːrɑ] ‘Come, then.’
t	Han fick det av mig. /hɑn fik det ɑv mɛ̟j/ [haɱ'fɪkːdɛ̟ɑv'mɛ̟jː], ?[haɱ 'fɪkːrɛ̟ɑv'mɛ̟jː]
	‘He got it from me.’

The rule of *d*-continuization is thus prosodically conditioned, being ultimately due to the fact that the target words do not form prosodic words. Beyond that, there are the conditions that the forms in question must begin with /d/ and be preceded by other segmental material of preferably high sonority.

Rules similar to this one apply to /d/ in other languages. However, the continuization of /d/ usually results in fricative [ð] or in a rhotic tap [ɾ] or flap [ɽ]. Many dialects of Basque have this alternation (Hualde 1991: ch. 4), and so do varieties of Spanish (see Núñez Cedeño 1987).

Our analysis above is entirely phonological. Teleman (2002b) suggests that the origin of this phenomenon may be influenced by segmentation in running speech and subsequent analogy rather than by the stress properties of a set of prosodically defined small words, as I have suggested here. Furthermore, Teleman points out that this phenomenon primarily belongs in the Stockholm area.

4.9 Spread glottis assimilation

The description of the laryngeal distinction among stops was given in 3.1 and resulted in the relevance of two features: [voice] and [spread glottis (s.g.)]. Swedish does not exhibit assimilation of the feature [voice], but there is assimilation of [spread glottis].[24] We will call this process spread glottis assimilation. In the literature, spread glottis assimilation is known variably as obstruent assimilation (Hellberg 1972b, 1974: 144), devoicing (Cho 1994) and voice assimilation **(p.103)** (Helgason and Ringen 2007). The assimilation has recently been investigated by Helgason and Ringen in a number of papers casting light on the nature of the assimilation and its ramifications, and we will rely chiefly on their results and interpretations. The process is sensitive to three main factors:

1) Source segment. Voiceless stops cause assimilation more reliably than voiceless fricatives.
2) Morphemic context. Spread glottis assimilation is more regular across inflectional morpheme boundaries than either morpheme-internally or across larger morpheme boundaries.
3) Direction. For the very limited application of spread glottis assimilation caused by an /s/, progressive application holds while regressive application does not. In all other cases, direction makes no difference.

The first set of forms illustrate the core context for assimilation, that is, adjacent voiced and voiceless stop consonant pairs across an inflectional morpheme boundary. Direction of assimilation is noted in the right-hand column. When there is agreement in [s.g.] or [voice] we register this as ‘agreement’. The preterite suffix is underlying /-de$_2$/, and it alternates morphophonemically between *-de* and *-te*, as conditioned by the last segment of the verb root.

(90) Assimilation of [spread glottis] from/to stops and /s/

a.

bygga /byg$^{\mu}$-ɑ$_2$/ [^{2}ˈbʏgːa]	bygg-de [^{2}ˈbʏgːdɛ̥] pret.	agreement
‘to build’	bygg-t [bʏkːt] p.ptcp.	regr. assim.
köpa /ɕøp-ɑ$_2$/ [^{2} ˈɕøːpʰa]~[^{2}ˈɕøːpa]	köp-te [^{2}ˈɕø̥pʰːtɛ̥]~[^{2} ˈɕø̥pːtɛ̥]	progr. assim.

‘to buy’	köp-t [ɕø̥^{h}pːt]~[ɕø̥^{h}pːt]	agreement

b.

väga /vɛg-ɑ$_{2}$/ [^{2}ˈvɛːga]	väg-de [^{2}ˈvɛːgdɛ̯]	agreement
‘to weigh’	väg-t [vɛːʰkt]~[vɛːkt]	regr. assim.
löpa /løp-ɑ$_{2}$/ [^{2}ˈløːpʰa]~[^{2}ˈløːpa]	löp-te [^{2}ˈløːʰptɛ̯]~[^{2}ˈløːptɛ̯]	progr. assim.
‘to run’	löp-t [løːʰpt]~[løːpt]	agreement

c.

läsa /lɛs-α_2/ [^{2}'lɛːsa]	läs-te [^{2}'lɛːstɛ̯]	progr. assim.
‘to read’	läs-t [lɛːst]	agreement

The words in (90a) have short vowels in the inflected forms, while those in (b) and (c) have long vowels in the inflected forms. Vowel length, or conversely moraic status of the targeted consonant, has no consequence for the assimilation.

Fricatives do not cause assimilation in the same clear way as stops do. This is demonstrated in Ringen and Helgason (2004) and Helgason and Ringen (2008a), where the comparison of word pairs like those in (91) yielded radically different results for stops and fricatives. The table is slightly adapted from Helgason and Ringen (2007). The rightmost column indicates the IPA transcription that these **(p.104)** results would suggest. VOffT=voice offset time, i.e. the measurement of voicing that is present from the end of the vowel to the closure of the following consonant.

(91) Voice offset time for final clusters comparing /t/ and /s/, and medial /dk/

cluster	example	mean VOffT	SD	IPA

a.

/k/+/t/ #	sök-t /søk-t/ ‘sought, p.ptcp.’	–10.7	14.8	[sø:$^{(h)}$kt]
/g/+/t/ #	trög-t /trøg-t/ ‘sluggish, neut.’	–9.1	20.3	[trø:$^{(h)}$kt]

b.

/p t k/+/s/ #	bröt-s /brøt-s/ ‘broke, pass.’	–0.2	12.7	[brø:ts]
/b d g/+/s/ #	bröd-s /brød-s/ ‘bread, gen.’	56.1	30.3	[brø:ds]

c.

/…dk…/	blidka /blidk-a/ ‘to appease’	56.4	37.3	[blɪdːka]

There is no significant difference for the average VOffT for the sequences /kt/ and /gt/, a result that confirms the presentation of data in (90). The results for the sequences /ts/ and /ds/ show that /s/ has no clear assimilatory effect on a preceding voiced stop (see Cho 1994). The difference in VOffT for the voiceless conditions (–10.7 and –0.2) might be due to segmental type, but the fact that forms like *bröds* exhibit such different VOffT confirms the argument that there is a categorical difference regarding the assimilatory effect of /t/ and /s/, respectively.

In the progressive condition, /s/ has the same effect as /t/. An example of this was included as (90c). This would appear to be the only evidence for a directional asymmetry relating to spread glottis assimilation. There is, however, always the possibility that the preterite allomorphs are no longer productively derived from a common underlying form /-de/ as is assumed by most authors. There are some old preterite forms with a voiced stem-final consonant that nevertheless exhibit the *-te*-allomorph, and this would support such an analysis: *mena, mente~menade* ‘to mean/pret.’, *spela, spelte~spelade* ‘to play/pret.’, *dela, delte~delade* ‘to share/pret.’, *tala, talte~talade* ‘to talk/pret.’. There is at least one verb that only has the *-te*-preterite: *begynna, begynte* ‘to begin/pret.’.

Other morphological boundaries have different effects on assimilation (Lyttkens and Wulff 1916; Hellberg 1974). The morphological boundary between compound elements shows no clear phonological assimilation effects (Helgason and Ringen 2008b). Thus, in forms like *papp-docka* /pɑpᵘ+dokᵘ-ɑ/ ‘paper doll’, *måtт-band* /motᵘ+bɑnd/ ‘measuring tape’, and *is-glass* /is+glɑsᵘ/ ‘ice cream’, progressive devoicing effects were variable among subjects, and not stable with any one subject. Neither was there a discernable difference between the effects of voiceless stops and /s/. This indicates that there is no phonological progressive assimilation across prosodic words. Similarly, in the regressive condition where forms like *hugg-tand* /hʉgᵘ+tɑnd/ ‘fang’, *grädd-kola* /grɛdᵘ+kol-ɑ$_2$/ ‘toffee’, *knubb-säl* /knʉbᵘ+sɛl/ ‘harbour seal’, and *grädd-soppa* /grɛdᵘ+sopᵘ-ɑ$_2$/ ‘cream **(p.105)** soup’ were used, no stable devoicing effect was discerned, and no stable difference registered between stops and the fricative /s/.[25]

There are, however, some lexicalized forms where vowel assimilation has taken place. One sign of lexicalization is vowel shortening.

(92) Lexicalized, assimilated forms

hög /høg/ [hø:g] ‘high’	högtid /høkᵘ+tid/ [^{2}'hœkːˌtʰi:d] ‘feast’
	högt /høk-t/ [hœk:t] ‘high, neut.’
vård /vord/ [vo:ɖ] ‘care’	vårdslös /voʂᵘ-løs/ [^{2}'vɔʂːˌløːs] ‘careless’

tisdag /tisdɑ/ [^{1}ˈtʰiːsda] or [^{1}ˈtʰɪsːta]

The lexicalized forms might make one expect clusters to be uniform with regard to phonation inside morphemes. In principle, this would be cases where the orthography would indicate a voicing difference that is phonologically invalid. Hellberg (1974) mentions the cases in (93a, c) where assimilation is at best partial (Hellberg marks a subscripted ring). Helgason and Ringen (2007) measured VOffT for the few forms given in (93a) and found that they did not exhibit assimilation, cf. the measurements in (91) above. This means that there is a distinction with regard to the contrasting morpheme-internal forms given in (93b), mostly borrowed names. The corresponding comparison in the progressive condition is given in (93c, d).

(93) No mandatory [s.g.] agreement inside morphemes

a. blidka [^{2}ˈblɪḏːka]~[^{2}ˈblɪdːka] ‘to appease’, idka [^{2}ˈɪḏːka]~[^{2}ˈɪdːka] ‘to exercise’, vodka [^{2}ˈvɔḏːka]~[^{2}ˈvɔdːka] ‘id.’
b. Ratkovic [^{1}ˈratːkɔvɪʧ], Kamtjatka [kam^{2}ˈɕatːka] (names)
c. anekdot [anɛ̰kˈḏoːt] ‘anecdote’; Mukden [^{1}ˈmɵkːḏɛ̰n], Asdod [^{1}ˈasːḏɔd] (names)
d. laktos [lakˈtoːs] ‘lactose’, mäktig [^{2}ˈmɛ̰ktɪg] ‘powerful’, etc.

Spread glottis assimilation appears to be bounded by the minimal prosodic word, as no assimilation takes place across prosodic words. On the other hand, the minimal prosodic word is not a sufficient condition, as assimilation is blocked morpheme-internally. Spread glottis assimilation thus turns out to be a true internal sandhi rule, requiring a morpheme boundary, but staying inside the prosodic word. The three crucial contexts are given with prosodic word structure marked in (94). The prosodic word is discussed in chapter 5.

(p.106) (94) Applications of spread glottis assimilation.

assimilation	(trög-t)$_{\omega}$	‘sluggish’
no assimilation	(blidka)$_{\omega}$	‘to appease’
no assimilation	((grädd)$_{\omega}$(kola)$_{\omega}$)$_{\omega}$ $^{\max}$	‘toffee’

The pattern provides reason to reflect on the double specifications as [voice] and [spread glottis] for obstruents in Swedish. The two features are not compatible, but will interact such that no conflict arises. Thus, in the presence of a [s.g.]-specification, an adjacent voiced segment will devoice, but not fully assimilate to [s.g.]. See Lahiri and Reetz (2010) for this feature behaviour.

The information at hand invites a different interpretation of the domain for the rule, and possibly slight generalization of previous results. To begin with, we may note that there is a phonotactic generalization regarding syllable codas (and vacuously onsets) that two stops must have the same value for [voice]/[s.g.], just as in English. Indeed, Golston and Kehrein (2004) find that this constraint is universal, and more general, such that voicing, aspiration, and glottalization occur at most once per onset, nucleus, or coda. We find forms like those in (95a) and one set of spread glottis assimilation falls squarely in that group (b).

(95) Coda stops agree in [voice]/[s.g.]

a. tautomorphemic: dygd /dygd/ [dʏgːd] ‘virtue’, takt /tɑkt/ [tʰakːt] ‘tact’
b. heteromorphemic: lag-d /lɑg-d/ [lagːd] ‘laid, ptcp.’, spak-t /spɑk-t/ [spɑːkt] ‘meek, neut.’, trög-t /trøg-t/ [trøː(ʰ)kt] ‘sluggish, neut.’

The absence of codas that do not agree in this respect allows for a phonological-only generalization for these cases of assimilation, in line with the predictions of Golston and Kehrein (2004). The morphological context would then be orthogonal to the rule as such.

4.10 Egentligen [ɐ̟'jɛ̟ŋːklɪ̟ɛ̟n]

The word *egentligen* ‘really, actually’ is phonemically /ejɛnt-lig$_2$-en/ and in careful speech usually pronounced [ɐ̟'jɛ̟nːtlɪgɛ̟n]. In many people’s speech, however, it is pronounced [ɐ̟'jɛ̟ŋklɪ̟ɛ̟n]. This pronunciation is quite indicative of Swedish syllable structure. Careful pronunciation requires the following syllabification: e.jent.li.gen, where the stressed syllable /ˌjɛnt./ constitutes a superheavy syllable. As the optimal weight of a stressed syllable is exactly two moras, the /t/ is pressured to syllabify as onset in the next syllable. However, [tl-] is not a **(p.107)** phonotactically legitimate onset in Swedish.[26] At some point, some (presumably young) speakers have changed /t/ into a /k/ such that it can form the legitimate onset [kl-]. The dorsal place of articulation triggers nasal assimilation (see 4.4) and the output is [ɐ̟.'jɛ̟ŋː.klɪ.gɛ̟n], [ɐ̟.'jɛ̟ŋː.klɪ.ɛ̟n], or [ɐ̟.'jɛ̟ŋː.klɪ̟ɛ̟n] (depending on the degree of reduction of intervocalic [g]).

The resyllabification rule and attendant change of place of articulation is clearly connected to frequency. *Egentligen* (and related forms) is the most frequent target (Swedish Language Bank has about 30,200 written tokens). Other, less frequent targets of the rule are also less frequent in the language: *ordentlig* /ordɛnt-lig$_2$/ [ɔ'ɖɛ̟nːtlɪ]~[ɔ'ɖɛ̟ŋːklɪ] ‘proper’ (>9,000), *äntligen* /ɛnt-lig$_2$-en/ ['ɛ̟nːtlɪɛ̟n]~['ɛ̟ŋːklɪɛ̟n] ‘at last’ (>8,000). Other forms like *muntlig* /mʉnt-lig$_2$/ ‘oral’ (about 1,100), *obefintlig* /u-be-fint-lig$_2$/ ‘non-existent’ (about 950), and *fryntlig* /frynt-lig$_2$/ ‘genial, jovial’ (about 100) are much less common and remain unaffected by this process (i.e. ['mønːtlɪg], ['uːbe̞ˌfɪnːtlɪg], [frʏnːtlɪg]). A possible next target with intermediate frequency would be *väsentlig* /vɛsent-lig$_2$/ ‘sizable’ (>4,500), but it has, as yet, not been heard or reported as $^{+}$[vɛ̟'sɛ̟ŋːklɪ].

4.11 Morpheme-final *r*-deletion

In a morpheme-final unstressed syllable, /r/ is often dropped in the final position before a non-coronal consonant which begins the next morpheme. The following examples were collected by Persson (2011): *undervisning* /ʉnder+vis-niŋ$_2$/ [^{2}ˈɵnːdɛ̠(r)ˌviːsnɪŋ] ‘instruction’, *överklass* /øver+klɑsᵘ/ [^{2}ˈøːvɛ̠(r)ˌklasː] ‘upper class’, *Östermalm* /øster+mɑlm/ [østɛ̠(r)ˈmalːm] (place name), *Barkarby* /bɑrkɑr+by/ [^{2}ˈbarːka(r)ˌbyː] (place name), *Fader vår* /fɑder vor/ [ˌfɑːdɛ̠(r) ˈvoːr] ‘pater noster’, *förklara* /før-klɑr-ɑ$_2$/ [fœ(r)^{1}ˈklɑːra] ‘to explain’. Prevocalically, the /r/ is preserved: *Västerås* /vɛster+os/ [vɛ̞stɛ̠ˈroːs] (place name), and in conjunction with following coronals it is assimilated as per the retroflexion rule: *undertill* /ʉnder+tilᵘ/ [^{2}ˈɵnːdɛ̠ˌʈɪlː] ‘underneath’, *fördela* /før-del-ɑ$_2$/ [fœ^{1}ˈɖeːla] ‘to distribute’. The last example shows that the /r/ is present to occasion vowel lowering of /ø/ (Eliasson 1986: 277). A similar rule is known from East Norwegian (Rykkvin 1946; Kristoffersen 2000: 311ff.).

Other properties that seem to favour *r*-deletion are mid rather than low quality of the preceding vowel, and the presence of a following /ɕ/ or /ɧ/.

Persson notes that the reality of the rule is in evidence in forms where an /r/ is sometimes inserted where it does not belong (marked [r]): *föräldra*[r]*möte* **(p. 108)** ‘parent-teacher meeting’, *Villa Ville*[r]*kulla* (house of Pippi Longstocking), *ba*[r]-*bord och styrbord-märke* ‘port and starboard sign’. The causes for this are likely to be in part folk etymological, but the reinterpretation is presumably made possible by the presence of the final *r*-deletion rule in the variety.

4.12 Obsolete segmental rules

This section discusses morphophonemic alternations that are no longer phonologically productive, but which still represent large correspondences in paradigms and lexical relations.

4.12.1 Palatalization of dorsal consonants

Dorsal consonants /k/ and /g/ alternate between stops [k], [g] and palatal fricatives/glides [ɕ], [j]. This is due to a historical rule which palatalized velars before front vowels, in stressed syllables. There are exceptions to the rule in both directions—i.e. dorsal pronunciation before front vowels and palatal pronunciation before back vowels—testifying to the near-petrification of the pattern.

Beginning with the historically regular pattern, the stop realization occurs before back and central vowels (including /ɑ/ and /ʉ/), as well as before some consonants. The palatalized realization occurs before front vowels.[27] Sets of historically related forms are given in (96).

(96) Lenition of dorsals in related forms

gå /go/ [goː] ‘to go; to walk’	gick /ɟikᵘ/ [jɪkː] ‘went; walked’, gänga /ɟɛŋᵘ-α$_2$/ [jɛ̟ŋːa] ‘screw-thread’
gås /gos/ [goːs] ‘goose’	gäss /ɟɛsᵘ/ [jɛ̟sː] ‘geese’
gav /gɑv/ [ˈgɑːv] ‘gave’	ge /ɟe/ [jeː] ‘to give’
gala /gɑl-α$_2$/ [^{2}ˈgɑːla] ‘to crow’	gäll /ɟɛlᵘ/ [jɛ̟lː] ‘shrill’
guld /gʉld/ [gʊlːd] ‘gold’	gyllene /ɟylᵘɛn-ɛ$_2$/ [^{2}ˈjʏlːɛ̟nɛ̟] ‘golden’
kall /kɑlᵘ/ [kalː] ‘cold (adj.)’	köld /ɕøld/ [ɕø̟lːd] ‘cold (n.)’, kyla /ɕyl-α$_2$/ [^{2}ˈɕyːla] ‘chill’
kunna /kʉnᵘ-α$_2$/ [^{2}ˈkʊnːa], kan /kɑnᵘ/ [kanː] ‘to know; can’	känna /ɕɛnᵘ-α$_2$/ [^{2}ˈɕɛ̟nːa] ‘to feel’, känsla /ɕɛnᵘsl-α$_2$/ [^{2}ˈɕɛ̟nːsla] ‘feeling’

(p.109)

The intuitive connection between these forms is often weak. There is little reason to assume that they are phonologically related synchronically, as indicated by the phonematic transcriptions (Hellberg 1974: 170ff.).

The generality of the pattern certainly does not depend on morphophonological alternations alone. Instead the pattern relies on orthography, and thereby to some extent on the historical relationship.

(97) Lenition of dorsals outside morphophonological alternation

gata /gɑt-α$_2$/ [^{2}ˈgɑːta] ‘street’	gift /ɟift/ [ɟɪfːt] ‘poison’
god /gud/ [guːd] ‘good’	get /ɟet/ [jeːt] ‘goat’
gumma /gʉmᵘ-α$_2$/ [^{2}ˈgʊmːa] ‘old woman’	gylf /ɟylf/ [ɟʏlːf] ‘fly, (n.)’
gåta /got-α$_2$/ [^{2}ˈgoːta] ‘riddle’	göl /ɟøl/ [jøːl] ‘pool’
gam /gɑm/ [gɑːm] ‘vulture’	gäl /ɟɛl/ [jɛːl] ‘gill’
kamma /kɑmᵘ-α$_2$/ [^{2}ˈkɑmːa] ‘to comb’	kisa /ɕis-α$_2$/ [^{2}ˈɕiːsa] ‘to squint’
kossa /kusᵘ-α$_2$/ [^{2}ˈkʊsːa] ‘cow’	kedja /ɕedɟ-α$_2$/ [^{2}ˈɕeːdja] ‘chain’
kuse /kʉs-e$_2$/ [^{2}ˈkʉ̟ːsɛ̟] ‘horse’	kyssa /ɕysᵘ-α$_2$/ [^{2}ˈɕʏsːa] ‘to kiss’

kåre /kor-e$_2$/ [^{2}'koːrɛ̟] ‘breeze’	kök /ɕøk/ [ɕøːk] ‘kitchen’
kase /kɑs-e$_2$/ [^{2}'kɑːsɛ̟] ‘beacon’	kälke /ɕɛlk-e$_2$/ [^{2}'ɕɛ̟lːkɛ̟] ‘sledge’

The obsolescence of the rule in present-day Central Swedish is manifest in the fact that there is a fair number of forms that have [k] and [g] before front vowels.

(98) Absence of palatalization before front vowels

kille /kilᵘ-e$_2$/ [^{2}'kɪlːɛ̟] ‘bloke’	gimmick /gimᵘik/ [^{1}'gɪmːɪk] ‘id.’
kimono /kimono/ [^{1}'kɪmːɔnɔ] ‘id.’	ginseng /ginsɛŋᵘ/ [gɪn'sɛ̟ŋː] ‘id.’
kyrillisk /kyrilᵘ-•sk/ [kʏ^1'rɪlːɪsk] ‘Cyrillic’	panegyrisk /pɑnɛgyr-•sk/ [panɛ̟^{1}'gyːrɪsk] ‘panegyric’
kybernetik /kybɛrnet-ik/ [kʏbæɳɛ̟'tiːk] ‘cybernetics’	geggig /gɛgᵘ-ig$_2$/ [^{2}'gɛ̟gːɪg] ‘gooey’
Kenya /kenyɑ/ [^{1}'keːnja], [^{1}'keːnɤ̟a] ‘id.’	geisha /gɛʝʂ-ɑ$_2$/ [^{2}'gɛ̟jːʂa], [^{2}'gɛ̟jːɧa] ‘id.’
ketchup /kɛtʂʉp/ [^{1}'kɛ̟tːɕɵp] ‘id.’	gem /gem/ [geːm] ‘paper holder’
kö /kø/ ['køː] ‘queue’	gerilla /gɛrilᵘ-ɑ$_2$/ [gɛ̟^{2}'rɪlːa] ‘guerilla’
kör /kør/ ['kœːr] ‘choir’	

These forms are certainly due to borrowing, but not necessarily by recent borrowing. Most forms in this group have either a fairly foreign appearance (*geisha*) or are hypocoristic (*kille* ‘bloke’) or onomatopoeic (*geggig* ‘gooey’). But there are also completely regular-looking forms like e.g. *kö* and *kör*. Relatively few forms contain a long vowel in the syllable containing the dorsal.

There are also numerous cases of palatal fricatives and approximants in the position before back and central vowels. This is not in itself an argument against **(p.110)** the (former) existence of a lenition rule, of course, but shows that /ɕ/ and /ʝ/ are phonemes in their own right.

(99) Palatal fricative/approximant before back and central vowels

tjuv /ɕʉv/ [ɕʉ̟ːv] ‘thief’	jul /ʝʉl/ [jʉ̟ːl] ‘Christmas’
kjol /ɕul/ [ɕuːl] ‘skirt’	jos, juice /ʝus/ [juːs] ‘juice’

tj*og* /ɕog/ [ɕoːg] ‘score’	j*oker* /ɻok•r/ [[1]ˈjoːkɛ̟r] ‘id.’
tj*ock* /ɕokᵘ/ [ɕɔkː] ‘fat; thick’	j*oddla* /ɻodl-ɑ$_2$/ [[2]ˈjɔdːla] ‘to yodel’
tj*ata* /ɕɑt-ɑ$_2$/ [[2]ˈɕɑːta] ‘to nag’	j*ama* /ɻɑm-ɑ$_2$/ [[2]ˈjɑːma] ‘to miaow’
tj*allare* /ɕɑlᵘ-ɑre$_2$/ [[2]ˈɕalːarɛ̟] ‘squealer’	j*acka* /ɻɑkᵘ-ɑ/ [[2]ˈjakːa] ‘jacket’

There is some variation between lenited and non-lenited forms indicating a certain vigour to the historical pattern, after all:[28] *kex, käx* [kɛ̟kːs] or [ɕɛ̟kːs] ‘cracker’, *kymig* [[2]ˈkyːmɪg] or [[2]ˈɕyːmɪg] ‘mean’, *kivi* [[1]ˈkiːvɪ]/[[1]ˈkɪvːɪ] or [[1]ˈɕiːvɪ] ‘kiwi fruit’, *gyro* [[1]ˈgyːrɔ] or [[1]ˈɻyːrɔ] ‘id.’, *geminata* [gɛ̟mɪ[2]ˈnɑːta] or [jɛ̟mɪ[2]ˈnɑːta] ‘geminate’, *originell* [ɔrgɪˈnɛ̟lː] or [ɔrjɪˈnɛ̟lː] ‘eccentric, extraordinary’, *gebit* [gɛ̟ˈbiːt] or [jɛ̟ˈbiːt] ‘domain’, *giffel* [[2]ˈgɪfːɛ̟l] or [[2]ˈɻɪfːɛ̟l] ‘croissant’. Variation is more common with [g]/[j], than with [k]/[ɕ] (Hellberg 1974: 173).

In the position before an unstressed syllable which occurs somewhere to the right of the stressed syllable, both dorsals are realized as stops, even if the vowel is front. This bears witness to the historical distribution of the targets for the lenition rule, which is stressed syllables.

(100) Unstressed final syllables

> b*åge* /bog-e$_2$/ [[2]ˈboːgɛ̟] ‘bow’, h*age* /hɑg-e$_2$/ [[2]ˈhɑːgɛ̟] ‘enclosed pasture’, m*age* /mɑg-e$_2$/ [[2]ˈmɑːgɛ̟] ‘belly’, (den) skyld*ige* /ʂyld-ig$_2$-e$_2$/ [[2]ˈɧʏlːdɪgɛ̟] ‘(the) guilty’
> dr*ake* /drɑk-e$_2$/ [[2]ˈdrɑːkɛ̟] ‘dragon’, spök*e* /spøk-e$_2$/ [[2]ˈspøːkɛ̟] ‘ghost’, jämlik*e* /ɻɛm-lik-e$_2$/ [[2]ˈjɛ̟mːˌliːkɛ̟] ‘equal’, Jannik*e* /ɻɑnᵘik*e*/ [[1]ˈjanːɪkɛ̟] (name)

Historically, lenition interacts with fricative/glide formation and the present-day orthography reflects these processes. Thus, spellings like ‹sk› and ‹skj› are pronounced with initial [ɧ] (or [ʂ]) in the relevant context: *skina* /ʂin-ɑ$_2$/ [[2]ˈɧiːna] ‘to shine’, *skjuta* /ʂʉt-ɑ$_2$/ [[2]ˈɧʉ̟ːta] ‘to shoot’; and the spelling ‹gj› as [j]: *gjuta* /ɻʉt-ɑ$_2$/ [[2]ˈjʉ̟ːta] ‘to mould’.

4.12.2 Ablaut and umlaut

As in the other Germanic languages, ablaut and umlaut occur in many strong verb paradigms, in word derivation, and in some inflectional morphology. The patterns **(p.111)** are largely lexicalized, and we will have only a brief look at the patterns that seem to still have some phonological life. In (101), the stem vowel qualities are indicated to the right. Inflectional structure is marked directly in the orthographic forms.

(101) Representative strong verbs

infinitive present past p.ptcp. gloss

a.

spring-a	spring-er	sprang	sprung-it	‘run’	/i/, /ɛ/ – /ɑ/ – /ʉ/
stjäl-a	stjäl	stal	stul-it	‘steal’	

b.

i

bjud-a	bjud-er	bjöd	bjud-it	‘bid; invite’	/ʉ/, /y/ – /ø/ – /ʉ/

ii

flyg-a	flyg-er	flög	flug-it	‘fly’

c.

skriv-a	skriv-er	skrev	skriv-it	‘write’	/i/ – /e/ – /i/
vrid-a	vrid-er	vred	vrid-it	‘turn’	

d.

far-a	far	for	far-it	‘go, set out’	/ɑ/ – /u/ – /ɑ/
tag-a, ta	tag-er, ta-r	tog	tag-it	‘take’	

e.

le	le-r	log	le-tt	‘smile’	/e/ – /u/ – /e/

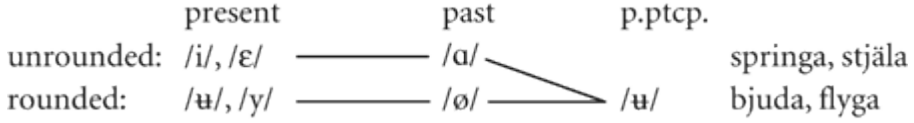
f.

gå	gå-r	gick	gå-tt	‘go’	/o/ – /i/ – /o/

Several tendencies are apparent here:

a) Almost all past participles (Swedish *supinum*) end in *-it*. One of very few true exceptions is *ligga, ligger, låg, legat* /legɑt/ ‘lie’. There is also a group of monosyllabic past participles, see d) below.
b) A substantial number of the past participles ending in *-it* have the stem vowel /ʉ/. These fall into two classes correlating with rounded and unrounded stem vowels in the past and present, respectively.

(102) (Un)roundedness correlation



For the /ʉ/-stem past participles, then, we can predict that they belong to one of two classes based on their stem vowel in the past tense, one rounded (/ø/) and one unrounded (/ɑ/). Each of these vowels then subcorrelate with two present tense stem vowels, and harmonize with them with respect to rounding.
c) The remaining strong verbs exhibit a correlation in vowel quality between present tense form and the past participle, which have the same vowel, even though the quantity of that vowel may vary. The past tense vowel is not obviously participating in a phonological correspondence pattern here. This **(p.112)** generalization overlaps with (b.i) for the vowel /ʉ/. The dependence of the past participle on the present is also visible for monosyllabicity, d).
d) Monosyllabic present tense strongly correlates with monosyllabic past participle: *ler, lett* ‘smile’; *går, gått* ‘go’; *står, stått* ‘stand’, etc. This correlation lies behind certain monosyllabic past participles that are considered dialectal and unacceptable in writing: *tar, tatt* (*tagit*) ‘take’; *blir, blitt* (*blivit*) ‘become’; *drar, dratt* (*dragit*) ‘pull’.

Other tendencies in the strong verb system show up in spoken language as deviances from the standard system. These include a tendency of shared vowel quality between the past participle and the present tense, causing the participles of pattern (101 b.ii) to show up as *fr*[yː]*sit* and *sn*[yː]*tit* where *fr*[ʉː]*sit* and *sn*[ʉː]*tit* are standard, for the verbs *fr*[yː]*sa* ‘to be cold’ and *sn*[yː]*ta* ‘to blow one’s nose’. There is also a tendency to lose the past participle [i] in some verbs, beyond the cases where the infinitive/present tense form is monosyllabic, e.g. *hållt* for *hållit* (*hålla* ‘to hold’), possibly in analogy with certain weak verbs that have monosyllabic past participles, e.g. *ställa, ställde, ställt* ‘put, place’, *hälla, hällde, hällt* ‘pour’.[29]

The old umlaut pattern is visible in singular/plural alternation and some word formation. Here the vowel qualities are more predictably related, the umlauted vowel being the [front] correspondent of a (historically) [back] vowel.

(103) Umlaut correspondences

a.

bok /buk/ [buːk] ‘book’	böcker /bøkᵘ-•r/ [ˈ¹bø̞kːɛ̝r] ‘books’
fot /fut/ [fuːt] ‘foot’	fötter /føtᵘ-•r/ [ˈ¹fø̞tːɛ̝r] ‘feet’
stad /stɑd/ [stɑːd] ‘town’	städer /stɛd-•r/ [ˈ¹stɛːdɛ̝r] ‘towns’
man /mɑnᵘ/ [manː] ‘man’	män /mɛnᵘ/ [mɛ̝nː] ‘men’
mus /mʉs/ [mʉ̞ːs] ‘mouse’	möss /møsᵘ/ [mø̞sː] ‘mice’

b.

falla /fɑlᵘ-α_2/ [ˈ²falːa] ‘to fall’	fälla /fɛlᵘ-α_2/ [ˈ²fɛ̞lːa] ‘to fell’, fäller /fɛlᵘ-•r/ [ˈ¹fɛ̞lːɛ̝r] (present)
full /fʉlᵘ/ [fʊlː] ‘full’	fylla /fylᵘ-α_2/ [ˈ²fʏlːa] ‘to fill’, fyller /fylᵘ-•r/ [ˈ¹fʏlːɛ̝r] (present)

c.

lång /loŋᵘ/ [lɔŋː] ‘long’	längd /lɛŋᵘ-d/ [lɛ̝ŋːd] ‘length’
många /moŋᵘ-α_2/ [ˈ²mɔŋːa] ‘many’	mängd /mɛŋᵘ-d/ [mɛ̝ŋːd] ‘quantity’

The umlaut plural correlates with accent 1. The plural morpheme beside the umlaut information could thus be classified with the group of *-er* plurals that lack accent 2 (e.g. *jon*, ˈ¹*joner* ‘ion, pl.’, see 10.5.1). One common way to capture the fact that these plurals do not induce accent 2, unlike several of the others, is to **(p.113)** assume that they are non-syllabic, i.e. /-r/ and that an epenthetic vowel is supplied where needed (hence *går* /go-r/ [goːr] ‘goes’, but *leder* /led-r/ [leːdɛ̝r] ‘leads’). In the derivational forms in (103b) the umlaut is separate from the suffix, which is accent 2-inducing infinitive *-a* $_2$ or accent-neutral present tense *-r*.

4.12.3 Regressive spreading of nasality

There is one more pattern involving nasality, which we may call regressive spreading of nasality. By this process a /g/ nasalizes to [ŋ] in the position before an /n/. The rule is now obsolete, but the pattern is stable.[30] The derivational process is unproductive, but the phonological ramifications still hold.

(104) Regressive spreading of nasality

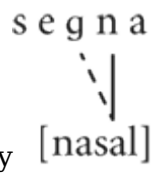
Basic form	Derivation

öga /øg-ɑ$_2$/ [^{2}ˈø:ga] ‘eye’	ögna /øg-nɑ$_2$/ [^{2}ˈøŋ:na] ‘to skim’
båge /bog-e$_2$/ [^{2}ˈbo:gɛ̟] ‘bow’	bågna /bog-nɑ$_2$/ [^{2}ˈbɔŋ:na] ‘to bulge, bend’
diger /dig•r/ [^{1}ˈdi:gɛ̟r] ‘thick’	digna /dig-nɑ$_2$/ [^{2}ˈdɪŋ:na] ‘to weigh down’
seg /seg/ [se:g] ‘tough’	segna /seg-nɑ$_2$/ [^{2}ˈsɛ̟ŋ:na] ‘to sink (to the ground)’
fager /fɑg•r/ [^{1}ˈfɑ:gɛ̟r] ‘beautiful’	fägna /fɛg-nɑ$_2$/ [^{2}ˈfɛ̟ŋ:na] ‘to please’
fägring /fɛgr-iŋ$_2$/ [^{2}ˈfɛ:grɪŋ] ‘beauty’	fägnad /fɛg-nɑd$_2$/ [^{2}ˈfɛ̟ŋ:nad] ‘delight’
ljuga /ʲʉg-ɑ$_2$/ [^{2}ˈjʉ̟:ga] ‘to lie’	lögn /løg-n/ [løŋ:n] ‘lie, n.’
förljugen /før-ʲʉg-en$_2$/ [fœr^{1}ˈjʉ̟:gɛ̟n] ‘dishonest’	lögnare /løg-n-ɑre$_2$/ [^{2}ˈløŋ:narɛ̟] ‘liar’
hugad /hʉg-ɑd$_2$/ [^{2}ˈhʉ̟:gad] ‘in the mood for’	hugnad /hʉg-nɑd$_2$/ [^{2}ˈhøŋ:nad] ‘comfort’
hugfästa /hʉg+fɛst-ɑ$_2$/ [^{2}ˈhʉ̟:gˌfɛ̟s:ta] ‘to make remembered’	hugna /hʉg-nɑ$_2$/ [^{2}ˈhøŋ:na] ‘to please’
hugsvalelse /hʉg+svɑl-ɛlse$_2$/ [^{2}ˈhʉ̟:gˌsvɑ:lɛ̟lsɛ̟] or [hʉ̟g^{1}ˈsvɑ:lɛ̟lsɛ̟] ‘comfort, solace’	

These forms are mostly old, literary, or obsolete, and the lexical meanings across the word pairs are not clearly related anymore. The most transparent ones occur at **(p.114)** the top, but in several forms ablaut and low frequency get in the way of the paradigm.

Given the characterization of nasals as stops, regressive spreading of nasality should be a simple process involving no other changes than the spread of nasality from /n/ to /g/.

(105) Regressive spreading of nasality



The dorsal stop must not be moraic at the outset, but it must become moraic in the derivation of the form (weight by position, see 8.4.3). These requirements are illustrated below.

(106) No regressive spreading of nasality with underlying moraic /g/

bygga /byg$^{\mu}$-ɑ$_2$/ [^{2}'bʏgːa] ‘to build’	byggnad /byg$^{\mu}$-nɑd$_2$/ [^{2}'bʏgːnad] ‘building’ (*[^{2}'bʏŋːnad])
hugga /hʉg$^{\mu}$-ɑ$_2$/ [^{2}'hʊgːa] ‘to hew; to cut’	huggna /hʉg$^{\mu}$-nɑ$_2$/ [^{2}'hʊgːna] ‘cut, ptcp. pl.’ (*[^{2}'hʊŋːna])

(107) No regressive spreading of nasality unless /g/ becomes moraic (weight by position)

mogen /mug-en$_2$/ [^{2}'muːgɛ̯n] ‘mature, ripe’	mognad /mug-nɑd$_2$/ [^{2}'muːgnad] ‘maturity’ (*[^{2}'mʊːŋnad])
slagen /slɑg-en$_2$/ [^{2}'slɑːgɛ̯n] ‘beaten, ptcp. sg.’	slagna /slɑg-nɑ$_2$/ [^{2}'slɑːgna] ‘beaten, ptcp. pl.’ (*[^{2}'slɑːŋna])
båge /bog-e$_2$/ [^{2}'boːgɛ̯] ‘bow’	bågna /bog-nɑ$_2$/ [^{2}'bɔŋːna] ‘to bulge, bend’

The alternations exhibiting regressive spreading of nasality are losing productivity. For one thing, some of the forms alternate between a nasalized and non-nasalized version, however typically respecting the generalization relating to morahood. As long as the phonological ramifications are respected, the phonological rule as such might be considered to be alive.

(108) Alternating forms

	båge ~ bågna	[^{2}'bɔŋːna]	or	[^{2}'boːgna]		
	hugad ~ hugna	[^{2}'hɵŋːna]	or	[^{2}'hʉ̟ːgna]		
but cf.	seg ~ segna	[^{2}'sɛ̟ŋːna]	or	[^{2}'seːgna]	or	[^{2}'sɛ̟gːna] (NSU)

If forms like [^{2}'sɻgːna] become regular, the phonological rule could be said to lose phonological status.

(p.115) In many cases, the morphological relationship between forms is lost, effectively removing any sense of synchronic alternation. Some etymologically related forms are given to the right.

(109) Other forms that undergo regressive nasalization

dygn /dygn/ [dʏŋːn] ‘day’	dag /dɑg/ [dɑːg] ‘day’
gagn /gɑgn/ [gaŋːn] ‘use’	gen /ʝen/ [jeːn] ‘straight’
gagna /gɑgn-ɑ$_2$/ [^{2}'gaŋːna] ‘to be of use’	genom /ʝen-om/ [^{1}'jeːnɔm], through’
inhägna /in-hɛgn-ɑ$_2$/ [^{2}'ɪnˌhɻŋːna] ‘to fence in’	hage /hɑg-e$_2$/ [^{2}'hɑːgɻ] ‘enclosed pasture’
hägn /hɛgn/ [hɻŋːn] ‘protection’	
stygn /stygn/ [stʏŋːn] ‘stitch’	sting /stiŋᵘ/ [stɪŋː] ‘id.’
ägna /ɛgn-ɑ$_2$/ [^{2}'ɻŋːna] ‘to devote’	egen /egen$_2$/ [^{2}'eːgɻn] ‘own’
agn /ɑgn/ [aŋːn] ‘bait’, agna /ɑgn-ɑ$_2$/ [^{2}'aŋːna] ‘to bait’	
lugn /lʉgn/ [løŋːn] ‘calm’, lugna /lʉgn-ɑ$_2$/ [^{2}'løŋːna] ‘to calm’	
regn /rɛgn/ [rɻŋːn] ‘rain’, regna /rɛgn-ɑ$_2$/ [^{2}'rɻŋːna] ‘to rain’	
ugn /ʉgn/ [øŋːn] ‘oven’	
vagn /vɑgn/ [vaŋːn] ‘wagon’	

The sequence [ŋn] will reduce to [ŋ] whenever a voiceless obstruent follows.

(110) Loss of /n/ before voiceless obstruent

lugn /lʉgn-t/ lugnt [løŋːt] ‘calm, neut.’, cf. [løŋːn] ‘calm’
dygn /dygn-s/ dygns [dʏŋːs] ‘day, gen.’, cf. [dʏŋːn] ‘day’
dygnsrytm /dygn-s+rytm/ [^{2}'dʏŋːsˌrʏtm̥] ‘day rhythm’, cf. [dʏŋːn] ‘day’
vagnskada /vɑgn+skɑd-ɑ$_2$/ [^{2}'vaŋːˌskɑːda] ‘damage to vehicle’, cf. [vaŋːn] ‘wagon’

There is also dialectal *n*-deletion without a following obstruent: *vagn* [vaŋː] ‘wagon’, *ugn* [ʉŋː] ‘oven’ (Loman 1967: 78; Noreen 1903–1907, I: 429f.). This pronunciation is dialectal and considered informal in the context of the standard language.

Notes:

([1]) There are very few cases where the phoneme /ʂ/ triggers retroflexion, e.g. *fräsch-t* /frɛʂ-t/ [frɛːʂt] or [fræːʂt] ‘fresh, neut.’, *mustaschtävling* /mʉstɑʂ+tɛvl-ɪŋ/ [mʊs[2]ˈtɑːʂˌtɛːvlɪŋ] ‘moustache contest’, and *duschtvål* /dʉʂᵘ+tvol/ [[2]ˈdʊʂːˌtvoːl] ‘shower soap’.

([2]) Previous analyses have usually assumed that coalescence should be broken down into two parts, spreading of e.g. [retroflex] (or [–anterior]) from /r/ and the subsequent deletion of /r/. While this looks like a logical and economic solution in view of the need for spreading anyway, it actually fails to account for the absence of dialects that have the spreading only, also from /r/, without *r*-deletion. In our account, spreading is rather seen as a subcase of coalescence, namely, when full fusion is prevented by conflicting feature specifications in the segments involved.

([3]) One reason for basing the phonological feature on retroflexion rather than apicality might be that this apicality is potentially implicated in anterior sounds.

([4]) In southern varieties, the phoneme /ʂ/ can be pronounced as [ʃ] also post vocalically. In that case, no retroflexion occurs ([lʊnːʃ], [[2]ˈklatːʃa]).

([5]) In the Göta varieties coronal assimilation may lead to shortened vowel in monosyllables undergoing retroflexion, see 4.1.4.

([6]) Exceptions are few. For [ɖ] there is the high-frequency form *gjorde* /jur-de$_2$/ ‘did’ which may be pronounced with a long retroflex [[2]ˈjʊːɖɛ̗] (possibly by *u*-shortening, see 2.2.8), beside [[2]ˈjʊːɖɛ̗], and the curling term *gard* /gɑrd/ ‘guard (stone protecting another stone)’ pronounced [[1]ˈgaɖːɛ̗n] in the definite form by those in the know. Apparently there is an older pronunciation of *garde* as [[2]ˈgaɖːɛ̗] in parallel with more common [[2]ˈgɑːɖɛ̗] ‘guard’ (Molde and Wessén 1968: 46).

([7]) In one word the /l/ has been lost instead: *karl* [kɑːr] ‘man’. This form is now underlyingly /kɑr/.

([8]) A few further remarks on retroflexion are collected here. A fuller description is given in Riad (2010).

([9]) Besides these verb forms there is the noun *fästmö* /ˈfɛst+ˈmø/ [[2]ˈfɛ̗sːtˌmøː] ‘fiancé’, which in the plural becomes *fästmör* /fɛst+mø-r/ [[2]ˈfɛ̗sːtˌmœːr] ‘id. pl.’, with vowel lowering.

([10]) Lindau (1970: 13) also suggests that the labiodental assimilation is optional (cited in Bonebrake 1973). If so, then only the labial and dorsal assimilations are obligatory.

([11]) Varieties of Spanish generally have wider application of nasal assimilation, see Harris (1969).

([12]) Thanks to Martin Persson for pointing this out.

([13]) *Finger* and *fingera* are not historically related, but may well be associated by folk etymology in many speakers' minds. This makes no difference for the argument.

([14]) According to Bonebrake (1973: 95), the alternative pronunciations without the *g*-excrescence are colloquial. The items mentioned by her are marked '~[ŋː]'. If anything, the alternative pronunciations testify to the non-phonological nature of the alternations in (75).

([15]) The name *Bengt*, originally from *Benediktus*, has two pronunciations [bɛ̟ŋːt] and [bɛ̟ŋːkt] and there are also two spellings, ‹Bengt› and ‹Benkt›, which however need not correspond to the respective pronunciations. The pronunciation [bɛ̟ŋːkt] could be seen as a case of *g*-excrescence followed by devoicing: [bɛ̟ŋːt] > [bɛ̟ŋːgt] > [bɛ̟ŋːkt]. The generality of the rule is however not investigated, e.g. if it is part of a wider process like stop insertion, such as is known from English where the pronunciations of *prince* and *prints* may be identical.

([16]) There is a deletion of [d] between homorganic [l] and [s] in *äldst* 'oldest' ['ɛ̟lːst], cf. *äldre* 'older' [[1]'ɛ̟lːdrɛ̟]. This deletion is also obligatory in careful speech, and hence differs from the postnasal deletions. The paradigm is already suppletive.

([17]) In *mintdoft*, the output might be understood as a mixture of properties of the /t/ and the /d/, in that the onset of the second syllable is an unaspirated [t]. A 'real' /t/ in prosodic word-initial position should be aspirated, see 3.1.

([18]) Another term that is sometimes used is *r*-ization (Sw *errisering*).

([19]) Of course, these morphemes can be stressed, but it will then be as a function of accenting. Word accent can only be assigned to a stressed syllable.

([20]) This form is like German *mal* and certain uses of English *then* (e.g. *now then*), but not straight time-adverbial uses. One way to diagnose the type for native speakers is that the *då* can also have the vowel change (independently of *d*>*r*): *da, ra*.

([21]) The fact that the pronouns predominate here is the accidental function of the fact that they happen to have an initial /d/. The presence of *då* is what shows that the group of words is delimited by a shared prosodic property, rather than a morphological one.

([22]) These forms are mostly not used informally in Central Swedish. Intuition clearly categorizes them as non-targets.

([23]) We cannot be entirely certain that the word type is not the decisive factor here, as there are no *d*-final pronouns.

([24]) While the realization of the feature [voice] meets the criterion for a narrow phonetic interpretation, i.e. prevoicing of word initial stops (Ringen and Helgason 2004), Swedish lacks a voice-assimilation rule, contra the prediction of van Rooy and Wissing (2001). In the historical perspective, it is expected that aspiration should be the active feature in a Germanic language (see Iverson and Salmons 1995: 369).

([25]) This result goes against the conclusions of Lombardi (1999: 285ff.).

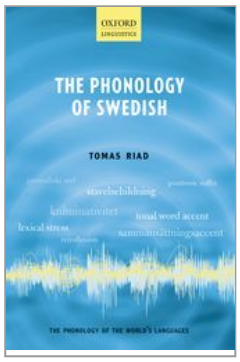
([26]) Syllabification always separates /t/ and /l/ in sequence: *chipotle* [ɕɪ.^{2}ˈpɔtː.lɛ̟] ‘id.’, *atlas* [^{1}ˈatː.las] ‘id.’, *Atlanten* [at.^{1}ˈlanː.tɛ̟n] ‘the Atlantic’, *atlet* [at.ˈleːt] ‘athlete’.

([27]) Historically, /g/ has also become palatalized as [j] following /r/ and /l/, e.g. *berg* /bɛrʲ/ [bærːj] ‘mountain’, *torg* /torʲ/ [tɔrːj] ‘square, place’, *bärga* /bɛrʲ-ɑ$_{2}$/ [^{2}ˈbærːja] ‘to salvage; to tow’; *helg* /helʲ/ [hɛ̟lːj] ‘holiday’, *svalg* /svɑlʲ/ [svalːj] ‘pharynx’, *galge* /gɑlʲ-e$_{2}$/ [^{2}ˈgalːjɛ̟] ‘hanger; gallows’.

([28]) Underlying forms will vary according to pronunciation.

([29]) For further discussion, see Allén (1967).

([30]) The rule may have become obsolete already at a time when /ɧ/ was a fricative rather than a stop in some positions and forms (Staffan Hellberg, p.c.).



The Phonology of Swedish
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Print publication date: 2013
Print ISBN-13: 9780199543571
Published to Oxford Scholarship Online: January 2014
DOI: 10.1093/acprof:oso/9780199543571.001.0001

The prosodic word

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DOI:10.1093/acprof:oso/9780199543571.003.0005

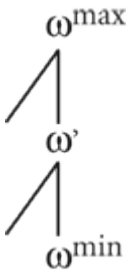
Abstract and Keywords

As in much current literature, prosodic structure is here taken to be recursive. The discussion of the prosodic hierarchy in Swedish must neessarily begin with the prosodic word which is an important point of alignment of morphological and prosodic structure. In this chapter the centrals generalizations of the minimal prosodic word are laid out, i.e. domain of syllabification, domain on culminativity (1 stress), and a few other properties relating to segment sequencing and rhythm. These properties can be used to diagnose the boundaries of the minimal prosodic word. Interestingly, the minimal prosodic word is also the domain within which a suffix can assign a lexical tone to a stressed syllable. This fact turns out to be a major key to understanding the regular inhibition of accent 2 under certain conditions. The chapter also describes the maximal prosodic word when it is distinct from the minimal prosodic word, and how word accent is culminative in that domain. The chapter also briefly touches on the formation of prosodic word domains in syntax.

Keywords: minimal prosodic word, maximal prosodic word, culminative domain, syllabification, lexical tone assignment

In this chapter we shall look at the lower parts of the prosodic hierarchy, beginning with the prosodic word, represented by the symbol ‘ω’. Because of certain tonal patterns in Central Swedish (discussed below), we will need to distinguish between simple and complex structures within the prosodic word. A model that allows for this is that of Itô and Mester (2006, 2007, 2011), where there is a minimal and a maximal projection of the category ‘ω’, and where recursion is permitted, as given in (111).

(111) The prosodic word



In this structure there is a minimal (ω^{min}) and a maximal (ω^{max}) projection of the category 'ω'. There is, in principle, infinite recursion within each prosodic category of the prosodic hierarchy, but rules can only refer to the minimal or maximal projection, or to the whole category at once.

The prosodic word is a culminative domain in Swedish, where Culminativity is instantiated by different means in the minimal and maximal projection, respectively. The hypothesis pursued here, following Riad (2012) and Myrberg and Riad (2013), is that in the minimal prosodic word (ω^{min}), stress is obligatory and culminative. In the maximal prosodic word (ω^{max}), word accent is obligatory and culminative. This creates a one-to-one relationship between ω^{min} and stress, and ω^{max} and word accent, with consequences for prosodic grouping in intonation. Some word accents will get promoted to the higher prominence level, focus accent, by virtue of factors relating to sentence intonation. Several morphological, and some syntactic, constructs are prosodically rendered as prosodic words. These include simplex forms, forms prefixed by pretonic prefixes, compounds, formal compounds, and various syntactic phrases involving deaccenting (Myrberg and Riad 2013). These are discussed in 12.3.

(p.118) A simplex prosodic word will be both minimal (ω^{min}) and maximal (ω^{max}), carrying the properties of both, as detailed below. The separation of the two levels is warranted by certain kinds of complexity in the morphological structure, especially compound formation and adjunction and incorporation at the left edge. The difference between the minimal and maximal prosodic word is manifest e.g. in the assignment of tonal accent.

Below, we first look at the minimal prosodic word, or rather cases when the minimal and maximal prosodic word are coextensive. Thereafter, we look at properties that are specific to the maximal prosodic word, and then at the various prosodic word formations that show up in morphology and syntax.

5.1 The minimal prosodic word, ω^{min}

The minimal prosodic word is primarily characterized by being the domain for syllabification as well as for Culminativity by stress. Furthermore, there are constraints on phonotactic well-formedness on intervocalic clusters within the ω^{min}, as well as some rhythmic and segmental properties that help identify and delimit the minimal word. Below we look at each of these properties.

5.1.1 Syllabification within the ω^{min}

The classic property of the minimal prosodic word in most Germanic languages is the fact that it is the domain for syllabification (Wiese 1996: 65f.; Hall and Kleinhenz 1999; Booij 1999; see also Vigário 2003 for Portuguese).[1] To show that this is true also for Swedish, we should challenge the Onset principle across the boundary between morphemes of different kinds. Most simplex forms (simple and inflected words) will constitute a single prosodic word (where $\omega^{min}=\omega^{max}$), whereas true compounds will consist of more than one minimal prosodic word.

(112) Onset and minimal prosodic word (ω) **(p.119)**

Form	*Syllabification*		*Translation*
'härm-ar	(här.mar)$_\omega$		‘imitates’
'härm-ade	(här.ma.de)$_\omega$		‘imitated’
'härm-ande	(här.man.de)$_\omega$		‘imitating’
'härm-ˌapa	(härm)$_\omega$(a.pa)$_\omega$	*(här.ma.pa)$_\omega$	‘imitation monkey’

The intuition that Onset is inhibited across the prosodic word boundary is quite clear. One of the phonetic correlates of this is aspiration of voiceless stops, which is prominent in the onset of a stressed syllable and initially in the prosodic word. In other positions, there is no aspiration, see (113).

(113) Aspiration of onsets but not of codas

	dröm-torpet	('drømː)$_\omega$(ˌtʰɔrːpɛ̱t)$_\omega$	‘the dream cottage’
vs.	skämt-orgie	('ɧɛ̱mːt)$_\omega$(ˌɔrːgɪ̱ɛ̱)$_\omega$	‘joke orgy’
	pann-kaka	('pʰaŋː)$_\omega$(ˌkʰɑːka)$_\omega$	‘pancake’
vs.	bank-avtal	('baŋːk)$_\omega$(ˌɑːv)$_\omega$(ˌtʰɑːl)$_\omega$	‘bank deal’
	procent-are	(prʊ'sɛ̱nːtarɛ̱)$_\omega$	‘miser’
vs.	present-artikel	(prɛ̱'sɛ̱nːt)$_\omega$(aˌʈʰɪkːɛ̱l)$_\omega$	‘present item’
	noll-tolerans	('nɔlː)$_\omega$(tʰɔlɛ̱ˌranːs)$_\omega$	‘zero tolerance’

The intuition for syllabification is true also for compounds where stresses are further apart. Below, various morpheme combinations with different stress placement are examined with respect to how they syllabify across the boundary.

(114) Syllabification as diagnostic test for minimal prosodic word

Compounds	C.V	.CV	
('röd)$_{\omega}$(ˌögd)$_{\omega}$	röd.ögd	*rö.dögd	‘red-eyed’
(favo'rit)$_{\omega}$(antipaˌti)$_{\omega}$	fa.vo.rit.an.ti.pa.ti	*fa.vo.ri.tan.ti.pa.ti	‘favourite antipathy’
('sokrates)$_{\omega}$(ˌanda)$_{\omega}$	so.kra.tes.an.da	*so.kra.te.san.da	‘Socrates spirit’
('sokrates)$_{\omega}$(antipaˌti)$_{\omega}$	so.kra.tes.an.ti.pa.ti	*so.kra.te.san.ti.pa.ti	‘Socrates antipathy’
('ord)$_{\omega}$(akrobaˌtik)$_{\omega}$	od.a.kro.ba.tik	*o.da.kro.ba.tik	‘word acrobatics’
('Bred)$_{\omega}$(ˌängs)$_{\omega}$(ˌav)$_{\omega}$(ˌåkningen)$_{\omega}$ ‘the driving into the ditch at Bredäng’			
	bred.ängs.av.åk.ni.ngen	*bre.däng.sa.våk.ni.ngen	

Derivations	C.V	.CV	
('van)$_{\omega}$(ˌartad)$_{\omega}$	van.a.ʈad	*va.na.ʈad	‘vicious’
('fuling)$_{\omega}$	*ful.ing	fu.ling	‘ugly one’
Inflections	C.V	.CV	
('härmade)$_{\omega}$	*härm.a.de	här.ma.de	‘imitated’
('grinar)$_{\omega}$	*grin.ar	gri.nar	‘cries; frets’

As it turns out, all inflectional endings (*-a, -e, -ar, -it, -or*, etc. in various functions) integrate into the same prosodic word as the stem: (*linn-e*)$_{\omega}$ ‘linen’, (*tag-it*)$_{\omega}$ ‘taken’, (*byx-or*)$_{\omega}$ ‘trousers’, etc. Derivational endings come in two types, those that form their own prosodic word (*-artad*, *-sam*, *-bar*, *-dom*, *-skap*, *-het*), and those that don’t (*-ig, -lig, -else, -nad, -are, -al, -tion, -and*). Thus, we get (*van*)$_{\omega}$(*artad*)$_{\omega}$, ‘vicious’, (*vak*)$_{\omega}$(*sam*)$_{\omega}$ ‘vigilant’, and (*trevlig*)$_{\omega}$ ‘pleasant’, (*lärare*)$_{\omega}$ ‘teacher’, respectively. These two types are sometimes referred to as non-cohering and cohering (Kristoffersen 2000: 43ff.). We will suggest instead a more direct way of capturing the distinction, namely by direct reference to lexical **(p.120)** properties pertaining to stress/prosody, see chapter 10. The crucial distinction among derivational endings, then, is whether they are lexically tonic, i.e. stressed, (-ˌ*artad*, -ˌ*bar*, -ˌ*het*, etc.) or not (*-ig, -else, -al, -tion*, etc.).[2]

The fact that ω^{min} forms the minimal domain for syllabification is visible also in the fact that all syllables must be well formed within this domain. There are root syllables like *vackr* ‘beautiful’ and *vibr* ‘vibr(ate)’ that yield ill-formed syllables unless they epenthesize (*vacker*) or combine with another morpheme (*vackr-a* ‘pl.’, *vibr-era* ‘to vibrate’). Lexical roots need to meet the well-formedness criterion of a branching syllable, see (158), but there are no requirements pertaining to stress or syllabification, not even to weight. These requirements instead come with the minimal prosodic word, and Culminativity.

5.1.2 Culminativity within the ω^{min}

Every prosodic word has exactly one head. By the logic of the model of Itô and Mester (2006), this means that each minimal as well as each maximal projection of the prosodic word has exactly one head. For the minimal prosodic word (ω^{min}), the head is manifest as stress, while for the maximal prosodic word (ω^{max}) the head is manifest as a tonal accent.

(115) Culminativity-ω

> ‘The prosodic word has exactly one head’
> ω^{min} – stress; ω^{max} – accent

Culminativity within ω^{min} is easily identified as the *only* stress within the domain.

(116) Culminativity

(e.lek.tri.fi.'e.ra)$_{\omega}$	‘to electrify’
(e.pi.de.'mi)$_{\omega}$	‘epidemic’
('hus)$_{\omega}$	‘house’
('sy.fi.lis)$_{\omega}$	‘syphilis’

(me.lo.'dra.mer.na)$_{\omega}$	‘the melodramas’

This pattern is distinct from several of the other Germanic languages (Kager 1989; Hammond 1999; Kaltenbacher 1999; Zonneveld, Trommelen, Jessen, Rice, Bruce, and Árnason 1999: 503ff.), in that Swedish exhibits very little evidence of stable secondary stress within the prosodic word. Below are a few cognates in American English, German, and Swedish.

(p.121) (117) English and Swedish stress

('mone,tary)$_{\omega}$	(mone'tär)$_{\omega}$
(to,tali'tarian)$_{\omega}$	(totali'tär)$_{\omega}$
('ab,stract)$_{\omega}$	(ab'strakt)$_{\omega}$

(118) German and Swedish stress

(,mili,tari'sieren)$_{\omega}$	(militari'sera)$_{\omega}$
(,ono,matopo'etisch)$_{\omega}$	(onomatopo'etisk)$_{\omega}$
(,uni,versi'tät)$_{\omega}$	(universi'tet)$_{\omega}$

It is important in this context to distinguish phonological stress from possible rhythmic prominences (discussed in 6.3.5). Rhythmic prominences, to the extent one perceives them, only leave phonetic traces like slight lengthening of every other syllable (Strangert 1985: ch. 4; Bruce 1998: 89ff.). There is no clear placement of lengthening in either the vowel or the consonant, as is the case in phonological lengthening.

Whenever there is more than one phonological stress present, the characteristic compound pattern arises (postlexical assignment of tone, primary stress preceding secondary stress). This results in a maximal prosodic word, ω^{max}. These effects never occur with rhythmic lengthening. Kristoffersen (2000: 162ff.) finds evidence in Norwegian for a weak initial phonological secondary stress in words like those in (117) and (118). These words may get a non-reduced vowel [ɛ] for initial /e/ in forms like *tele'fon* ‘telephone’ and *ele'fant* ‘elephant’, where otherwise schwa would have been expected, in Norwegian. No parallel evidence is available in Central Swedish. The evidence in German involves e.g. prefix selection according to the initial foot structure of the root (Kaltenbacher 2000), beside the clear phonetic enhancements that create the consensus perception of secondary stress (as also in English). Again, for CSw, this is not at all as clear, and we will proceed under the assumption that there is only one phonological stress within the minimal prosodic word. There are some interesting implications of this assumption regarding the type of stress shift that is triggered by the Swedish version of the rhythm rule (see 6.3.2).

5.1.3 Medial clusters

We cover the phonotactics of syllable onsets and syllable codas in chapter 13. Here we shall take a brief look at syllable contact (Clements 1990; Ham 1998) in medial position in the minimal prosodic word. The difference between the sequences in (119a) and (119b) below could be related to well-formedness. Each combination cited is legitimate, but some are felt to be better formed than others, as indicated. While the spelling varies, each cluster follows a short vowel in a stressed syllable.

(p.122) (119) Syllable contact within the minimal prosodic word

a. Well formed		b. Less well formed	
(chaṟken)$_\omega$	‘the delicatessen counter’	(schaṉckṟa)$_\omega$	‘to barter’
(feṃte)$_\omega$	‘fifth’	(feṭma)$_\omega$	‘fatness’
(gryṃtet)$_\omega$	‘the grunt’	(ryṭmen)$_\omega$	‘the rhythm’
(vaṉten)$_\omega$	‘the mitten’	(vaṭtnet)$_\omega$	‘the water’

(120) No obstacle across minimal prosodic words

(schaṉck)$_\omega$-(ṟegel)$_\omega$	‘chess rule’
(feṭt)$_\omega$-(ṃängd)$_\omega$	‘fat content’
(flyṭt)$_\omega$-(ṃånad)$_\omega$	‘moving month’
(haṭt)$_\omega$-(ṉål)$_\omega$	‘hatpin’

The pattern found fits well with the findings on sonority sequencing discussed in Clements (1990) and Ham (1998). The minimal prosodic word constitutes the domain for these judgements. Syllabification does not take place across minimal prosodic words, and conditions on syllable contact, too, appear to be inert there.

5.1.4 Rhythmic grouping

The minimal prosodic word is also manifest as a domain for rhythmic grouping. This property can be brought out by looking at the same segmental content within a minimal prosodic word, and across two minimal prosodic words. The compounds *ˈtetraˌvinet* ‘the Tetra Pak wine (bag in box wine)’ and *ˈbäckraˌvinen* ‘the gully’ both consist of four syllables, and both have alternating stress. They both also have the segmental sequence [-raˈviːn-] in the middle. But the boundary between the minimal prosodic words is in different places.

(121) Rhythmic grouping

a.

(ˈtetra)$_{\omega}$-(ˌvinet)$_{\omega}$	[x .] [x .]

b.

(ˈbäck)$_{\omega}$-(raˌvinen)$_{\omega}$	[x] [. x].

When [-raˈviːn-] is within one and the same minimal prosodic word, it is rhythmically an iamb, whereas when [-raˈviːn-] is split between two prosodic words, it is not. Rather, *tetravinet* is rhythmically two trochees, whereas *bäckravinen* has an iamb in the middle. This rhythmic difference is probably often very slight in connected speech, and smoothed over in poetic recitation. Nevertheless, it is accessible to intuition and it indicates that the boundaries of the minimal prosodic word influence rhythmic grouping. In poetry, the difference between iambs and **(p.123)** trochees come out according to the iambic-trochaic law at the level of the verse foot (Fant et al. 1991; Hayes 1995).

5.1.5 Segment distribution

Generalizations at the segmental level may also relate to the prosodic word, giving further support and indication of its ramifications. In Central Swedish the segment [ŋ] cannot occur at the beginning of the prosodic word (**ŋante*), while it can occur medially (*finger* [^{1}ˈfɪŋːɛr] ‘id.’, *långa* [^{2}ˈlɔŋːa] ‘long’) and finally (*kung* [kʉŋː] ‘king’, *träning* [^{2}ˈtrɛːnɪŋ] ‘workout’). Vigário (2003) and Prieto (2004) cite equivalent cases from Portuguese, where [ʎ], [ɲ], [ɾ], and [ɨ] are banned from prosodic word-initial position. Several other cases where the prosodic word is the bounding domain for segmental generalizations are cited in Nespor and Vogel (1986), Hall and Kleinhenz (1999), Vigário (2003, 2010), e.g. vowel harmony in Hungarian, and final voicing in Sanskrit.

5.1.6 Coordinatory truncation

The minimal prosodic word is also implicated in coordinating structures involving truncation, see Booij (1985) and Wiese (1996: 69ff.) for Dutch and German. Below the comparison is made with German. This type of truncation would seem to be possible only with morphemes that constitute minimal prosodic words. As we shall see, that is a characterization that needs some qualification, see (125). Compound members and derivations with stressed suffixes permit truncation, see (122), whereas members of prosodically reduced compounds and unstressed derivational suffixes do not, see (123).

(122) German and Swedish truncations with coordinated prosodic words

Gmn:	(Herbst)$_{\omega}$(~~blumen~~)$_{\omega}$ und (Frühlings)$_{\omega}$(blumen)$_{\omega}$	‘autumn and spring flowers’
Sw:	('höst)$_{\omega}$(ˌ~~blommor~~)$_{\omega}$ och ('vår)$_{\omega}$(ˌblommor)$_{\omega}$	
	('pojk-)$_{\omega}$(ˌ~~grupper~~)$_{\omega}$ och ('flick)$_{\omega}$(ˌgrupper)$_{\omega}$	‘boy and girl groups’
	('is-)$_{\omega}$(ˌ~~björnar~~)$_{\omega}$ och ('brun)$_{\omega}$(ˌbjörnar)$_{\omega}$	‘polar and brown bears’
Gmn:	(Ritter)$_{\omega}$(~~schaft~~)$_{\omega}$ und (Bauern)$_{\omega}$(schaft)$_{\omega}$	‘Knighthood and peasantry’
Sw:	('riddar-)$_{\omega}$(ˌ~~skap~~)$_{\omega}$ och ('bonde)$_{\omega}$(ˌskap)$_{\omega}$	
	('vän-)$_{\omega}$(ˌ~~skap~~)$_{\omega}$ och ('fiend)$_{\omega}$(ˌskap)$_{\omega}$	‘friendship and enmity’
	('god-)$_{\omega}$(ˌ~~artad~~)$_{\omega}$ eller ('elak)$_{\omega}$(ˌartad)$_{\omega}$	‘benign or malignant’

(p.124) (123) German and Swedish disallowed truncations: lexicalizations

Gmn:	$^{?}$(Freund-)$_{\omega}$(~~schaft~~)$_{\omega}$ und (feind)$_{\omega}$(schaft)$_{\omega}$	‘friendship and enmity’
Sw:	*('mån-)$_{\omega}$(ˌ~~dag~~)$_{\omega}$ eller ('tis)$_{\omega}$(ˌdag)$_{\omega}$	‘Monday or Tuesday’
	^{OK}('måndag)$_{\omega}$ eller ('tisdag)$_{\omega}$	
	^{OK}('helg-)$_{\omega}$(ˌ~~dag~~)$_{\omega}$ och ('fri)$_{\omega}$(ˌdag)$_{\omega}$	‘holiday or free day’
	*('tran-)$_{\omega}$(ˌ~~bär~~)$_{\omega}$ och ('blå)$_{\omega}$(ˌbär)$_{\omega}$	‘cranberries and blueberries’
	^{OK}('gräs-)$_{\omega}$(ˌ~~frön~~)$_{\omega}$ och ('blom)$_{\omega}$(ˌfrön)$_{\omega}$	‘grass and flower seeds’

German allows truncation of *-schaft* in some forms but not others. The pattern is due to a difference in reduction on the part of the suffix in relation to preceding context. If the preceding part is disyllabic (or longer), truncation is possible, whereas if the root is just a single syllable, truncation is less felicitous. This corresponds with the pattern for Swedish *-sam*, which appears to be in the process of losing its stress (see 11.9). When there is a stress clash between the root and the suffix, reduction of the stress in the suffix is mandatory. Stress reduction allows for the reanalysis of the prosodic structure as reformed, the suffix being incorporated into the prosodic word of the stem. The simple reason for this is grammatical: stress is an obligatory feature of the minimal prosodic word.

Comparable Swedish forms are also found with the weekdays (*dag*) and the berries (*bär*), which are prosodically reduced. This is evident in surface tonal accent, which is not the regular and expected accent 2, but accent 1 (see 11.10).[3] Other compounds involving *dag* which do not belong to the closed set of weekdays, however, permit truncation (*namnsdag* ‘nameday’, *fridag* ‘free day’). Similarly, the *bär*-words form a closed set, whereas e.g. *frön* ‘seeds’ do not. These reductions are comparable to Dutch *bongerd* (< *boomgaard*) ‘garden’, *wingerd* (< *wijngaard*) ‘vineyard’, indeed, Sw *-gård* also forms a small semantic set: *lagård* (< *ladugård*) ‘farm (lit. barn yard)’, *trädgård* ‘garden (lit. tree yard)’, *gärsgård* (< *gärdsgård*) ‘fence (lit. fenced in field yard)’. The set of words exhibit signs of lexicalization in that the first element is reduced and the consonant /g/ geminated, even though it is etymologically onset to the second element, i.e. *träd* ['trɛːd], *gård* ['goːɖ], but *trädgård* [^{1}'trɛgːɔɖ].

Coordinatory truncations that separate out unstressed suffixes are not grammatical.

(124) German and Swedish disallowed truncations: unstressed suffixes

Gmn:	*(winz-~~ig~~)$_{\omega}$ oder (ries-ig)$_{\omega}$	‘tiny or huge’
Sw:	*både ('trev-~~lig~~)$_{\omega}$ och ('far-lig)$_{\omega}$	‘both nice and dangerous’
	*varken ('trag-~~isk~~)$_{\omega}$ eller ('kom-isk)$_{\omega}$	‘neither tragical nor comical’

(p.125) There is a lot of parallelism here between cognate suffixes (*-schaft*/*-skap*, *-ig*/*-ig*), but there are also contrasts, e.g. *-lich*/*-lig*, where the Swedish suffix is no longer a prosodic word, but the German suffix is.

It is also possible to truncate larger units than single minimal words, as long as the morphological branching is respected. Below is first an ordinary truncation in a larger compound (125a), and then the case where a unit larger than a single minimal prosodic word is truncated (b), and finally a case of illegitimate truncation, where the morphological structure of the compound is not respected (c).

(125) Larger truncations in Swedish

a. småbåts~~motorer~~ och segelbåtsmotorer
‘small boat ~~engines~~ and sailing boat engines’

b. långfärds~~segelbåt~~ och fritidssegelbåt
‘long journey ~~sailing boat~~ and pleasure sailing boat’,
flugfiske~~sällskap~~ och veteranflygsällskap
‘fly fishing ~~society~~ and veteran flying society’

c. *små~~båtsmotorer~~ och segelbåtsmotorer
‘small ~~boat engines~~ and sailing boat engines’

The pattern indicates that the condition for truncation in fact is not the minimal prosodic word as such but *minimally* a minimal prosodic word. The crucial condition is that there is some sufficiently prosodified structure, containing at least one stress. Remaining conditioning is morphological and semantic.

5.1.7 Tonal accent induced by suffix

The minimal prosodic word is also the domain within which a lexical tone is assigned and expressed, see (133) below. Lexical tone is inherent in either roots or suffixes. In the latter case, the suffix itself does not carry stress, but incorporates into a minimal word with a preceding stressed morpheme. A single syllabification domain is created. Within that domain the tone is then assigned from the unstressed suffix to the root.[4] Suffixes that incorporate and cause accent 2 in the output are either inflectional (all suffixes that are syllabic), or derivational (some, others being stressed and hence forming their own minimal prosodic word). If such an accent 2-inducing suffix ends up incorporated into the minimal prosodic word, in a position that is adjacent to primary stress, it will be able to assign its tone to the stressed syllable. Thus, /-lig$_2$/, which induces accent 2, will assign its lexical tone to the preceding stressed syllable when incorporated into the minimal **(p.126)** prosodic word: (^{2}'trev-lig)$_\omega$ ‘pleasant’.[5] So far the lexical part. On top of that, there is the prominence function of accent, realized as tonal contours, assigned equally to words carrying a lexical tone (accent 2) and those lacking it (accent 1). It is the integrated structure of the intonational prominence tone and a lexical tone that together make up what is referred to as ‘accent 2’. In the case of accent 1, it is just the intonational part (see further 9.2.2). The accent takes the maximal prosodic word as its domain of realization. There is only ever one tonal accent per maximal prosodic word. The best illustrations of this are compounds, which are made up of two or more minimal prosodic words, and which will never contain more than a single tonal accent, however long they are.

This concludes the discussion of the minimal prosodic word. We turn now to the maximal projection of the prosodic word (ω^{max}). Our analysis presupposes that these different projections should all belong to the same category, but, while descriptively convenient, we note here that it is not the only way of conceiving of this part of the prosodic hierarchy. Vigário (2010, see also 2003) argues that the fact that the properties of the lowest and highest projection of the prosodic word are partly different warrants a separation of the highest level into a separate category between the prosodic word and the prosodic phrase. She calls this category the prosodic word group (PWG). We acknowledge the observation that there are several differences between the minimal and maximal word. Indeed, we are trying to exploit these differences in order to identify the minimal and maximal projection. Quite possibly, the Swedish facts would be better described by assuming a different prosodic category instead of the maximal prosodic word, i.e. the PWG, especially if behavioural unity should be a central property of a category.

5.2 The maximal prosodic word, ω^{max}

The maximal prosodic word will either be coextensive with the minimal prosodic word, or form a larger unit, within which a number of minimal words could be grouped together (as in compounds), or some element is adjoined to a minimal prosodic word (as in some prefixation).

5.2.1 Compounds

Just like the other Germanic languages, Swedish both permits and frequently uses long as well as short compounds, containing as many minimal prosodic **(p. 127)** words as there are stressed morphemes. In CSw they are prosodically signalled by the designation of the first stress as carrying a tonal accent (by Culminativity). In Central Swedish the accent of regular compounds is invariably accent 2, which is identical to the lexical one, i.e. a H tone is associated to the main stress. However, this tone is assigned by a *prosodic* rule, hence postlexically. This is the Central Swedish version of a 'compound rule' (Gussenhoven 2004: 214f.), but it refers to the number of stresses or the number of minimal prosodic words, rather than to the morphological construct 'compound'. It is thus a wholly prosodic generalization.

(126) The compound accent generalization

Words containing two or more stresses are assigned a postlexical H tone on the main stressed syllable. This results in accent 2.

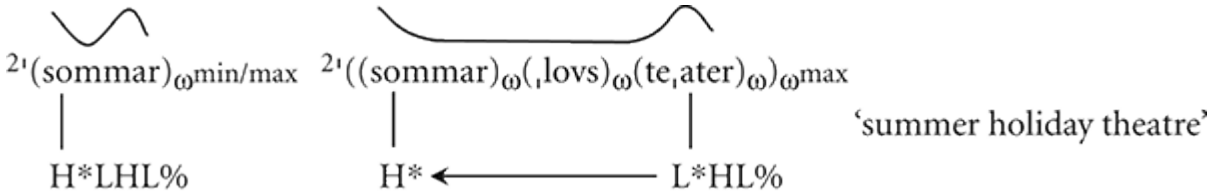
Beside compounds, forms containing tonic derivational affixes will also fall under this generalization. This is illustrated in (127).

(127) Lexical and postlexical accent 2

Lexical accent 2 (root, suffixes):				
sommar	/somᵘɑr$_2$/	[^{2}'sɔmːar]	‘summer’	root
trevlig	/trev-lig$_2$/	[^{2}'treːvlɪg]	‘pleasant’	suffix
Postlexical accent 1 (single stress):				
lov	/lov/	[^{1}'loːv]	‘holiday’	root
jul	/ʝʉl/	[^{1}'jʉːl]	‘Christmas’	
Postlexical accent 2 (several stresses):				
sommar-lov	/somᵘɑr$_2$+lov/	[^{2}'sɔmːarˌloːv]	‘summer break’	compound
jul-lov	/ʝʉl+lov/	[^{2}'jʉːlˌloːv]	‘Christmas break’	
tvätt-bar	/tvɛtᵘ-bɑr/	[^{2}'tvɛ̟tːˌbɑːr]	‘washable’	tonic suffix
grym-het	/ɡrym-het/	[^{2}'ɡrʏmːˌheːt]	‘cruelty’	
på-laga	/po+lɑg-ɑ$_2$/	[^{2}'poːˌlɑːga]	‘tax; duty’	tonic prefix
o-nödig	/u+nød-ig$_2$/	[^{2}'uːˌnøːdɪg]	‘unnecessary’	

In compounds, the maximal prosodic word manifests itself as distinct from the minimal prosodic word, by virtue of the regular postlexical accent assigned. The presence of several stressed syllables, hence several minimal prosodic words, triggers a particular tone association pattern for accent 2, when the compound is focus accented (see 12.2.1). The first part of the tonal contour (H*) is associated to the primary stress, and the latter part (L*H) is associated to the last stress. The difference in relation to forms with only one stress (simplex forms) is illustrated in (128), where the final boundary tone has been added (L%).

(p.128) (128) Lexical and postlexical accent 2, focus accented

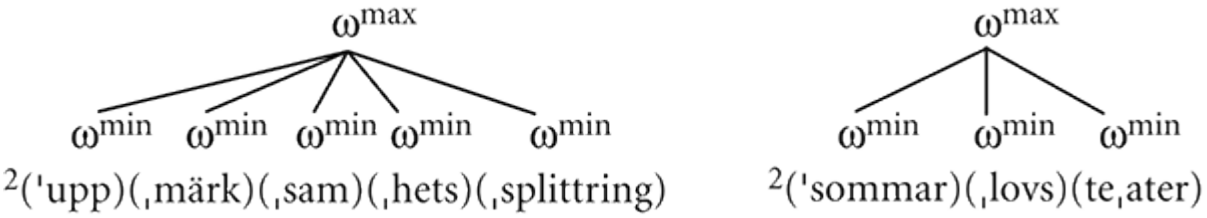


The presence of more than one stress means that there is more than one tone-bearing unit available, and this is exploited in postlexical association of focus accent 2. The tone association rule is bounded by the maximal prosodic word, which could be as long as is manageable (e.g. '*sommar-*ˌ*lovs-te*ˌ*ater*ˌ*-följe* ˌ*tongs-manu*ˌ*skriptet* 'the summer holiday play serial manuscript'). There are two parts to focus accent 2, the H* (lexical or postlexical) and the LH which is the focal intonation part of the contour. In accent 1 as well as in compound accent 2, focal LH can associate as L*H, since in these two cases there is a tone-bearing unit available (the only stress in accent 1, the last secondary stress in compound accent 2). In simplex accent 2, the focal LH floats, as the only tone-bearing unit is taken by lexical accent 2, see (128).

It is commonly assumed that the first stress of a compound is primary (Bruce 1998: 31), and we mark it as such in transcription. However, it is not clear that there is any particular property that makes it primary, other than the very fact that the first stress is associated to the beginning of the tonal contour of accent 1 or accent 2 (as the case may be). Similarly, the last stress is more prominent than any medial stresses (under focus accentuation), but again this would appear to be due to the tonal marking on that syllable, rather than to any separate metrical criterion.

The upshot then is that there is no internal metrical prominence structure within the maximal prosodic word. As shown in 6.3.4, there is no reason to assume that any phonological stresses between the peripheral ones are removed in compound formation. They are just not very prominent for lack of tonal mark. The net result is that the tonal structure of the maximal prosodic word signals coherence of a lexical unit, but no internal morphological structure, in Central Swedish. Thereby, too, there is no indication that the prosodic structure of compounds is anything other than flat, as far as the realization of accent is concerned, see Fig. 5.1.

(129) The flatness of prosodic compounds in CSw



The morphological structure of compounds may of course vary in branching, and in some dialects—those that do not exhibit the compound accent generalization — **(p.129)**

the tonal structure may to some extent match it (Abrahamsen 2003; Riad 2006), much like in English or Danish (Basbøll 2005: 489ff.).

5.2.2 Adjoined prefixes

Another shape of the maximal prosodic word results when an unstressed syllable is adjoined to a minimal word. This is an asymmetrical formation, where the outcome has only one stress. The assignment of accent is postlexical, since the minimal and maximal prosodic words are not coextensive. The postlexical accent is accent 1 when there is only one stress.

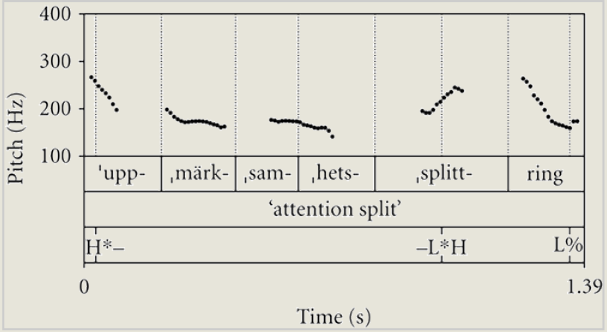


Fig. 5.1. Tonal association pattern in a long compound. *Uppmärksamhetssplittring* 'attention split' contains five stresses.

Vetandets värld, SR

The morphological basis for this type of adjunction is primarily the two unstressed pretonic prefixes *be-* and *för-*, both of which correlate with accent 1, that is, the absence of lexical (or postlexical) tone. These prefixes frequently attach to forms that would have had accent 2 without the prefix. In (130) we indicate lexical tonal information with a subscripted ‘2’ at the end of the suffix (in CSw this corresponds to a H tone, while in e.g. South Swedish it is a L), and the surface accent of the whole word with a raised digit before the stressed syllable.

(130) Prefixed and unprefixed forms

föra /før-α_2/ [^{2}'fœːra] ‘to lead’	förföra /før-før-α_2/ [fœr^1'fœːra] ‘to seduce’
maning /mɑn-iŋ$_2$/ [^{2}'mɑːnɪŋ] ‘exhortation’	förmaning /før-mɑn-iŋ$_2$/ [fœr^1'mɑːnɪŋ] ‘admonition’
tala /tɑl-α_2/ [^{2}'tɑːla] ‘to speak’	betala /be-tɑl-α_2/ [bɛ̟^{1}'tɑːla] ‘to pay’
given /j̈iv-en$_2$/ [^{2}'j̈iːvɛ̟n] ‘given, ptcp.’	begiven /be-j̈iv-en$_2$/ [bɛ̟^{1}'j̈iːvɛ̟n] ‘keen on’
hållare /hol$^{\mu}$-ɑre$_2$/ [^{2}'hɔlːarɛ̟] ‘holder’	behållare /be-hol$^{\mu}$-ɑre$_2$/ [bɛ̟^{2}'hɔlːarɛ̟] ‘container’

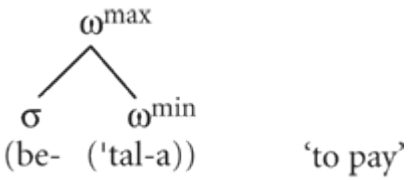
(p.130) There are many more corresponding forms like this, but it is by no means the case that each form on the left or right has a correspondent on the other side. But the accent pattern is entirely regular. There is thus a conflict between the lexical accent induced by the suffix (accent 2) and what looks like a property of the prefixes (accent 1).[6] However, we shall attribute the tone pattern not to the prefixes as such, but to the prosodic structure that they give rise to. This allows us to maintain the simple generalizations for the assignment of accentual defaults in (131).

(131) Postlexical default accent assignment

One stress yields accent 1; two stresses yields accent 2.

Accent 1 results in the prefixed forms here, just as it does in all other accentless forms that contain only one stress, that is, by postlexical default. The adjoined prosodic word structure is indicated in (132).

(132) Adjunction to the prosodic word



Given this structure we can formulate an accent assignment generalization that separates the minimal prosodic word from its projections.

(133) Postlexical accent generalization

When the minimal prosodic word is not coextensive with the maximal prosodic word, accent is assigned by postlexical default.

For compounds and derivations with stressed affixes there is a postlexical procedure for accent 2 assignment, as seen above, depending on number of stresses (or equivalently, number of minimal prosodic words), i.e. (126). For forms derived with a pretonic prefix, no tone is assigned, i.e. accent 1 results.

To support this analysis, there are arguments that establish the prefix as external to the minimal prosodic word, and that it is distinct from both a minimal prosodic word and also from the maximal prosodic word in compounds, i.e. when there is more than one minimal prosodic word.

The simplest way to show that *be-* and *för-* do not belong inside the minimal prosodic word is to consider syllabification. This can be tested only with *för-* which ends in a consonant, which would syllabify with a following vowel if it were within the minimal word. It does not: *för.ä.ra* 'to present; to bestow', **fö.rä.ra*. **(p.131)** This test works best in slow speech. The result is, then, that there should be a minimal prosodic word boundary between *för-* and *ära*, i.e. för-(ära)$_{\omega}$. We simply extend this analysis to the other unstressed pretonic prefix *be-*: be-(tala)$_{\omega}$ 'to pay'.

Another argument for this analysis is the distribution of optional glottal stop insertion in onsetless syllables. The correct characterization of glottal stop insertion is 'initial in the minimal prosodic word', and predicts a difference between (be-(akta)$_{\omega}$)$_{\omega}$ 'to observe' and (reaktor)$_{\omega}$ 'nuclear reactor'. For the argument, see 13.1.

The prefix alone does not constitute a minimal word, since it does not fulfil the requirement of Culminativity, i.e. it is not stressed. If it were stressed, we would have expected a compound-like structure, with primary stress in the prefix and (postlexical) accent 2 across the whole structure. Interestingly, the prefixes *be-* and *för-* can be stressed in one particular configuration, when attached to an extant compound. The generalization is that compounds do not allow the incorporation of units smaller than a prosodic word at their left edge. Therefore, these pretonic prefixes have to be promoted to minimal words in order to be incorporated: be-(('led)$_{\omega}$(ˌsaga)$_{\omega}$)$_{\omega}$ $^{\max}$ > ^{2}(('be)$_{\omega}$(ˌled)$_{\omega}$(ˌsaga)$_{\omega}$)$_{\omega}$ $^{\max}$ ‘to accompany’. The resultant structure is prosodically a compound, with a tonal mark on the first stress, postlexical accent 2. This pattern is discussed in 10.2.3.

5.3 Prosodic words in syntax

The formation of prosodic words appears not to be limited to morphological structures in Central Swedish. It occurs also in various syntactic formations. Here, we will briefly review the three central cases that correspond to the morphological cases given above, that is, incorporation at the right edge of a minimal prosodic word, compound formation, and prefix incorporation (Myrberg and Riad 2013).

Incorporation into ω$^{\min}$. Incorporation into the minimal word typically occurs with unstressed/destressed pronouns following a verb. The verb '*gav* ‘gave’ followed by the pronoun (')*henne* $_{2}$ ‘her’ may form a prosodic unit as ^{1}('*gavene*)$_{\omega}$ $_{\min}$ ‘gave her’. The loss of /h/ indicates that the first syllable of *henne* is neither stressed, nor initial in a prosodic word, i.e. that neither of the distributional criteria for /h/ is met (3.3.8 and 6.1). The syllabification is *ga.ve.ne* (rather than **gav.e.ne*), indicating that we are looking at a single syllabification domain, i.e. a single minimal prosodic word.[7]

(p.132) Compound formation. So-called particle verbs normally have an accented particle (adverb or preposition) and a deaccented verb. In many dialects, however, particle verbs can optionally receive compound prosody, whereby the accent falls on the verb and the particle retains a secondary stress, just like the last member of a compound. The pattern is well known in East Norwegian (Kristoffersen 2000), but also occurs in Swedish, especially in northern dialects. Postlexical accent 2 is assigned by default, see (131).

(134) Prosodic compounds formed in the syntax

a.

Nw	('komme) ^{1}('in)	>	^{2}(('komme)$_{\omega}$(ˌin)$_{\omega}$)$_{\omega}$ $^{\max}$	‘to come in’
Nw	('gå) ^{1}('ut)	>	^{2}(('gå)$_{\omega}$(ˌut)$_{\omega}$)$_{\omega}$ $^{\max}$	‘to go out’

b.

Sw	('kom) ^{1}('upp)	>	$^{2}((\text{'kom})_{\omega}(,\text{upp})_{\omega})_{\omega}$ $^{\max}$	‘came up’
Sw	('slå) ^{1}('in)	>	$^{2}((\text{'slå})_{\omega}(,\text{in})_{\omega})_{\omega}$ $^{\max}$	‘to wrap’

c.

Sw	('säg) ^{1}('det)	>	^{2}(('säg)$_{\omega}$(,det)$_{\omega}$)$_{\omega}$ $^{\max}$	‘say that’

Prefix incorporation. We also find the formation where a syllable adjoins like a pretonic prefix to a minimal prosodic word in the syntax. The construction is productive with the adverb *för* ‘too’. When *för* is followed by accent 2 forms like ^{2}'*många* ‘many’ and ^{2}'*länge* ‘long’, lexical accent is regularly removed and replaced with default accent 1: *för* ^{1}'*många* ‘too many’, *för* ^{1}'*länge* ‘too long’ (Malmgren 1992). We take this to be due to the formation of a prosodic word in the syntax, just like the one formed in morphology.

(135) Prosodic word formation in morphology and syntax[8]

morphology:	för- dyr -a	(för-(^{1}'dyra$_2$)$_\omega$)$_\omega$ $^{\max}$	‘to make more expensive’
syntax:	för ^{2}('många)	(för (^{1}'många$_2$)$_\omega$)$_\omega$ $^{\max}$	‘too many’

The pattern in syntax is regular with *för* ‘too’ as long as the following form is fairly frequent. Forms like '*liten* $_2$ ‘little’, '*stora* $_2$ ‘big, pl.’, and '*ofta* $_2$ ‘often’ will all quite predictably get accent 1, even though their lexical accent is 2. But when the forms are less common (*dy-ig* $_2$ ‘muddy’, *egen* $_2$ ‘odd, special’), or longer (*gyllen-e* $_2$ ‘golden’, *heder-lig* $_2$*-a* $_2$ ‘honest, pl.’), the pattern is less obligatory, or indeed not preferred (Sara Myrberg p.c.). We will interpret this variability as meaning that it remains possible to interpret accent inside the minimal prosodic word. Thus, we do not assume a difference of structure, see 12.3.

This concludes our discussion of prosodic words in Central Swedish. More will be said regarding accent assignment in 11.5.

Notes:

(^{1}) Swiss German (Alemannic) is an exception to this, in that the phrase is the syllabification domain (Kraehenmann 2003: 12). This is also what permits the famous initial geminates in this language. Thanks to Bernhard Wälchli for pointing this out to me.

(^{2}) Affixes that are not tonic may be either posttonic or unspecified. The formal and empirical evidence is given in chapter 10.

(^{3}) This is interpretable as loss of secondary stress.

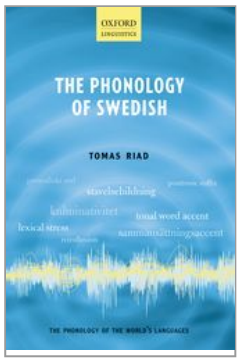
(^{4}) In more complex structures, where the minimal and maximal word are not coextensive, accent is assigned in a different manner, see (131).

(^{5}) There are other conditioning factors that influence accent assignment, notably anacrusis within the prosodic word, which may or may not inhibit accent assignment (Riad 2009b). The full discussion is given in chapter 11.

([6]) This is often assumed, e.g. Lahiri et al. (2005a); Wetterlin (2010).

([7]) The accentual effect is also of interest, for which see 11.10.

([8]) There are some other morphological forms that appear to exhibit the same pattern. The forms meaning ‘the same’ are a case in point. The word *samma* [^{2} 'samːa] ‘same’ has accent 2, but the pronouns *densamma, detsamma*, and *desamma* ‘the same c.g./neut./pl.’ have accent 1: [dɛ̯n^{1}'samːa], [dɛ^{1}'samːa].



The Phonology of Swedish
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Print publication date: 2013
Print ISBN-13: 9780199543571
Published to Oxford Scholarship Online: January 2014
DOI: 10.1093/acprof:oso/9780199543571.001.0001

The prosodic foot and stress patterns

Tomas Riad

DOI:10.1093/acprof:oso/9780199543571.003.0006

Abstract and Keywords

The prosodic foot turns out to be defective in Swedish. There is no evidence for more than a single foot per minimal prosodic word, and since stressed syllables in Swedish are mandatorily heavy, all of the foot is taken up by a single syllable. The evidence for the foot, beyond stress, is found in the distribution of /h/ and prosodic minimality. The latter part of the chapter presents patterns of stress clash resolution and the Swedish version of the rhythm rule. There is a discussion of how stress can be diagnosed in Swedish, with the help of compound formation and vocative chant. The notion of rhythmic prominence and patterns of stress alternations are also briefly discussed.

Keywords: stress, foot, defective, clash resolution, rhythm rule, vocative chant

The properties of the prosodic foot have not been thoroughly worked out for Swedish. The challenge is to connect various levels of structure in a way that situates the foot in a phonology where it is distinct from the prosodic word. In the Swedish stress system, as analysed in this book, the foot is taken to be a bimoraic domain carrying stress. In practice, this means that the foot will always be the size of a single stressed syllable, as stressed syllables must be heavy in Swedish. Outside of stressed syllables, there is no real evidence for the foot in terms of phonological iteration or delimitation of a domain for segmental processes. This will lead us to consider foot structure as defective in Central Swedish.

One theme in previous research on the prosodic hierarchy in Swedish concerns how to predict what appears to be the unmarked location of stress. Often, stress on the penultimate syllable is taken to be the default, and stress rules have been designed to obtain that result via regular assignment of foot structure, e.g. Schmid (1987), Bailey (1990), Andréasson (1997), and Frid (2003). Much of the early generative work on Swedish takes an equivalent stance, e.g. Öhman (1967), Teleman (1969), and Linell (1972). It has also been argued that final stress should be considered the default (Shokri 2001). These accounts start from an assumption that stress in Swedish should be assigned by algorithm, chiefly through the phonology, via a model like that used in Hayes (1995).[1] There is precedence for this in the analysis of several other Germanic languages, e.g. Kager (1989), Trommelen and Zonneveld (1999), Hammond (1999), Féry (1996), Jessen (1999), and Kristoffersen (2000). As in all Germanic languages, there are a number of irregularities and subregularities pertaining to stress placement, some of which are clearly due to morphology, others less clearly so.[2] One general problem with these approaches is that subregular and exceptional stress placement is modelled as exceptional in a way that hides any morphological dependence. Measures such as extrametricality, lexical specification of vowel quantity, and even lexical stress, are all diacritic unless framed in a morphological way. **(p.134)** The phonological approaches thus tend to use exceptional devices to make the phonological algorithm look good, while at the same time missing a number of morphological generalizations.

The approach taken in this book acknowledges the role of morphology much more directly, by suggesting a substantial role for prosodic prespecification in the lexicon (see chapter 10). This rather changes the basis for comparison with predominantly phonological approaches to stress in the Germanic languages that are the closest to Swedish with regard to quantity and stress placement (Norwegian; German, Dutch; Danish, Faroese).

In order to fully evaluate proposals regarding the prosodic foot in Germanic languages, one must, on the one hand, explicitly distinguish it from the prosodic word (or whatever category one assumes directly dominates it), and, on the other hand, decide what the general relationship between the prosodic hierarchy and the morphology is. In view of that, the clearly distinguishable properties of the prosodic foot are few and quite simple.

The chief property of the prosodic foot in Swedish is stress. A stressed syllable is minimally bimoraic, a state of affairs known as Stress-to-Weight. This is a well-known generalization in many languages (Vennemann 1988). In the Germanic context, the North Germanic standard languages, except Danish, all have this generalization as an undominated feature: every phonologically stressed syllable must be heavy in Icelandic, Faroese, Swedish, and Norwegian. This weight in turn is instantiated either as a long vowel or a short vowel followed by a long consonant. Expressed as foot structure, this means that the foot is bimoraic.

(136) The prosodic foot in CSw

Ft = [μμ]

It is reasonable to assume that the foot in Germanic always comes with stress. At any rate, this appears always to be taken for granted. For Swedish that will mean that the foot will always be realized within a single syllable (see chapter 8). And as a consequence of that, polysyllabic simplex words will not be fully footed. There is no clear evidence for the foot as a domain beyond a single syllable in CSw, nor is there evidence for alternating, phonological stress patterns outside the main stressed syllable of prosodic words. The prosodic word carries a condition of Culminativity, which is fulfilled by the presence of a prosodic foot, and there only seems to be a single foot per prosodic word. Whenever there is more than one foot in a word, there is also more than one minimal prosodic word, and that will trigger the compound rule (126). Structures that contain two prosodic words are either real or formal compounds, or they are derivations formed with a stressed derivational suffix. The compound rule that signals this structure assigns a H* tone to the first stress in the word, thereby making it primary. If the whole structure is in focal position in an utterance, the **(p.135)** rest of the accentual contour (L*H, often called the prominence tone) is associated to the last stress, in Central Swedish.

The defective, non-exhaustive foot structure in CSw leaves no cause to assume iteration of prosodic feet in Swedish, i.e. there is no reason to assume that stress, primary or otherwise, is located to certain syllables by counting from either edge. Furthermore, there are no segmental phenomena that are bounded specifically by the foot, such as have been suggested for English in terms of aspiration and flapping (Kiparsky 1979). Corresponding phenomena in Swedish (aspiration, *d*-continuization) are otherwise bounded, e.g. by the prosodic word (see chapter 4).

Instead of edge-in footing, much of stress placement in Swedish falls out from prosodic specification in the lexicon, where morphemes carry with them subcategorization for stress (pretonic, posttonic), or are specified as carrying stress (tonic), or are unspecified for stress. Prosodically unspecified morphemes often end up stressed, and that part of the stress system is phonological, instantiated by the assignment of final stress. Combinations of morphemes yield structures with different stress properties. This system is presented and defended in chapter 10.

Finally, the prosodic foot is not taken to be integral to the prosodic hierarchy (Downing 2006: 115). That is to say that the prosodic hierarchy is taken to connect prosodic shape conditions on stems and roots with shape conditions on the prosodic word (7.2). The prosodic foot brings with it a connection between stress and quantity, but does not directly define minimality conditions either on words or on morphemes in Swedish. This view is the same as that given in Downing (2006) and related work (Inkelas 1989; Gordon 1999).

6.1 Evidence for the foot

The distribution of [h] provides evidence for the presence of the foot. The segment [h] has a prosodically conditioned distribution, where the prosodic word and the foot together form a generalization. [h] is acceptable in prosodic word-initial syllables, whether stressed or unstressed. In prosodic word-medial position, it shows up reliably only in the onset of a stressed syllable, hence a footed syllable. Below, we repeat the distribution from (45).

(137) [h] is admitted prosodic word- and foot-initially (a), prosodic word- but not foot-initially (b), foot- but not prosodic word-initially (c). Optionally [h] may surface between two unstressed vowels (d)

a.

$([_{Ft}$'huckle$)_{\omega}$	[^{2}'hɵkːlɛ̯]	‘kerchief’
$([_{Ft}$'hemlig$)_{\omega}$	[^{2}'hɛ̯mːlɪg]	‘secret’
$([_{Ft}$'mä$)_{\omega}([_{Ft}$ˌhä$)_{\omega}$	[^{2}'mɛːˌhɛː]	‘milksop’

(p.136)

b.

his$[_{Ft}$'toria$)_{\omega}$	[hɪs^{1}'tuːrɪa]	‘history’
heral$[_{Ft}$'dik$)_{\omega}$	[hɛ̯ral'diːk]	‘heraldry’

c.

ma$[_{Ft}$'hogny$)_{\omega}$	[ma^{1}'hɔŋːnʏ]	‘mahogany’
Kanda$[_{Ft}$'har$)_{\omega}$	[kandaˈhɑːr]	(place name)

d.

maha$[_{Ft}$'radja$)_{\omega}$	[ma(h)a^{2}'radːja]	‘maharaja’
kohe$[_{Ft}$'rens$)_{\omega}$	[kʊ(h)ɛ̯'rɛ̯nːs]	‘coherence’

Swedish exhibits much the same distribution of /h/ as English (cf. ˈ*vehicle* vs. *ve* ˈ*hicular, prohi*ˈ*bition* vs. *pro*ˈ*hibitive*), but with some difference in obligatoriness. The safest way to cast the distribution for Swedish is to say that /h/ is obligatorily pronounced foot-initially and prosodic word-initially.

[h] is frequently deleted in running speech in personal pronouns like *hon* ‘she’, *henne* ‘her’, *hennes* ‘her, gen.’, *han* ‘he’, *honom* ‘him’, *hans* ‘his’. We analyse this as incorporation of pronouns into a preceding prosodic word.[3]

(138) Deletion of [h] within the prosodic word, when not in a stressed syllable

(ˈkan han)$_{\omega}$ (ˈDET)$_{\omega}$?	[ˈkanːanˈdeː]	*[ˈkanːhan…]	‘can he?’
(ˈgav henne) (ˈMJÖLK)	[ˈgɑːvɛnɛ ˈmjø̟ːlːk]	*[ˈgɑːvhɛnɛ…]	‘gave her milk’
(ˈGÅR han)$_{\omega}$ (ˈsen)$_{\omega}$?	[ˈgoːranˈsɛ̟ːn]	*[ˈgoːrhan…]	‘will he leave then?’
(ˈtog hon)$_{\omega}$ (ˈDIT den)$_{\omega}$?	[ˈtuːgʊnˈdiːtɛ̟n]	*[ˈtuːghʊn…]	‘did she bring it there?’

This pattern raises the question of stress status for the *h*-initial pronouns, and hence also their status as independent prosodic words. There are enclitic allomorphs for these pronouns which are clearly unstressed (*-en* ‘him; it c.g.’, *-na* ‘her’, *-et* ‘it neut.’), and one might think that the full pronouns should therefore be stressed. However, the full forms can participate in object shift, whereby light objects may move to the left of the sentence adverbial, a clear indication of unstressed status, or at least unaccented status (Holmberg 1986). At the same time, these pronouns can indeed carry stress, so we must allow for variation with regard to stress status. The use of the clitic forms is parallel to the regular pronouns, rather than alternating, and is considered old-fashioned and perhaps also somewhat rural. For the analysis of phonologically unstressed words, see 10.6.

(p.137) 6.2 Prosodic minimality

The prosodic minimality of free forms indeed relates to the foot, which is bimoraic (see (136)). This essentially means that content words should be stressable. As will be seen in chapter 10, we make a distinction between lexically stressed morphemes and lexically unspecified morphemes, and we also separate out function words that do not form prosodic words (see 10.6). Forms that are unspecified may receive stress phonologically by virtue of prosodic word formation and obligatory Culminativity. Other forms are lexically unstressed, e.g. some monosyllabic pronouns, and remain that way, as evidenced e.g. by the *d*-continuization rule (see 4.8). Such forms often have stressed variants, or rather, may receive stress in certain syntactic positions or by virtue of contrastive or emphatic enhancement. In all these cases, a bimoraic syllable is present or created, by the placement of a foot, i.e. stress. Prosodic minimality is to be distinguished from morphological minimality of roots, see (158).

6.3 Stress patterns

The general pattern for Swedish is that exactly one phonological stress occurs in every minimal prosodic word. In this section we look at stress clash and its resolution, the identification of stressed syllables, and the status of stress in compounds.

6.3.1 Stress clash resolution

Swedish, like all Germanic languages, does not tolerate stress clash. When two stresses end up next to each other within a word, the first one (primary stress) remains and the second is reduced.

(139) Stress clash resolution

x x		x .	
själv+mål	>	självmål	‘own goal’
kvar+skatt		kvarskatt	‘residual tax’
bär-bar		bärbar	‘portable’
var-sam		varsam	‘gentle’

All forms containing two stresses get postlexical accent 2. If the second syllable of a compound or derivation with stressed suffix contains a long vowel, the vowel quality and to some extent quantity are retained under stress reduction: ^{2}'*till*ˌ*ta* /tilᵘ+tɑ/ [^{2}'tɪl$_{(ˌ)}$tɑ·] ‘to increase’ vs. ^{2}'*tilta* /tilt-ɑ$_{2}$/ [^{2}'tɪlːta] ‘to tilt’. If however, the vowel is short, the second syllable virtually neutralizes with unstressed syllables, in normal speech. This is the case when we compare ^{2}'*kvar*ˌ*skatt* /kvɑr+skɑtᵘ/ **(p.138)** [^{2}'kvɑː$_{0}$ʂkat] ‘residual tax’ with ^{2}'*forskat* /forsk-ɑt$_{2}$/ [^{2}'fɔʂːkat] ‘researched, p.ptcp.’, or ^{2}'*lo*ˌ*katt* /lu+kɑtᵘ/ [^{2}'luː$_{0}$kat] ‘lynx’ with ^{2}'*bokat* /buk-ɑt$_{2}$/ [^{2}'buːkat] ‘booked, p.ptcp.’, where the latter form in each pair contains an unstressed inflectional suffix. Both forms have accent 2, the compound via the postlexical rule, the verb form via the posttonic suffix.

The clash reduction with retained accent 2 is the context also for diachronic, permanent stress removal, according to Riad (1998a). All syllabic inflectional suffixes are unstressed, and some derivational suffixes are unstressed, too. These are all accent 2-inducing, and the argument would be that stress clash resolution, when habitual, opens up the possibility of reanalysing suffixes as lexically marked for accent 2 instead of being stressed. The suffix *-sam* (e.g. *långsam* ‘slow’, *hälsosam* ‘wholesome’) appears to be in the process of losing its stress (see 11.9).

6.3.2 The Swedish rhythm rule

Rhythm rules typically change the relative strength of a number of prominences in a word or phrase. Typical and often cited English cases that concern word-internal stress patterns are *fòurtéen wómen* > *fóurtèen WÓMEN* and *Mìssissíppi múd* > *Míssissìppi MÚD* (Hayes and Puppel 1985). Swedish does not have this particular type of rhythmic adjustment between two word-internal stresses. This is also predicted by the defective foot structure that we have assumed for Swedish, and Culminativity. If minimal prosodic words only contain a single stress (foot), then there are simply no relative prominences to negotiate rhythm amongst. Thus, phrases like *militär grád* ‘military rank’ or *Mississíppis léra* ‘Mississippi’s mud’ do not entail any changes in stress pattern.

In a system with no secondary stresses inside minimal prosodic words, the only way to change prominence is to use stronger measures, such as contrastive stress. This is, in fact, employed in a small set of words that typically end in *-ív* and that form contrastive pairs (*positiv/negativ, aktiv/passiv, explicit/implicit*). The interesting phonology surrounding these forms is discussed in 6.3.6. We mention this here because the process could be partly influenced by rhythmic concerns.

There are rhythmic adjustments at the phrasal level that involve deaccenting of a word in a phrase. A typical trigger is a phrase with a certain degree of lexicalization.[4] The rule reduces stress in a word that typically immediately precedes the head of the phrase. Thus, in names and lexicalized verbs consisting of a verb and a particle or noun, the verb stress is reduced or removed (Anward and Linell 1976).[5] Importantly, reduction does not only apply in case of stress **(p.139)** clash, and it is thereby not clear that there is a particular rule referring to clash beside a more general reduction within the phrase. As in English, the rule reduces a stress that precedes the phrasal maximum.

(140) The Swedish rhythm rule

a. names, titles

kap'ten, 'Johans‚son	>	kap^{0}ten 'Johans‚son ‘captain J.’
'Karl, 'Olof	>	^{0}Karl-'Olof
'Eric, 'Erics‚son	>	^{0}Eric 'Erics‚son

b. verb + particle, noun[6]

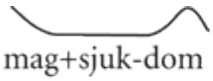
'komma ‘to come’, 'ut ‘out’	>	^{0}komma 'ut ‘to come out’
'tvätta ‘to wash’, 'bort ‘away’	>	^{0}tvätta 'bort ‘to wash off’
leta ‘to search’, fram ‘forward’	>	^{0}leta 'fram ‘to find’
'spela ‘to play’, 'kula ‘marble’	>	^{0}spela 'kula ‘to play with marbles’

There is some unclarity regarding what phonological processes are active here. No intonational accent occurs on the reduced element, and that is in itself part of the reduction, as content words otherwise typically carry accent, much as a default (Myrberg 2010). But that only amounts to deaccenting, and the question remains whether there is also destressing. At least in the cases in (140a) above, there appears to be reduction of stress. In these forms, a long vowel may show up shortened and crucially with changed quality, indicating phonological shortening, which in turn indicates true loss of stress (e.g. *kapten* /kɑpten/ [kap 'teːn], [kap^{0}tɐ̟n]). In (140b) it seems more as though the absence of a tonal prominence on the reduced form is all that happens, and that stress and length remain (Myrberg and Riad 2013). It is at least clear that one cannot as naturally use the short allophone in (140b) (*leta* ['leːta], *leta fram* [^{0}leta 'fram], *[^{0}lɐ̟ta 'fram]). The issue should be investigated further.

6.3.3 Diagnosing stress: compounds and vocative chant

In view of stress reduction, it can sometimes be unclear to intuition whether a syllable is stressed or not. In such cases there are a couple of tests available to establish stress status. The most reliable test is to use the compound accent generalization in (126), which singles out the first and last stresses of a form by marking them tonally. The accent 2 tone (H*) associates to the first stress and the prominence tone (L*H) associates to the last. Stressed syllables between these tonally marked ones are not at all as prominent. To illustrate, consider the two **(p.140)** derivational suffixes *-dom* and *-ning* in the forms *sjuk-dom* 'illness' and *tid-ning* 'newspaper'. The suffixes are right next to the primary stress in both forms and therefore subject to stress clash resolution, if stressed (see (139)). In order to find out if either, neither, or both of the suffixes are indeed stressed, the whole forms should be placed at the end of a longer compound, adding some element at the beginning. Native speaker pronunciation will be as in (141).

(141) Diagnosing stress by the compound accent generalization


mag+sjuk-dom 'stomach illness'

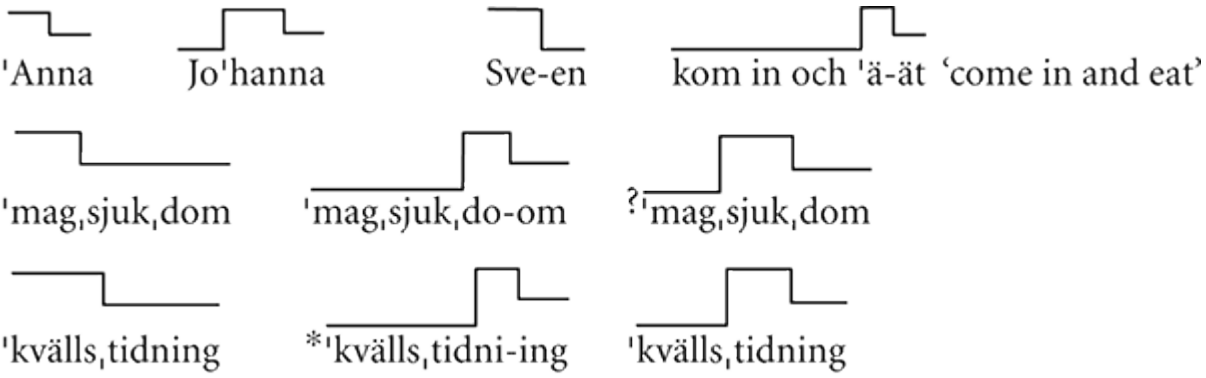

kvälls+tid-ning 'evening newspaper, tabloid'

The L*H prominence tone occurs on *-dom* in *mag+sjuk-dom* and on *tid* in *kvälls+tid-ning*. This means that these are, respectively, the last stressed syllables in their compounds, which in turn means that *-dom* is a stressed derivational suffix /-dúm/, while *-ning* is not, i.e. /-niŋ$_2$/.

Primary stress is much easier to perceive, and there is no neutralizing process like clash reduction that sometimes conceals the pattern. But in principle, one could always put a morpheme (with either accent in free form) at the beginning of a long compound. It will then get the H* tone according to the compound rule. This test might be helpful in determining the placement of stress in long words like *militär* 'military', *doktorand* 'PhD student' and *klematis* 'clematis'. By placing one of these words first in a long compound we make available a secondary stress towards the end, with which to contrast the primary stress: *mili* '*tär+akade*ˌ*min* 'the military academy', *dokto*'*rand+*ˌ*om+*ˌ*buds+*ˌ*mannen* 'the PhD student ombudsman', '*klematis+specia*ˌ*listen* 'the clematis specialist'.

Another useful test exploits the calling contour, also known as vocative chant. This is a melodic morpheme used for calling people, all over Europe and likely beyond (Varga 2008). The Central Swedish calling contour has two obligatory elements: a high tone and a mid tone. If chanted, the interval between these two tones is a minor third.[7] Beside the obligatory tones, a low tone preceding the high is available (approximately an octave or approximately a fifth below the high tone). The property of the vocative chant that admits diagnosing stress is the fact that one can only place a stressed syllable on the high tone.

(p.141) (142) Vocative chant



This test works well in the main cases, though there may be a methodological difficulty with applying the calling contour to things like stomach illness. It is somewhat suboptimal to place the medial stress of *magsjukdom* on the high tone of the vocative melody.[8]

6.3.4 Stress in tonally unmarked syllables

It is a common view that Swedish (complex) words can only contain two stresses, however long they are (e.g. Garlén 1984: 138). In really long compounds, this would entail destressing of all stressed morphemes, except the first and last one. From the phonological perspective, this is too simplistic as a characterization of the Central Swedish compound rule, and already the vocative chant above contradicts it. Instead, the fact is that the first and last stresses become *tonally* marked in complex words, and that they therefore are perceived as prominent, while stresses remain intact. To demonstrate the presence of stress in tonally unmarked syllables, we can vary the rhythmic composition of the morphemes in the compound. If there were real destressing, we would not be able to distinguish an iambically stressed word from a trochaically stressed one in the position between the peripheral, tonally marked stresses. So, if we use *kamel* /kɑmel/ [ka'meːl] 'camel' as our token iambic form, and '*sadel* /sɑd•l/ ['sɑdɛ̯l] 'saddle' as our token trochee, we can construct the long compounds in (143).

(p.142) (143) Medial iambs and trochees (tonally marked stresses are in small capitals)

²'LÄder+	,sadel	+,till+,VERK-ning	'manufacturing of leather saddles'
²'LÄder+	ka,mel	+,till+,VERK-ning	'manufacturing of leather camels'
²'LÄder+	,sadel	+be-,HOV	'need of leather saddles'
²'LÄder+	ka,mel	+be-,HOV	'need of leather camels'
²'Över+	,målar	+,mästar+,JOBbet	'the head master painter job'
²'WIEner+	ka,pell	+,mästar+,JOBbet	'the Wien bandleader job'

The intuition is quite clear regarding the rhythmic difference between the pairs in the box, and that establishes the phonological stresses as real, also in compound medial position.[9] Phonetically, the difference will show up as longer duration of the stressed syllables, in medial position just as in any other position.

6.3.5 Rhythmic prominences

The proposal made here is that only phonological stresses constitute proper feet. We have found evidence for only one such stress/foot per minimal prosodic word. Thus, there are as many minimal prosodic words in a form as there are stresses. If there is more than one phonological stress/foot in a word, then that is also a complex word formation of some sort, typically a compound or a derivation with a stressed suffix. Foot structure in Central Swedish could hereby be seen as defective, compared with many other languages, including some of the Germanic languages (Hayes 1995).

When there are several stresses in a complex word, the first stress gets a tonal mark by virtue of the compound accent generalization. That tonal mark is the word accent. If the form is in the right intonational context for focus, then the last stress, too, gets a tonal mark, in Central Swedish, as in several other dialects.

Beside phonological stress, there is rhythmic prominence, which shows up in a couple of different contexts. In this section we catalogue these instances.

First, there are rhythmic prominences in long stretches of unstressed syllables which precede the primary stress. In English and German, corresponding structures are normally treated as footed (Roca and Johnson 1999; Wiese 1996: 291f.). We mark these prominences with a subscripted ‘x’ before their syllable. Doubtful or optional prominences are parenthesized.

(p.143) (144) Rhythmic prominences

$_{x}$demo$_{(x)}$krati'sera	‘to democratize’
$_{x}$mili$_{(x)}$tari'sera	‘to militarize’
$_{x}$ono$_{(x)}$matopo'etisk	‘onomatopoeic’
$_{x}$acceptabili'tet	‘acceptability’
$_{x}$messia'nism	‘id.’
diskrimi'nering	‘discrimination’

The general pattern is that the initial syllable is the easiest to identify as rhythmically prominent, but it is not mandatory (*diskrimi'nering*). Rhythmic grouping like this is phonetically investigated by Strangert (1985: ch. 4), and found to entail slight lengthening. Similar patterns are reported also in Bruce (1998: 29ff., 89ff.), although with a different analysis from the one given here.

There are some cases of alternation among forms similar to those in (144). These are given in (145).

(145) Variable rhythmic prominence

$_{x}$magneti'sera	~	mag$_{x}$neti'sera	‘to magnetize’
$_{x}$histo$_{(x)}$rici'tet	~	his$_{x}$torici'tet	‘historicity’
$_{x}$republika'nism	~	re$_{x}$publika'nism	‘republicanism’
$_{x}$amerika'nism	~	a$_{x}$merika'nism	‘americanism’

The pull to the second syllable may, in some cases, be due to other forms in the paradigm (*mag'net* ‘id.’, *his'toria* ‘history’, *A'merika* ‘America’). The instability of rhythmic stress here points away from phonological status as foot structure. There is also no (known) interaction with other stresses in Swedish. Such interaction has been reported at least for German, where for example the prefix *ent-* can be stressed or destressed according to prosodic properties of the following stem (e.g. *ent-*,*stalini'sieren* ‘to de-Stalinize’ vs. ,*ent-dä*,*moni'sieren* ‘to de-demonize’, Kaltenbacher 2000: 15). There are also some forms that appear not to admit initial prominence altogether, given in (146).

(146) Non-initial rhythmic prominence

a.

mu$_{x}$hammeda'nism	*$_{x}$muham$_{(x)}$meda'nism	‘mohammedanism’

b.

i$_{x}$dentifi'era	*$_{x}$identifi'era	‘to identify’
e$_{x}$lektrici'tet	*$_{x}$elektrici'tet	‘electricity’

Very few forms fit into the patterns of (146), testifying to the fact that lexical stress in roots is rare when non-initial. This is discussed in chapter 10, where the Germanic vocabulary is seen to be mostly lexically stressed (tonic), while the Romance part is mostly unspecified. Of the forms in (146), *Muhammed* would seem to be the strongest case for a lexical stress in the second syllable. The other **(p.144)** two forms (*identifiera, elektricitet*) have necessarily heavy second syllables, which is another potential cause for rhythmic stress attraction.

The fact that forms like *amerikanism* and *republikanism* can also take initial rhythmic prominence speaks for the fact that stress is not a property of the root in these instances. Thus, the form *A*'*merika* likely has a posttonic suffix *-ika* (cf. '*Annika, An*'*gelika*, '*Afrika* (names), '*rättika* 'black radish', *har*'*monika* 'harmonica', *ba*'*silika* 'basil', '*nejlika* 'carnation; clove'). If the suffix is posttonic, then the primary stress can be lexical or provided by the phonological rule. The latter is the likely case in *A*'*merika* in view of pronunciations of *ameri*'*kanare* as either [am■rɪ'kɑːnarɛ̯] or [amɛ̯rɪ'kɑːnarɛ̯], and the pronunciation of *am*[ɛ̯]*rika* '*nism*, with no trace of a putative lexical stress in the base form *Am*['eː]*rika*.[10]

Bruce (1998: 90) proposes that rhythmic stresses are likely to be properties of the phrase rather than the word. The argument is the very fact that they may move around in one and the same form, e.g. the form $_{x}$ *ekono*'*mi* 'economy' can get two different patterns when part of a compound: $_{x}$ *natio*'*nal*+$_{x}$ *ekono*,*mi* or $_{x}$ *natio*'*nal*+ *e* $_{x}$ *kono*,*mi* 'economics'. Phonological stress will not move in this way.

Another argument why initial prominence of the type discussed in this section should not be considered as phonological stresses is their uselessness in filling lift positions in verse. Consider (147) where words with rhythmic prominences are used in simple iambic and trochaic metres. The test here is to actually read the verse much as a nursery rhyme, i.e. with marked scansion.

(147) Verse test for rhythmic prominence

a.

Vi 'gick en 'kväll på $_{x}$maske 'rad	'we went to a masquerade one night
en 'yppig 'klädes$_{x}$kaval,kad	an exuberant dress-cavalcade'

b.

$_{x}$vita'min som $_{x}$profy'lax	'vitamin as prophylaxis
'hjälper 'ej en 'sjuklig 'tax	will not help a sickly dachshund'

The second example, especially, sounds odd when read with trochaic rhythm. The first line of (147b) is much better read as two anapests (with an extra syllable in the middle).

Let us finally mention the rhythmic alternation of stressed elements. In compounds constituted by monosyllabic roots only, an alternating pattern can sometimes be noticed. Staffan Hellberg (p.c.) provides the illustrative, genuine example in (148).

(p.145) (148) Alternation in stretches of stressed elements

X . x . x	
'tull‚pack‚hus‚karls‚lag	‘customs pack house (work)men’s team’

6.3.6 Stress-alternating forms

There is a set of forms which vacillates between final primary stress and initial primary stress. There are two types, according to what the accent of the initial stressed form gets. The first pattern, illustrated in (149), gets accent 2 with initial stress, which amounts to formal compound formation in the cases where the base is perceived as a monomorpheme in Swedish.

(149) Alternating stress patterns: accent 2

alko^{1}'hol	^{2}'alko‚hol	‘alcohol’
per^{1}'silja	^{2}'per‚silja	‘parsley’
e^{1}'lände	^{2}'e‚lände	‘misery’
boj^{1}'kott	^{2}'boj‚kott	‘boycott’
sal^{1}'peter	^{2}'sal‚peter	‘saltpetre’
löjt^{1}'nant	^{2}'löjt‚nant	‘lieutenant’
pre^{1}'senning	^{2}'pre‚senning	‘tarpaulin’
rä^{1}'disa	^{2}'rä‚disa	‘radish’

There are many more forms showing this alternating pattern in East Norwegian, where the main basis for producing initial-stressed forms is Romance loans.[11] In this dialect it is also much clearer that there is a direction of change as indicated in (150). The forms are given in Kristoffersen’s (2000) rendering of these forms, but with tonal accent added as a raised digit before the primary stress. Corresponding forms in Swedish would be treated here as the forms in (144), with a rhythmic rather than phonological initial stress in the original form. The suggested analysis in terms of prosodic word structure is indicated to the right.

(150) East Norwegian initial stress (Kristoffersen 2000: 165)

pròtes[1]tére	>	[2]prótestère	‘to protest’	hence: $((^{2}{}'\text{protes})_{\omega}{}^{\min}(,\text{tere})_{\omega}{}^{\min})_{\omega}{}^{\max}$
sèlek[1]sjón	>	[2]séleksjòn	‘selection’	
bèkka[1]sín	>	[2]békkasìn	‘snipe’	

The addition of initial primary stress leads to the creation of formal compounds, always with resultant, postlexical accent 2 (Kristoffersen 2000: 165).

Another group of Romance loans that get initial stress, and that behave like the Norwegian forms, are given in (151). These forms typically end in *-iv* or *-tiv* and have the shape of formal compounds, but with no alternating stress pattern, unlike **(p.146)** (150) (Garlén 1984: 133). Among these we find many terms in the grammatical vocabulary. We register the prosodic word structure to the right.

(151) Formal compounds, grammatical terms

^{2}'ackusa‚tiv	'accusative'	hence: ((^{2}'ackusa)$_{\omega}$ ^{min}(‚tiv)$_{\omega}$ ^{min})$_{\omega}$ ^{max}
^{2}'geni‚tiv	'genitive'	
^{2}'adjek‚tiv	'adjective'	
^{2}'substan‚tiv	'noun'	
^{2}'infini‚tiv	'infinitive'	
^{2}'impera‚tiv	'imperative'	
^{2}'kompara‚tiv	'comparative'	
^{2}'frika‚tiva	'fricative (segment)'	

If a new stress is inserted, this is the expected outcome, i.e. that a compound structure with accent 2 is created.

The next set of forms mostly alternate in stress pattern, sometimes with a difference in meaning. The interest of these forms is that the initial stressed forms (to the right) do not exhibit accent 2, as one would have expected from looking at the Norwegian and Swedish data above, but what sounds like accent 1. In fact, these forms are best analysed as doubly accented.

(152) Alternating stress pattern

objek^{1}'tiv 'lens'	~	^{1}'objek^{1}'tiv	'unbiased'
provoka^{1}'tiv	~	^{1}'provoka^{1}'tiv	'provocative'
posi^{1}'tiv 'barrel organ'	~	^{1}'posi^{1}'tiv	'positive'
nega^{1}'tiv 'negative (of photo)'	~	^{1}'nega^{1}'tiv	'negative, adj.'
impli^{1}'cit	~	^{1}'impli^{1}'cit	'id.'

expli^{1}'cit	~	^{1}'expli^{1}'cit	‘id.’
ali^{1}'bi	~	^{1}'ali^{1}'bi	‘id.’

Bruce (1993), referring to Kjellin (1978), notes that the forms to the right are in fact pronounced as *phrases* such as ^{1}'*bättre* ^{1}'*liv* ‘better life’, ^{1}'*längre* ^{1}'*svit* ‘longer suite’, and *per* ^{1}'*sonligt ar* ^{1}'*kiv* ‘personal archive’. Sara Myrberg (p.c.) points out that while the prosodic identity of the structures is auditively obvious, it can also be established by the phrasal plateau that occurs between the two word accents assigned, a regular phrase prosodic formation (see 12.2.5). She also notes that there are similarities with corrective focus pronunciation.[12] The structure here, then, is that two maximal prosodic words are formed, rather counter to intuition, but nevertheless quite clearly manifest in the tonal behaviour (Myrberg and Riad 2013). The structure is as in (153).

(p.147) (153) Phrasal intonation of morphological simplex

a.

(^{1}'objek)$_{\omega}$ ^{max} (^{1}'tiv)$_{\omega}$ ^{max}	‘unbiased’
(^{1}'provoka)$_{\omega}$ ^{max} (^{1}'tiv)$_{\omega}$ ^{max}	‘provocative’

b.

(^{1}'bättre)$_{\omega}$ ^{max} (^{1}'liv)$_{\omega}$ ^{max}	‘better life’
(per^{1}'sonligt)$_{\omega}$ ^{max} (ar^{1}'kiv)$_{\omega}$ ^{max}	‘personal archive’

The reason why this particular set of words should get this phrasal prosody (as opposed to the other similar-looking forms, discussed directly below), probably has to do with the contrast expressed in the word pairs. Indeed the very fact that most of the words come in contrastive pairs is the strongest indicator of this. The fact that adjectives exhibit this pattern more than nouns likely follows from the antonymity. The argument as such presupposes a closeness between ‘corrective’ and ‘contrastive’.

A few-*iv* forms, other than those given in (152), very occasionally exhibit final stress only in free form, e.g. *aktiv* ‘active’, *passiv* ‘passive’, and *kreativ* ‘creative’. However, in compounds the final stress shows through, as per the compound test given in (141): ^{1}'*ak* ^{1}'*tiv*, ^{2}'*jätteak*‚*tiv* ‘very active’; ^{1}'*krea* ^{1}'*tiv*, ^{2}'*överkrea*‚*tiv* ‘hyper-creative’. There is no reason to assume that the initial stress of *aktiv* and *kreativ* in free form is preserved in a compound formation. There are some scattered individual forms that have this double prosodic word structure in the lexicon: (^{1}'harle)$_{\omega}$ (^{1}'kin)$_{\omega}$ /'hɑrle 'kin/ ‘harlequin’, which in the plural reforms into a single prosodic word: (harle'kin]-er)$_{\omega}$.

Yet other forms only ever exhibit final stress: *initia* [1]'*tiv* ‘initiative’, *recita* [1]'*tiv* ‘recitativo’.

Notes:

([1]) Hayes, however, does not include the Germanic languages in his broad overview of the stress systems of the world, because of the significant role of morphology in these systems (Hayes 1995: 32).

([2]) Icelandic and Faroese have fewer irregularities in their stress systems than the other Germanic languages (Árnason 2011: 271ff.). The stress system of Faroese is closer to that of Swedish and Danish than to Icelandic, however (Thráinsson et al. 2004: 29f.).

([3]) Syllabification across the boundary between the verb and pronoun is completely natural here: *går han* → *gå.ran* ‘went he’, *tog hon* → *to.gon* ‘took she’.

([4]) ‘Lexicalized’ does not mean that the formation must be old in the language. It could be formed impromptu as well (Anward and Linell 1976; Svanlund 2010).

([5]) The clearest sign of this is the fact that such a stress cannot carry accent prominence (see 12.3).

([6]) These so-called particle verbs can also be reformed as prosodic compounds, see (134).

([7]) Varga (2008), who is mainly concerned with Hungarian, analyses this part as H*!H-, that is a H tone followed by a downstepped H.

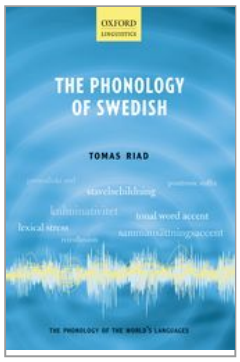
([8]) This test does not allow us to place any of the alleged secondary stresses that are sometimes said to occur before the primary stress. There are two cases. The first concerns words like *historici*'*tet* ‘historicity’ or *odontolo*'*gi* ‘odontology’ where some scholars have assumed secondary stress in the initial or second syllable (Bruce 1998: 89f.; Lorentz 1996: 120). We analyse these as rhythmic rather than phonological (see 6.3.5). The second case are forms like *slipe*'*ri* ‘grindery’ and *bage*'*ri* ‘bakery’, where the vowel quality and some quantity is retained in the initial syllable, after derivation with suffix *-eri*, which takes primary stress. These are analysed as cases of stress deletion (see 10.2.2).

([9]) As mentioned in 5.1.4, the grouping into minimal prosodic words has some effect on the perception of rhythmic units, even when the sequencing of stressed and unstressed syllables is the same.

([10]) The form *mu* $_{x}$ *hammeda'nism* should probably be considered as *mu* ^{0} *hammeda'nism*, in parallel with forms like *slipe'ri*, discussed in 10.2.2, that is, the result of conflicting specifications. Thus, from the base form *Mu*[$_{Ft}$'*ham*]*med* a derivation is created with the prosodically unspecified suffix *-ism*, which gets primary stress by virtue of the phonological stress rule. As only one prosodic word is formed, Culminativity entails that the lexical stress be deleted: (*mu* ^{0} *hammeda'nism*)$_{\omega}$.

([11]) The rule is even more general in Trøndelag Norwegian.

([12]) An example relating to the form *kaprifol* [kaprɪ'fuːl] 'honeysuckle' would be: *Sa du kiprifol* [^{1}'kɪpːrɪ^{1}'fuːl]*? Nej, jag sa kaprifol* [^{1}'kapːrɪ^{1}'fuːl]*!* 'Did you say kiprifol? No, I said kaprifol!'



The Phonology of Swedish
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Print publication date: 2013
Print ISBN-13: 9780199543571
Published to Oxford Scholarship Online: January 2014
DOI: 10.1093/acprof:oso/9780199543571.001.0001

Minimality and optimality of roots: branchingness and nicknames

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DOI:10.1093/acprof:oso/9780199543571.003.0007

Abstract and Keywords

The chapter begins the discussion of prosodic constraints on morphemes. Roots turn out to require branchingness, rather than having a prosodic requirement in terms of a foot. many latinate roots, for instance, are unstressed in Swedish. To gain further insight into the unmarked phonology of Swedish morphology, we look here into the structure of nicknames and other hypocoristics. This is a spectacular word formation process and one which is highly informative of the nature of prosodic structure in Swedish: Nicknames (i.e. prosodically optimal words) should be disyllabic, bimorphemic, initial stressed and have a single place of articulation between the vowels.

Keywords: nicknames, branching, roots, hypocoristic

The issue of minimality can be broken down into two parts, regarding what constitutes a minimal free word and what constitutes a minimal root.[1] Both aspects of minimality are relevant in Swedish but should not be confounded when implemented in hypotheses of the prosodic hierarchy.

7.1 Notions of minimality

Frequently, at least in the analysis of Germanic languages, the prosodic foot is taken to express the requirement of minimality on words (e.g. McCarthy and Prince 1986). The assumption is that a free content word should be stressed and that the canonical size of the metrical foot would minimally be required in a free form. In the Germanic context, the widest consensus puts the foot down as bimoraic (μμ).

There are some problems with this approach, at least if one looks for universality in the prosodic hierarchy. One is that a phonological analysis of a language may rely on feet without requiring them to also be carriers of stress. The clearest case is Japanese, a language without stress, yet widely using a bimoraic foot (Poser 1990). Thus, the role of stress in minimality must be language dependent.

Another problem relates to the layering of the notions mora, syllable, and foot within the prosodic hierarchy. In languages where the foot may dominate one or two syllables, the relation is straightforward, but in a language like Swedish (as analysed here), the foot will always be coextensive with a syllable, providing no direct evidence for a dominance relation. Also, the foot is often characterized in terms of a quantitative measure, typically moras, which in models like Selkirk (1984) and McCarthy and Prince (1986) puts the foot in a dominance relation with the moras directly, in disregard of syllable structure, as feet will typically vary between one and two syllables depending on the moraic make-up of those syllables. Taken together, this means that the foot as a category does not have an **(p.150)** unequivocal place in the prosodic hierarchy, as it may sometimes dominate the syllable, sometimes be dominated by it.

Finally, in languages like the Germanic ones, the assumption that bimoraic feet entail stress often comes in conflict with the actual distribution of stress. Essentially, sequences of stressed syllables are expected to be tolerated (HH́, HĹL). In English, at least the sequencing of heavy syllables is acceptable (ˌ*Chi* ˈ*nese*, ˈ*lo*ˌ*cate*), and so is a heavy syllable followed by two lights where the first light is stressed (ˌ*ban*ˈ*danna*, possibly *mo*ˈ*der*ˌ*nity*). While these patterns are possible, English is a language where rhythmic adjustment is quite frequent, at least in the phrasal domain (cf. the rhythm rule). In Swedish, none of this is possible. Stressed light syllables do not occur in the first place (see 8.1), and if two stressed heavy syllables are next to each another, then they belong to separate prosodic words, hence are likely parts of a compound (ˈ*spar*ˌ*bank* ‘savings bank’). And such structures are subject to clash resolution (see 6.3.1). In Swedish, then, there is only one stressed syllable in a prosodic word, even if there are two or more closed, and hence potentially heavy, syllables (e.g. *in.dig.na*.ˈ*tion* ‘id.’).

These things jointly speak at least for a separation of stress from the foot as domain, in the universal perspective, as well as for the defective distribution of feet in North Germanic, where stress comes with a requirement on weight on a single syllable.

The other notion of minimality concerns the parallelism with the morphosyntactic hierarchy, which is unquestioned as such in the upper part of the prosodic hierarchy (prosodic word and up), but which breaks down in the lower part of the prosodic hierarchy. If there are conditions on the prosodic word that it should line up with morphological edges, we might expect there to be prosodic conditions on the stem, root, and even affixes. This is the stance taken in Inkelas (1989), Gordon (1999), and Downing (2006). For the study of minimality of roots, this work shows that empirically wider generalizations are obtained if the minimality of roots is expressed as the more general notion of branchingness, over and above stress or number of moras. Thus, a branching rhyme (nucleus + coda) as well as a branching stress unit (μμ, σσ) will fulfil minimality.

Swedish exhibits evidence for both these notions of minimality. The branching of the syllable forms part of the prosodic hierarchy proper, whereas the branching of the foot is a separate condition relating to Culminativity.[2] We focus here on the generalizations we can gain from a separation of the branching condition from a quantitative requirement and a syllable structure requirement.

(p.151) There are two types of lexical prosodic states relating to stress that go with Swedish roots that necessarily form prosodic words: tonic and unspecified (see 10.2.2, 10.2.1). Tonic morphemes contain a foot as part of their lexical specification and are thereby guaranteed to always branch quantitatively. The obligatory status of Culminativity will take care of minimality in these forms, whenever they are used in isolation (and far beyond). Thus, the forms on the left in (154) will come out with a heavy, bimoraic syllable as indicated by segmental length under stress to the right.[3]

(154) Tonic roots under Culminativity

fin	/[$_{\text{Ft}}$fin/	['fiːn]	‘fine, nice’
schabrak	/ʂɑ[$_{\text{Ft}}$brɑk/	[ɧa'brɑːk]	‘caparison’
ansjovis	/ɑn[$_{\text{Ft}}$ʂuvis/	[an^{1}'ɧuːvɪs]	‘anchovies’
mössa	/[$_{\text{Ft}}$møs$^{\mu}$-ɑ$_{2}$/	[^{2}'møsːa]	‘hat’
trevlig	/[$_{\text{Ft}}$trev-lig$_{2}$/	[^{2}'treːvlɪg]	‘pleasant’
glömsk	/[$_{\text{Ft}}$gløm$^{\mu}$-sk/	['gl̪øm̪ːsk]	‘forgetful’
tvättare	/[$_{\text{Ft}}$tvɛt$^{\mu}$-ɑre$_{2}$/	[^{2}'tv̪ɛ̝tːarɛ̝]	‘washer’
kaviar	/[$_{\text{Ft}}$kɑv$^{\mu}$iɑr/, /kɑvi[$_{\text{Ft}}$ɑr/	[^{1}'kavːɻar], [kavɪ'ɑːr]	‘caviar’
charm	/[$_{\text{Ft}}$ʂɑrm/	['ɧarːm]	‘id.’
uppenbar	/[$_{\text{Ft}}$ʉp$^{\mu}$en+[$_{\text{Ft}}$bɑr/	[^{2}'ɵpːɛ̝n̩ˌbɑːr]	‘obvious’

intryck	/[$_{Ft}$in$^{\mu}$+[$_{Ft}$tryk$^{\mu}$]/	[^{2}ˈɪnːˌtrʏkː]	‘impression’
omärklig	/[$_{Ft}$u+[$_{Ft}$mɛrk-lig$_{2}$/	[^{2}ˈuːˌmærːklɪg]	‘imperceptible’

For the unspecified roots the strong pattern is that they typically do not end up stressed, since they most commonly combine with other unspecified morphemes, phonological stress going to the right edge (see chapter 10). Even though these roots are not stressed, there is some evidence that they are subject to a minimality requirement of branchingness. The central piece of evidence is the variable pronunciation at the morpheme juncture before the suffix *-tion* /ʂun/ in long and short roots, respectively. The pattern is given in (155).

(155) Unspecified roots under Culminativity

a.	motion	/mot-ʂun/	[mɔtˈʃuːn]	‘exercise’
	nation	/nɑt-ʂun/	[natˈʃuːn]	‘id.’
	ration	/rɑt-ʂun/	[ratˈʃuːn]	‘id.’
	portion	/port-ʂun/	[pɔʈˈʃuːn]	‘id.’
b.	aktion	/ɑk-ʂun/	[akˈʃuːn]	‘action; drive’
	fiktion	/fik-ʂun/	[fɪkˈʃuːn]	‘fiction’
	option	/op-ʂun/	[ɔpˈʃuːn]	‘id.’
	stagnation	/stɑgnɑ-ʂun/	[stagnaˈʃuːn]	‘id.’
	position	/posi-ʂun/	[pɔsɪˈʃuːn], [pʊsɪˈʃuːn]	‘id.’
	operation	/operɑ-ʂun/	[ɔpɛraˈʃuːn], [ʊpera ˈʃuːn]	‘id.’
	kontemplation	/kontɛmplɑ-ʂun/	[kɔntɛmplaˈʃuːn]	‘contemplation’

(p.152)

For the first four words, a /t/ is considered part of the root and it is also pronounced, whereas in all longer forms or forms with another coda consonant in the root, no /t/ is pronounced. Obviously, this pattern is due to diachronic integration of these borrowed morphemes, where the relevant /t/ from Latin has been lost in some cases. We would argue that the distribution of *t*-loss is due to the interference of phonology, specifically that the /t/ is retained where it is required for meeting the minimality of branching roots.[4] There are also words like *passion, mission, fission*, and *fusion*, for which there is no good way to establish whether the roots are closed syllables (/pas, mis, fis, fus/) or not (/pa, mi, fi, fu/). One possible, albeit weak, argument would be the tendency to pronounce *fusion* with the centralized allophone [fʊˈʃuːn], beside [fʉˈʃuːn]. The centralized allophone [ʊ] is obligatory in closed syllables, but it does also sometimes occur in open syllables in unstressed position (see 2.2.7).

We will now extend the argument to include the optimal shape of roots. The point here is that, if minimality by branching rhyme in singleton root syllables is not really *mandatory* in Swedish, at least we can argue that a branching rhyme (VC over and above Vː) is *optimal* in the language. The argument builds on two sources of Swedish data: the formation of hypocoristics and the inflection of CV adjectives like *ny* ‘new’.

7.2 Hypocoristics formation

The formation of nicknames and other hypocoristics in Swedish tells us quite a lot about prosodic well-formedness in the language. The process creates a disyllabic, bimorphemic structure of any input form. In (156) are a few representative names, and in (157) some other hypocoristic forms.

(156) Nicknames, the prosodic and morphological target

♀	Kata'rina	>	Katt-is [^{1}ˈkatːɪs], Kin-a [^{2}ˈkiːna]
	Karo'lina	>	Karr-o [^{1}ˈkarːʊ], Lin-a [^{2}ˈliːna]
	E'lisabet	>	Lis-a [^{2}ˈliːsa], Bett-an [^{2}ˈbɛ̯tːan]
	Marga 'reta	>	Magg-an [^{2}ˈmagːan], Met-a [^{2}ˈmeːta]
♂	'Tomas	>	Tomp-a [^{2}ˈtɔmːp-a], Tomm-e [^{2}ˈtʊmːɛ̯]
	Bo	>	Boss-e [^{2}ˈbʊsːɛ̯]
	Sven	>	Svenn-e [^{2}ˈsvɛ̯nːɛ̯], Svemp-a [^{2}ˈsvɛ̯mːpa], Svenn-is [^{1}ˈsvɛ̯nːɪs]
	'Lennart	>	Lell-e [^{2}ˈlɛ̯lːɛ̯]

'Magnus	>	Mang-e [^{2}'maŋːɛ̯], Mank-an [^{2}'maŋːkan]
Bengt	>	Beng-an [^{2}'bɛ̯ŋːan], Benk-e [^{2}'bɛ̯ŋːkɛ̯]
'Tor‚björn	>	Tobb-e [^{2}'tʊbːɛ̯], [^{2}'tɔbːɛ̯]
Per-'Fredrik	>	Peff-e [^{2}'pɛ̯fːɛ̯]

(p.153)

(157) Hypocoristic forms, the prosodic and morphological target

'vakt‚mästare	>	vakt-is [^{1}'vakːtɪs]	‘warden’
kondito'ri	>	kond-is [^{1}'kɔnːdɪs]	‘patisserie’
kondi'tion	>	kond-is [^{1}'kɔnːdɪs]	‘condition’
fri'syr	>	frill-e [^{2}'frɪlːɛ̯]	‘hairdo’
'av‚und‚sjuk	>	av-is [^{1}'ɑːvɪs]	‘envious’
fun'gera	>	funk-a [^{2}'fʊŋːka]	‘to function’
foku'sera	>	fok-a [^{2}'fuːka]	‘to focus’
bäng ‘stupid’	>	bäng-o [^{1}'bɛ̯ŋːʊ]	‘stupid one’
–	>	puck-o [^{1}'pʊkːʊ]	‘stupid one’

The input forms vary greatly in shape and stress pattern, but the output is strikingly homogeneous: two syllables, initial stress, two morphemes (a root + a suffix).[5] The suffixes are in part drawn from the pool of stem-forming suffixes (*-a* and *-e*), sometimes in their definite forms (*-an*, much less often *-en*), however without regard to the original gender difference as far as semantic gender of the stem is concerned (*Beng-an, Svemp-a* are names for males, even though *-a*(*n*) is the old weak feminine ending). The suffixes actually seem not to carry gender in themselves, when used in hypocoristics, and this is particularly clear with *-is*, an originally Latinate suffix that is specific to the hypocoristic domain. The two base forms for the hypocoristic *kond-is* have different gender (*kondition*, c.g., *konditori*, neut.) and those genders persist in the respective hypocoristic forms.[6]

(p.154) Unlike many characterizations of nickname formation in Germanic, the Swedish type is not just truncation. Looking at the global shape it is clear that long names become shorter (*Katarina* > *Kattis*) and short names become longer (*Bo* > *Bosse*). Also, disyllabic names may reshape into disyllabic nicknames (*Magnus* > *Mang-e*), providing insight into the fact that a nickname has not only a prosodic shape, but also a morphological structure, namely that of a stem. Nickname and hypocoristic formation is thus the creation of an optimal stem consisting of a root and a suffix. We would argue that there are prosodic shape conditions on all morphological categories here: root, suffix, and stem.

We take the canonical shape of unstressed affixes to be monosyllabic. Swedish unstressed suffixes are disyllabic, monosyllabic, or just consonantal, where the largest group is monosyllabic. It is from this group that the suffixes used in hypocoristics are drawn. For roots the canonical shape is more specifically a branching syllable rhyme, either at the syllable structure level or at the moraic level, ideally at both.

(158) Canonical morpheme shapes

Type of morpheme		*Prosodic shape*
Suffix	σ	CV, CVC, V, VC
Root	σ	CVC:, CV:, V:
	∧	i.e. branching
Stem	σ + σ	CVC:+CV, CV:+CV, etc.
	∧	

We find among the stressed syllables of nicknames both CV: and CVC: but according to a pattern. If the base form contains a long vowel in its *stressed* syllable and that syllable is used also in the nickname, then the long vowel is quite likely to persist (*Karo'l*[i:]*na* > '*L*[i:]*na, Marga'r*[e:]*ta* > '*M*[e:]*ta*). We take this to be a faithfulness effect. In these cases, however, the postvocalic consonant is always retained, too (*Margareta* > **Mea*).[7] If the stressed syllable contains a short vowel that occurs also in the nickname ('*M*[aŋ:]*nus* > '*M*[aŋ:]*e*) or if some *unstressed* syllable of the base form is made the root syllable of the nickname (*K*[a]*ta*'*rina* > '*K*[at:]*is*), a closed syllable (CVC:) is the regular result in the nickname. This holds also for monosyllabic names like *Jan* and *Bo* which come out as *Janne* and *Bosse*. This means that in situations where there is a choice, the branching rhyme structure at the syllabic level is preferred. The case **(p.155)** of *B*[u:] > *B*[ʊs:]*e* is particularly revealing in that a consonant is supplied and the vowel comes out short rather than the other way around (putative **B*[u:]*se*). That is an effect testifying to the optimal shape of roots as containing a branching rhyme.[8]

The basic result of nickname formation, then, is the morphological combination of two canonically shaped morphemes, one root and one suffix, into a (thereby) canonical stem which forms a prosodic word (as seen in syllabification and Culminativity).[9] Other properties are also canonical, such as the placement of stress in the syllable immediately preceding the suffix, which is posttonic, as well as the very disyllabicity of the resulting prosodic word.

It might be added here that the canonical shape of roots is met in the many monosyllabic roots of the language, but whether a given root syllable will in fact surface with a branching rhyme will in part depend on its morphological context (*sten* ‘stone’, *ste.n-ar* pl., *ste.n-ig* ‘rocky’, *sten+satt* ‘paved’; *ga.t-a* ‘street’, *gat+lyk.ta* ‘street lamp’).

As seen in (156) and (157) the stress need not always occur on the same syllable as in the base form. The most accessible syllables for use in the nickname/hypocoristic is the stressed syllable (*Karo*ˈ*lina* > ˈ*Lina*; ˈ*dagˌhem* > ˈ*dagis* ‘kindergarten’) and the initial syllable (*So*ˈ*fia* > ˈ*Soffan*; *soci*ˈ*aldemoˌkrat* > ˈ*sosse* ‘social democrat’), sometimes bits of both (*Marga*ˈ*reta* > ˈ*Meta*). These are known as positional faithfulness effects (Beckman 1997, 1998; Nelson 2003).

7.3 Segmental patterns

There are more indications of the unmarked phonology of nicknames at the segmental level which we will briefly touch on here (for a fuller account, see Riad 2002; see also Willson 2007 for related processes in Icelandic). Regarding segmentals, there is a certain difference between nicknames and the other hypocoristics, where nicknames exhibit relatively stronger conditions on unmarkedness. For instance, there may be no more than one place of articulation between the vowels in nicknames, whereas that requirement is looser with other hypocoristics.

(p.156) (159) One intervocalic place of articulation in nicknames

Lars /lɑrs/ [lɑːʂ]	Lasse /-e$_2$/ [^{2}ˈlasːɛ],		*Larre
	Larsa /-ɑ$_2$/ [^{2}ˈlɑːʂa], [^{2}ˈlaʂːa]		
Hans /hɑns/	Hasse /-e$_2$/ [^{2}ˈhasːɛ],		*Hanne
	Hansa /-ɑ$_2$/ [^{2}ˈhɑːnsa]		
Nils /nils/ [nɪlːs]	Nisse /-e$_2$/ [^{2}ˈnɪsːɛ]	*Nilse	*Nille
Margareta /mɑrgɑretɑ$_2$/ [marga^{2}ˈreːta]	Maggan /-ɑ$_2$-n/ [^{2}ˈmagːan]	*Margan	*Marran
Agneta /ɑgnetɑ$_2$/ [aŋ^{2}ˈneːta]	Agge /-e$_2$/ [^{2}ˈagːɛ]	*Agne	*Anne

Hjalmar /ɧalmɑr/ [^{1}ˈjalːmar]	Hjalle /-e$_2$/ [^{2}ˈjalːɛ̯]		*Hjamme
Albin /ɑlbin/ [^{1}ˈalːbɪn]	Abbe /-e$_2$/ [^{2}ˈabːɛ̯][10]	*Albe	*Alle
Henrik /henrik/ [^{1}ˈhɛ̯nːrɪk]	Henke /-e$_2$/ [^{2}ˈhɛ̯ŋːkɛ̯],	*Henre,	
	Hempa /-ɑ$_2$/ [^{2}ˈhɛ̯mːpa]	*Hemba	
Tomas /tumɑs/ [^{1}ˈtuːmas]	Tompa /-ɑ$_2$/ [^{2}ˈtɔmːp-a]	*Tomba	
Viktor /viktor/ [^{1}ˈvɪkːtɔr]	Vicke /-e$_2$/ [^{2}ˈvɪkːɛ̯]	*Vikte	*Vitte
Ulf /ɯlf/ [ɵlːf]	Uffe /-e$_2$/ [^{2}ˈɵfːɛ̯]	*Ulfe	*Ulle
Mats /mɑts/ [matːs]	Matte /-e$_2$/ [^{2}ˈmatːɛ̯]		

Whenever there is a cluster, the two consonants are homorganic. Furthermore, the second of these consonants must be voiceless (*Tompa, Ante* rather than **Tomba*, **Ande*), an effect that can be ascribed to the lesser markedness of the voiceless obstruents. A similar unmarkedness effect is seen in the more common treatment of medial clusters in the base name, where the least marked consonant is chosen, the other simply not being transferred to the nickname. In this case, the pattern is for the segment with relatively low sonority to remain (see second column of unattested nicknames). Obstruents can be seen as more canonical consonants than sonorants. If both consonants are of about the same sonority, then the first of them will be prioritized (*Vicke, Hjalle* rather than **Vitte*, **Hjamme*), although there are cases where either consonant can be picked out (*Mats*: *Matte, Masse*; *Gottfrid*: *Gotte, Goffe*, where, however, *Masse* and *Goffe* are less common).

For the other type of hypocoristics, the constraints are weaker, in view of forms like *vaktis* ‘warden’, *markan* ‘military canteen’ with heterorganic clusters, and *kondis* ‘patisserie; condition’, *bombis* (< '*bomb*,*säker*) ‘sure (as hell)’, with voiced second consonant. These hypocoristics have the same function as nicknames, i.e. to express familiarity or intimacy, however not necessarily with any fixed positive or negative values tied to them.

There are some other properties tied to nicknames and hypocoristics. Some of these are listed in (160).

(p.157) (160) Various properties of hypocoristics

a. partial truncation	ga'lonˌbyxor	ga[lonis]ar	‘trousers in vinyl-coated fabric’	
		Kris'tina	*Kris[titti], Titti	
b. segment substitutions				
	> r	Gustav	Gurra	
		syster	syrra	‘sister’
		fest	ferre	‘party’
	> r	visky	virre	‘whisky’
		fisk	firre	‘fish’
		flaska	flarra, [flɑːra]	‘bottle’
	> l	Per	Pelle	
		Fredrik	Frille	
		pris	prilla	‘pinch (of snuff)’
		franska	fralla	‘roll (of bread)’
		frisyr	frilla, frille	‘hair-do’
	> s	fot	fossing	‘foot’
		bjuda	bjussa	‘treat’
	> b	Klas	Klabbe	
	> p	Fredrik	Frippe	

		Johan	Joppe	
		Forsberg	Foppa	
c. segment additions				
	labial	Sven	Svempa	
		Henrik	Hempa	
	s	Bo	Bosse	
		ko	kossa	‘cow’
		far	farsa	‘dad’
		mor	morsa	‘mum’
		bror	brorsa	‘bro’
	l	grå ‘grey’	Grålle	‘grey horse’
	devoicing	brud	brutta	‘broad’

These patterns illustrate a certain preference for continuant liquids and /s/, and also a preference for the labial place of articulation.

7.3.1 Labial preference

Labials have a privileged status in nickname formation. We saw some forms in (160) and a few more types are given below. In nicknames formed with nasal clusters, a labial element can be added *ex nihilo*, while dorsals and coronals must have a source in the base.

(p.158) (161) Nasal clusters in nicknames

	Base	*Nickname*	*Add labial*	*
Coronal	Anders	Ante		
	Sven	Svenne	Svempa	*Sveŋke, *Svente
Dorsal	Henrik	Heŋke	Hempa	*Hente
	Bengt	Beŋke	Bempa	*Bente
Labial	Tomas	Tompa	Tompa	*Toŋke, *Tonta

The labial preference also shows up as onsets in rhyme-reduplicating formations, unlike other features.

(162) Rhyme-reduplicating nicknames

Anna	–	Anna-p̪anna
Jan	Janne	Janne-p̪anne
Olof	Olle	Olle-p̪olle
Alf	Affe	Affe-p̪affe

In this type, the whole stem is doubled, but a new labial onset inserted into the reduplicant.

7.3.2 Reduplication

Nicknames can also be formed by reduplication of the root syllable selected for the nickname. In these nicknames the intervocalic consonant is invariably long and the tone assigned is accent 2. The reduplicated unit is CV drawn from a stressed syllable or the beginning of the base name.

(163) Reduplication

Base	*Reduplication*
Sofie, Sofia	Fiffi [^{2}ˈfɪfːɪ]
Kristina	Kicki [^{2}ˈkɪkːɪ], Titti [^{2}ˈtɪtːɪ]
Lennart	Lelle [^{2}ˈlɛ̪lːɛ̪]
Bo	Bobbo [^{2}ˈbʊbːʊ]
Johanna	Jojjo [^{2}ˈjʊjːʊ]
Birgitta	Bibbi [^{2}ˈbɪbːɪ]
Louise	Lollo [^{2}ˈlʊlːʊ]

These nicknames would stem from children’s early speech. As the adults repeat them back the quantitative information is added, making the medial consonant phonologically long (Riad 2002). Alternatively, one could consider the consonant lengthening as the optimization of stem structure. With a medial long consonant, the root will have a branching rhyme in the syllable structure (CVC), as well as in the foot structure (μμ). This would be possible under the particular grammatical conditions that obtain for nickname formation, especially with regard to faithfulness. In other domains of grammar, there is no synchronic consonant lengthening.

Notes:

([1]) This is separate from the special notion of minimal prosodic word (Itô and Mester 2007) that we discussed in chapter 5.

([2]) Whether the foot is seen as a largely inert category or if it is removed entirely from the prosodic hierarchy, or indeed it is seen as a separate hierarchical structure involving feet and quantity, are issues that cannot be addressed here.

([3]) Regarding underlying segmental quantity specifications, see chapter 8.

([4]) An exception would be *station* 'id.' which is pronounced [sta'ʃuːn] without [t] in CSw.

([5]) Tone accent varies along with the suffix, where *-is* and *-o* are accent neutral leading to overall accent 1, as the root is monosyllabic, and *-e* $_2$(*n*) and *-a* $_2$(*n*) are accent 2-inducing (see chapter 11). Incidentally, if the widespread perception that accent 2 is the unmarked accent of disyllabic forms were true, then we would expect all nicknames to have accent 2, in view of the otherwise unmarked properties they exhibit at all levels. If we, on the other hand, maintain that accent 2 is marked on suffixes (the view defended here and elsewhere, e.g. Riad 2009a, b), then the variable pattern is expected to correlate with suffix. Indeed, it provides evidence for the fact that forms that *look* as if they are mere truncations (*Karro, Lina*, both from *Karolina*) are reanalysed as bimorphemic.

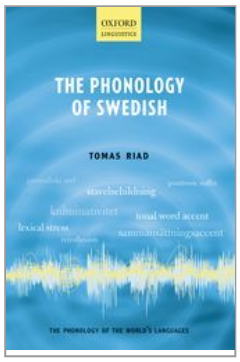
([6]) The phenomenon is known from other languages, cf. e.g. referents of *Sasha* and *Pasha* in Russian.

([7]) It would appear that the only regular nicknames that do not have an intervocalic consonant are the ones that also lack one in the corresponding place of the base form: *Ma'ria* > *'Mia, Doro'thea* > *'Thea*. The form *Eje* from *Einar* has an intervocalic glide, and such a glide may also be present in *Mia* ['miːja], and is sometimes seen in spellings like ‹Mija› and ‹Pija› (commonly ‹Pia›).

([8]) This would mean that the so-called expressive function of gemination (Eliasson 1980) boils down to unmarkedness.

([9]) German so-called *i*-Bildungen and Bernese Swiss German *u*-formations would seem to share this property (Wiese 2001; Grüter 2003).

([10]) This is again an argument for suffix specification of accent 2, as the base has accent 1.



The Phonology of Swedish
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Print publication date: 2013
Print ISBN-13: 9780199543571
Published to Oxford Scholarship Online: January 2014
DOI: 10.1093/acprof:oso/9780199543571.001.0001

Segmental quantity and prosodic weight

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DOI:10.1093/acprof:oso/9780199543571.003.0008

Abstract and Keywords

Swedish has mandatory stress to weight, i.e. a requirement on stressed syllables to be heavy. This is a difference with respect to English. This prosodic constraint is met by segmentals in two basic ways, by placing two moras on a vowel, or by placing one on the vowel and onte on the following consonant. Some consonants are underlyingly specified for a mora, while vowel length is predictable. The chapter reviews the discussion and arguments for underlying vowel length as well as for underlying consonant length. The phonological behaviour of vowels under different conditions, such as consonant suffixation is also covered.

Keywords: stress-to-weight, consonant length, vowel length, mora, vowel lengthening

8.1 Stress-to-Weight and complementary quantity

The quantity system of Swedish is dependent on stress. There are quantitative distinctions in both vowels and consonants in stressed syllables, but not in unstressed syllables. A stressed syllable is always heavy. We express this as a bimoraic requirement (μμ), known variably as Prokosch's law (Vennemann 1988; Riad 1992) and Stress-to-Weight (Prince and Smolensky 1993). This measure is exact and precludes light (μ) as well as superheavy (μμμ) weight in stressed syllables. In the descriptive system used here, unstressed syllables are light, whether they are closed or not. Long vowels are banned from unstressed syllables. The quantitative distinction between heavy and light *syllables* is thus closely tied to the distribution of stress.

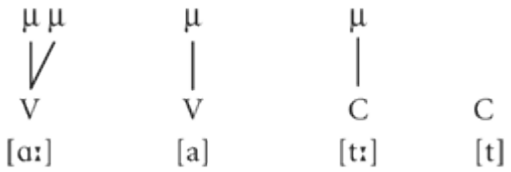
The heavy, bimoraic weight of a stressed syllable can be supplied segmentally in one of two ways; either the vowel is long, or the vowel is short and the postvocalic consonant is long. This is known as complementary quantity/length or quantitative complementarity.[1] At the *segmental* level, then, there is a quantitative distinction between V and Vː, as well as between C and Cː.[2]

(164) Quantitative segmental distinction **(p.160)**

Disyllables							
läka	/lɛk-α_2/	[^{2}ˈlɛːka]	‘to heal’	läcka	/lɛk$^{\mu}$-α_2/	[^{2}ˈlɛ̯kːa]	‘to leak’
såpa	/sop-α_2/	[^{2}ˈsoːpa]	‘soft soap’	soppa	/sop$^{\mu}$-α_2/	[^{2}ˈsɔpːa]	‘soup’
puta	/pʉt-α_2/	[^{2}ˈpʉ̞ːta]	‘to pout; bulge’	putta	/pʉt$^{\mu}$-α_2/	[^{2}ˈpɵtːa]	‘to putt; push’
tiga	/tig-α_2/	[^{2}ˈtiːga]	‘to keep silent’	tigga	/tig$^{\mu}$-α_2/	[^{2}ˈtɪgːa]	‘to beg’
Monosyllables							
ful	/fʉl/	[fʉ̞ːl]	‘ugly’	full	/fʉl$^{\mu}$/	[fɵlː]	‘id.’
vin	/vin/	[viːn]	‘wine’	vinn	/vin$^{\mu}$/	[vɪnː]	‘win’
lob	/lub/	[luːb]	‘lobe’	lobb	/lob$^{\mu}$/	[lɔbː]	‘lob’
lam	/lɑm/	[lɑːm]	‘lame’	lamm	/lɑm$^{\mu}$/	[lamː]	‘lamb’

Segmental quantity can be straightforwardly represented with moras as given in (165), see Riad (1992).

(165) Moraic representation of the segmental quantitative distinctions



The asymmetric representation for vowels and consonants is a function of the fact that vowels, but not consonants, necessarily form syllable nuclei, and the fact that syllable nuclei are obligatorily vowels. The palatal glide [j] is phonologically a consonant in Swedish. It may carry quantity (*skoj* /skoj̬$^{\mu}$/ [skɔjː] 'fun') and has a fricative alternant [j̬] that we also use as a symbol for the phoneme /j̬/.

Complementary quantity entails some predictability. It evokes the question of whether vowel length or consonant length could be predicted on the basis of the length of the other, and this issue has been much discussed. We shall assume that it is consonant quantity that is distinctive, over and above vowel quantity, and will henceforth mark long consonants as C$^{\mu}$ in phonemic representations, e.g. *kopp* /kop$^{\mu}$/ [kɔpː] 'cup'. We return to the arguments for underlying consonant quantity in section 8.4.2.

8.2 The phonetic basis of segmental quantity

The phonetic correlates of quantity have been thoroughly studied by Elert (1964), who is the main source for this section. Another important study concerned with the durational variation across the Swedish-speaking regions is Schaeffler (2005). The segmental quantity of vowels is phonetically expressed as duration, which is correlated with differences in vowel quality. High vowels tend to be shorter than low vowels, but there is no quantitative correlate relating to the front-back or rounded-unrounded dimensions. The environmental influence on vowel quantity is strong for following consonants, and virtually non-existent for preceding consonants. Following voiced and fricative consonants have a lengthening effect on vowels. On average, retroflex and dental consonants are preceded by longer vowels than are labials and palatal-velars. The syllabic count of words also **(p.161)** matters, where vowels are longer in monosyllabic than in disyllabic forms. Moreover, accent 2 yields a longer stressed vowel than does accent 1, in CSw.

The duration of a short allophone relative to the long allophone of the same vowel phoneme is 65 per cent on average. This is a smaller difference than is found in the other Germanic languages, where only a vowel quantity distinction is in evidence, phonetically.[3] The difference appears to be due to the relative complexity of the quantity system under a strong Stress-to-Weight requirement. This observation is supported in Schaeffler (2005: 120), in the context of the quantitative systems *within* Swedish varieties; the more complex the system (in terms of number of quantitative contrasts), the smaller the durational differences between long and short segment, whether vowel or consonant.

The durational difference between long and short consonants is smaller than that between long and short vowels, around 75–80 per cent for short consonant allophones relative to corresponding long consonant allophones. Comparison can be made here with languages where consonant length is not correlated with vowel length, e.g. Finnish and Hungarian, where long consonants can easily have more than twice the length of short consonants. The presence of quantitative complementarity thus has a checking effect on both vowels and consonants.

The intrinsic length of consonants is most reliably in evidence when the preceding vowel is /i/ or /ɑ/ (Elert 1964: 144). Furthermore, voicing and place and manner of articulation all influence consonant length in CSw. As is common elsewhere, voiced consonants are shorter than corresponding voiceless ones. For voiceless consonants, the dental place of articulation entails relatively longer consonants than labial place of articulation (the comparison made between /t/, /s/ and /p/, /f/). The voiceless velar /k/ is the longest of all. The pattern is reversed for some of the voiced consonants, where [b] is significantly longer than [d], and [bː] is significantly longer than [gː]. Regarding manner of articulation, the comparisons reported concern voiceless stops and voiceless fricatives, the latter being shorter than the former, on average.

The length of a preceding vowel may influence consonant quantity, where long vowels appear to have a more marked effect than short vowels. High and mid long vowels correspond with relatively longer duration in the following **(p.162)** consonant than do the low vowels, but the effect varies according to intrinsic duration of vowels and in combination with different consonants (for a fuller picture, see Elert 1964: ch. 6, and Schaeffler 2005: 12ff.). The influence of word length is similar for consonants as it is for vowels; monosyllables contain longer postvocalic consonants than do polysyllables. The presence of accent 2 has a tendency to yield longer postvocalic consonants than accent 1. Elert (1964: 156f.) connects this fact with the later intensity maximum found in accent 2 compared with accent 1. This is however likely to vary between dialects, in view of the fact that some dialects have a second peak in accent 2 (e.g. Central and West Swedish), whereas other dialects simply have a later timing of the single peak that occurs in both accents (e.g. South and Dala Swedish).

When the various properties of vowels and consonants are combined and measured as syllable quantity, be it V:C or VC:, the main finding is that stressed syllables tend to be very similar in overall duration. This is largely due to the influences that the intrinsic properties of vowel and consonants have on one another. The properties of long vowels here have a slightly greater influence on overall duration than do consonants, yielding somewhat longer V:C syllables than VC:, on average, especially for syllables containing vowels with great intrinsic length, such as /ɑ/.

In order to estimate the stability in the phonetic signal of an underlying, relevant quantity distinction in both vowels and consonants, Elert measured the 'ratio of ratios', i.e. a division of V:C with VC:. For the two-way distinction to be present and perceptible, the values must be above 1. For the 650 word pairs measured, the average value was 2.1 (SD .78), and only about three per cent of the database fell below 1. The argument is that there is grounds for assuming a stable quantity distinction, given that the listener reacts to *relative* quantity values between vowel and consonant, compensating for the influences of segmental environment, segment quality, and general experience of the speaker's speech habits and speech rate.

8.3 Outlook to varieties of Swedish

The quantity system of Central Swedish (and Germanic languages in general) derives from a fully segmentally controlled system where any combination of long and short vowels and consonants was permitted (Hesselman 1901, 1902; Prokosch 1939; Riad 1992, 1995). Some of the progression can be traced in contemporary North Germanic dialectology. Schaeffler (2005) studied the quantity system of all the Swedish varieties included in the SweDia 2000 database (Bruce, Engstrand, and Eriksson 1998) and found three clear phonetic/durational clusterings: Finland-Swedish, Northern, and Southern (map in Schaeffler 2005: 75). The cluster study was made on the basis of one monosyllabic word pair only **(p.163)** (*tak* 'roof' and *tack* 'thank you').[4] The durational contrasts found lead us to identify three quantitative systems, as given in (166).

(166) Quantitative types of Swedish

Syllable weight	Finland-Swedish cluster	Northern cluster	Southern cluster
superheavy	V:C:	--	--
heavy	V:C	V:C	V:C
heavy	VC:	VC:	VC:
light	VC	VC	--

Syllable weight	Finland-Swedish cluster	Northern cluster	Southern cluster
# distinctions	4-way	3-way	2-way

(p.164)

As shown in Fig. 8.1, the Finland-Swedish cluster exclusively contains varieties spoken in mainland Finland. The Northern cluster covers the north of Sweden down to an east-west boundary from northern Dalarna across to Hälsingland, Gästrikland, and Northern Uppland. All varieties to the south of that border belong to the Southern cluster.

Thereby, Central Swedish falls squarely within the Southern cluster as far as quantity is concerned. One characteristic of the Southern cluster is the relatively small durational difference between C: and C, especially in the geographic south.[5] But the distinction is still there, even in Skåne, whereas in Danish spoken across the Öresund sound, it is not.

8.4 The phonological status of the quantitative distinction

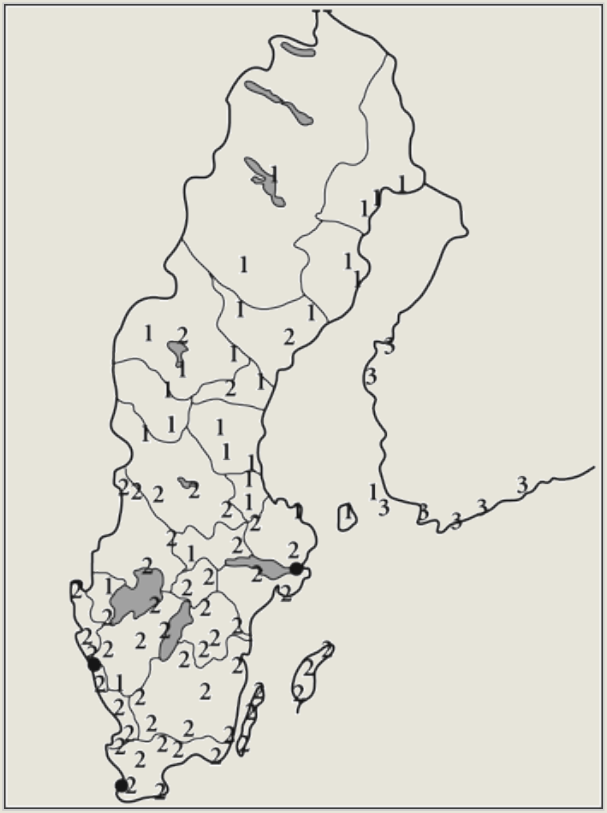


Fig. 8.1. Geographical distribution of the three quantitative types according to cluster analysis obtained with the Ward method. ‘1’ = Northern cluster, ‘2’ = Southern cluster, ‘3’ = Finland-Swedish cluster.

From Schaeffler (2005: 75)

Economy considerations would dictate that if we can predict part of the quantity of segments and syllables on the basis of other available information, we should do so. Thus, the presence in the main standard varieties of Swedish, Norwegian, and Icelandic (and many other varieties) of a mandatory condition on stressed syllables to be heavy (Stress-to-Weight) should also be synchronically responsible for inducing weight in some stressed syllables. The question then becomes which segment type, vowels or consonants, it is that should lengthen synchronically under stress. The issue has been debated for a long time.

8.4.1 Distinctive vowel quantity

Defenders of distinctive vowel quantity have usually based their argument on the fact that the durational difference between long and short vowels is larger and therefore easier to perceive (Linell 1978, 1979: 59f.; Schaeffler 2005). This is a concreteness argument, which, despite its immediate appeal, isolates the quantity distinction from the context in which it occurs, as pointed out by Árnason (1978). Complementary quantity is always there, and so the ratio of vowel to consonant could be what is relevant for perception (Eliasson 1985: 107).

Linell also cites hypocoristic formation (including nicknames) as evidence for an underlying vowel length distinction. When an unstressed syllable of the input form appears as the stressed syllable in the corresponding nickname, the postvocalic consonant gets lengthened.

(p.165) (167) Hypocoristics: unstressed syllables as base

Aka^{1}'demiska (sjukhuset)	^{1}'A[kː]is	‘(Uppsala) University hospital’
baga^{1}'tell	^{1}'ba[gː]is	‘trifle’
biblio^{1}'teket	^{2}'bi[bː]lan	‘the library’
soci^{2}'aldemo,krat	^{2}'so[sː]e	‘social democrat’
depri^{1}'merad	^{2}'de[pː]ig	‘depressed’
Kata^{2}'rina	^{1}'Ka[tː]is	name

The argument is that if vowel quantity were not underlying, we would have expected vowel lengthening, as in the paradigmatic alternations of *dr*['ɑː]*ma~dram*['ɑː]*tisk* (a case that Linell does not discuss). However, as Raffelsiefen (2002: 50ff.) points out, there are many hypocoristic formations where a syllable containing a long vowel in the base form shows up with a short vowel in the corresponding hypocoristic. This should be unexpected under distinctive vowel quantity.

(168) Hypocoristics: stressed syllables as base

bror	[bruːr]	[^{2}'brʊʂːa]	‘brother’
ko	[kuː]	[^{2}'kʊsːa]	‘cow’
bjuda	[^{2}'bjʉ̟ːda]	[^{2}'bjøsːa]	‘to invite’
smakfull	[^{2}'smɑːkfʊlː]	[^{2}'smarːɪg]	‘tasty’
Robert	[^{1}'Roːbɛʈ]	[^{2}'Rɔbːan]	name

These cases show that the hypocoristic form does not necessarily exhibit faithfulness to the segmental quantity of the base. As is now better known, nickname formation is unfaithful to base phonology in several respects and generally favours unmarked structure (see 7.2). In this case, it would seem that there is an independent constraint on hypocoristic forms that favours a long intervocalic consonant over and above a short one. This was suggested to be due to the unmarkedness of a branching syllable structure in roots, which would emerge in hypocoristic formation.

8.4.2 The argument for distinctive consonant quantity

Eliasson (1978) argues against distinctive vowel quantity, and first mentions the basic observation that there are no minimal pairs based on vowel quantity alone in the Swedish lexicon. This is not a strong argument since it can be called with equal force against distinctive consonant length. The fact is that neither vowel nor consonant quantity could be separated from stress and complementary quantity.

The next argument is that we get a simpler and more consistent grammar with fewer ad hoc assumptions if we assume distinctive consonant quantity. This argument is defended in Teleman (1969), Eliasson (1978, 1985), Eliasson and LaPelle (1973), Riad (1992), Löfstedt (1992), among others, and it is what we **(p.166)** will adopt in this account. The argument has several parts. We will focus on the structural generalizations and leave the question of psychological relevance aside.

8.4.3 Long consonants are moraic[6]

Long consonants have three sources. They may be underlying, result from the assimilation of dental stops, or be underlyingly short but receive weight by position as the first consonant of a postvocalic cluster. These sources are exemplified in (169).

(169) Long consonants from three sources

Underlying:	vinna /vin$^{\mu}$-ɑ$_{2}$/	[^{2}'vɪnːa] ‘to win’
	räcka /rɛk$^{\mu}$-ɑ$_{2}$/	[^{2}'rɛ̟kːa] ‘to suffice’

	katt /kɑtᵘ/ [kat:] ‘cat’
	kam /kɑmᵘ/ [kam:] ‘comb’
Assimilated:	bytte /byt-de$_2$/ [^{2}'bʏt:ɛ̯] ‘changed’ (vb byta [^{2}'by:ta] ‘to change’)
	mätte /mɛt-de$_2$/ [^{2}'mɛ̯t:ɛ̯] ‘measured’ (vb mäta [^{2}'mɛ:ta] ‘to measure’)
	vitt /vit-t/ [vɪt:] ‘white, neut.’ (c.g. vit [vi:t] ‘white’)
	vitt /vid-t/ [vɪt:] ‘wide, neut.’ (c.g. vid [vi:d] ‘wide’)
	lödd /lød-d/ [lø ǀ d:] ‘soldered, p.ptcp.’ (vb löda [^{2}'lø:da] ‘to solder’)
	lött /lød-t/ [lø ǀ t:] ‘to solder, perf.’
Weight by pos.:	linda /lind-ɑ$_2$/ [^{2}'lɪn:da] ‘to wind’
	kasta /kɑst-ɑ$_2$/ [^{2}'kas:ta] ‘to throw’
	hets /hets/ [hɛ̯t:s] ‘frenzy; baiting’
	mjölk /mj̯ølk/ [mjø ǀ l:k] ‘milk’

A long consonant from either source in (169) is indistinguishable from the corresponding long sound in the others. Thus, there is no phonetic trace of a geminate composition. Also, they have the same distribution, namely the position directly after a short stressed vowel. Eliasson (2010) takes the symmetry of the first two contexts as reason to treat them as geminates, i.e. as clusters of identical consonants, and as such they correspond to clusters of different consonants in the same position (see also Round 2007 for a similar stance).[7]

(p.167) Here, instead, we will generalize across the three contexts via the notion of mora. A long consonant is a consonant that carries a mora (see (165)), and this is phonetically realized as length in CSw. Consonants that contribute weight by position are somewhat shorter than the other two cases, and they are variably marked in pronunciation dictionaries and other transcriptions: SSU marks full length (*limpa* ['lĭm:pa] ‘loaf of bread’), while NSU does not mark it at all ([`lɪmpa], ‘`’ is used to mark accent 2). One can also sometimes see the mark for half-long segment being used (['lɪm·pa]). Half-length on the consonant is only an approximation of a phonetic fact. The phonological status of being moraic is just the same as in the phonetically longer cases.[8]

Relating to this, a long consonant is often taken to be shared between two syllables (McCarthy and Prince 1986; Hayes 1986), thus both contributing quantity to the stressed syllable and forming onset to the following syllable. This is in line with the intuitions of speakers of Swedish regarding the placement of the syllable boundary, i.e. down the middle (Gårding 1967: 25). This holds equally for underlying and assimilated long consonants. In the third case, syllabification yields weight by position, whereas the second consonant of the cluster forms the onset of the following syllable. In cases where the sonority profile is rising in the cluster, weight by position is suspended and the vowel is lengthened. In this type of cluster, too, the first consonant may be underlyingly long and thus give rise to contrast, as illustrated in (170).

(170) Contrasting medial clusters

stapla /stɑpl-α_2/ [^{2}ˈstɑːpla] ‘to heap’	stappla /stɑpᵘl-α_2/ [^{2}ˈstapːla] ‘to stagger’
vakna /vɑkn-α_2/ [^{2}ˈvɑːkna] ‘to awake’	teckna /tɛkᵘn-α_2/ [^{2}ˈtɛ̟kːna] ‘to draw’
Sinatra /sinɑtr-α_2/ [sɪ^{2}ˈnɑːtra] ‘id.’	snattra /snɑtᵘr-α_2/ [^{2}ˈsnatːra] ‘to quack; to gabble’
dräglig /drɛgl-ig$_2$/ [^{2}ˈdrɛːglɪg] ‘tolerable’	dregla, drägla /drɛgᵘl-α_2/ [^{2}ˈdrɛ̟gːla] ‘to drool’
mygla /mygl-α_2/ [^{2}ˈmyːgla] ‘to wangle’	uggla /ʉgᵘl-α_2/ [^{2}ˈөgːla] ‘owl’
fodra /fudr-α_2/ [^{2}ˈfuːdra] ‘to feed’	fladdra /flɑdᵘr-α_2/ [^{2}ˈfladːra] ‘to flutter’
mäkla /mɛkl-α_2/ [^{2}ˈmɛːkla] ‘to mediate’	vackla /vɑkᵘl-α_2/ [^{2}ˈvakːla] ‘to stagger’
åsna /osn-α_2/ [^{2}ˈoːsna] ‘donkey’	lyssna /lysᵘn-α_2/ [^{2}ˈlʏsːna] ‘to listen’
jubla /j̟ʉbl-α_2/ [^{2}ˈj̟ʉ̟ːbla] ‘to rejoice’	bubbla /bʉbᵘl-α_2/ [^{2}ˈbөbːla] ‘to bubble’
tävla /tɛvl-α_2/ [^{2}ˈtɛːvla] ‘to compete’	stövlar /støvᵘl-ɑr$_2$/ [^{2}ˈstø ǀ vːlar] ‘boots’
levra /levr-α_2/ [^{2}ˈleːvra] ‘to coagulate’	

(p.168)

The simplest way to interpret the data given in this section is to assume a moraic representation, where long consonants are associated to a mora, whatever the (word-internal) source for that mora. It is also a highly concrete description as moras invariably correspond to phonetic length. In the phonological analysis, we take some consonants to be underlyingly moraic, hence place distinctive quantity with consonants rather than vowels, and derive vowel length in the phonology as lengthening under stress.

8.4.4 The behaviour of vowels

The argument for distinctive consonant quantity entails the expectation that vowel length should be structurally predictable. Vowel lengthening takes place in several cases, always under stress, and we may refer to this process as open syllable lengthening. The first case is open word-final syllables.

(171) Open syllable lengthening in final syllables

dementi	/dɛmɛnti/	[dɛ̟mɛ̟n'tiː]	‘denial; disclaimer’
sky	/ʂy/	['ʃyː]	‘cloud; sky’
tre	/tre/	['treː]	‘three’
miljö	/miljø/	[mɪl'jøː]	‘environment’
disträ	/distrɛ/	[dɪs'trɛː]	‘absent-minded’
spa	/spɑ/	['spɑː]	‘id.’
skrå	/skro/	['skroː]	‘guild’
tro	/tru/	['truː]	‘belief’
tabu	/tɑbʉ/	[ta'bʉ̟ː]	‘taboo’

Lengthening also takes place before a morpheme-final single consonant. This is final consonant extrametricality (extraprosodicity), well known from other Germanic languages (see e.g. Kager 1989; Kristoffersen 2000).

(p.169) (172) Syllables with a final extrametrical consonant

kamin	/kɑmin/	[ka'miːn]	‘stove’
syl	/syl/	['syːl]	‘awl; pricker’
spel	/spel/	['speːl]	‘game’
besök	/be-søk/	[bɛ̟'søːk]	‘visit’
träl	/trɛl/	['trɛːl]	‘thrall’

spak	/spɑk/	['spɑːk]	‘lever’
pråm	/prom/	['proːm]	‘barge’
klok	/kluk/	['kluːk]	‘wise’
figur	/figʉr/	[fɪ'gʉ̟ːr]	‘figure’

In the final position, a consonant without a mora does not form weight by position, but ‘is reserved’ as it were to form onset to a following syllable, should an inflection be added (see Giegerich 1985 for an elaboration of what this could mean phonologically).

A special case of final extrametricality is occasioned by the retroflexion rule (see 4.1). The best analysis is to assume a biphonemic underlying representation, which sometimes coalesces, sometimes not, under a regular, if complex, patterning (see 4.1 and Riad 2010). In monomorphemic forms like *hård* ‘hard’, *barn* ‘child’, *kart* ‘unripe fruit’, and *sorl* ‘murmur’, the coalescence entails that the consonant cluster merges into a single short consonant. The vowel then lengthens: [hoːɖ], [bɑːɳ], [kɑːʈ], and [soːɭ]. Thus, they fall under the generalization of final extrametricality.

Vowel lengthening can also be seen to take place in non-final syllables, in the description given here.

(173) Vowel lengthening in non-final syllables 1

krita	/krit-α_2/	[^{2}'kriːta]	‘chalk’
fyra	/fyr-α_2/	[^{2}'fyːra]	‘four’
meta	/met-α_2/	[^{2}'meːta]	‘to angle’
krönika	/krønik-α_2/	[^{1}'krøːnɪka]	‘chronicle’
kräsen	/krɛs-en$_2$/	[^{2}'krɛːsɛ̟n]	‘fastidious’
Tirana	/tirɑn-α_2/	[tɪ^2'rɑːna]	capital of Albania
målare	/mol-ɑre$_2$/	[^{2}'moːlarɛ̟]	‘painter’
tobak	/tubɑk/	[^{1}'tuːbak]	‘tobacco’
luden	/lʉd-en$_2$/	[^{2}'lʉ̟ːdɛ̟n]	‘hairy’

The most striking case of open syllable lengthening is when stress occurs on different syllables within the same paradigm, and vowel length moves around accordingly.

(p.170) (174) Vowel lengthening in non-final syllables 2[9]

pol['iː]tiker ‘politician’	pol[ɪ]tis['eː]ra ‘to politicize’
f['yː]siker ‘physicist’	f[ʏ]sik['ɑː]lisk ‘physical’
prof['eː]t ‘prophet’	prof[ɛ]t['eː]ra ‘to prophesy’
milj['øː] ‘environment’	milj[ø]d['iː] ‘environmental melody’ (joc.)
karakt['æː]r ‘character’	karakt[ɕ]rist['iː]k ‘characterization’
	karakt[ɕ]ris['eː]ra ‘to characterize’
dr['ɑː]ma ‘drama’	dr[a]m['ɑː]tisk ‘dramatic’
	dr[a]m[a]t['iː]k ‘drama’
elektr['oː]n ‘electron’	elektr[ɔ]n['iː]k ‘electronics’
positi['uː]n ‘position’	positi[ʊ]n['eː]ra ‘to position’
	positi[ʊ]nalit['eː]t ‘positionality’
komm['ʉ̥ː]n ‘municipality’	komm[ʉ̥]n['ɑː]l ‘municipal’
	komm[ʉ̥]n[a]lis['eː]ra ‘to bring under the auspices of the municipality’

Syllabification controls the lengthening pattern, such that the normal case is for vowels to lengthen in open syllables (and also in final syllables closed by an extrametrical consonant). Long consonants show up where weight by position applies. To see this, the crucial cases to look at are intervocalic clusters with different sonority profiles (175) and stem alternations (176).

(175) Intervocalic clusters and lengthening

V.CCVVC.CV

a.

tävla [^{2}'tɛː.vla] ‘to compete’	tända [^{2}'tɕnː.da] ‘to light’
vägra [^{2}'vɛː.gra] ‘to refuse’	välta [^{2}'vɕlː.ta] ‘to overturn’
sebra/zebra [^{2}'seː.bra] ‘id.’	sektor [^{2}'sɕkː.tɔr] ‘sector’

b.

tavel-, tavla [^{2}'tɑː.vla] ‘painting’	tanka [^{2}'taŋː.ka] ‘to fill up’
sägen, sägner [^{1}'sɛː.gnɕr] ‘legend /pl.’	släntra [^{2}'slɕnː.tr̥a] ‘to saunter’

segel, segla [^{2}ˈseː.gla] ‘sail; to sail’	hantel, hantlar [^{2}ˈhanː.tl̪ar] ‘dumbbell /pl.’
google, googla [^{2}ˈguː.gla] ‘to google’	gurka [^{2}ˈgʊrː.ka] ‘cucumber’

When the sonority profile of the intervocalic cluster admits tautosyllabification, vowel lengthening may take place (as long as there is no lexical marking of consonant length, see (170)). In (175), the left-hand examples include unchanging roots (175a) and roots that have an unstable vowel in some forms (175b). In the right-hand examples the postvocalic consonant gets weight by position.

(p.171) There is a marginal pattern of stem alternation where stress is in the same syllable, but the shape of the stem varies between the vowel lengthening context and the weight by position context (examples from Eliasson 1985: 109).

(176) Stem alternation

diagnos /diɑgnos/ [dɪagˈnoːs] ‘diagnosis’	[dɪagˈnɔsːtɪsk] ‘diagnostic’
perifras /perifrɑs/ [pɐ̟rɪˈfrɑːs] ‘periphrasis’	[pɐ̟rɪˈfrasːtɪsk] ‘periphrastic’

There are a few monomorphemic forms with a lengthened vowel before the coronal consonant clusters [ln] and [st] (Eliasson 1972: 183): *aln* /ɑln/ [ɑːln] ‘ell’; *kölna* /ɕøln-ɑ$_2$/ [^{2}ˈɕøːlna] ‘kiln’; *moln* /moln/ [moːln] (or possibly [mɔlːn], but this pronunciation sounds South Swedish) ‘cloud’; *test* /test/ [teːst] or [tɕ̟sːt] ‘wisp (of hair)’.

A strong argument against underlying vowel quantity relates to the problems with determining which quantity a given vowel has. Eliasson (1985) mentions the difficulties and the many rules needed to derive patterns like those given in (174), e.g. *komm*[ˈʉ̟ː]*n* ‘municipality’, *komm*[ʉ̟]*n*[ˈɑː]*l* ‘municipal’, *komm*[ʉ̟]*n*[a]*lis*[ˈeː]*ra* ‘to bring under the auspices of the municipality’, where for each alternating vowel one must decide which underlying quantity it has, without there being any reliable fact to base such a decision on. For instance, the second unstressed syllable of *balsam* [ˈbalːsam] ‘balm’ shows up as long in the derivation *balsamisk* [balˈsɑːmɪsk] ‘balsamic’. It would not make sense to set this vowel up as underlyingly long, since that information is not available in the base form (/bɑlᵘsɑm/). Thus, for cases like this, one would want to set up a vowel lengthening rule anyway, and that rather weakens the case for underlying vowel length (given that one manages to bring all the other cases of long vowels under the rule).

The synchronic addition of morphemes will in general not have an effect on vowel length, except in three cases. First, endings with dental stops that attach to words ending in *-d* or *-t* assimilate (see (169)). Some of these are listed in (177b) together with some examples of the otherwise regular behaviour in (177a).

(177) Adding morphemes

a.

ful /fʉl/ [fʉ̟ːl]	/fʉl-t/ [fʉ̟ːlt]	‘ugly /neut.’
klok /kluk/ [kluːk]	/kluk-t/ [kluːkt]	‘wise /neut.’
banal /bɑn-ɑl/ [baˈnɑːl]	/bɑn-ɑl-t/ [baˈnɑːlt]	‘banal /neut.’
korkad /kork-ɑd$_2$/ [^{2}ˈkɔrːkad]	/kork-ɑd$_2$-t/ [^{2}ˈkɔrːkat]	‘stupid /neut.’
stel /stel/ [steːl]	/stel-nɑ$_2$/ [^{2}ˈsteːlna]	‘stiff; stiffen’
van /vɑn/ [vɑːn]	/vɑn-lig$_2$/ [^{2}ˈvɑːnlɪg]	‘used to; common’[10]

(p.172)

b.

vit /vit/ [vɪːt]	/vit-t/ [vɪtː]	‘white /neut.’
glad /glɑd/ [glɑːd]	/glɑd-t/ [glatː]	‘happy /neut.’
vid /vid/ [viːd]	/vid-d/ [vɪdː]	‘wide /width’

The other case of vowel quantity alternations relates to a set of derivational suffixes which correlate with a vowel length variation in the root. For the most part, these can be said to be historically derived and no longer in a synchronic, phonological relationship. Raffelsiefen (2007: 253ff.) discusses these in terms of prosodic word structure, where a short (unlengthened) vowel indicates that the derivational suffix is included in the prosodic word. Some examples of derivations are given in (178).

(178) Derivational suffixes and vowel length variation

-ma, n.	fet /fet/ [feːt]	fetma /fet-mɑ$_2$/ [^{2}ˈfe̯tːma] ‘fat; fatness’
	söt /søt/ [søːt]	sötma /søt-mɑ$_2$/ [^{2}ˈsø ǀ tːma] ‘sweet; sweetness’

-ga, vb	vid /vid/ [viːd]	vidga /vid-gɑ$_2$/ [^{2}'vɪdːga] ‘wide; to widen’
	glöd /glød/ [gløːd]	glödga /glød-gɑ$_2$/ [^{2}'gløˌ	dːga] ‘embers; to make red-hot’
	stad /stɑd/ [stɑːd]	stadga /stɑd-gɑ$_2$/ [^{2}'stadːga] ‘stead; to steady’
-ja, n.	fara /fɑrɑ/ ['fɑːra]	färja /fɛr-ʝɑ$_2$/ [^{2}'færːja] ‘to go; ferry’
-ja, vb	val /vɑl/ [vɑːl]	välja /vɛl-ʝɑ$_2$/ [^{2}'vɛ̟lːja] ‘choice; to choose’
	tam /tɑm/ [tɑːm]	tämja /tɛm-ʝɑ$_2$/ [^{2}'tɛ̟mːja] ‘tame; to tame’
-sa, n.	kök /ɕøk/ [ɕøːk]	köksa /ɕøk-sɑ$_2$/ [^{2}'ɕøˌ	kːsa] ‘kitchen; kitchen maid’
	hel /hel/ [heːl]	hälsa /hɛl-sɑ$_2$/ [^{2}'hɛ̟lːsa] ‘whole; health’
-ska, n.	grön /grøn/ [grøːn]	grönska /grøn-skɑ$_2$/ [^{2}'grøˌ	nːska] ‘green; verdure’
	våt /vot/ [voːt]	vätska /vɛ̟t-skɑ$_2$/ [^{2}'vɛ̟tːska] ‘wet; liquid’
-ka, vb	hal /hɑl/ [hɑːl]	halka /hɑl-kɑ$_2$/ [^{2}'halːka] ‘slippery; to slip’
	sval /svɑl/ [svɑːl]	svalka /svɑl-kɑ$_2$/ [^{2}'svalːka] ‘cool; to cool’
-ka, n.	hal /hɑl/ [hɑːl]	halka /hɑl-kɑ$_2$/ [^{2}'halːka] ‘slippery; slipperiness’
	dyr /dyr/ [dyːr]	dyrka /dyr-kɑ$_2$/ [^{2}'dʏrːka] ‘dear; to adore’
-kan, n.	dyr /dyr/ [dyːr]	dyrkan /dyr-kɑn$_2$/ [^{2}'dʏrːkan] ‘dear; adoration’
-s•l, n.	höra /hør-ɑ$_2$/ [^{2}'hœːra]	hörsel /hør-s•l/ [^{1}'hœʂːɛ̟l] ‘to hear; hearing’
	yr /yr/ [yːr]	yrsel /yr-s•l/ [^{1}'ʏʂːɛ̟l] ‘dizzy; dizziness’
	göda /ʝød-ɑ$_2$/ [^{2}'jøːda]	gödsel /ʝød-s•l/ [^{1}'jø̟sːɛ̟l] ‘to fertilize; manure’
	bita /bit-ɑ$_2$/ [^{2}'biːta]	betsel /bet-s•l/ [^{1}'bɛ̟tːsɛ̟l] ‘to bite; bridle’[11]

(p.173)

The vowel length alternations are due to the suffix (one way or the other) and the way it attaches to the root as seen from other derivations with the same roots: *fetna* /fet-nɑ$_2$/ [^{2}ˈfeːtna] ‘to become fat’, *svalna* /svɑl-nɑ$_2$/ [^{2}ˈsvɑːlna] ‘to become cool’, *gödning* /ɟød-niŋ$_2$/ [^{2}ˈjøːdnɪŋ] ‘fattening, fertilization’, etc. For an analysis in terms of prosodic domains, see Raffelsiefen (2007).

We have a different definition of the prosodic word (see chapter 5), and would not want to derive the quantitative difference between *f*[ɛ̟tː]*ma* and *f*[eːt]*na* from prosodic word structure. The forms *fetma* and *fetna* are both minimal prosodic words (ω^{min}) in our analysis. Instead, we would suggest stem allomorphy, with lexically long postvocalic consonants in the one set of forms, i.e. /fet$^{\mu}$-mɑ/, /svɑl$^{\mu}$-kɑ/, /yr$^{\mu}$-s•l/, etc. This lexical view implies improductivity of the suffixes that correlate with underlying consonant length. However, the allomorphy does not prevent the morphological segmentation of forms into root and suffix for the purpose of other generalizations, or indeed that of identifying the stem as an allomorph.[12]

The third case of vowel length alternation due to suffixation occurs when the suffix contains a surface long initial consonant: *-dde*, *-tt*. These are exemplified in (179), where forms that do not abide by the general pattern are set in parentheses. We shall assume that the consonant length on the part of the consonantal suffixes is derived rather than underlying (see discussion after (179)).

(p.174) (179) Long suffix-initial consonants: dental stops

a.

infinitive	past *-dde* /-de$_2$/	p.ptcp. *-tt* /-t/	p.ptcp. *-dd* /-d/
tro /tru/ [truː] ‘believe’	trodde [^{2} ˈtrʊdːɛ̟]	trott [trʊtː]	trodd [trʊdː]
fly /fly/ [flyː] ‘flee’	flydde [^{2} ˈflʏdːɛ̟]	flytt [flʏtː]	flydd [flʏdː]
klä /klɛ/ [klɛː] ‘dress’	klädde [^{2} ˈklɛ̟dːɛ̟]	klätt [klɛ̟tː]	klädd [klɛ̟dː]
nå /no/ [noː] ‘reach’	nådde [^{2}ˈnɔdːɛ̟]	nått [nɔtː]	nådd [nɔdː]
strö /strø/ [strøː] ‘strew’	strödde [^{2}ˈstrø | dːɛ̟]	strött [strø | tː]	strödd [strø | dː]
glöda /glød-ɑ$_2$/ [^{2} ˈgløːda] ‘glow’	glödde [^{2}ˈgløː | dːɛ̟]	glött [gløː | tː]	--

tyda /tyd-ɑ$_2$/ [^{2} ˈtyːda] ‘interpret’	tydde [^{2}ˈtʏdːɛ̯]	tytt [tʏtː]	tydd [tʏdː]
se /se/ [seː] ‘see’	(såg [soːg])	sett [sɛ̯tː]	(sedd [sɛ̯dː])
dö /dø/ [døː] ‘die’	(dog [duːg])	dött [dø ∣ tː]	(död [døːd])

b.

Adjectives	neuter *-tt* /-t/
grå /gro/ [groː] ‘grey’	grått /gro-t/ [grɔtː]
blå /blo/ [bloː] ‘blue’	blått /blo-t/ [blɔtː]
ny /ny/ [nyː] ‘new’	nytt /ny-t/ [nʏtː]
fri /fri/ [friː] ‘free’	fritt /fri-t/ [frɪtː]

c.

verb	noun *-dd* /-d/
gro /gru/ [gruː] ‘to sprout’	grodd /gru-d/ [grʊdː] ‘sprout’
ro /ru/ [ruː] ‘to row’	rodd /ru-d/ [rʊdː] ‘rowing’
sno /snu/ [snuː] ‘to twist’	snodd /snu-d/ [snʊdː] ‘string’
så /so/ [soː] ‘to sow’	sådd /so-d/ [sɔdː] ‘sowing’

Teleman’s classic analysis of these data is that the inflections are underlyingly long/geminate (Teleman 1969: 200). For a recent analysis along the same lines, see Löfstedt (2010: 55). This hardwires the quantity information in the underlying form and derives the correct pattern, but at the cost of generality, as the actual distribution looks rather phonological.

Raffelsiefen (2002) instead proposes to analyse this pattern as a synchronic minimality effect, where a syllable closed by a consonant is a preferable form to meet the Stress-to-Weight requirement over a syllable left open. In Raffelsiefen's grammar, vowels in open syllables are all monomoraic. Therefore, the suffix-initial consonant shows up long rather than short.[13] Final singleton consonants **(p.175)** are considered as belonging to a following syllable with an empty nucleus (see Giegerich 1985 and other work in this tradition). Raffelsiefen's analysis is attractive in that it captures the fact that all weak, monosyllabic infinitives belong to the same paradigm, and that this paradigm also exerts attraction on strong verbs with the same monosyllabic form, especially in the past participle: *bli* 'become', p.ptcp. *blitt*, beside *blivit*; *ta* 'take', p.ptcp. *tatt*, beside *tagit*; *dra* 'pull', p.ptcp. *dratt*, beside *dragit*. The breadth of the pattern across categories is also significant and indicates that the generalization is phonological in nature. However, Raffelsiefen's model carries the assumption that vowels in open syllables are monomoraic and that the length alternations are not phonologically quantitative, which is less intuitive.

We may sketch a possible analysis building on Raffelsiefen's idea, but rather than attributing the output shape to *minimality*, we can attribute it to *optimality*, much as we did with the nicknames (see 7.2). Given that vowel length is not underlying, the input to the grammar will always be a short or monomoraic vowel plus the consonantal suffix. For instance, the root *tro* 'believe' is /tru/ without any vowel length in our analysis. The past participle that we add can now be assumed to be just a single non-moraic consonant /-t/. The grammar should now evaluate candidates for input form /tru-t/, and the winning output is [trʊtː] rather than *[trʊːt]. The output form has the virtue of containing a branching rhyme both in terms of moras (as per Stress-to-Weight) and in terms of syllable structure (the rhyme branches to nucleus and coda). If this is on the right track, the output is attributable to optimality in terms of branching, i.e. that it is better for a root syllable to branch both in terms of moras and rhyme structure, than to just branch in one or the other, see (158). The reason why we invariably find long inflectional consonants following roots that are made up of open syllables is then due to the combination vowel quantity *not* being distinctive and the following consonant (whether final or not) not being made extrametrical. This will have to do with how the process is situated in the grammar. Non-derived forms do not lead to long final consonants (*gul* /gʉl/ [gʉːl], *[gølː] 'yellow'). This outline of an analysis makes a phonological connection across adjectives (*nytt* /ny-t/ [nʏtː] 'new, neut.'), verbs (*trodde* /tru-de$_2$/ [trʊdːɛ], *trott* /tru-t/ [trʊtː] 'believed'), and hypocoristics (*Kattis* /kɑt-is/ [kɑtːɪs] 'Katarina, hypocoristic').

The lengthening of the consonant is less regular with the suffix *-s*, where there are old forms often with middle or reciprocal interpretation which show lengthening, while the passives do not. Among nouns, the old genitive form tends to trigger consonant length more than the contemporary genitive marker.

(p.176) (180) Suffix-initial *-s*

a.

infinitive	passive	middle
slå /slo/ [sloː] ‘hit’	slås [sloːs]	slåss [slɔsː] ‘fight, inf., pres.’
brå /bro/ [broː] ‘take after’	brås [broːs]	brås [brɔsː] ‘take after’
riva /riv-ɑ$_2$/ [^{2}'riːva] ‘scratch’	rivs ['riːʏs]	rivs [rɪfːs] ‘scratch, pres.’

b.

noun	genitive	old genitive
sjö /ʂø/ [ɧøː] ‘lake’	sjös [ɧøːs]	sjöss [ɧøsː]
skog /skug/ [skuːg] ‘forest’	skogs [skuːg̊s]	skogs [skʊkːs]
hav /hɑv/ [hɑːv] ‘sea’	havs [hɑːʏs]	havs [hafːs]
dag /dɑg/ [dɑːg] ‘day’	dags [dɑːg̊s]	dags [dakːs]

This shows that, to the extent the lengthening can be understood as a minimality factor, it is not fully phonological and synchronic, but rather exhibits a pattern of diachronic lexicalization of underlying quantity in suffixes beginning with a consonant. And the quality of those consonants matters. The dental plosives /d/ and /t/ lengthen the most generally, /s/ less so, and other consonants even less. The nasal /n/ in the use as definite article for common gender is sometimes lengthened (*snö* /snø/ [snøː] ‘snow’, *snön* [snøːn] ‘the snow’; *sjö* /ʂø/ [ɧøː] ‘lake’, *sjön* [ɧøːn] ‘the lake’) as is the case with final nasals in pronouns (*min* [mɪnː] ‘my’, *din* [dɪnː] ‘your’, *vem* [vɛ̟mː] ‘who’, *dem* [dɛ̟mː]/[dɔmː] ‘them’) and some other function words (*sen* [sɛ̟nː] ‘then’, *mens* [mɛ̟nːs] ‘while’).

8.5 Fate of long consonants in unstressed syllables

The proposed analysis for CSw quantity is that consonants are underlyingly marked as moraic, where necessary. Such syllables sometimes alternate between stressed and unstressed status.

(181) Long consonants in stress alternation

kokett /koket$^{\mu}$/ [kɔ'kɛ̟tː] ‘coquettish’	kokettera [kɔkɛ̟^{1}'teːra] ‘to coquette’
tyrann /tyrɑn$^{\mu}$/ [tʏ'ranː] ‘tyrant’	tyranni [tʏra'niː] ‘tyranny’

attack /ɑtɑkʰ/ [aˈtakː] ‘id.’	attackera [ata[1]ˈkeːra] ‘to attack’
hatt /[$_{\text{Ft}}$hɑtʰ/ [hatː] ‘hat’	hatteri [hatɛ̯ˈriː] ‘hattery’

When stress is shifted away from a syllable containing a long consonant no trace of length is left behind, whether the stress is lexical or not. Thus, we cannot diagnose the distinction between tonic and unspecified morphemes (see 10.2) when the stressed syllables contain short vowels and long consonants. Part of the reason may well be the lack of phonetic contrast in other respects than quantity. **(p.177)** For vowels, there is the qualitative difference between long and short allophones, and the quality of long vowels is retained in lexically stressed (i.e. tonic) morphemes, when stress is shifted away, e.g. under derivation with *-eri*.[14] The consonants do not have any such qualitative support for the quantitative contrast, and that distinction becomes neutralized in unstressed position.

The result of this overview is that there is regular alternation between long and short vowel as stress moves between syllables in related forms. The corresponding patterns of alternation in consonants are much more limited. The consonant alternations are due either to the addition of a suffix morpheme (*vit-t* ‘white, neut.’), minimality effects (whereby the consonant itself becomes long and, as such, non-alternating), or weight by position. For vowel alternations, however, we can obtain a simple and wide generalization, namely lengthening in open syllables, under stress. A stressed syllable is checked for quantity (by Stress-to-Weight), and if found too light, lengthened. The fact that it is the vowel that lengthens follows from the simple fact that it constitutes the last segment in an open syllable. The advantage of this approach, over and above the reverse approach where underlying vowel quantity is assumed, is that we can connect synchronic lengthening to syllable structure and stress. Synchronic lengthening of syllables will always be implemented as vowel lengthening in open syllables, a very natural thing.

In the reverse scenario, where vowel quantity were taken to be underlying and consonant lengthening synchronically predictable, we would have to index consonants for lengthening in the underlying structure, even in simple words like *katt* ‘cat’ and *matta* ‘mat’. The hypothetical underlying form of *matta* would be /mata/, with a short vowel. Syllabification would yield /ma.ta/ and this structure would challenge Stress-to-Weight. The natural measure to take would be to lengthen the *vowel* (i.e. /ma.ta/ > *[^{2}'maːta] ‘mat’), since the vowel belongs to the offending syllable, but this would yield the wrong result and create neutralization with *mata* [^{2}'maːta] ‘to feed’. So, to get the postvocalic consonant (the onset of *another* syllable) to lengthen into the coda of the stressed syllable, the rule would have to be directed to that consonant by diacritical information. Differently put, on a vowel quantity analysis, syllable structure would not play a role in the quantitative alternations, and that would be a major generalization missed.

(p.178) 8.6 Consonant quantity as predictor of quantitative complementarity

A general type of argument for underlying consonant quantity comes from the fact that it straightforwardly predicts the quantitative complementarity of segments in stressed syllables (Riad 1992, 1995). The hypothesis of an underlying vowel quantity distinction does not make this prediction. The superordinate condition is Stress-to-Weight which mandates that stressed syllables be heavy. This condition is very visible in the Germanic languages, historically and synchronically, but it is general only in the NGmc group (except Danish). In the WGmc languages (plus Danish) it is a desideratum, but not mandatory. This difference can be derived from the distinctive quantity at the segmental level (Riad 1995).

If a vowel is short in an open syllable and receives stress, it will lengthen to two moras by Stress-to-Weight (CV^{μ} > $CV^{\mu\mu}$, phonetically CVː). If a vowel is short and followed by a long consonant, then Stress-to-Weight is met by the short vowel and the mora of the consonant ($CV^{\mu}C^{\mu}$, phonetically CVCː). If a vowel is short and followed by a consonant cluster, part of which is in the same syllable, then Stress-to-Weight will make the postvocalic consonant moraic, i.e. weight will be instantiated by position ($CV^{\mu}C.CV$ > $CV^{\mu}C^{\mu}.CV$, phonetically CVCː.CV). These are the only three cases and they always result in heavy stressed syllables. The crucial point is that a long consonant will show up where syllabified into the rhyme of a stressed syllable or where it is underlyingly long, and the phonetic reflex is direct: moraic consonants are long and vowels are long or short according to their number of moras. The phonetic length of moraic consonants in Swedish is a simple fact (Schaeffler 2005). In the phonological analysis of many languages, moraic consonants do not necessarily exhibit such a direct, phonetic reflex.

If one makes the reverse assumption that vowel quantity is underlying, then it takes a more complex grammar to implement Stress-to-Weight, indeed one which is different from Danish and English, where distinctive vowel quantity is usually not in doubt (and no morpheme-internal consonant is long). For one thing, consonants must routinely be recruited from *other* syllables than the one which receives stress, and lengthened. For another, one must account for why a short vowel should not lengthen under stress in an open syllable, otherwise the most common response to Stress-to-Weight in Germanic languages historically.[15] The typological issues internal to Germanic are discussed in Riad (1995).

(p.179) Because of the neutralization of short /e/ and /ɛ/ (see 2.2.4), the short vowels constitute a smaller set than the long vowels in the Central Swedish variety described here. The vowels /e/ and /ɛ/ must be kept apart among the short ones in view of the result they yield on the surface (e.g. under synchronic lengthening), yet they are indistinct in all of the short stressed instances, where they are both realized as [ɛ̧], and subject to vowel lowering if followed by a retroflex consonant. It does seem problematic to derive the long vowels from a surface neutralized context, and the issue deserves closer study. Synchronically, the alternations are still there, and so speakers will pick up the underlying forms from morphophonological alternations involving long/short-alternation (*väta* /vɛt-α_2/ [^{2}'vɛːta], *vätte* /vɛt-de$_2$/ [^{2}'vɛ̧tːɛ̧] ‘to wet /pret.’, *heta* /het-α_2/ [^{2}'heːta], *hette* /het-de$_2$/ [^{2}'hɛ̧tːɛ̧] ‘to be called /pret’). This can be straightforwardly done under the analysis given here, as the evidence for an underlying consonantal quantity distinction is obviously much wider than the contexts for this vowel alternation.

8.7 Long or geminate?

Elert (1955), Eliasson and LaPelle (1973), and Round (2007) embrace the view that consonant quantity is in fact consonant *gemination*. One reason for this is the homophony of the final consonant of *kitt* /ɕitː/ ‘putty’, *glatt* /glɑtː/ ‘slippery’ and *vitt* /vid-t/ ‘white, neut.’, *glatt* /glɑd-t/ ‘happy, neut.’. Starting from the assimilated cases, one can generalize gemination to the underlying cases, which would then be /ɕitt/ rather than /ɕit$^{\mu}$/. But one could just as well take the reverse stance, and employ moras for the same generalization. In this view, the assimilation creates long consonants, when one of them becomes moraic (*glatt* /glɑd-t/ ['glatː] ‘happy’), otherwise a short consonant is created, i.e. when the assimilating consonants are ‘postmoraic’ in a stressed syllable (*klämt* /klɛmd-t/ ['klɛmːt] ‘squeezed’), or simply occurs in an unstressed syllable (*krystat* /krystɑd-t/ ['krʏsːtat] ‘strained’). This is truer to the process of assimilation as a segmental and phonetic phenomenon. The ostensive gain of considering long surface consonants as geminate is that it would permit generalization across clusters (of different or identical consonants). However, that generalization is lost in unstressed syllables, where putative geminates must degeminate, while clusters of different consonants do not (*ädelt* /ɛdl-t/ ['ɛːdɛ̯lt] ‘noble, neut.’). The moraic representation captures this generalization better and also generalizes across all quantity in both vowels and consonants, whether lexical or otherwise. The fact **(p.180)** that assimilated as well as underlying long and short consonants are phonetically identical is easily captured by the presence of a segmental coalescence rule instantiating the assimilation (see 4.7).

8.8 Marginal vowel length or morphological segmentation?

Eliasson (2010: 13) draws attention to the case of *basket* ['bɑːskɛ̯t] ‘(the game of) basketball’, where we uncharacteristically find a long vowel before a consonant cluster within what looks like a monomorpheme. The expected form under Swedish phonology, given the underlying form /bɑsket/, would have been $^{+}$[^{1}'bɑsːkɛ̯t], just like in *misket* /misket/ [^{1}'mɪsːkɛ̯t] ‘type of Turkish folk music’, *loska* /losk-ɑ$_{2}$/ [^{2}'lɔsːka] ‘gob’, and *fiska* /fisk-ɑ$_{2}$/ [^{2}'fɪsːka] ‘to fish’. Eliasson suggests underlying vowel length for *basket* and similar cases, after all, i.e. /bɑːsket/ (see also Kristoffersen 2000: 159). An alternative to marginal underlying vowel length might be a formal morphological division, i.e. /bɑs-ket/ which would predict vowel lengthening as per (177a). There are a number of forms in this group, mostly referring to games, which allow the segmentation of a suffix *-ket*: *cricket* [^{1}'krɪkːɛ̯t] ‘id.’, *racket* [^{1}'rakːɛ̯t] ‘id., bat’, *krocket* [^{1}'krɔkːɛ̯t] ‘croquet’, *pocket* [^{1}'pɔkːɛ̯t] ‘paperback’. The other cited forms here all have a short root vowel, a fact that would be expected if the root ended in *-k*, hence /krik-ket/, /rɑk-ket/, /krok-ket/, and /pok-ket/.

The choice of analysis here might seem marginal, verging on the pointless. The importance of proposing alternative analyses for the marginal facts resides with the role one gives to diacritic marking in the model. Exceptions do occur, but for better or worse reasons, and that should be captured in the description. Diacritic marking that makes a form escape a rule should be looked on with suspicion. The point becomes clear (if a little exaggerated) when we look at truly phonological phenomena like nasal assimilation. No one would propose that otherwise entirely normal words could be diacritically marked for escaping nasal assimilation. But in analyses of stress systems, it is quite common to have this type of marking (exceptional vowel quantity, exceptional stress, exceptional extrametricality), which is intended to make a form escape other constraints in the system. In the case at hand, the lexical marking of vowel quantity in a system that otherwise has no distinctive vowel length seems more ad hoc than a more articulated morphological analysis, such as is needed in the stress and accent systems, anyway.

Notes:

([1]) This is often expressed as V:C vs. VC:, but this is phonologically a slight overstatement, as the C of V:C is onset to the following syllable and thereby does not contribute quantity.

([2]) Not all consonants appear in both quantities. /h/ is always short, and in fact never occurs in a coda. The phonemes /ŋ/ and /ɻ/ never follow a long vowel, thus always occur as long when in stressed syllables. For /ŋ/ this is likely to be correlated with its very limited ability to form onset (see 3.2.4, 4.5). Finland-Swedish admits /ɻ/ after a long vowel as in *Lojo*, FiSw ['luːju] vs. CSw ['lɔjːʊ] (place name).

([3]) Elert (1964: 110) cites measurements for German and Danish where the long/short ratio for vowels is around 50 per cent. The relative duration is however larger than for Italian, a language that has a similar quantity system as Swedish, where the figure is about 71 per cent. This figure is based on the figures for open and closed penultimate syllables only, as given in D’Imperio and Rosenthall (1999: 4). The earlier study of Lipski (1973) gets a ratio of about 75 per cent, where, however, the stressed syllables measured are not all necessarily penultimate. The corresponding figure for contrastive consonants is 50 per cent, in Lipski’s measurements. The proportions in Vogel (1982) are about the same (for discussion, see McCrary 2004: ch. 4). Whatever differences in measurement techniques there may be, it seems clear that Swedish and Italian phonetically present their similar phonologies in this area rather differently.

([4]) This would have some effect on the results, in terms of distinctions being biased towards a slight exaggeration of overall average durations, both regarding vowel quantity and monosyllabicity.

([5]) A typology exploiting more quantitative properties in a Scandinavian context is presented in Kiparsky (2008), based mainly on Finland-Swedish varieties.

([6]) Much of the discussion in this section relies on Eliasson's work (especially on Eliasson and LaPelle 1973 and Eliasson 2010), although we do make some different assumptions, notably that long consonants are long rather than geminate.

([7]) The underlying length of consonants tends to be signalled also in orthography (see 14.3).

([8]) The notion of 'half-length' is based on a methodological error, as the *second* consonant of the cluster is not factored into the quantity of the syllable, while in a single long consonant, the second half which is onset to the following syllable is of course included. The relevant comparison between *simma* 'to swim' and *limpa* 'loaf of bread' is /mᵘ/ vs. /mp/, and the result will be something like [mː] vs. [m·p]. Since there is a strong tendency for stressed syllables of any make-up to be about the same overall length (Elert 1964), comparing /mᵘ/ with postvocalic /m/ (of /mp/) will naturally and predictably yield a phonetically shorter token for the latter.

([9]) One case where the alternation involves a lengthened consonant is *grammat*['iː]*k* 'grammar', *gramm*['atː]*isk* 'grammatical'. This is left as an exception here.

([10]) There are also cases like *adel* /ɑdl/ ['ɑːdɛ̠l] 'nobility', *adlig* /ɑdl+ig/ ['ɑːdlɪg] 'aristocratic', where the retained length in *adlig* could be explained either as the result of interpreting the suffix as *-lig* rather than *-ig*, or as a paradigm uniformity effect.

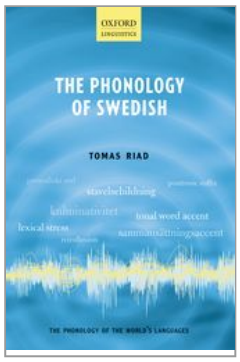
([11]) Some of the *-sel* words have later been given what is most likely a reading pronunciation with long vowel (as an alternative to the short), possibly under analogical influence of the perceived base: *trivsel* ['triːvsɛ̠l]/['trɪvːsɛ̠l] 'well-being', *vigsel* ['viːgsɛ̠l]/['vɪgːsɛ̠l] 'wedding'.

([12]) The suffix *-ma* has recently become somewhat productive, at least in blogs (Språktidningen 6, 2009). The new forms do not cause shortening of vowels when these are long in the base: *ful* [fʉ̟ːl] 'ugly', *fulma* [[2]'fʉ̟ːlma] 'ugliness', *kåt* [koːt] 'randy', *kåtma* [[2]'koːtma] 'randiness', *het* [heːt] 'hot', *hetma* [[2]'heːtma] 'heat; spiciness', *snygg* [snʏgː] 'good looking', *snyggma* [[2]'snʏgːma] 'beauty'.

([13]) This analysis could probably be connected to the notion of root minimality (Downing 2006), that we employed for hypocoristic formation in chapter 7.

([14]) When the root is unspecified, no trace of vowel length is left behind, see the discussion in chapter 10.

([15]) Such cases would certainly obliterate the vowel length distinction in stressed syllables (/CV$^{\mu}$CV$^{\mu}$/ and /CV$^{\mu\mu}$CV$^{\mu}$/ would both come out [CV:.CV]). Indeed, in the typological analysis of the Germanic quantity systems, Dutch and German could be depicted as precisely this type of system (open syllable lengthening of vowels with attendant neutralization of the vowel quantity distinction in that position), their context for the expression of a vowel contrast being largely limited to closed word-final syllables (Riad 1995).



The Phonology of Swedish
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Print publication date: 2013
Print ISBN-13: 9780199543571
Published to Oxford Scholarship Online: January 2014
DOI: 10.1093/acprof:oso/9780199543571.001.0001

Tonal word accents

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DOI:10.1093/acprof:oso/9780199543571.003.0009

Abstract and Keywords

This chapter lays out the basic information regarding the tonal accent distinction in Swedish. This lexical distinction is due to the presence of a lexical tone in some morphemes, especially in some very frequent syllabic suffixes. In intonation, the tonal cases come out as what is called accent 2. Accent 1 is fully made up of intonation tones. Beside the lexical accent 2 tones, there is a postlexical source for accent 2, namely in the context of two stresses (e.g. as in compounds). A few characteristic tonal contours are given in the chapter, to illustrate the way accents 1 and 2 come out in two intonational conditions: word accented and focus accented, where the latter is a higher prominence degree.

Keywords: accent, intonation, accent 1, accent 2, word accented, focus accented

Several of the Germanic languages of Scandinavia exhibit tonal word accent systems beside their stress systems. The accent systems are tonal in most varieties of Swedish and Norwegian. In Danish varieties there is a corresponding system of stød vs. no-stød (Basbøll 2005).[1] The phonetic, phonological, and distributional properties are quite different between tonal varieties and stød varieties, but there is no doubt that they are historically related, where all indications point at stød being secondary to a tonal configuration (Ringgaard 1983; Riad 2000a, b; see Fischer-Jørgensen 1989: 17ff. for a discussion of different theories).

By ‘tonal accent system’ we mean that there is a phonological distinction between two tonal configurations, of which minimally one must have lexically represented tokens. Traditionally, as well as in modern analyses, one talks about two word accents, ‘accent 1’ and ‘accent 2’, or (nowadays less frequently) ‘acute’ and ‘grave’, and these terms refer to the full tonal contour assigned in intonation, where lexical tones have been integrated. Phonologically, the most recent analyses tend to defend a representationally privative distinction, whereby either of the tonal configurations is taken to be marked and lexically represented (in the crucial sets of forms), the other being either assigned by default, or simply being the empty set. The analysis presented in this chapter is of the latter kind, where accent 2 is taken to be the marked category, by virtue of having a specific tone as part of the lexical representation of a number of morphemes.[2] Accent 1 is taken to be intonation, pure and simple, and hence it is invariably the result of postlexical processes. Proposals that by and large adhere to this view include Sweet (1877), Rischel (1963), Haugen (1967), Elert (1970), Engstrand (1995, 1997), Kristoffersen (2000), and Riad (1998b, 2003a, 2006, 2009a). Other analyses have proposed a so-called equipollent representation (Bruce 1977, however with accent 2 considered as marked; Gussenhoven 2004), or a reverse privative **(p.182)** distinction, where accent 1 is taken to be lexically specified and accent 2 is assigned by default (Lahiri, Wetterlin, and Jönsson-Steiner 2005a; Kristoffersen 2006, 2007; Wetterlin 2007, 2010).[3] A very useful discussion and comparison of the various proposals made in the literature is given in Naydenov (2011).

9.1 Basic facts

The terms ‘accent 1’ and ‘accent 2’ are mostly used to refer holistically to the entire tonal contour of words, that is, including the accents assigned by intonation. The distinction is typically illustrated with word pairs like those given in (182a). Accent is indicated by a raised digit before primary stress.

(182) The tonal accent distinction

a.	^{1}'and-en	‘the duck’	^{2}'ande-n	‘the spirit’
	^{1}'steg-en	‘the steps’	^{2}'stege-n	‘the ladder’
b.	^{1}'syrak	‘angry’	^{2}'elak	‘mean’
	^{1}'ketchup	‘id.’	^{2}'senap	‘mustard’

The examples in (182a) are the closest one gets to minimal pairs within the same word class, but they are defective as minimal pairs in view of the fact that the words have different morphological make-up, the accent 1 forms typically being monosyllabic stems, and accent 2 typically being represented by disyllabic stems. In larger sets of accent pairs one finds other concomitant differences, like word class. There are about 350 such pairs in Swedish (Elert 1972), and more than 3,000 in Norwegian (Leira 1998), due mostly to later vowel neutralization between historical /ɑ/ and /e/ in poststress syllables. The contention of this is that the functional load of the tonal distinction is virtually zero, and several dialects also lack it entirely.

The fact that there is a lexical distinction between forms is not in question, and to show this it is better to look at forms like those in (182b). These forms are not segmentally identical, but they are monomorphemic and belong to the same word class, indeed are semantically close to each other. The intonation in citation form is different between the members of each pair, and this means that there must be a lexically represented distinction between them, causing the tonal difference (for the representation, see (185) and chapters 11 and 14).

There are some basic conditionings. There is no requirement of sonority in the syllable to which the lexical tone associates. This is a difference vis-à-vis Danish **(p.183)** stød which can only be realized in syllables with two sonorant moras (Basbøll 2005: 272ff.). Similar restrictions obtain also in tonal accent systems like Central Franconian and Lithuanian, but not in any of the Scandinavian tonal varieties.

The lexical (or postlexical, in compounds) tone of accent 2 must associate to the primary stressed syllable: ^{2}'*sommar* ‘summer’, ^{2}'*hög*ˌ*sommar* ‘high summer’ (*'*som* ^{2} *mar*, *'*hög* ^{2}ˌ*sommar*). This tone has precedence to the stressed syllable, and thereby pushes the intonation tones that make up the rest of the contour to the right. In accent 1, where there is no lexical tone, the accentual tones are supplied by intonation and may hence associate directly to the primary stress syllable (^{1}'*ketchup*).

Accent 2 only occurs in words that have a poststress syllable, whereas accent 1 has no such limitation. The extra syllable may be stressed or unstressed, but it must be there: ^{2}'*nunnor* /nʉnᵘ-ur$_2$/ ‘nuns’, ^{2}'*senap* /senɑp$_2$/ ‘mustard’, ^{2}'*barn*-ˌ*dom* /bɑrn+dumᵘ/ ‘childhood’, ^{2}'*värn*-ˌ*plikt* /vɛrn+plikt/ ‘military service’. In a few dialects, apocope has given rise to what looks like accent 2 in monosyllables (usually called circumflex, Lorentz 2008). A representational fact that correlates with the space requirement on the part of accent 2 is the fact that it generally contains one extra tone (the lexical tone) in comparison with accent 1.[4] Monosyllables and final stressed forms invariably exhibit accent 1: ^{1}'*bil* ‘car’, *ortocera* ^{1}'*tit* ‘orthoceratite’ (*^{2}'*bil*, **ortocera* ^{2}'*tit*).

There are two sources for accent 2. One is the lexical marking of morphemes with a lexical tone, be it on roots or—more regularly—on suffixes. The other source is prosodic/postlexical. In Central Swedish and many other dialects, accent 2 is regular in any word structure that contains two stresses (compounds, some derivations, see (126)). The tonal configuration is the same in both realizations of accent 2, but there is a difference in association pattern, due to the presence of more than one stress in e.g. compounds. Examples of forms containing more than one stress are given in (183).

(183) Compounds and compound-like forms

Compounds:	²ˈsommarˌdag ‘summer day’, baˈ²nanˌskal ‘banana peel’, ²ˈbyxˌkjol ‘pant-skirt’
Formal compounds:	²ˈävenˌtyr ‘adventure’, ²ˈparaˌdis ‘paradise’, ²ˈarˌbete ‘work’
(Some) derivations:	²ˈsjukˌdom ‘illness’, ²ˈkraftˌfull ‘forceful’, ²ˈunderˌbar ‘wonderful’

The tone-bearing unit in Central Swedish is the stressed syllable, namely the foot. Equivalently, one could say that the minimal prosodic word is the tone-bearing **(p.184)** unit and that association takes place to the head, in an order of priority, where a lexical tone has precedence over an intonation tone (Riad 1998b).

9.2 Phonological representation

Accents are very often realized in the intonation contour, such that it is fair to say that the regular pattern is for every primary stress to exhibit word accent.[5] There are, however, two prominence levels at which accent is realized (Bruce 1977; Heldner 2001). Thus, the presence of an accent on a syllable means that a given prosodic word has received a certain level of prominence. The first notch up from simply stressed is known as ‘word accented’, and the next higher prominence level is called ‘focus accented’. In Myrberg (2010), these are called prominence levels 1 (word accented) and 2 (focus accented). Bruce (1977) uses the terms ‘word accent’ and ‘sentence accent’. Later the terms ‘word accent’ and ‘focus accent’ have come to be used, and those are the terms used here (Heldner 2001; Bruce 2007). The realization of each of accent 1 and accent 2 is different in the two prominence conditions, as laid out in (184). The (lexical or postlexical) tone that distinguishes accent 2 from accent 1 is bolded.

(184) Accents and prominence levels

Prominence level	Accent 1	Accent 2	Accent 2 in compounds	Typical functions
Focus accent	L*H	**H***LH	**H***L*H	focus, contrastive topic
Word accent	HL*	**H***L	**H***L	given material, second occurrence focus (post focally), new material (non-final in the phrase)

The fact that there are two different accent ‘melodies’ (accent 1 and accent 2) is of no importance to the level of prominence as such. The accents have distinct melodic properties and different association patterns at both levels, leading to a characteristic timing difference between the identical (intonational) parts of the contours (Bruce 1977, 2007a). This timing difference recurs in pretty much every dialect.

(p.185) 9.2.1 Tonal contours

The realization of the tonal accents in the focus accented condition are given in Fig. 9.1, 9.2, and 9.3. These represent the same realization as one gets in citation form.

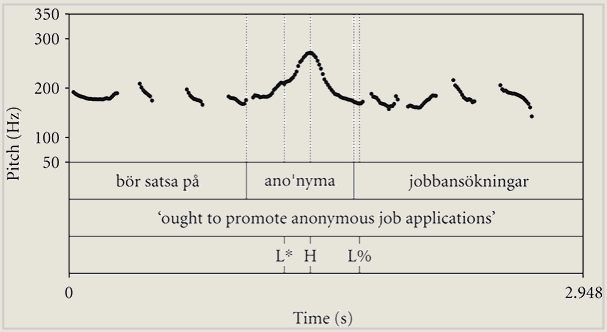

Fig. 9.1. Accent 1, simplex, focus accent, *ano* ^{1}'*nyma* ‘anonymous’. The tonal contour is L*H, followed by a L% boundary tone.

Radio Sweden (SR)

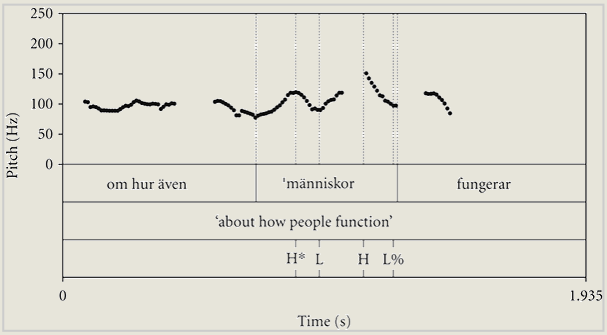

Fig. 9.2. Accent 2, simplex, focus accent, ^{2}'*människor* ‘people’. The tonal contour is H*LH, followed by a L% boundary tone.

Vetandets värld, SR

The compound has two association points. One is the first stress, where the accent 2 tone (H*) associates, and one at the last stress of the compound, where the prominence tone associates (L*H). The associating L* spreads backwards to **(p.186)** the H*, instantiating a clear fall right after the H*, in CSw.[6] This is clearly visible in long compounds (see chapter 12 and Fig. 9.6). In diagrams like (186) this is marked with an arrow.

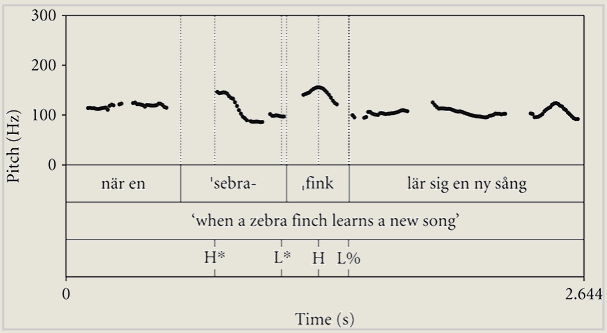

Fig. 9.3. Accent 2, compound, focus accent, ^{2}'*sebra*‚*fink* 'zebra finch'. The tonal contour is H*L*H, followed by a L% boundary tone.

Vetandets värld, SR

Let us next look at the realization of the accents in the word accented condition, the lower degree of tonal prominence. The panel in Fig. 9.4 begins **(p.187)** with two focus accents (the first is accent 1, fa1, the second accent 2, fa2), but all the remaining accents are word accents, of both types (wa1, wa2). This is seen in the variable timing of the HL contour between the two accents (HL* and H*L, respectively).

The panel in Fig. 9.5 illustrates the lower prominence level in long compounds.

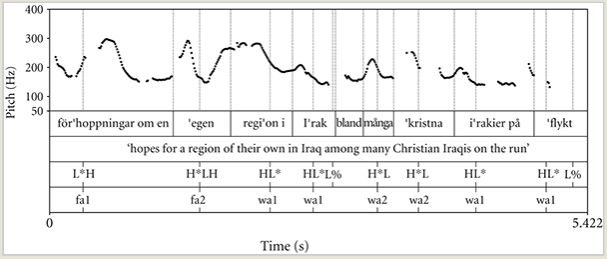

Fig. 9.4. Accent 1 and accent 2 at both prominence levels. The second tier from the bottom indicates tonal contours. The bottom tier indicates prominence level, where 'fa' is focus accented and 'wa' is word accented, the following digit indicating accent 1 or 2.

Människor och tro, SR

9.2.2 Association patterns

A given tone-bearing unit —a stressed syllable/a foot—can only accommodate a single tone. While several tones are contour tones, it is always only one segment of such a contour tone that actually associates, while the other tone either leads into the association point (i.e. HL*) or trails after it (i.e. L*H). Bruce (1987) shows that a trailing tone has variable timing in utterances of different length, a fact that indicates that it is not associated.

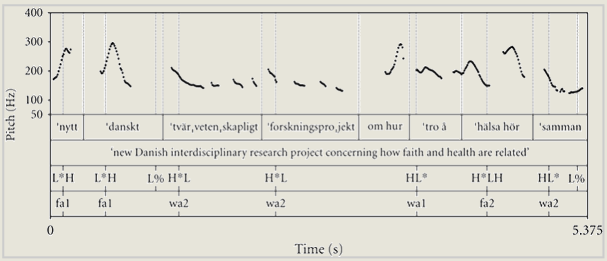

Fig. 9.5. The two compounds ^{2}'*tvär,veten ,skapligt* 'interdisciplinary' and ^{2} '*forsknings-pro,jekt* 'research project' occur with word accents in the lower prominence level. The bottom tier indicates prominence level, where 'fa' is focus accented and 'wa' is word accented, the following digit indicating accent 1 or 2.

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The accent 2 H* tone always has precedence in association, and this holds for all varieties of Swedish and Norwegian. When there is no lexical tone present, the prominence L* tone associates. This is illustrated with stylized examples in (185). We add the boundary tone (which is aligned rather than associated) that occurs at the end of citation forms.

(185) Simplex accent 2 and accent 1, representation of focus accent (fa)

H*LH L%	L*H L%
's e n a p	'k e t ch u p
'mustard'	'id.'

(p.188) Thus, a large portion of the tonal contour (i.e. LHL) is identical, but the timing differs due to the precedence of the initial lexical tone to the stressed syllable (Bruce 1977).

In compounds and prosodically similar words, there are several minimal prosodic words, hence several stressed syllables, hence several tone-bearing units. This allows for both the accent 2 H* tone (postlexical) and the prominence L*H tone (=accent 1) to associate. These tones associate to the first and last tone-bearing unit of a compound, thereby creating what is sometimes called a ‘connective’ prosodic structure.[7]

(186) Compound accent 2, representation of focus accent (fa)

This is the compound accent generalization of Central Swedish (see 5.2.1). As described in Riad (1998b), there are a number of constraints involved that create this structure. Beside the obligatory association of the accent 2 tone to the primary stress, there is right-alignment of the prominence tone, and the association of the prominence tone (L*H). Also, there is left-alignment of the prominence tone, creating the spreading of the L* tone segment to the preceding H*. Fig. 9.6 repeats the example of a long compound given in Fig. 5.1. It contains five stresses, the first and last of which are tonally marked.

(p.189) 9.3 A note on typology

When we look across the Scandinavian dialects for patterns in their tonal grammar, we find that they lend themselves to uniform description and analysis. Several properties are shared in all dialects, while other properties vary in small and orderly ways. This means that it is indeed meaningful to talk of a coherent dialect area based on very similar grammatical properties.

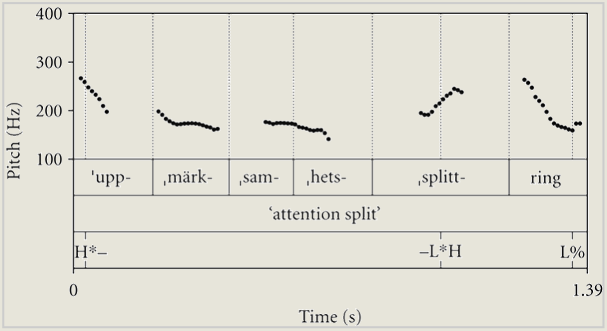


Fig. 9.6. Long compound showing the connective tonal pattern of accent 2

Vetandets värld, SR

The lexical pitch accent opposition can be uniformly described as privative (i.e. accent 2 is instantiated as a lexical tone, while accent 1 has no lexical specification). The central tones obey the Obligatory contour principle (Leben 1973) in a strikingly uniform manner across dialects. Thus, if the first tone is H, the next tone will be L or begin with L, and vice versa. Part of the tonal contour is also functionally identical between dialects and the crucial tones appear in the same order. Thus, the lexical tone (accent 2) is always initial in the primary stressed syllable. The prominence tone exhibits some variation in how it holds itself with respect to the lexical tone to the left, the boundary tone to the right, and whether or not it spreads. Other areas of variation concern the extent of tonal association, where Central Swedish has two associated tones in compounds, whereas e.g. South Swedish only has one. Also the orientation of unassociated tones varies (left/right, see Riad 1998b, 2006, 2008).

When we turn to the lexical distribution of accents, there is also a strong core of shared patterns. The strongest shared pattern is that of syllabic suffixes, which induce accent 2 in dialect after dialect, in the canonical conditions (see 11.4.2). Bruce (1998: 50) notes that it is the accent of root morphemes that is the least stable across dialects, and that is also a much smaller number of token forms. The bottom line is, however, that the North Germanic tonal systems are quite homogeneous, both regarding tonal behaviour and tonal distribution. Several of the areas of divergence can be related to representational differences. For instance, the major divide between dialects that have uniform accent 2 in compounds and those that permit either accent in compounds is directly related to whether or not there is mandatory association of the prominence tone to a secondary stress (shown in Fig. 9.7). Double association entails uniform accent in forms that have more than one stress (stressed syllables being the tbu), whereas single association admits tonal variation in compounds just as in simplex forms. In such dialects, lexical tone and morphological structure also influence the resultant accent, as well as prosodic factors.

We assume that tonal accent is an obligatory property of the maximal prosodic word, following Myrberg and Riad (2013). While there are certainly deaccented words in phrasal phonology, we take those instances to involve the incorporation of deaccented words into a maximal prosodic word nearby. Previous scholarship **(p.190)** has often assumed that there is a higher category, variably referred to as the Accentual phrase (Kristoffersen 2000; Abrahamsen 2003; Hognestad 2012), the Tonal foot (Fretheim and Nilsen 1989; Nilsen 1992), or the Prosodic word in a different sense from that used here (Bruce 1998; Hansson 2003). However, while these models may fairly describe the tonal behaviour, the prosodic categories do not themselves align with morpho syntactic structure in a principled way, and **(p.191)** hence do not organically connect with the prosodic hierarchy as conceived of in phonology in general.

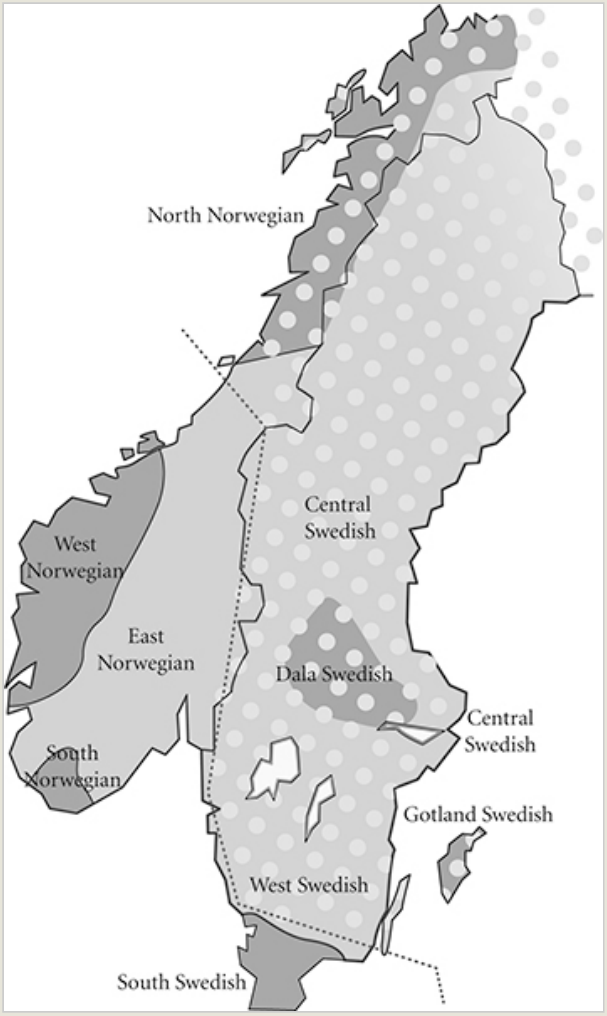


Fig. 9.7. Map of the major tonal dialects of North Germanic

Dark areas have a L lexical tone in accent 2, light areas have a H lexical tone in accent 2. The isogloss marks the boundary between connective and non-connective dialects. East and north of the isogloss, compounds uniformly get accent 2 (two association points), whereas west and south of the isogloss, compounds vary in accent (one association point).

The unitary domain of the tonal accents as the maximal prosodic word can be related to the culminative prominence function of accent, as word accent and focus accent (see 12.2). In each instance, only one tonal accent will be assigned to the maximal prosodic word. Various intonational and information structural factors influence whether a word accent or a focus accent is assigned, while which of accent 1 or accent 2 is assigned is determined by morphological information, prosodic information at the word level, or else by default, see (131).

Notes:

([1]) Stød is a laryngeal feature, realized as creaky voice or full glottal stop, which has a prosodic distribution. It occurs in several Danish varieties, with a grammatical distribution, but also shows up as a facultative feature in varieties of Swedish, west of Stockholm, where it is known as ‘Eskilstuna curl’ (Sw *Eskilstunaknorr* or *-knarr*).

([2]) The idea that tones are represented directly in the lexicon, rather than via some diacritic, is pursued in the analysis of a variety of languages, e.g. Japanese (Meeussen 1972; Poser 1985), Bantu (Hyman 1982; Pulleyblank 1986; Downing 2006), Serbo-Croatian (Inkelas and Zec 1988), Lithuanian (Blevins 1993), Latvian (Karinş 1996).

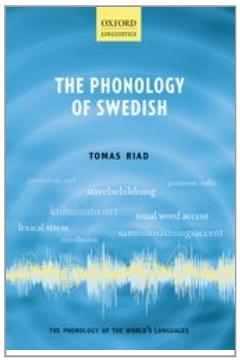
([3]) There is also a proposal that assumes no underlying tones (Morén-Duolljá 2007, 2013) and which derives the tonal variation from the prosodic structure of words. The assumptions regarding the prosodic word are, however, radically different in this proposal, making it difficult to evaluate with respect to other proposals.

([4]) Ultimately, there is a diachronic reason for this, see Riad (1998a, 2005).

([5]) There are some systematic cases where this does not hold, listed in (267).

([6]) In otherwise closely related North Swedish varieties, the initial fall is typically less pronounced, sometimes leading to the perception of a lesser prominence at the initial stress of compounds, and primary stress at the last.

([7]) The term ‘connective’ is also used with a more general meaning, referring to the fact that accent 2 in nearly all instances occurs on a morphologically complex form, even if only by plural inflection (e.g. Elert 1981).



The Phonology of Swedish
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Print publication date: 2013
Print ISBN-13: 9780199543571
Published to Oxford Scholarship Online: January 2014
DOI: 10.1093/acprof:oso/9780199543571.001.0001

Prosodic status of morphemes in the lexicon: stress

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DOI:10.1093/acprof:oso/9780199543571.003.0010

Abstract and Keywords

A major theme of this book is the lexcial specification of prosodic information, and the consequences that this has for the understanding of word formation and the shape of the lexicon in Swedish. It also help for the understanding of the stress system as such. Thus, there are four types of morphemes: tonic (i.e. stressed), pretonic, posttonic and unspecified. Given the previously introduced constraints on Culminativity within the minimal prosodic word, this system now predicts that certain combinations of morphemes should be better formed than others, and those predictions are shown to be borne out. Where no stress is in place, a phonological routine will provide stress at the right edge of the word, where however a posttonic morpheme can steer stress to the preceding syllable. This system explains the pattern of how “Germanic” and “foreign” morphemes combine or don’t combine in Swedish, as a purely prosodic phenomenon.

Keywords: tonic, pretonic, posttonic, unspecified, culminativity, stress rule, word formation, combinatorics, “Germanic”, foreign

Stress placement in CSw is largely determined on the basis of morphologically specified prosodic information. This chapter provides a picture of how morphology and phonology interact to determine the placement of stress in morphologically complex forms. Four classes of morphemes are identified, based on type of prosodic specification or lack thereof.[1] When morphemes are combined in inflection, derivation, and compounding, various interactions take place, which have a direct influence on the predominant shapes of the lexicon. The typical combination of morphological (or lexically specified) and phonological properties in stress systems usually takes the form of a regular basic phonological procedure combined with sets of lexical exceptions (as e.g. in Oñati Basque, Hualde 1999: 969ff.). Here, we are looking for a more entrenched role of morphological specification in the lexicon.

The advantages of giving morphological information a central role in the stress system amounts to the acknowledgement that morphology is directly involved in the stress system. Indeed, the morphological specification of stress is a long-standing fact in several of the Germanic languages, most clearly seen in the placement of primary stress on the root initial syllable in the etymologically Germanic vocabulary. The challenge is rather how to make sense of the variation in the vocabulary, e.g. in the comparison of so-called Germanic and Romance (or otherwise ‘foreign’) morphology, without the use of diacritics and without losing sight of the obvious morphological *and* phonological generalizations. Another reason for admitting prosodic specification in the morphology is that we have it already, in the lexical specification of tone. As mentioned and further discussed in 11.5.1, lexical tone is predominantly specified in suffixes in Swedish, from where they induce accent 2 in the stressed element they attach to.

(p.194) 10.1 Background: phonological stress assignment by algorithm

The analysis proposed here differs from the chiefly phonological analyses that have been popular in the analysis of Germanic languages in the last twenty-five years or so. The prosodic work on stress systems that culminated with Hayes (1995) included many publications on Germanic stress which accounted for these systems in terms of algorithms for stress assignment (van der Hulst 1984, Langeweg 1988, Kager 1989 for Dutch; Kager 1989, Hammond 1999 for English; Jessen 1999, Féry 2008 for German; Schmid 1987, Bailey 1990, Andréasson 1997, Shokri 2001 , Frid 2003 for Swedish; Lorentz 1996, Kristoffersen 2000 for Norwegian).[2] These algorithms were constructed based on stress feet, usually counting from the right edge of the word. Where there were exceptions, features such as extrametricality and direct marking for exceptional behaviour were used. A good exponent for this approach to a North Germanic language is Kristoffersen (2000: ch. 6 and 7), a careful analysis of Urban East Norwegian (UEN), essentially East Norwegian as spoken in Oslo. His assumption is that the stress system of UEN is constructed on syllables which lack quantitative information (supplied later in the derivation), with stress feet that are moraic trochees, and which are laid out from right to left. Under this system, closed final syllables will attract stress (*tra*'*fik* ‹trafikk› ‘traffic’), final open syllables will be unstressed pushing stress to the penultimate syllable ('*hake* ‹hakke› ‘chin; axe’, *ca*'*nasta* ‘id.’, *a*'*roma* ‘id.’). There are groups of words that do not abide by these generalizations, and in order to make them fit the algorithm they may be individually marked with extraprosodicity ('*ha*‹*lik*› ‹hallik› ‘pimp’, '*kole*‹*ra*› ‘cholera’, '*indi*‹*go*› ‘id.’), or by exceptional lexical vowel length (*ar*'*me* μμ ‹armé› ‘army’, *me*'*si* μμ *as* ‹messias› ‘Messiah’). The essential idea is to get stress to land on the final syllable if closed, otherwise on the penultimate syllable. Beyond that, pretty much all other placements of stress are exceptional.

While surface true for a large segment of the vocabulary, the generalizations expressed in the algorithmic approach lack intuitive support in that there is no clear sense of exceptionality being connected with marked forms.[3] For instance, trisyllabic forms with an open penult may very well carry stress on the antepenultimate ('*Kana*‹*da*› ‘Canada’) or the penult (*ar*'*mada* ‘id.’). Whichever way you count, there is going to be a substantial number of forms that have to be considered as exceptional (see Kristoffersen 2000: 153).

(p.195) Furthermore, there is a weaker sense of automaticity to the stress system, in contrast with the more prototypically phonological prominence systems of French, Finnish, Polish, or Arabic, where the prominence rule strongly tends to get in the way when speaking or learning a foreign language with a different stress system. This argument is to some extent anecdotal and impressionistic, but it is certainly the experience of many a teacher of Swedish as a foreign language. Finns learning Swedish, on average, have difficulty getting the stress away from the initial syllable, and French learners of Swedish correspondingly have to work to get the stress away from the last syllable. Swedish speakers of other languages, however, do not, in general, have equivalent difficulties in pronouncing words with stress on any particular syllable. But they do have difficulties switching off completely general postlexical generalizations of Swedish phonology like the obligatory heavy weight of stressed syllables. One interpretation of this state of affairs is that the phonological part of the Swedish stress system is very limited, in comparison with Finnish and French, stress placement being mostly controlled by morphological, lexical marking. Even though there indeed exists a phonological stress rule in Swedish phonology, it is still very much in the hands of the morphological stress generalizations.

Finally, a look at Swedish language history reveals that the many French loans that were brought into Swedish in the 17th and 18th centuries retain stress on the same syllable as prominence tended to occur in the lending language. If there were a strong phonological generalization for stress placement, we should have expected it to exert some influence on at least some of these loans. But there are almost no such effects. Again, this supports an analysis where stress placement in Swedish looks for morphologically connected generalizations. There is no strong, automatic phonological generalization that pulls stress in one direction or the other, or we would be able to register its effects in language history and in synchronic second language learning.

Besides these weaknesses of the algorithmic approaches, there are also a number of generalizations connected with morphology that are missed, both for the distribution of stress and for the behaviour of the (stress-dependent) tonal accent system. The brief background here serves as a pre-theoretic basis for proposing the morphology-based stress system in the following sections. An analysis of Swedish within the phonological approach depicted earlier in this chapter would look very much like the one given in Kristoffersen (2000). Conversely, the Norwegian stress system could, in all likelihood, be described in morphological terms much like Swedish is in 10.2.

(p.196) 10.2 Lexical foot structure–four types of morpheme[4]

If categorized according to their prosodic properties relating to stress and prosodic word formation, roots and derivational morphemes can be sorted into four groups in Swedish: *prosodically unspecified, tonic, pretonic*, and *posttonic*.[5] The positive specifications indicate whether a morpheme is lexically stressed (tonic), whether it appears in the position before a stress (pretonic), or after a stress (posttonic). As these morphemes combine, the prosodic specifications—together with general conditions on prosodic words—make certain combinations better formed than others. This information, in turn, enables us to predict which combinations should occur more frequently than others, everything else being equal, and thus gives us a grip on the predominant prosodic shapes of the lexicon. One important player in the system is Culminativity, repeated here from (115).

(187) Culminativity-ω

> 'The prosodic word has exactly one head'
> ω^{min} – stress; ω^{max} – accent

Culminativity limits the number of stresses within a prosodic word to one. If the morphemes within the prosodic word do not include a tonic one, a stress must be supplied by the grammar, i.e. the phonology. This is done by a general phonological stress rule (given in (195)) which is right-edge oriented, but sensitive to lexical prosodic specification at that edge. Posttonic and pretonic morphemes in turn make demands on the location of stress in roots and other morphemes that they attach to, thus restricting the set of morphemes that they will comfortably combine with.

Representationally, stress is best captured with the prosodic foot, which is in Swedish a moraic trochee (see (136) and Kristoffersen 2000). Since every stressed syllable in Swedish is bimoraic, the prosodic foot is invariably confined to a single syllable. With this fact comes some phonological inertness. In particular, the prosodic foot cannot be used to locate a syllable in order to place stress on it. Instead it simply implements Culminativity. My assumptions for the foot are thus quite different from what has been proposed in previous work on Swedish such as Schmid (1987), Bailey (1990), Andréasson (1997), Shokri 2001 , and Frid (2003).

(p.197) We turn now to a presentation of the different types of morpheme, beginning with the prosodically unspecified.

10.2.1 Prosodically unspecified morphemes

Many morphemes that participate in prosodic word formation lack prosodic specification. This means they will sometimes get stress via the phonological rule in (195). The typical morphemes of this sort are what would in other models often be categorized as ‘foreign’, ‘French’, ‘Romance’, or ‘learned’. Some examples are given in (188). Suffixes are of variable character and this affects the placement of stress, as discussed below.

(188) Prosodically unspecified roots

ä'm-abel	‘amiable’	gen't-il	‘generous’
ackompan'j-era	‘to accompany’	ka'b-in	‘cabin’
ar'k-ad	‘arcade’	ka'lif	‘caliph’
ba'l-ans	‘balance’	ko'k-ett	‘coquettish’
ba'n-al	‘id.’	le'g-al	‘id.’
biblio-'tek	‘library’	matema't-ik	‘mathematics’
bril'j-ant	‘brilliant’	meka'n-ik	‘mechanics’
'cykl-isk	‘cyclic’	na't-ion	‘id.’
de'k-al	‘sticker’	o'r-era	‘to hold forth’
divi'd-era	‘to discuss’	pe'n-ibel	‘embarrassing’
e'lektr-iker	‘electrician’	po'lit-isk	‘political’
exe'g-et	‘exegete’	por't-al	‘id.’
exer'c-era	‘to drill’	seri-'ös	‘serious’
fi'g-ur	‘figure’	sol'v-ent	‘id.’
ga'r-ant	‘guarantor’	teo'r-et-isk	‘theoretical’

Unspecified roots typically look incomplete without endings on them. Only few roots of this type are also free morphemes, e.g. *ka'lif* ‘caliph’. Some unspecified adjectival, verbal, and nominal suffixes are given in (189), (190), and (191).

(189) Prosodically unspecified adjectival suffixes

deka'd-ent	‘decadent’	minuti-'ös	‘meticulous’
deli'k-at	‘delicious’	mo'd-est	‘id.’
dispo'n-ibel	‘disposable’	natio'n-ell	‘national’
gra'c-il	‘slender’	norma't-iv	‘normative’

gra'v-id	‘pregnant’	obs'k-yr	‘obscure’
grandi-'os	‘grandiose’	por't-abel	‘portable’
gro't-esk	‘grotesque’	signifi'k-ant	‘significant’
kommu'n-al	‘municipal’	vio'l-ett	‘violet’
lu'n-ar	‘id.’	vul'g-är	‘vulgar’
masku'l-in	‘masculine’		

(p.198)

For the verbal suffixes the boundary with the root or other suffixes is not very clear. There are several variants of what is basically a single verbal ending: *-era*, *-iera*, *-isera*, *-fiera*, *-ifiera*, *-ificera*. I will not discuss the alternative solutions to the issue of segmentation into stem and suffix here. Instead, I will consider the suffix formed by the morph *-er-* followed by regular verbal inflection *-a* (for infinitive), *-ar* (for present tense), etc. What precedes *-er-* may either belong to the suffix or the stem.

(190) Prosodically unspecified verbal suffixes

fabr-i'c-er-a	‘fabricate’	kvalif-i'c-er-a	‘qualify’
finans-i'er-a	‘finance’	mumi-fi-'er-a	‘mummify’
glori-fi-'er-a	‘glorify’	ope'r-er-a	‘operate’
konden's-er-a	‘condense’	proj-i'c-er-a	‘project’
kopi-'er-a	‘copy’	strat-ifi-'er-a	‘stratify’

For nouns, as for adjectives, there are plenty of suffixes. The definition of ‘suffix’ is quite wide, and structural rather than semantic. The crucial criterion is *segmentability*, i.e. that one can separate the root from the suffix and that the suffix recurs in at least a couple of other forms. The frequency of suffixes in this group varies greatly.

(191) Prosodically unspecified nominal suffixes

abbe'd-iss-a	‘abbess’	kar'b-on [-oːn]	‘the Carboniferous’
ak'v-arium	‘aquarium’	klavia't-ur	‘keyboard’
ar'k-iv	‘archive’	kommi'ss-ion	‘commission’
ara'b-esk	‘arabesque’	kompa'n-i	‘company’
arki'v-ar-ie	‘archivist’	konve'n-ans	‘propriety’

arr-'est	‘detention’	ku'b-ism	‘cubism’
borge'n-är	‘creditor’	kur't-is	‘flirtation’
dan's-ös	‘dancer, fem.’	kva's-ar	‘quasar’
de'k-an	‘dean’	lära'r-inn-a	‘teacher, fem.’
delikat-'ess	‘delicacy’	lo'k-al	‘premises’
des'p-ot [-oːt]	‘id.’	obdu'c-ent	‘pathologist’
diag'n-os	‘diagnosis’	patri-'ark	‘patriarch’
disko-'tek	‘discotheque’	pi'l-ot [-uːt]	‘id.’
divi'd-end	‘id.’	poli't-yr	‘polish’
dokto'r-and	‘graduate student’	predi'k-ant	‘preacher’
dru-'id	‘id.’	prins-'ess-a	‘princess’
evene-'mang	‘event’	proveni-'ens	‘provenance’
firma-'ment	‘id.’	rep't-il	‘reptile’
ga'r-age	‘id.’	ron'd-ell	‘roundabout’
gar'd-in	‘curtain’	sar'k-om	‘sarcoma’
ge'n-es	‘genesis’	servi-'tris	‘waitress’
gra'f-ik	‘graphic art’	skorpi-'on [-uːn]	‘scorpion’
ha'r-ang	‘harangue’	solip's-ist	‘id.’
kabin-'ett	‘cabinet’	suff'l-ör	‘prompter’
kali'f-at	‘caliphate’	troll-e'ri	‘magic’
kano'n-ad	‘cannonade’	univers-i'tet	‘university’
kap's-yl	‘cap’		

(p.199)

There are also prefixes that are prosodically unspecified, some of which are given in (192).

(192) Prosodically unspecified prefixes

trans-pa'rent	‘id.’	ad-jun'gera	‘to call in’
pre-posi'tion	‘id.’	in-di'vid	‘individual’
pro-fa'nera	‘to profane’	des-infor'mera	‘to disinform’

In forms constituted exclusively by unspecified morphemes, stress shows up on the last morpheme, indeed the last syllable. Thus, the stacking of suffixes of this kind will make it look as if stress moves further and further to the right. Each form in (193) constitutes a single prosodic word as per the diagnostic tests given in chapter 5.

(193) Strings of prosodically unspecified morphemes[6]

(ba'n-al)$_{\omega}$	(ban-al-i'tet)$_{\omega}$	(ban-al-i's-er-a)$_{\omega}$
(trans-planta-'tion)$_{\omega}$	(trans-planta-tio'n-ell)$_{\omega}$	
(karak't-är)$_{\omega}$	(karakt-er-is't-ik)$_{\omega}$	(karakt-er-i's-er-a)$_{\omega}$
(nat-'ion)$_{\omega}$	(nat-io'n-ell)$_{\omega}$	(nat-ion-a'l-ist)$_{\omega}$
(pro-'dukt)$_{\omega}$	(pro-duk-'tion)$_{\omega}$	(pro-duk-tiv-i'tet)$_{\omega}$

The most important indicator of phonological, as opposed to morphological, stress, is the fact that, within the prosodic word, unspecified morphemes either carry main stress or are entirely unstressed (namely when stress falls elsewhere). Morphemes carrying true lexical stress are not flexible in this way (see (197) below), and this allows for an empirical contrast. To establish the status of morphemes as unspecified we should look at alternations in syllables where stress induces vowel length. In such syllables, the quality as well as the quantity of the vowel varies quite distinctly. The pattern illustrated in (194) should be compared with that given in (197).

(p.200) (194) Prosodically unspecified morphemes: few or no traces of vowel length

Phoneme	Allophones	Long stressed	Short unstressed
/i/	iː ~ ɪ	pol['iː]tiker ‘politician’	pol[ɪ]ti'sera ‘to politicize’
/y/	yː ~ ʏ	f['yː]siker ‘physicist’	f[ʏ]si'kalisk ‘physical’
/e/	eː ~ ɛ	prof['eː]t ‘prophet’	prof[ɛ̝]'tera ‘to prophesy’
		obsc['eː]n ‘obscene’	obsc[ɛ̝]ni'tet (also obsc[ˌeˑ]ni'tet) ‘obscenity’
/ø/	øː ~ ø	milj['øː] ‘environment’	“milj[ø̝ ‖]'di” ‘environmental melody’

Phoneme	Allophones	Long stressed	Short unstressed
	œː ~ œ (_r)	kommend['œː]r ‘commodore’	f[œ]r'ändra ‘to change’
/ɑ/	ɑː ~ a	dr['ɑː]ma ‘drama’	dr[a]'matisk ‘dramatic’, dr[a]ma'tik ‘drama’
/o/	oː ~ ɔ/ʊ	elektr['oː]n ‘electron’	elektr[ɔ]'nik ‘electronics’
/u/	uː ~ ʊ	positi['uː]n ‘position’	positi[ʊ]'nera ‘to position’
		fas['uː]n ‘shape’	fas[ʊ]'nera ‘to shape’
/ʉ/	ʉː ~ ʉ	komm['ʉː]n ‘municipality’	komm[ʉ]'nard ‘Communard’, komm[ʉ]nali 'sera ‘to bring under the auspices of the municipality’
		kult['ʉː]r ‘culture’	kult[ʉ]'rell / kult[ɵ]'rell ‘cultural’

The basic phonological rule of stress assignment seeks out the last available syllable in the string, where ‘available’ means that some prosodic specification in the last morpheme may influence the placement.[7]

(195) General stress rule, ALIGN-R(FT,PRWD)[8]

‘Stress the rightmost available syllable in the prosodic word’

In the cases shown where most of the words lack all specification, this means that stress goes to the very last morpheme in the whole word. We interpret the fact that the vowel quality and quantity changes so much under stress to mean that there is no lexical stress present. This interpretation relies on the observation that things are different with lexical stresses, and we now turn to them.

(p.201) 10.2.2 Prosodically specified morphemes: tonic

Tonic morphemes contain a lexical stress. We represent this as lexically specified foot structure. The stress foot is bimoraic in Swedish and never dominates more than a single syllable. Feet are indicated with square brackets. The boundaries of feet will shift around a little depending on syllabification, an alignment that I take to be unproblematic.

(196) Tonic morphemes

a.	Roots:	['glöm]-sk	‘forgetful’	scha['brak]	‘caparison’
		['trev]-lig	‘pleasant’	['ka]viar or kavi['ar]	‘caviar’
		['tvätt]-a	‘to wash’	an['sjo]vis	‘anchovies’
		['tvätt]-are	‘washer’	py['ja]mas	‘id.’
		['charm]	‘id.’		
b.	Suffixes:	['fränd]-[ˌskap]	‘friendship’	['uppen]-[ˌbar]	‘obvious’
		['stor]-[ˌhet]	‘largesse’	för['äld]ra-[ˌlös]	‘orphan’
		-['Vːn]	‘from X’	-['eːs]	‘from X’
		kub-['an]	‘Cuban’	kin-['es]	‘Chinese’
		rum-['än]	‘Romanian’	liban-['es]	‘Lebanese’
		chil-['en]-are	‘Chilean’	javan-['es]	‘Javanese’
c.	Prefixes:	['ur]-[ˌtrev]-lig	‘very pleasant’	['miss]-[ˌtag]	‘mistake’
		['o]-[ˌmärk]-lig	‘imperceptible’	['in]-[ˌtryck]	‘impression’

Tonic morphemes can be roots as well as affixes. They are typically of Germanic origin, but there are also plenty of borrowings in this group, many of which are monosyllabic (like most Germanic roots are, too): *chef* ‘boss’, *mousse* ‘id.’, *glass* ‘ice cream’, *sky* ‘gravy’, *sfär* ‘sphere’, *gage* ‘fee’. Suffixes, too, may be borrowed, like those indicating origin in (196b).

In order to establish that a given morpheme is tonic we should look at related forms where main stress is in different syllables. This test works well only when the lexical stress is in a syllable that gets a long vowel. Unlike unspecified morphemes, tonic morphemes always leave a trace of vowel length and vowel quality behind if primary stress is forced away. Shifting stress away from a tonic morpheme does not come easily (this has to do with Culminativity), but there is one productive derivational suffix *-eri* denoting ongoing activity or place where an activity takes place, which can be combined with pretty much any root, tonic or not.

(p.202) (197) Tonic morpheme + unspecified morpheme (trace of vowel length)[9]

Phoneme	Allophones	Long stressed	Half-long unstressed
/i/	iː ~ i·	sl['iː]pa ‘to grind’	sl[i·]pe'ri ‘grindery’
		gr['iː]s ‘pig’	gr[i·]se'ri ‘messiness’
/y/	yː ~ y·	pr['yː]d ‘prudish’	pr[y·]de'rier ‘pruderies’
/e/	eː ~ e·	l['eː]k ‘game’	l[e·]ko'tek ‘play place’
		ch['eː]f ‘boss’	ch[e·]fe'ri ‘bossing’
		kin['eː]s ‘Chinese’	kin[e·]se'ri ‘chinoiserie’
/ø/	øː ~ ø·	s['øː]ka ‘to seek’	(fel)s[ø·]ke'ri ‘troubleshooting’
		g['øː]ta- ‘Geat-’	g[ø·]ti'cism ‘Geatishness’
	œː ~ œ· ___r	n['œː]rd ‘nerd’	n[œ·]rde'ri ‘nerdery’
/ɛ/	ɛː ~ ɛ·	kl['ɛː]der ‘clothes’	kl[ɛ·]de'ri ‘(constant) dressing’
	æː ~ æ· ___r	b['æː]ra ‘to carry’	(brev)b[æ·]re'ri ‘postman activity’
/ɑ/	ɑː ~ ɑ·	b['ɑː]gare ‘baker’	b[ɑ·]ge'ri ‘bakery’

Phoneme	Allophones	Long stressed	Half-long unstressed
		d['ɑː]tor ‘computer’	d[ɑ·]tor'tek ‘computer place’
		charlat['ɑː]n ‘id.’	charlat[ɑ·]ne'ri ‘charlatanism’
/o/	oː ~ o·	sk['oː]da ‘to behold’	(navel)sk[o·]de'ri ‘navel-gazing’
/u/	uː ~ ʊ·/ʊ	k['uː]ka ‘to boil’	k[ʊ·]ke'ri, k[ʊ]ke'ri ‘(place for) boiling’
		pr['uː]sa ‘prose’	pr[ʊ·]sa'ist, pr[ʊ]sa'ist ‘id.’
		n['uː]rden ‘the north’	n[ʊ]r'dist ‘scholar in Scandinavian languages’
/ʉ/	ʉː ~ ʉ·/ʉ	gj['ʉː]ta ‘to mould’	gj[ʉ·]te'ri, gj[ʉ]te'ri ‘foundry’
		m['ʉː]ra ‘to lay bricks’	m[ʉ·]re'ri ‘masonry’
		l['ʉː]ta ‘lute’	l[ʉ·]te'nist ‘lute player’

These examples show that, in contrast with (194), some traces of vowel length remain in the lexically stressed syllable, after stress has shifted away to the last morpheme. Besides quantity, the vowels retain the same quality as they have when stressed. This test of lexical stress works reliably when there is an intervening syllable between the stressed syllable of the base form and the derivation. Full reduction of a lexically stressed syllable may occur when it is adjacent to the new stress, cf. '*st*[iː]*l* ‘style’, *st*[i·]*le*'*ri* ‘activity of styling’, but *st*[ɪ] '*list* ‘stylist’.

We interpret the traces of vowel length and quality as *loss* of stress rather than as *demotion* of stress, otherwise the most common interpretation (Linell and **(p. 203)** Anward 1971; Anward and Linell 1976). Two generalizations are at stake, Culminativity and Initiality of primary stress in words. Culminativity requires each prosodic word to contain exactly one stress, and the domains we are looking at here form single prosodic words as seen in their singular syllabification (see 5.1 for criteria for identifying prosodic words). Forms that contain more than one stressed morpheme (compounds, some derivations) invariably make the first stress primary and the following stresses secondary. Moreover, these structures get accent 2. If the first half-long syllable of *sliperi* is considered stressed, both of these generalizations are lost. Forms like *sliperi* are strongly limited and warranted by the semantic productivity of certain suffixes, which override and disregard the presence of a lexical stress. We thus interpret the situation as a conflict between lexical and postlexical information, where faithfulness to the lexical information causes the retention of quality and some quantity of long vowels even after the stress as such is removed.

Regardless of how one treats Culminativity, the test as such is valid, the contrast between tonic and unspecified being manifest in near minimal pairs like *gr*['iː]*s*~*gr*[iˑ]*se*'*ri* ‘pig~messiness’ vs. *mask*['iː]*n*~*mask*[ɪ]*ne*'*ri* ‘machine~machinery’.

Another test that distinguishes tonic and unspecified morphemes is instantiated by the realization of the suffix -(*i*)*sk*, which alternates between syllabic (-*isk*) and non-syllabic form (-*sk*). This suffix is itself posttonic, see 10.2.4. The variation is partly caused by phonotactic and quantitative considerations (Riad 1999), but some variation is directly due to tonicity, as illustrated here.

(198) Epenthesis/no epenthesis in the -(*i*)*sk* suffix

Tonic stem-final morpheme		Unspecified stem-final morpheme	
spar['tan]-sk	‘spartan’	me'kan-isk	‘mechanical’
(*spar['tan]-isk)		(*me'kan-sk)	
['syn]-sk	‘psychic’	'cyn-isk	‘cynical’
isra['el]-sk	‘Israeli’	isra'el-isk	‘Israeli’[10]
['fal]-sk	‘false’	aristo'tel-isk	‘Aristotelian’

Whenever the suffix attaches to a tonic morpheme, there is no epenthesis of [ɪ]. This could be taken to be a faithfulness effect, minimizing the distance between suffix and stem. When the stem-final morpheme is prosodically unspecified, the overall prosodic word shape is instead optimized, by epenthesis. The optimal shape here is a disyllabic domain with stress on the first syllable. We have seen this shape instantiated in a spectacular manner with nicknames (see 7.2), and we will see it influence the shape of the definite article (see 13.2).

(p.204) Note that (197) contains examples of different origin and type. There are borrowed tonic root morphemes (*chef-eri*), Germanic tonic root morphemes (*bag-eri*), and tonic derivational suffixes (*kin-es-eri, charlat-an-eri*). While there are clear etymological patterns, it is important to note that etymology cannot fully *predict* the prosodic properties.

10.2.3 Prosodically specified morphemes: pretonic

Swedish has two pretonic morphemes, both prefixes, namely *be-* and *för-*. These prefixes are specified to occur in the position before a stressed syllable, and this is strictly true in Swedish (unlike the equivalents in e.g. German).

(199) Pretonic morphemes

be-[$_{Ft}$	be-['hov]	‘need’
	be-['re]da	‘to prepare’
för-[$_{Ft}$	för-['akt]	‘contempt’
	för-['de]la	‘to distribute’

The prefixes are borrowed from Low German and have most likely been borrowed as part of full lexemes into Swedish (Söderbergh 1968; Wetterlin, Jönsson-Steiner, and Lahiri 2007). Later on, the prefixes have come to be used as morphemes in their own right, with a certain productivity. In verbs, *för-* often means ‘make into [root meaning]’ as in *för*'*arga* ‘to aggravate’, *för*'*slava* ‘to enslave’, *för*'*dyra* ‘to make more expensive’, *för*'*svenska* ‘to make Swedish’, and *be-* has a general transitivizing meaning: *be*'*bo* ‘to inhabit’, *be*'*kämpa* ‘to fight (against)’*, be*'*stiga* ‘to climb’, *be*'*tvivla* ‘to doubt’. These prefixes adjoin to a minimal prosodic word as discussed in 5.2.2.

The pretonicity is statically established, as these prefixes always precede a stressed syllable. The fact that they are somewhat productive allows us to generate forms where the pretonicity would not hold, and thereby test these structures against native speaker intuition, e.g. $^{+}$ *förindig*'*nera* ‘to aggravate’ (*indignerad* ‘indignant’) in parallel with *för*'*arga*, and $^{+}$ *behabi*'*tera* ‘to inhabit’ in parallel with *be*'*bo*. These are intuitively ruled out.

We can get a better understanding of the nature of the lexical specification when we look at cases where these prefixes actually carry *primary* stress. In the productive meanings, there are instances where *be-* and *för-* show up in forms that are derived from compounds. The prosodic result in such cases is primary stress on the prefix (Elert 1981: 83).

(200) Primary stress on prefix

^{2}'be‚ar‚beta /be-ɑrbet-$ɑ_{2}$/	‘to work up; to belabour’
^{2}'för‚or‚saka /før-ur+sɑk-$ɑ_{2}$/	‘to cause’
^{2}'för‚o‚rätta /før-u+rɛt$^{\mu}$-$ɑ_{2}$/	‘to insult’
^{2}'för‚an‚leda /før-ɑn+led-$ɑ_{2}$/	‘to occasion’
^{2}'för‚öd‚mjukelse /før-ød+mj̯ʉk-else$_{2}$/	‘humiliation’

(p.205)

(201) Variable stress

^{2}'be‚led‚saga ~ be^{2}'led‚saga /be-led+sɑg-$ɑ_{2}$/	‘to accompany’
^{2}'för‚all‚mänliga ~ för^{2}'all‚mänliga /før-al$^{\mu}$+mɛn-lig-$ɑ_{2}$/	‘to make common’

(202) Compounds containing prefixed forms

be^{2}'talka‚nal /be-tɑl+kɑnɑl/	‘pay channel’
för^{2}'lossnings‚sal /før-los$^{\mu}$-niŋ-s+sɑl/	‘delivery ward’

Whether the prefix itself gets stress or not, it remains pretonic. The variation between stressed and unstressed status reflects the structure of the compound. When the prefix remains unstressed it is interpreted as adjoined to a single minimal prosodic word, which might in turn form a compound with another prosodic word (203a). When the prefix incorporates into an existing compound it gets promoted to a prosodic word, hence acquires a stress by the requirement of Culminativity on prosodic words (203b). This yields the typical flat structure of compounds.

(203) Prosodic structures

a.

Prefixed form	^{1}(be('tala)$_{\omega}$)$_{\omega'}$	‘to pay’
Simplex	(ka^{1}'nal)$_{\omega}$	‘channel’

Compound	$^{2}((\text{be}(\text{'tal})_{\omega})_{\omega'}(\text{ka}_{,}\text{nal})_{\omega})_{\omega}$ $^{\max}$	‘pay channel’

b.

Compound	$^{2}((\text{'or})_{\omega}(_{,}\text{saka})_{\omega})_{\omega}$ $^{\max}$	‘to cause’
Prefixation	för-$[_{\text{Ft}}$	
Compound	$^{2}((\text{'för-})_{\omega}(_{,}\text{or})_{\omega}(_{,}\text{saka})_{\omega})_{\omega}$ $^{\max}$	‘to cause’

The accent pattern of these forms is discussed in chapter 11. We turn now to the fourth type of morpheme.

10.2.4 Prosodically specified morphemes: posttonic

Posttonic suffixes strive towards a position adjacent to a stress, alternatively, see to it that the preceding syllable gets stress, via the phonological stress procedure in (195). This group of morphemes includes a great many syllabic suffixes, including those that vary in syllabicity by epenthesis (e.g. -(*i*)*sk*, -(*e*)*n*). Most of the suffixes that have a stable vowel, i.e. are syllabic, carry a lexical tone, as marked with the subscripted ‘2’ in (204)–(207). Inflectional suffixes are also included among the posttonic morphemes, but since they occur on the outside of derivational suffixes, it is often the case that the posttonicity is not fulfilled for them. Nevertheless, it can be demonstrated that inflections are indeed posttonic (see 10.5.1). Here, we look first at derivational suffixes.

(p.206) Etymologically, the posttonic suffixes are of different origins. A number of central types are given here, according to word class.[11]

(204) Nouns, derivational suffixes

$_{Ft}$]-ing$_2$	['snygg]-ing	‘handsome one’	['tackl]-ing	‘tackle’
$_{Ft}$]-ning$_2$	['rätt]-ning	‘correction’	['mask]-ning	‘going slow’
$_{Ft}$]-ling$_2$	['änk]-ling	‘widower’	['mynd]-ling	‘ward’
	['älsk]-ling	‘darling’	['fem]-ling	‘quintuplet’
	['sjuk]-ling	‘sickly person’		
$_{Ft}$]-on$_2$	['ling]-on	‘lingonberry’	['od]-on	‘bog bilberry’
	['hall]-on	‘raspberry’		
$_{Ft}$]-are$_2$	['drag]-are	‘draught animal’	['spel]-are	‘player’
	['vin]-are	‘bottle of plonk’	bog['ser]-are	‘tower’
$_{Ft}$]-ska$_2$	['bråd]-ska	‘haste’	['jämt]-ska	‘woman from Jämtland’
	['glöm]-ska	‘forgetfulness’	stu['dent]-ska	‘female student’
$_{Ft}$]-else$_2$	['var]-else	‘being’	['föd]-else	‘birth’
$_{Ft}$]-nad$_2$	['mark]-nad	‘market’	['vård]-nad	‘care’
	['pryd]-nad	‘decoration’		
$_{Ft}$]-or$_2$	['dokt]-or	‘doctor’	konser['vat]-or	‘curator’
	pro['fess]-or	‘id.’		
$_{Ft}$]-iker	['mag]-iker	‘magician’	alge['bra]-iker	‘algebra expert’
$_{Ft}$]-e$_2$[12]	['vek]-e	‘wick’	['Benk]-e	‘(nickname)
	['gubb]-e	‘geezer’		

$_{Ft}$]-a$_2$	['sält]-a	‘salinity’	['Katt]-a	‘(nickname)
	['halk]-a	‘slipperiness’	['Lars]-a	‘(nickname)
	['näs]-a	‘nose’		
$_{Ft}$]-is	['feg]-is	‘coward (hyp.)’	['vakt]-is	‘warden (hyp.)’
$_{Ft}$]-o	['puck]-o	‘stupid one’	['hyggl]-o	‘kind person’
	['miff]-o	‘stupid one’		

(205) Adjectives, derivational suffixes

$_{Ft}$]-ig$_2$	['gryn]-ig	‘grainy’	['tål]-ig	‘hardy’
$_{Ft}$]-lig$_2$	['vän]-lig	‘friendly’	['trev]-lig	‘pleasant’
$_{Ft}$]-(i)sk	['kom]-isk	‘comic’	['sven]-sk	‘Swedish’
$_{Ft}$]-ad$_2$	['kork]-ad	‘stupid’	['larm]-ad	‘with the alarm set’
	kvalifi['cer]-ad	‘qualified’		
$_{Ft}$]-o	['lattj]-o	‘fun’	['sol]-o	‘lonely’
	['mysk]-o	‘weird’	['rek]-o	‘alright’
$_{Ft}$]-is	['av]-is	‘envious, hyp.’	['bak]-is	‘hung over, hyp.’

(p.207)

(206) Verbs, derivational suffixes

$_{Ft}$]-a$_2$	['bok]-a ‘to book’	['kalv]-a ‘to calve’
	['tvätt]-a ‘to wash’	
$_{Ft}$]-na$_2$	['vek]-na ‘to weaken’	['smal]-na ‘to become narrower’

(207) Participials, derivational suffixes

$_{Ft}$]-ende$_2$	['tro]-ende	‘believing’
$_{Ft}$]-ande$_2$	['tvätt]-ande	‘washing’
$_{Ft}$]-ad$_2$	['hämt]-ad	‘fetched’

Posttonic suffixes steer stress to the syllable preceding them, or combine with already stressed syllables, i.e. tonic morphemes. Some posttonic suffixes combine with both types. When a posttonic suffix combines with unspecified morphemes the regular stress rule is triggered. This rule is repeated in (208).

(208) General stress rule, ALIGN-R(FT,PRWD)

‘Stress the rightmost available syllable in the prosodic word’

If there is no tonic morpheme in a structure, or a tonic morpheme is followed by unspecified morphemes to the right, then the morphemes must be parsed into prosodic words and stress must be assigned, as there are ‘available’ syllables at the right end. This amounts to two requirements. First, prosodically unspecified syllables must be parsed. This is due to a requirement of Exhaustive parsing.

(209) Exhaustive parsing

‘All syllables are parsed in prosodic structure.’

The central function of this requirement is to see to it that all syllables are incorporated into prosodic words. How this is done will depend on the prosodic specifications of morphemes in a structure as well as their morphological and semantic status. Second, the requirement of stress is due to Culminativity, see (187).

Stress assignment looks at the right edge and places a stress there if there is a syllable available. The left edge of the (simplex) word is unimportant. By ‘available’ in (208) we mean that the placement of stress is sensitive to prosodic structure that is aligned at the right edge. In the examples in (210), the combination of posttonic suffixes with tonic morphemes is given to the left, and the combination with unspecified morphemes to the right.

(p.208) (210) Posttonic suffixes

	Following tonic morphemes		Following unspecified morphemes	
$_{Ft}$]-lig$_2$	['trev]-lig	‘pleasant’	rekord-'er]-lig	‘reliable’
	['o][ˌvan]-lig	‘unusual’	kontinu-'er]-lig	‘continuous’
	['land][ˌskap]-lig	‘landscape-like’	presid-'ent]-lig	‘presidential’
	na['tur]-lig	‘natural’		
$_{Ft}$]-are$_2$	['vin]-are	‘bottle of plonk’	krimi'nal]-are	‘detective’
	brasili['an]-are	‘Brazilian’	marke'tent]-are	‘canteen manager’
	ka['not]-are	‘canoeist’	bog'ser]-are	‘tower’
			sekre'ter-are	‘secretary’
$_{Ft}$]-ing$_2$	['snygg]-ing	‘handsome’	diskrimi-'ner]-ing	‘discrimination’
	['hövd]-ing	‘chieftain’	pla'cer]-ing	‘placement’
	för-['säkr]-ing	‘insurance’	rekry'ter]-ing	‘recruitment’
$_{Ft}$]-or$_2$			pro'fess]-or	‘id.’
			'mot]-or	‘id.’
			'vekt]-or	‘vector’
$_{Ft}$]-(i)sk	['grek]-isk	‘Greek’	si'syf]-isk	‘Sisyphus-like’
	['dan]-sk	‘Danish’	'typ]-isk	‘typical’
$_{Ft}$]-iker			me'kan]-iker	‘mechanic’
			'klin]-iker	‘clinician’

In forms like *krimi*'*nal*]-*are* ‘detective’ and *marke*'*tent*]-*are* ‘canteen manager’ the stress occurs on syllables that are not lexically specified for stress (i.e. not tonic). This is obvious in other forms like *kriminali*'*tet* ‘crime’ and *marketente*'*ri* ‘(milit.) canteen’ where stress occurs on a syllable further to the right than *-al-* and *-tent-*, respectively. Similarly in '*klin*]-*iker* ‘clinician’, which alternates with fully unspecified *kli*'*n-ik* ‘clinic’, which gets final stress.

Posttonic specification in derivational endings is robust. One effect of this is the fact that a conflict arises if posttonic suffixes are sequenced (e.g. $_{\text{Ft}}$]-*ing*-$_{\text{Ft}}$]-*lig*) and this is in general not permitted. This is due in part to Culminativity, and in part to the fact that the specifications of derivational suffixes are not normally in a dominance relationship (Riad 2012).[13] There is only one single posttonic suffix, *-or*, which allows for other posttonic suffixes, derivational or inflectional, to follow. In such cases, the posttonicity of the following suffix prevails. Indeed, *-or* also admits unspecified suffixes after it, thus creating structures that will trigger the General stress rule (see (208)). The behaviour of - **(p.209)** *or* is an important clue to the nature of prosodic specification, in that it allows us to see clearly that inflectional suffixes, too, are posttonic in character, even though they often fail to exert definitive influence over the placement of stress.

(211) Posttonic suffixes sequenced

	Following posttonic morphemes	
'mot]-or	^{0}mot]-'or]-isk ^{0}mot]-'or]-er	‘motoric’ ‘engines’
pro'fess]-or	pro^{0}fess]-'or]-lig pro^{0}fess]-'or]-er	‘professorial’ ‘professors’

If *-lig*, *-isk*, and plural *-er* were not posttonic, we would expect forms like **pro*'*fessorlig* and **pro*'*fessorer* with stress in the same syllable as in *pro*'*fessor*. That not being the case, we can infer that the placement of stress is determined by the suffixes *-lig* (derivational) and *-er* (inflectional).

Another way of diagnosing posttonicity is by looking at the few exceptions that do occur. The suffix *-lig* occurs in some forms where the stress is two syllables away. In these cases phonotactic constraints thwart syncopation of the second syllable (212a), unlike forms where the suffix is vowel initial (*hedra* /hed•r-α$_2$/ ‘to honour’), or the forms as such are archaic (212b).

(212) Exceptional breach of posttonicity

a.

^{1}'heder /hed•r/ ‘honour’	^{2}'heder-lig /hed•r-lig$_2$/ ‘honest’	*hed•r-lig, cf. hed•r-a ‘to honour’
^{2}'syster /syster$_2$/ ‘sister’	^{2}'syster-lig / syster$_2$-lig$_2$/ ‘sisterly’	*syst•r-lig, cf. syst•r-ar ‘sisters’
^{2}'sam,hälle / sɑm$^{\mu}$+hɛl$^{\mu}$e/ ‘society’	sam^{1}'hälle-lig / sɑm$^{\mu}$+hɛl$^{\mu}$-e$_2$-lig$_2$/ ‘societal’	*samhällig

b.

^{2}'all,män / ɑl$^{\mu}$+mɛn$^{\mu}$/ ‘common’	all^{1}'männe-lig / ɑl$^{\mu}$+mɛn$^{\mu}$-e-lig$_2$/ ‘commonly’	$^{+}$'all,mänlig, cf. 'vän ‘friend’, 'vänlig ‘friendly’
glad /glɑd/ ‘happy’	^{2}'glade-lig /glɑd-e-lig$_2$/ ‘happily’	$^{+}$'gladlig, cf. 'ljud ‘sound’, 'ljudlig ‘loud’

Another form of interest is *månatlig* ‘monthly’ derived from *månad* ‘month’, *-ad* $_2$ being a posttonic suffix. In this case the second syllable is assigned secondary stress, ostensibly to solve the conflict: *månad* /mon-ɑd$_2$/ [^{2}'moːnad], vs. *månatlig* /monɑt$_2$-lig$_2$/ [^{2}'moː,nɑːtlɪg].[14] The presence of stress can be inferred from vowel **(p.210)** length and vowel quality, as well as from the mandatory association of the prominence tone to the second syllable. Note that this result satisfies the posttonicity of both *-ad* and *-lig*.[15] In forms like *hederlig*, the prominence tone is unassociated for lack of a stressed syllable, and may occur on the second or third syllable.

Posttonicity can largely be inferred from static patterns, such as the absence of forms like *'*senap*]-*ig* ‘mustard-y’ or *'*päron*]-*lig* ‘pear-ly’, where a posttonic suffix is attached to a disyllabic root, and *'*gry*]-*ning*]-*ig* ‘dawn-y’ or *'*bygg*]-*nads*]-*lig* ‘building-ly’, where a posttonic suffix is attached outside another posttonic suffix (which is not *-or*). Tonic derivational suffixes, of course, are fully able to attach in that position, as they form their own prosodic word: ['*grabb*]-*ig*[,-*het*] ‘laddishness’, ['*främ*]-*ling*[,-*skap*] ‘alienation’.

The stability and robustness of posttonicity in suffixes is in itself an argument for the morphological approach to a large part of stress assignment in Swedish. For instance, the purely phonological analyses are unable to predict the lack of this kind of sequencing of derivational posttonic suffixes in the Swedish lexicon.

The prosodic information relating to stress correlates with morphemes as in (213).

(213) Morphemes and prosodic specifications

roots:	tonic, unspecified
prefixes:	tonic, unspecified, pretonic
suffixes:	tonic, unspecified, posttonic

Roots can be tonic or unspecified, but never pretonic or posttonic, whereas affixes can be of all four kinds (where pretonicity goes with prefixes only, and posttonicity with suffixes only). Thus, the lexical specifications that can be characterized as prosodically dependent on other morphemes (pretonic and posttonic) correlate with affix status. Roots are never prosodically dependent in this way. Unspecified roots are very often morphologically bound, hence not fully free and independent. Instead, they combine with suffixes, and then form prosodic words that get stress via the phonological rule, i.e. (195). Note that this is not to be understood as prosodic dependence.

10.3 Minor types

All morphemes that obligatorily form (part of) prosodic words can be categorized according to the typology given in (213). However, there are some morphemes that are less stable in their behaviour. We shall briefly look at the patterns surrounding neoclassical compounds.

(p.211) 10.3.1 Neoclassical compounds

So-called neoclassical compounding (e.g. Bauer 1998) constitutes a special case of combination of unspecified morphemes. The participating roots are nearly always of Classical Greek origin. What is special about them from a prosodic point of view is the fact that they often form a single prosodic word across the entire compound. The common pattern is otherwise for each compound member to form its own minimal prosodic word.

(214) Neoclassical compounding: one prosodic word

(tauto-lo'gi)$_{\omega}$	‘tautology’	(mikro-'fon)$_{\omega}$	‘microphone’
(bio-lo'gi)$_{\omega}$	‘biology’	(allo-'fon)$_{\omega}$	‘allophone’
(taxo-no'mi)$_{\omega}$	‘taxonomy’	(foto-'graf)$_{\omega}$	‘photographer’
(psyko-^{1}'farmaka)$_{\omega}$	‘psychoactive drugs’	(karto-'graf)$_{\omega}$	‘cartographer’
(psyko-so^{1}'matisk)$_{\omega}$	‘psychosomatic’	(tele-'graf)$_{\omega}$	‘telegraph’
(mikro-'skop)$_{\omega}$	‘microscope’	(paro-donto-lo 'gi)$_{\omega}$	‘periodontics’

The characteristic property of these words is that they exhibit a combination of morphological complexity and prosodic simplicity. The individual morphemes are prosodically unspecified, but the alignment of one prosodic word per root morpheme sometimes takes priority. It seems clear that the semantic side of compound formation is involved here.

(215) Neoclassical compounding: two prosodic words

$^{2}(('foto)_{\omega}(elektrici‚tet)_{\omega})_{\omega}$ ^{max}	‘photoelectricity’
$^{2}(('tele)_{\omega}(kommunika‚tion)_{\omega})_{\omega}$ ^{max}	‘telecommunication’
$^{2}(('para)_{\omega}(psykolo‚gi)_{\omega})_{\omega}$ ^{max}	‘parapsychology’
$^{2}(('para)_{\omega}(nor‚mal)_{\omega})_{\omega}$ ^{max}	‘paranormal’
$^{2}(('mikro)_{\omega}(moleky‚lär)_{\omega})_{\omega}$ ^{max}	‘micromolecular’
$^{2}(('bio)_{\omega}(mate‚matiker)_{\omega})_{\omega}$ ^{max}	‘biomathematician’

Rather predictably, some neoclassical compounds vary prosodically between one and two prosodic words, and this is especially true when the first element is prefix-like in its distribution and/or meaning. The consequence is that there is a large set of first elements that vary between forming their own prosodic word or forming one together with the second element. Here are a few instances of variation within the same word (216) and between forms with the same first element (217).

(216) Neoclassical compounding and prefixation: variation 1

$(fotoke'mi)_{\omega}$	~	$('foto)_{\omega}(ke‚mi)_{\omega}$	‘photochemistry’
$(fotosyn'tes)_{\omega}$	~	$('foto)_{\omega}(syn‚tes)_{\omega}$	‘photosynthesis’
$(manodepres'siv)_{\omega}$	~	$('mano)_{\omega}(depres‚siv)_{\omega}$	‘manic depressive’
$(semi\text{-}fi'nal)_{\omega}$	~	$('semi\text{-})_{\omega}(fi‚nal)_{\omega}$	‘id.’

(p.212)

(217) Neoclassical compounding and prefixation: variation 2

(hyper-'bol)$_{\omega}$	‘hyperbole’	~	('hyper-)$_{\omega}$(ak,tiv)$_{\omega}$	‘hyperactive’
(neo-lo'gism)$_{\omega}$	‘id.’	~	('neo-)$_{\omega}$(konserva,tiv)$_{\omega}$	‘neoconservative’
(kontra-sig'nera)$_{\omega}$	‘to countersign’	~	('kontra-)$_{\omega}$(,dans)$_{\omega}$	‘contra dance’
(kontra-'hent)$_{\omega}$	‘contracting party’	~	('kontra-)$_{\omega}$(,bas)$_{\omega}$	‘double bass’
(auto-'graf)$_{\omega}$	‘autograph’	~	('auto-)$_{\omega}$(pi,lot)$_{\omega}$	‘id.’

Whenever the combination occurs with a tonic morpheme, two prosodic words are the regular result, as can be seen in the last three forms to the right (*dans, bas, pilot*). A number of first elements/prefixes exhibit this pattern.

(218) First elements exhibiting variable prosodic word formation

anti-	sub-	pseudo-	multi-	ultra-	infra-
semi-	kontra-	hyper-	super-	poly-	mikro-
mono-	makro-	intra-	inter-	neo-	auto-
pan-	krypto-	mini-	geo-	meta-	ego-
foto-	aero-	astro-	bio-	bi-	ex-
hydro-	hemi-	mega-	post-	extra-	retro-
non-	socio-		tele-	termo-	stereo-

Some of these elements develop free forms (e.g. *extra, retro, mikro*). As such, they can of course occur in the second position of compounds ('*mini*ˌ*retro* ‘(e.g.) short film in retro style’, '*tips*ˌ*extra* ‘TV programme about betting’, '*monster* ˌ*mikro* ‘model of powerful small stereo equipment’), but then always forming separate prosodic words.

The formation of neoclassical compounds that are longer than two elements is largely limited to technical language domains. It appears that they are always prosodic compounds ('*xeno-trans-plant-a*ˌ*tion* ‘transplantation across a species boundary’, *ace*'*tylkolineste*ˌ*ras* ‘enzyme that decomposes acetylcholine’). The formation of single prosodic words would thereby seem to be limited to two elements.

The prosodic aspect of the behaviour of neoclassical morphemes is quite clear. As a group, they tend to be prosodically unspecified, while morphologically bound. Several of them move toward freer status, a semantic process which entails increased prosodic independence in complex formations. The semantic development, involving things like clarity of separation of core meanings and relationship between the meanings of the individual morphemes requires further study (cf. '*autopi*ˌ*lot* ‘id.’ vs. *auto*'*nom* ‘autonomous’, or '*hyperak*ˌ*tiv* ‘hyperactive’ vs. *hyper*'*bol* ‘hyperbole’).

(p.213) 10.4 Combinatorics

The model of prosodic specification of Swedish morphemes presented in this chapter makes predictions regarding what to expect in terms of combination of specifications. Some combinations are prosodically well formed and might therefore be expected to occur freely, while others are less felicitous, and might be expected to be less common, if prosodic properties are at all involved in the productivity of word formation. It would be an exaggeration to say that the prosodic information of morphemes *determines* the form space for morphology. Grammar is dialectic and certain derivations (with *-eri*, in particular) become productive simply because of their semantic usefulness, in spite of the fact that they sometimes lead to prosodic conflict. In such cases, the prosodic conflict will have to be somehow resolved. Similarly, even though inflectional syllabic suffixes are often posttonic, syntax drives them sometimes to occur away from a stressed syllable, thus giving rise to a prosodic conflict. We see various effects of prosodic conflict resolution, which adds important information to our understanding of the shape of the Swedish lexicon, and the workings of the word prosody of the language.

An overview of the logically available combinations for two morphemes from the classes roots and derivations is given in (219).[16] Lexical specifications (or lack thereof) of the morphemes are given to the left. The prediction regarding each combination is given in the fourth column, where there are three possibilities: ‘no prediction’, ‘incompatible’, and ‘harmonic’. The following two columns indicate putative and attested forms as single prosodic word or two prosodic words. In these columns there should be extant and unattested forms in line with the prosodic prediction (everything else being equal). Cases where the prosody is predicted to be disharmonic, but where combination is attested, are marked in italics. A comment on interaction (or not) of the combining morphemes is given in the rightmost column.

(219) Combining morphemes, overview (roots and derivational affixes)

Type	Morph-eme 1	Morph-eme 2	Prosodic prediction	One prosodic word	Two (or more) prosodic words	Inter-action?
1	tonic	pretonic	no prediction	n/a	(['mag])(be-[ˌsvär) (['o])(för-[ˌstånd)	none
2	unspec.	pretonic	no prediction	n/a	(ba'lans)(för-[ˌskjutning)	none
3	posttonic	pretonic	no prediction	n/a	('mot]-or)(för-[ˌening)	none
4	tonic	tonic	no prediction	n/a	(['mel]lan) ([ˌmål]) (['kraft])([ˌfull])	none
5	posttonic	tonic	no prediction	n/a	('part]-isk)([ˌhet]) ('fäng]-else) ([ˌkund])	none
6	pretonic	posttonic	Incompatible *	*(be-[…]-ning) *(för-[…]-else)	n/a	n/a
7	pretonic	pretonic	Incompatible *	*(be-['för-['komma) *(för-['be-['låna)	n/a	n/a
8	posttonic	posttonic	Incompatible *	*('gryn]-'ing]-ig)	n/a	n/a
8x	$_{\text{Ft}}$]-*or*			(*pro* ^{0} *fess*]-'*or*]-*lig*)	n/a	last wins

Type	Morph-eme 1	Morph-eme 2	Prosodic prediction	One prosodic word	Two (or more) prosodic words	Inter-action?
9	pretonic	unspec.	Incompatible *	*(be-['salu'tera) *(för-['indig'nera)	n/a	n/a
10	posttonic	unspec.	Incompatible *	*(krimi'nal]-ar-'at)	n/a	n/a
10x	$_{Ft}$]-*or*			(*pro* ^{0} *tekt*]-*or*-'*at*)	n/a	last wins
11a	tonic rt	unspec. sfx	Incompatible *	*['glöm]i'tet	n/a	n/a
11x		*-eri*		([^{0} *slip*]-*e*'*ri*)		last wins
11b	tonic rt or pfx	unspec. rt & sfx			('spindel)(fo‚bi) ('o)(professio ‚nell)	none
12	unspec.	unspec.	Harmonic	(na-tion-'ell) (agora-fob-'i)	(naviga'tions) (posi‚tion) ('neo)(konserva ‚tiv)	none
13	pretonic	tonic	Harmonic	(be-['röv]a) (för-['del]a)	(('be-])(‚ar) (‚beta)) (('för-])(‚an) (‚leda))	Promotion of pfx
14	unspec.	tonic	Harmonic	*(effekt-'full)	(ef'fekt)(‚full) (ef 'fekt)(‚skatt)	none

Type	Morph-eme 1	Morph-eme 2	Prosodic prediction	One prosodic word	Two (or more) prosodic words	Inter-action?
14x		[$_{\text{Ft}}$ -*V:n*]		(*rum*[-'*än*])	*('ru)(ˌmän)	none
15	tonic	posttonic	Harmonic	(['vän]-lig) (['led]-are)		n/a
16	unspec.	posttonic	Harmonic	(rekord-'er]-lig) (krimi'nal]-are)		n/a

Translation (of attested forms): *magbesvär* ‘stomach problems’, *oförstånd* ‘foolishness’, *balansförskjutning* ‘shift of balance’, *motorförening* ‘motor society’, *mellanmål* ‘snack’, *kraftfull* ‘powerful’, *partiskhet* ‘bias’, *fängelsekund* ‘jailbird’, *professorlig* ‘professorial’, *protektorat* ‘protectorate’, *griseri* ‘filth’, *spindelfobi* ‘arachnophobia’, *oprofessionell* ‘unprofessional’, *vänlig* ‘friendly’, *ledare* ‘leader’, *rekorderlig* ‘reliable’, *kriminalare* ‘detective’, *beröva* ‘to bereave’, *fördela* ‘distribute’, *bearbeta* ‘to work; to cultivate’, *föranleda* ‘to occasion’, *nationell* ‘national’, *agorafobi* ‘agoraphobia’, *navigationsposition* ‘navigation position’, *neokonservativ* ‘neo-conservative’, *effektfull* ‘striking’, *effektskatt* ‘power tax’, *rumän* ‘Romanian’.

(p.214) **(p.215)** In 10.4.1, I comment on the morpheme combinations shown in (219). For ease of reference the type numbers are given in the examples.

10.4.1 Contenders and predictions

In the description of the prosodic word we have noted Culminativity and syllabification as central defining properties (see 5.1). Every minimal prosodic word has exactly one stress and every maximal prosodic word has exactly one tonal accent (word or focus accent). The minimal prosodic word is the syllabification domain. Culminativity is the central factor from which we can derive some predictions regarding word formation other than in compound-like formations.

(220) Combination with no predictions (roots and derivational affixes)

1	tonic	pretonic	no prediction	n/a	(['mag])(be-[ˌsvär) (['o])(för-[ˌstånd)	none
2	unspec.	pretonic	no prediction	n/a	(ba'lans)(för-[ˌskjutning)	none
3	posttonic	pretonic	no prediction	n/a	('mot]-or)(för-[ˌening)	none
4	tonic	tonic	no prediction	n/a	(['mel]lan) ([ˌmål]) (['kraft])([ˌfull])	none
5	posttonic	tonic	no prediction	n/a	('part]-isk)([ˌhet]) ('fäng]-else) ([ˌkund])	none

In the first set of five morpheme combinations (types 1–5) the morphemes do not interact at all. For instance, when the second element is pretonic it ‘faces the other way’ from any preceding morpheme. In all these cases, separate prosodic words are formed, given that further morphemes are supplied for the pretonic and posttonic morphemes requiring them. Tonic suffixes and prefixes are prosodically self-sufficient and therefore need not interact prosodically with adjacent morphemes.

There is one combination (type 14), however, where one might have expected more interaction than we find.

(221) Harmonic combination with no predictions (roots and derivational affixes)

14	unspec.	tonic	Harmonic	*(effekt-'full)	(ef'fekt)(ˌfull) (ef 'fekt)(ˌskatt)	none
		[$_{\text{Ft}}$ -*V:n*]		(*rum*[-'*än*])	*('ru)(ˌmän)	none

In the combination unspecified and tonic, we could have expected the formation of one prosodic word, with the tonic morpheme as prosodic head and the preceding unspecified morpheme as incorporated. Since it is a derivation rather than compounding, one could imagine that the semantics would not force a division.

(p.216) The pattern, in fact, only occurs with one tonic suffix, namely -[$_{\mathrm{Ft}}$'Vːn], a suffix which indicates the origin of persons (mostly) from the place or institution referred to in the root. The vowel quality of the vowel position is picked up from the stem it attaches to (underscored to the left).

(222) tonic -[$_{\mathrm{Ft}}$'Vːn]

Country name	*Derivation*	*Translation*
Kampuchea	(kampuche-'aːn)$_{\omega}$	‘Kampuchean’
Kuba	(kub-'aːn)$_{\omega}$	‘Cuban’
Angola	(angol-'aːn)$_{\omega}$	‘Angolan’
Bolivia	(bolivi-'aːn)$_{\omega}$	‘Bolivian’
Rumänien	(rum-'äːn)$_{\omega}$	‘Romanian’
Chile	(chil-'eːn-are)$_{\omega}$	‘Chilean’
Italien	(itali-'eːn-are)$_{\omega}$	‘Italian’

The reason why we should consider this suffix as tonic is the fact that it retains vowel quality and some quantity in derivation with *-eri* (*charlat*[ɑ·]*ane*'*ri* ‘charlatanism’, see (197)) and that it is derived with *-sk* (*rumänsk* ‘Romanian’, *amerikansk* ‘American’) rather than *-isk* (see (198)).[17]

Beyond this suffix, the combination of unspecified roots with tonic suffixes (type 14) results in two separate prosodic words.

(223) unspecified & tonic (type 14)

root & suffix		
((kontrol'ler)$_{\omega}$([ˌbar])$_{\omega}$)$_{\omega}$ $^{\max}$	‘controllable’	*(kontroller'bar)$_{\omega}$
((da'ter)$_{\omega}$([ˌbar])$_{\omega}$)$_{\omega}$ $^{\max}$	‘datable’	
((ef'fekt)$_{\omega}$([ˌfull])$_{\omega}$)$_{\omega}$ $^{\max}$	‘striking’	*(effekt'full)$_{\omega}$
((res'pekt)$_{\omega}$([ˌfull])$_{\omega}$)$_{\omega}$ $^{\max}$	‘respectful’	
((tempera'ments)$_{\omega}$([ˌfull])$_{\omega}$)$_{\omega}$ $^{\max}$	‘temperamental’	

((redak'tör)$_{\omega}$([ˌskap])$_{\omega}$)$_{\omega}$ ^{max}	‘editorship’	*(redaktör'skap)$_{\omega}$
((re'vis-or)$_{\omega}$([ˌskap])$_{\omega}$)$_{\omega}$ ^{max}	‘auditorship’	

(223) shows that a tonic suffix does not normally incorporate preceding material into its own prosodic word. Instead, two prosodic words are formed, although the prosodic specifications as such are in harmony. Why this should be is an open question. Tonic suffixes are always derivational and therefore relatively contentful, semantically, a fact which might be part of the picture, but, on the other hand, so are unspecified roots, and they do combine with both unspecified and posttonic **(p.217)** suffixes. More likely, there is a blocking effect to incorporation from the left edge of tonic morphemes (of any kind). If this is true, the blocking would be overridden only when there is a specific factor requiring incorporation, as in the case of -[$_{\mathrm{Ft}}$'Vːn], where the vowel quality must be taken from the root. We have seen something similar with the pretonic prefixes *be-* and *för-*, which adjoin rather than fully incorporate to the right (see 5.2.2).

The next set of combinations are the contradictory specifications (types 6–8). Since roots are never prosodically dependent, the combination of pretonic (always a prefix) and posttonic (always a suffix) cannot occur, as seen in type 6. The combinations of two pretonic (type 7) or two posttonic affixes (type 8) are also ruled out. This shows the robustness of these specifications in derivational endings. Only the posttonic derivational suffix *-or* is flexible in this way, as we saw in (211). We mark particular properties on the part of single morphemes like this with ‘x’ and the number of the type they belong to, and italicize the mildly surprising attested forms.

(224) Incompatible combinations

6	pretonic	posttonic	Incompatible *	*(be-[…]-ning) *(för-[…]-else)	n/a	n/a
7	pretonic	pretonic	Incompatible *	*(be-['för-['komma) *(för-['be-['låna)	n/a	n/a
8	posttonic	posttonic	Incompatible *	*('gryn]-'ing]-ig)	n/a	n/a
8x	$_{\text{Ft}}$]-*or*			(*pro* ^{0} *fess*]-'*or*]-*lig*)	n/a	last wins

Next we have the prosodically specified first elements in combination with unspecified second elements (types 9–11). In these cases, there is a conflict between the stress placement requirements of the lexical specifications and the phonological stress assignment (195). The latter is driven by the conditions of Exhaustive parsing and Culminativity.

(225) Incompatible combinations

9	pretonic	unspec.	Incompatible *	*(be-['salu'tera) *(för-['indig'nera)	n/a	n/a
10	posttonic	unspec.	Incompatible *	*(krimi'nal]-ar-'at)	n/a	n/a
10x	$_{Ft}$]-*or*			(*pro* ^{0} *tekt*]-*or*-'*at*)	n/a	last wins
11a	tonic rt	unspec. sfx	Incompatible *	*['glöm]i'tet	n/a	n/a
11x		*-eri*		([^{0} *slip*]-*e*'*ri*)		last wins
11b	tonic rt or pfx	unspec. rt & sfx			('spindel)(fo‚bi) ('o)(professio ‚nell)	none

Pretonic and posttonic specifications remain robust in these combinations, ruling out types 9 and 10. Again, the only exception is the derivational suffix *-or*, which yields to unspecified suffixes and the placement of phonological stress (*protekto'rat*).

(p.218) Tonic first elements (here: roots or prefixes) are not quite as robust. Most unspecified suffixes do not show up in combination with tonic roots (**glömi'tet* 'forgetfulness'), a static fact that we interpret as evidence of the prosodic infelicity of word formation with morphemes that have incompatible prosodic properties. However, the semantic usefulness of some suffixes shows that word formation will sometimes take place anyway, and in these cases the conflict is resolved in favour of the suffix (type 11x). While Culminativity is fulfilled by stress on the suffix in all such cases, some noticeable traces of lexical stress are retained on the lexically specified root, granted that it normally contains a long vowel and that it does not end up adjacent to the phonological stress taken by the suffix. In all nominal formations, long vowels come out as half-long and with the original vowel quality (see (197), where this pattern was used to identify lexical tonicity). The verbal formations tend to reduce tonic roots more. Tonic roots containing short vowels cannot be diagnosed in this way, and they are simply denoted here as tonic on the basis of origin and the static evidence provided by their general lack of flexibility in word formation with prosodically incompatible morphemes.

Supremely productive among these suffixes is nominalizing *-eri* (also in other Germanic languages) which denotes ongoing activity or place where the activity denoted by the root takes place. Other less productive suffixes are *-tek* (place-denoting), *-ist* and *-när* (person-denoting), *-ism*, *-age*, *-tion*, and *-at* (general nominalizers), and the verbal suffixes containing *-er-*.

(226) Unspecified suffixes that combine with tonic roots

-eri	sl['iː]pa	‘to grind’	(^{0}sl[i·]pe'ri)$_\omega$	‘grindery’
	br['yː]	‘care’	(^{0}br[y·]de'rier)$_\omega$	‘perplexities’
-tek	l['eː]k	‘play’	(^{0}l[e·]ko'tek)$_\omega$	‘play place’
-ism	g['øː]t	‘Geat’	(^{0}g[ø·]ti'cism)$_\omega$	‘Geaticism[18]’
-ist	pr['uː]sa	‘prose’	(^{0}pr[ʊ·]sa'ist)$_\omega$, (^{0}pr[ʊ]sa 'ist)$_\omega$	‘id.’
-age	'last	‘load’	(^{0}last'age)$_\omega$	‘id.’
	'buske	‘bush’	(^{0}busk'age)$_\omega$	‘shrubbery’
	'läcka	‘leak’	(^{0}läck'age)$_\omega$	‘leak’
-tion	'munter	‘merry’	(^{0}muntra'tion)$_\omega$	‘jollification’
	'segla	‘to sail’	(^{0}s[e·]gla'tion)$_\omega$	‘sailing’
	'bygga	‘to build’	(^{0}byggna'tion)$_\omega$	‘construction’
	'lustig	‘funny’	(^{0}lustifika'tion)$_\omega$	‘jollification’
-at	'falsk	‘false’	(^{0}falsifik'at)$_\omega$	‘falsification’
	'sold	‘pay’	(^{0}sold'at)$_\omega$	‘soldier’
-när	'sold	‘pay’	(^{0}sold'när)$_\omega$	‘mercenary’
	'tull	‘customs’	(^{0}tull'när)$_\omega$	‘customs officer’
	'gäld	‘debt’	(^{0}gälde'när)$_\omega$	‘debtor’
	'borgen	‘bail’	(^{0}borge'när)$_\omega$	‘creditor’

	'resa	‘to travel’	(^{0}rese'när)$_{\omega}$	‘traveller’
-era	'stil	‘style’	(^{0}stili'sera)$_{\omega}$	‘stylize’
	'halv	‘half’	(^{0}hal'vera)$_{\omega}$	‘to divide in half’
	'lack	‘lacquer’	(^{0}lac'kera)$_{\omega}$	‘to lacquer’
	'pik	‘jibe’	(^{0}pi'kera)$_{\omega}$	‘to jibe’
	'frukost	‘breakfast’	(^{0}frukos'tera)$_{\omega}$,	‘to have breakfast’
-isera	'pulver	‘powder’	(^{0}pulvri'sera)$_{\omega}$	‘to pulverize’
	van'd[ɑ:]l	‘id.’	(van^{0}d[a]li'sera)$_{\omega}$	‘to vandalize’
-ifiera	'kod	‘code’	(^{0}kodifi'era)$_{\omega}$	‘to codify’
	bil'jett	‘ticket’	(bil^{0}jet'tera)$_{\omega}$	‘to write ticket for’
	'dansk	‘Danish’	(^{0}danifi'era)$_{\omega}$	‘to make Danish’
	'vers	‘verse’	(^{0}versifi'era)$_{\omega}$	‘to versify’
	'snutt	‘snippet’	(^{0}snuttifi'era)$_{\omega}$	‘to divide into snippets’

(p.219)

Derivation with the productive *-eri* suffix may also target compounds. In these cases, we find two types of prosodic output: the morphologically expected formation of a single prosodic word with stress on the final morpheme (227a), and prosodic compound formation (227b). Some forms vary between these structures. The productive pattern, as evidenced by novel formations (227c), is to form a single prosodic word.

(227) *-eri* derivations from compounds (and phrases)

a. $(^{0}\text{fyr}_{0}\text{verke'ri})_{\omega}$ ‘fireworks’ (⟨ '*fyr*,*verk* ‘fire things’ obs.), $(^{0}\text{an}_{0}\text{give 'ri})_{\omega}$ ‘informing’ (⟨ '*an*,*ge* ‘to snitch’), $(^{0}\text{gäst}_{0}\text{give'ri})_{\omega}$ ‘inn’ (⟨ '*gäst* ,*givare* ‘inn keeper’), $(^{0}\text{sko}_{0}\text{make'ri})_{\omega}$ ‘shoemaker’s shop’ (⟨ '*sko* ,*makare* ‘shoemaker’), $(^{0}\text{lant}_{0}\text{mäte'ri})_{\omega}$ ‘land surveying’ (*mätning av land* ‘land surveying’)
b. $(('\text{sko})_{\omega}(_{0}\text{make,ri})_{\omega})_{\omega}{}^{\max}$, $(('\text{lant})_{\omega}(_{0}\text{mäte,ri})_{\omega})_{\omega}{}^{\max}$, $(('\text{rätts})_{\omega}(_{0}\text{have,ri})_{\omega})_{\omega}{}^{\max}$ ‘dogmatism’, $(('\text{rätts})_{\omega}(_{0}\text{have,rist})_{\omega})_{\omega}{}^{\max}$ ‘dogmatist’
c. $(^{0}\text{är}_{0}\text{bare'ri})_{\omega}$ e.g. ‘ongoing being honourable’ (⟨ '*är*,*bar* ‘honourable’), $(^{0}\text{land}_{0}\text{skape'ri})_{\omega}$ e.g. ‘persistent painting of landscapes’ (⟨ '*land*,*skap* ‘landscape’), $(^{0}\text{blå}_{0}\text{gule'ri})_{\omega}$ e.g. ‘exaggerated exhibition of the Swedish national symbols’ ('*blå*,*gul* ‘blue-yellow’)

There are also some verb forms of this type, which are less productive, and always have the prosodically predicted shape.

(p.220) (228) *-era* derivation from compounds

$(^{0}\text{för}_{0}\text{skot'tera})_{\omega}$ ‘to provide advance’ (⟨ '*för*,*skott* ‘advance’), $(^{0}\text{ar}_{0}\text{vo'dera})_{\omega}$ ‘to pay fee for’ (⟨ '*ar*,*vode* ‘fee’), $(^{0}\text{bo}_{0}\text{lagi'sera})_{\omega}$ ‘to convert into company’ (⟨ '*bo*,*lag* ‘company’)

These data indicate that the structures are single prosodic words, and as such they are subject to the condition on Culminativity, allowing for only one phonological stress. To meet this requirement, lexical stress on the root is removed (all roots, in the case of compounds), even if it is lexically specified (and expected to be prosodically stable). The phonetic effects of stress, however, remain to some extent, i.e. with the quality and some quantity of long vowels retained, as previously seen in (197). Main stress is assigned in the regular phonological fashion, to the last available syllable. Lexical prosodic specification is thus not heeded and the derivational process treats stems as if they were unspecified.

If the prosodically unspecified latter element of a compound made up of tonic and unspecified contains a root morpheme, a prosodic compound will regularly result (type 11b). The formation of a single prosodic word in type 11x is thus contingent on the unspecified element being a derivational ending. This is a morphological fact rather than a prosodic one.

The last set of formations are all prosodically harmonic, i.e. types 12–13 and 15–16. These have all been richly illustrated earlier in this section and we add only a few comments here.

(229) Harmonic combination

12	unspec.	unspec.	Harmonic	(na-tion-'ell) (agora-fob-'i)	(naviga'tions) (posi‚tion) ('neo)(konserva ‚tiv)	none
13	pretonic	tonic	Harmonic	(be-['röv]a) (för-['del]a)	(('be-])(‚ar) (‚beta)) (('för-])(‚an) (‚leda))	Promotion of pfx
15	tonic	posttonic	Harmonic	(['vän]-lig) (['led]-are)		n/a
16	unspec.	posttonic	Harmonic	(rekord-'er]-lig) (krimi'nal]-are)		n/a

Combination of two or more unspecified morphemes will result in either a single prosodic word or more prosodic words (type 12). Both combinations are harmonic and the decision will be made on morphological or semantic grounds. If the second element is a suffix, then a single prosodic word results, if there are two roots in the structure, the normal result is two prosodic words. We discussed the exceptions to this in section 10.3.1, i.e. neoclassical compounds and similar formations with prefix-like first elements.

As for type 13, both single and double prosodic words are harmonic results, as in both cases the prefix is pretonic (see section 10.2.3). The latter type, however, **(p.221)** where the prefix gets promoted to a full prosodic word, is no longer productive. It does show, however, that incorporation of morphemes to the left of a tonic morpheme does not come easily in Swedish. It worked with tonic second elements only for the suffix -[$_{\text{Ft}}$'V:n], which recruits vowel quality from the preceding syllable. The pretonic prefixes also provide evidence of this resistance, when it comes to attachment to compounds which form maximal prosodic words. Compounds will only admit incorporation of prosodic words, to the left, and we interpret the promotion of *be-* and *för-* in this position as a way of meeting this requirement.

The combination of tonic and posttonic (type 15, '*vänlig*) is fully harmonic as long as the stress of the tonic morpheme is located in the last syllable. This is the common case as roots are predominantly monosyllabic in Swedish as in the other Germanic languages (Golston and Wiese 1998).

The combination of unspecified and posttonic (type 16, *krimi*'*nalare*) results in a single prosodic word, where the lexical prosodic information guides the phonological stress placement (the General stress rule) to the right syllable. Given the distinction between tonic and unspecified morphemes, it would not be right to consider the posttonic suffixes as *prestressing*. They only appear to be prestressing when combining with unspecified roots. It is better to consider them posttonic and for the placement of stress to be negotiated between the general stress rule in interaction with the specification of the suffix.

In the analysis given, we have endeavoured to capture the distinction between the harmonic and the incompatible in the prosodic arena, and tie that distinction to productivity of word formation in a general way. Everything else being equal, prosodically harmonic formations should be favoured, while the formation of forms with prosodically incompatible specifications should require justification outside prosody. The incompatible formations we have looked at, e.g. *-eri* (and scattered forms with suffixes *-lek*, *-ism*, *-age*, etc.), were due to semantic factors. The semantic need, so to speak, makes these formations productive in the language, even though they do not come out prosodically harmonic. In other cases, override is to be explained prosody-internally, and understood in terms of lexical properties of individual suffixes. Thus, *-or* is posttonic like most other syllabic suffixes, but also has the property of having a weaker claim on posttonicity than all other posttonic derivational suffixes, allowing it to combine with other posttonic suffixes. Also the case of -[$_{\text{Ft}}$'Vːn] falls into the category of prosody-internal explanation, i.e. there is a phonological reason for its unusual behaviour, namely its unspecified vowel quality.

When we now turn to inflectional endings, override is commonplace and due to syntax which requires forms to be inflected in various ways and positions.

(p.222) 10.5 Prosodic specification in inflection

Inflections are invariably suffixes in Swedish. They are either posttonic or unspecified. Most syllabic inflectional suffixes are posttonic (e.g. plurals *-ar*, *-or*; agreement markers *-a*, *-e*), and some are unspecified (e.g. def.art. *-n*, *-et*). The unspecified inflectional suffixes never attract stress, however, and this is a distinction with respect to derivational suffixes. We take this to be a consequence of the stress assignment being lexical, whereas inflection is assigned in the syntax.[19]

10.5.1 Posttonic inflectional morphemes

To establish the posttonicity of inflectional suffixes there are two main sources of information. There are some effects where the suffix is seen to control the placement of stress, e.g. with the single transparent posttonic derivational suffix *-or*, which yields stress to inflectional suffixes: *pro*'*fess*]-*or*~*profes*'*sor*]-*er*. There are a couple of other instances where similar behaviour is in evidence, e.g. when secondary stress is promoted to main stress, given in (230).

(230) Posttonicity in inflectional suffixes

a.

sg.	'hutu /hʉtʉ/ ‘Hutu’	pl.	hu'tu]-er, also 'hutuer
	'baryton /bɑryton/ ‘baritone’		bari'ton]-er, bari'täng]-er

b.

sg. 'by,rå /byro/ ‘chest of drawers’ pl. ^{0}by'rå]-er, also 'by,rå]-ar

The other source of information on the posttonicity in inflectional suffixes is their tonal behaviour. Posttonic suffixes in general tend strongly to induce accent 2. However, this will only happen when the suffix is adjacent to the stressed syllable, i.e. under locality, see (231). Since inflections must be permitted also in disyllabic roots, accent 2 can sometimes not be assigned, and the result is then the accent 1 default as in (131). Like before, the suffixes that induce accent 2 are marked with a subscripted ‘2’. In CSw the lexical tone happens to be H. The accent of the whole word is marked with a superscripted digit before primary stress. It is sometimes useful to indicate the absence of a lexical tone, and we do this with a subscripted ‘0’.

(231) No accent 2 assignment under non-locality

a.

sg.	[^{1}'bil]	‘car’	pl.	[^{2}'bil]-ar$_{2}$	acc. 2
	[^{1}'cir]kus	‘circus’		[^{1}'cir]kus]-ar$_{2}$	acc. 1
	[^{1}'kle]matis	‘clematis’		[^{1}'kle]matis]-ar$_{2}$	acc. 1
	[^{1}'komp]-is$_{0}$	‘chum’		[^{1}'komp]-is$_{0}$]-ar$_{2}$	acc. 1

(p.223)

b.

sg.	[^{1}'ros]	‘rose’	pl.	[^{2}'ros]-or$_{2}$	acc. 2
	[^{2}'kann]-a$_{2}$	‘jug’		[^{2}'kann]-or$_{2}$	acc. 2
	[^{1}'o]<u>per</u>]-a$_{2}$	‘id.’		[^{1}'o]<u>per</u>]-or$_{2}$	acc. 1
	[^{1}'ka]<u>mer</u>]-a$_{2}$	‘camera’		[^{1}'ka]<u>mer</u>]-or$_{2}$	acc. 1

The second argument here is more theory dependent than the first, that is, it requires that one accepts the idea that lexical tone (yielding output accent 2) is a property of many suffixes and that it is assigned to the primary stressed syllable from suffixes, under locality. For instance, Teleman, Hellberg, and Andersson (1999) consider accent 1 in *cirkusar, opera*, etc. to be due to the fact that the singulars, too, have accent 1. The data in (231) do not contradict such a view. There are, however, strong arguments for assuming that lexical tone is a property of many suffixes (beside some roots), see chapter 11 (Riad 2009a, 2009b, 2012).

Posttonic, inflectional suffixes will often occur outside derivational posttonic suffixes. The common result is then accent 2, by virtue of the derivational suffix, which is in locality with primary stress.

(232) Posttonicity: Accent 2 assignment despite non-local inflections

[^{2}'tid]-ning$_{2}$	‘newspaper’	[^{2}'tid]-ning$_{2}$]-ar$_{2}$	‘newspapers’	acc. 2
[^{2}'trev]-lig$_{2}$	‘nice’	[^{2}'trev]-lig$_{2}$]-a$_{2}$	‘nice, wk’	acc. 2
[^{2}'sot]-ig$_{2}$	‘sooty’	[^{2}'sot]-ig$_{2}$]-e$_{2}$	‘sooty, wk’	acc. 2

We can infer that the inflectional endings here have no tonal effect by looking at derivations where there is an accent-neutral ending preceding the inflectional suffix. In these cases, accent 1 results, by virtue of non-locality (cf. *kompisar* in (231a)).

The plural endings of forms like *marknader* ‘markets’ and *frestelser* ‘temptations’ occur outside derivational endings, but are not necessarily tone carriers. In *marknader* it is *-er* which sometimes induces accent 2 (^{2}'*dikter* ‘poems’), but sometimes does not (^{1}'*joner* ‘ions’). The analysis here is that in one case there is a real syllabic suffix, carrying accent 2 (*-er* $_{2}$), in the other case just the *-r* which causes epenthesis after a consonant final stem, but carries no tonal information. Non-syllabic suffixes, then, are taken to not have prosodic properties. In particular, they never seem to induce accent 2, which indicates that they at least do not carry tone.[20]

A list of several syllabic inflectional posttonic suffixes is given in (233). A couple of them are accent-neutral, others accent 2-inducing (as marked).

(p.224) (233) Posttonic inflections

-re	^{1}'läng]-re	‘longer’	^{1}'bätt]-re	‘better’	adj., comp.	acc. 1
-de/-te	^{2}'vän]-de$_{2}$	‘turned’	^{2}'smäl]-te$_{2}$	‘melted’	vb, pret.	acc. 2
-dde	^{2}'tro]-dde$_{2}$	‘thought’	^{2}'klå]-dde$_{2}$	‘beat up’	vb, pret.	acc. 2
-es	^{2}'sök]-es$_{2}$	‘is sought’	^{2}'finn]-es$_{2}$	‘is found’	vb, pass.	acc. 2
-it	^{2}'stul]-it$_{2}$	‘has stolen’	^{2}'funn]-it$_{2}$	‘has found’	vb, p.ptcp.	acc. 2
-en	^{2}'stul]-en$_{2}$	‘stolen’	^{2}'funn]-en$_{2}$	‘found’	vb, p.ptcp.	acc. 2
-na	^{2}'stul]-na$_{2}$	‘stolen’	^{2}'kom]-na$_{2}$	‘come’	vb, p.ptcp. pl.	acc. 2

10.5.2 Unspecified inflectional morphemes?

No inflectional morpheme ever attracts stress to itself, whether primary or secondary. The question that arises is whether there are any prosodically unspecified inflectional suffixes at all. The issue can be broken down into two parts. First, there are many suffixes which are non-syllabic or alternating syllabic/non-syllabic. For these, we shall assume that they cannot carry prosodic specification, either metrical or tonal. That must be the null-hypothesis and it also fits well with the diachronic development where suffixes that induce accent 2 are invariably posttonic, syllabic, and formerly stressed (Riad 1998a). For the suffixes that do not induce accent 2, their syllabic form is often apparent, that is due to epenthesis, and so they are really non-syllabic. The categorization in (234) differs from that in Teleman et al. (1999; SAG 3:§43), mostly because we factor in the tonal behaviour, unlike SAG. Thus, forms like ^{1}'*spring-er* ‘runs’ and ^{1}'*jon-er* ‘ions’ are here taken to get accent 1 by virtue of taking a non-syllabic *-r* as suffix. For the nouns this will contrast with e.g. ^{2}'*dikt-er* $_{2}$ which has a syllabic and accent 2-inducing suffix *-er* $_{2}$.

(234) Non-syllabic inflectional suffixes

Suffix	Non-syllabic	Syllabic by epenthesis		
-r, present	går /go-r/	‘walks’	springer /spriŋᵘ-•r/	‘runs’
-r, plural	skor /sku-r/	‘shoes’	jon-er /jun-•r/	‘ions’
-n, def. art.	trappan /trɑpᵘ-ɑ$_2$-n/	‘the staircase’	bok-en /buk-•n/	‘the book’
-n, plural	täcken /tɛkᵘ-e$_2$-n/	‘covers’	huvud-en /hʉvʉd-•n/	‘heads’
-t, neut. concord	vackert /vɑkᵘ•r-t/	‘beautiful’		
-s, passive	bryts /bryt-s/	‘breaks’		

There are of course also a number of syllabic inflectional suffixes. Most of these are straightforwardly posttonic as well as accent 2-inducing, see (233). For other suffixes it is harder to establish posttonicity, in particular the neuter definite article *-et* which, unlike the common gender definite article *-(e)n* exhibits clearer syllabic behaviour in Swedish (Riad 2003b). The definite articles (also plural *-na*, as in [1]'*bar-na* 'the children', [1]'*klematisar-na* 'the clematises', [2]'*vandrar-na* 'the wanderers') have no effect on tone and are therefore clearly unspecified for it.

(p.225) Lahiri et al. (2005b) argue that the definite articles are clitics in Swedish and that this makes them prosodically inert, and at any rate invisible to the phonological stress rule (see (208)). The specific point here is to avoid wrongfully predicting stress attraction to any inflectional suffix. Thus, the definite form of nouns formed by a sequence of unspecified morphemes will never change the placement of stress: *posi'tion-en* 'the position', *drama'tik-en* 'the dramatics'. It might be added here that, where comparable, the definite articles exhibit the same behaviour as the suffix *-(i)sk* with regard to prosodic adjustments to the favoured disyllabic shape of stems, e.g. *regel-n* (**regel-en*) 'the rule' vs. *del-en* (**del-n*) 'the part'. This is not strictly posttonicity, but the parallel behaviour invites parallel analysis. We shall assume that, barring evidence to the contrary, all syllabic inflectional suffixes are posttonic.

10.6 Unspecified function words

The four classes of morphemes discussed up to this point in this chapter participate in the formation of prosodic words. As is often noted, there are also words that do not spontaneously form prosodic words, and typically it is function words that belong in this class. We encountered one set of such words in the discussion of *d*-continuization. In fact, *d*-continuization identifies precisely this property, as it singles out a class of words that undergoes weakening in a particular context.

(235) Prosodically unspecified words targeted by *d*-continuization

du, dej	'you, sg.nom./obl.'
dom	'they; them'
den, det	'it, c.g./neut.'
din, ditt, dina	'your, sg., c.g./neut./pl.'
den-'här, det-'här, de-'här	'this one, c.g./neut./pl.'
den-'där, det-'där, de-'där	'that one, c.g./neut./pl.'
den-[1]'samma, det-[1]'samma, de-[1]'samma	'the same, c.g./neut./pl.'
då, da	'then'

On the basis of the unstressed morphemes in (235) we can straightforwardly include other morphemes with similar meaning and function, i.e. the other monosyllabic personal pronouns.

(236) Prosodically unspecified words, by parallel

jag, mej	‘I, me’
vi, oss	‘we, us’
hon, henne	‘she, her’
han, honom	‘he, him’

(p.226)

The personal pronouns that begin with /h/ are subject to *h*-loss when incorporated into a preceding prosodic word (see 6.1). This indicates that they are probably lexically unstressed. When the same pronouns occur with /h/ retained this should mean that they are initial in a prosodic word, but it need not mean that they are stressed, given the distribution of /h/ given in (137). Instead, we may analyse such cases as incorporation to the right into a prosodic word, which then licenses the pronunciation of /h/.

(237) Incorporation into prosodic word

han (^{2}ˈtalar)$_{\omega}$	⟩	(han (^{2}ˈtalar)$_{\omega}$)$_{\omega}$ $^{\max}$	[han^{2}ˈtɑːlar]	‘he speaks’
han (^{2}ˈspanar)$_{\omega}$	⟩	(hon (^{2}ˈspanar)$_{\omega}$)$_{\omega}$ $^{\max}$	[hʊn^{2}ˈspɑːnar]	‘she gazes’
cf.		(hisˈtoria)$_{\omega}$ $^{\max}$	[hɪs^{1}ˈtuːrɪa]	‘history’
		(heralˈdik)$_{\omega}$ $^{\max}$	[hɛ̯ralˈdiːk]	‘heraldry’
but		(ˈtog hon)$_{\omega}$ (ˈDIT den)$_{\omega}$	[ˈtuːgʊn^{1}ˈdiːtɛ̯n]	‘did she bring it there?’
		(ˈGÅR han)$_{\omega}$ (ˈsen)$_{\omega}$	[ˈgoːranˈsɛ̯nː]	‘will he leave then?’

Many function words seem to be sometimes stressed, sometimes unstressed. This raises the question of their lexical status in the prosodic perspective. We may assume that they are typically unstressed, and that they are given stress as a function of accenting. There is no obvious way in which we can separate stress from accent here, so our null hypothesis should be that it is accent that compels stress in certain contexts, as accent cannot be carried by an unstressed syllable. A possible expectation is that there could probably be words that cannot be naturally stressed or accented in any context beyond pure citation form. The one word that seems to fulfil this task for Swedish is *ju*, which is used as a particle that confirms the proposition of the utterance (cf. German *ja*), and in the comparative construction *ju…ju*, *ju…dess*, or *ju…desto* 'the…the' (as in *the more the merrier*).

(238) Unstressed *ju*

a.

Eva är ju inte här än	'Eva isn't here yet, though'
Anne kommer ju vid sju	'Anne will show up at seven'

b.

ju varmare ju bättre	'the warmer the better'
ju förr dess/desto bättre	'the sooner the better'

This morpheme cannot be stressed or accented in normal syntax (like German *ja*). We may take this as an indication that there is a class of function words that are not stressed and cannot ever receive stress (*ju*), beside those that are unstressed but can become stressed if accented (*den*). Yet other function words are always stressed, that is tonic, but variably show up as accented or unaccented depending on context (*denna*). Whether there are function words that are basically tonic but admit destressing (beyond deaccenting), is at this point an open question and not all that easy to test for.

(p.227) 10.7 Etymology

It is easy to get the impression that the Swedish lexicon is etymologizing, 'Germanic' morphemes combining with 'Germanic' morphemes, and 'Foreign' morphemes combining with 'Foreign' morphemes.

(239) The etymological impression

'Germanic'	$(^{2}$'styr-ning$)_{\omega}$	'steering'
	$(^{2}$'finn-as$)_{\omega}$	'to exist'

	(^{2}'lys-ande)$_{\omega}$	‘brilliant’	$^{+}$lys-ant
‘Foreign’	(naviga-'tion)$_{\omega}$	‘navigation’	
	(exist-^{1}'era)$_{\omega}$	‘to exist’	
	(brilj-'ant)$_{\omega}$	‘brilliant’	$^{+}$brilj-ande

However, to the extent that this patterning is true it is dependent on prosodic specification, rather than on etymology. To see this properly one should look at the combinatorics empirically and establish what cross-over effects there are and how natural/intuitive they are, or not. Here, we will just point to the predictions that the prosodic account makes regarding the expected shape of stems in the CSw lexicon. Barring overriding influences, we would expect the harmonic combinations to profuse, and the disharmonic combinations not to show up or only show up under some kind of pressure (semantic). In particular, this model gets away from specifying any part of the CSw lexicon as ‘native’ or ‘foreign’ which would structure or interfere in word formation in any meaningful sense (as against e.g. Weinstock 1970; Linell 1972: 16; Baeskow 2004; Basbøll 2005). This can all be reduced to prosodic information, which is overt and directly accessible to the language-learning child. We also get a better understanding of the cases where foreign and native combine, and where they do not, if we look at their prosodic properties rather than at their etymological ones. A good test case is the harmonic type 16, where an unspecified root (or a sequence of unspecified morphemes) combines with a posttonic suffix. Here it is frequently the case that foreign combines with native.

(240) Foreign unspecified root + Germanic posttonic suffix

(rekor^{1}'der-lig)$_{\omega}$	‘good, reliable’	(speci^{2}'al-are)$_{\omega}$	‘(a) special’
(per^{1}'son-lig)$_{\omega}$	‘personal’	(krimi^{2}'nal-are)$_{\omega}$	‘(police) detective’
(^{2}'chef-ig)$_{\omega}$	‘bossy’	(instrumen^{2}'tal-are)$_{\omega}$	‘instrumental piece’
(gar^{1}'der-ing)$_{\omega}$	‘hedging’	(^{2}'mobb-ning)$_{\omega}$	‘mobbing’
(kontinu^{1}'er-lig)$_{\omega}$	‘continuous’	(sum^{1}'mer-ing)$_{\omega}$	‘summation’
(na^{1}'tur-lig)$_{\omega}$	‘natural’	(rubri^{1}'cer-ing)$_{\omega}$	‘heading’
(proportio^{1}'ner-lig)$_{\omega}$	‘proportional’	(kanali'ser-ing)$_{\omega}$	‘channelling’

(sym^{1}'metr-isk)$_{\omega}$	‘symmetric’	(klassifi^{1}'cer-ing)$_{\omega}$	‘classification’
(peri^{1}'od-isk)$_{\omega}$	‘periodic’	(miljo^{2}'när-ska)$_{\omega}$	‘millionaire, fem.’
(epi^{1}'sod-isk)$_{\omega}$	‘episodic’	(fri^{2}'sör-ska)$_{\omega}$	‘hairdresser’
(ana^{1}'log-isk)$_{\omega}$	‘analogical’	(stu^{2}'dent-ska)$_{\omega}$	‘student, fem.’
(^{1}'man-isk)$_{\omega}$	‘manic’		

(p.228)

Prosodically these are entirely well formed, as predicted by the analysis above. Etymology, however, has nothing to say for them. Also with the harmonic combination of unspecified roots (of foreign origin) with tonic Germanic suffixes, etymology must be silent. But this is a fully productive and natural combination, as predicted by the prosodic approach advocated here (type 14).

(241) Foreign unspecified root + Germanic tonic suffix

(kontrol^{2} 'ler)$_{\omega}$(ˌbar)$_{\omega}$	‘controllable’	(redak^{2} 'tör)$_{\omega}$(ˌskap)$_{\omega}$	‘editorship’
(da^{2}'ter)$_{\omega}$(ˌbar)$_{\omega}$	‘datable’	(re^{2} 'visor)$_{\omega}$(ˌskap)$_{\omega}$	‘auditorship’
(ef^{2}'fekt)$_{\omega}$(ˌfull)$_{\omega}$	‘striking’	(kon^{2}'tur)$_{\omega}$(ˌlös)$_{\omega}$	‘vague’
(res^{2}'pekt)$_{\omega}$(ˌfull)$_{\omega}$	‘respectful’	(res^{2}'pekt)$_{\omega}$(ˌlös)$_{\omega}$	‘disrespectful’
(tempera^{2} 'ments)$_{\omega}$(ˌfull)$_{\omega}$	‘temperamental’		

Also type 15 is of interest, in principle, where tonic roots are combined with posttonic suffixes. We might expect this to be a reasonable context for crossover, i.e. the case where a Germanic root combined with a posttonic foreign suffix. There is, however, none or very little of that. The reason is that there are very few posttonic suffixes that are not also Germanic. The two best cases of posttonic foreign suffixes are *-iker* (*magiker* 'magician', *diagnostiker* 'diagnostician') and *-or* (*doktor* 'doctor', *professor* 'id.'). Both functionally compete with the agent noun ending *-are*, which is originally Romance, but for a very long time an integrated suffix in the Germanic languages (*lärare* 'teacher', *nybörjare* 'beginner'). In Swedish it is clearly the most productive suffix in the category. Also, at least *-iker* appears to subcategorize for stems with typical endings like *-i*, *-ik*, or *-et-ik* with final stress by virtue of the General stress rule. The forms with the posttonic suffix *-iker* will come out here with stress in a different syllable (cf. *ma'g-i*, *'mag-iker*). All these properties make *-iker* rather special and unlikely to attract new roots (putative $^{+}$ *lag-iker* 'law abider', $^{+}$ *häd-iker* 'heretic'). Equally, *-or* would not seem able to attract new roots, certainly not in competition with *-are*.

Another suffix of foreign origin is hypocoristic *-is*, which is originally borrowed from Latin. This ending goes with any root (*kändis* 'famous person', *kondis* 'fitness'), but that root has to be shaped into a single syllable according to the specific hypocoristic word formation procedure (see 7.2). Thereby, this suffix will behave just like the other Germanic ones that occur in the same function (*-e* $_2$, *-a* $_2$, *-an* $_2$).

(p.229) This rather makes the point that the etymologizing view of the lexicon is not going to be able to express the patterns in any principled way. Borrowed morphemes will not form a homogeneous group in Swedish. Some will get shaped into native-likeness such as *-are* $_2$, while others might retain properties shared with a subgroup (*-iker*). For any suffix, particular patterns in terms of subcategorization may develop.

10.8 Conclusion

The exposition of Swedish stress in this chapter brings Swedish closer to the dominance systems of Japanese, Basque, and Greek, where morphemes are taken to be prosodically specified in different ways that determine and/or influence the resultant stress pattern (Riad 2012). The big difference with respect to these systems is the very limited override of prosodic specifications in Swedish word formation. Typical dominance systems have regular override in cases of conflicting specification. Swedish instead clearly avoids generating those structures, or forms more complex structures within the prosodic word, i.e. by admitting several minimal prosodic words, each constituting its own culminativity domain, into one maximal prosodic word. It is this resistance to override that allows us to see how the lexicon is in fact shaped by the different kinds of prosodic information that reside in the morphemes. As far as we can see, neither a phonological characterization of the stress system nor an etymological one can manage to capture such generalizations naturally.

Notes:

([1]) A fifth class is constituted by words that do not form prosodic words, see 10.6.

([2]) I include both rule- and constraint-based analyses in these references. The important property is that stress is treated as phonological without reference to morphology.

([3]) An early critique of the overly phonological approach is given in Witting (1977: 45ff.).

([4]) A fuller account of this system is given (in Swedish) in Riad (2009b). A summary version has been published in Riad (2012).

([5]) In addition to these, there are free morphemes like *ju* (confirming adverb), *den*/*det* ‘it’, and *så* ‘so’ which do not form prosodic words unless contrastively stressed. These are discussed in section 10.6. The inflectional suffixes are either posttonic or unspecified (see section 10.5).

([6]) The very last morpheme of *banaliser-a* and *karakteriser-a*, the infinitive suffix, is not unspecified, but posttonic, and that is why stress is not on the very last syllable in these forms; see 10.2.4, for discussion.

([7]) The Swedish pattern is similar to Cairene Arabic, where a long vowel is only allowed if it is also stressed. In Cairene Arabic, the requirement is stronger in that a long vowel must be licensed by a primary stress (McCarthy 2005: 10).

([8]) This constraint corresponds to e.g. Rice’s (2006: 1177).

([9]) The suffix *-eri* is more frequent with Germanic roots than with foreign roots, among established forms.

([10]) The tonic form *isra*ˈ*el-sk* would probably derive from *isra*[ˈ*el*] ‘Israeli person’, while *isra*ˈ*el-isk* might be derived from ˈ*Isra*ˌ*el*, the name of the country, which is construed as a formal compound in Swedish.

([11]) For a fuller list, see Riad (2009b: appendix).

([12]) The short endings *-e* and *-a* are often considered part of the root, rather than as suffixes (e.g. Kristoffersen 2000 in his treatment of stress). For prosodic purposes (both as regards stress and tonal accents) it is more reasonable to treat them as suffixes. For one thing, they often go away in compounding (*gubb-mage* ‘old man’s belly’). Furthermore, the *-e* ending does not trigger the historical rule of lenition of /g/ and /k/ before front vowels (*hage* ‘enclosed pasture’ [hɑːgɛ̟], *[hɑːjɛ̟]), see 4.12.1).

([13]) The notion of dominance, well known from Greek and Japanese, is however applicable elsewhere, such as in the relationship between derivational and inflectional suffixes, where the latter must often see their posttonic specification frustrated. Tonal specifications also seem to be differently strong in different suffixes (see chapter 11).

([14]) The form is somewhat corrupt, and likely also influenced by German *monatlich* with the same meaning, in view of the [t].

([15]) This is essentially the same situation as with the pretonic prefixes *be-* and *för-*. They are normally unstressed, but sometimes stressed, yet always pretonic.

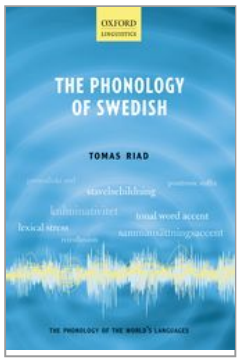
([16]) Inflections are discussed in section 10.5.

([17]) There are other suffixes indicating origin which resemble -[$_{\mathrm{Ft}}$ˈ*V:n* but which are more difficult or impossible to test for tonicity: *kin-*ˈ*es* ‘Chinese person’, *liba* ˈ*n-es* ‘Lebanese person’, *cypri-*ˈ*ot* ‘id.’, *kalma*ˈ*r-it* ‘person from Kalmar’, *malmö-*ˈ*it* ‘person from Malmö, *kana*ˈ*d-ens-are* ‘Canadian person’, *lun*ˈ*d-ens-are* ‘person from Lund’.

([18]) The idea that the Germanic people originated in Sweden.

([19]) Alternatively, we would postulate a new prosodic class of morphemes, but then also miss the generalization that these morphemes are all confined to inflection.

([20]) This would be expected in the historical perspective, where accent 2-inducing suffixes derive from former stressed syllables, which have lost their stress in clash, that is, in regular posttonic position (Riad 1998a, 2005).



The Phonology of Swedish
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Print publication date: 2013
Print ISBN-13: 9780199543571
Published to Oxford Scholarship Online: January 2014
DOI: 10.1093/acprof:oso/9780199543571.001.0001

Prosodic status of morphemes in the lexicon: tone

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DOI:10.1093/acprof:oso/9780199543571.003.0011

Abstract and Keywords

Tone is specified in most syllabic suffixes. This is here demonstrated via an analysis of the interaction of tone with less than well-formed structures, such as anacrusis, i.e. words that begin with unstressed syllables. While the stress properties of morphemes largely determine the shape of words, the tonal properties of morphemes provide a source of information on prosodic wellformedness. When a suboptimal structure arises, tone may fail to be assigned from a suffix to a preceding stress, thus giving us a window on markedness and unmarkedness of prosodic structure. Parallel patterns between suffixation in Central Swedish and compound accent in South Swedish are demonstrated. It is shown that there is a lexical distinction relating to strength of accent assignment between tonal suffixes.

Keywords: tonal suffixes, anacrusis, locality, strength

The basic properties of tone and tonal accents were described in chapter 9. In this chapter, an analysis of the distribution of lexical tone in the lexicon is proposed. As with stress, the general argument is that tone and the distribution of resultant accent 2 is largely morphologically controlled. The assumption that tone accent 2, the marked member of the privative contrast, is lexically represented is not a new one (Rischel 1963), though not all agree it is (see in particular Lahiri et al. 2005a). But there are issues relating to its distribution that have not been thoroughly discussed before, such as accent 2 induction by suffix (although see Kristoffersen 1993), interaction of lexical tone and anacrusis of the stem, and the exact contexts for the assignment of unmarked accent, i.e. what is called accent 1, which is constituted by intonation tones only.

11.1 Markedness

By ‘markedness of accent 2’ we mean that there is a tone present in the lexical representation of some morpheme. In CSw, this tone is H and it can be specified only in roots and posttonic suffixes. The most stable and general distribution of accent 2 across dialects relates to the posttonic suffixes, where typically the very same suffixes induce accent 2 in canonical contexts. The distribution of lexical tone in roots is more varied across dialects (Bruce 1998). As for realization, the lexical tone can only occur in a primary stressed syllable (the tone-bearer, tbu). Thus, while the tone is part of the lexical specification of suffixes, it is realized in an adjacent primary stressed syllable. Thus, one could say that the suffixes are tonally *preaccenting*, or that they *induce* accent 2 (the term I will mostly use, in order to avoid unclarity).[1] The fact that only such suffixes that are also posttonic may induce accent 2 is an indication of the historical relationship between stress and lexical tone in North Germanic (Riad 1998a).

(p.232) 11.2 The limited relevance of polysyllabicity

Traditional analyses of accent 2 tend to treat it as phonologically controlled in that it is associated with polysyllabicity (Kock 1878; Danell 1937: 51; Malmberg 1970: 157; Öhman 1966; Teleman 1969: 187).[2] Thus, it is common to assume that a general rule of accent assignment applies at a stage in the derivation when disyllabicity holds. In some work, the implication is that accent 2 is somehow functionally a signal of polysyllabicity (Liberman 1982). However, that amounts to a highly redundant function, the polysyllabicity being independently parsable in terms of the very syllables. Furthermore, there are plenty of polysyllabic words that exhibit accent 1 ([1]'*fänrik* ‘second lieutenant’, [1]'*bandy* ‘id.’). Some of these can be considered to be underlying monosyllables, typically those that end in *-el*, *-en*, and *-er* (e.g. [1]'*cykel* ‘bike’, [1]'*socken* ‘parish’, [1]'*seger* ‘victory’, see Rischel 1963). But even setting these aside, many polysyllabic accent 1 words remain, with nothing to explain their exceptional status in relation to the generalization.

Indeed, for initially stressed words that are longer than two syllables, accent 1 is the rule (^{1}'*gigolo* 'id.', ^{1}'*syfilis* 'syphilis', ^{1}'*Kanada* 'Canada'). Thus, not only are there many exceptions when the generalization is stated in terms of number of syllables, it also holds most satisfactorily only for disyllables to the exclusion of trisyllables. Another fact that goes unexpressed, under the view that accent 2 is a correlate of polysyllabicity, is the stability of accent across dialects in the inflected and derived set of words as opposed to disyllabic roots, where accent variation is common (Bruce 1998: 50). Furthermore, the treatment of accent 2 as postlexically assigned to polysyllables is strictly speaking not compatible with the representational and phonetic markedness of accent 2, relative to accent 1. Taken together, these are strong arguments for abandoning polysyllabicity as synchronic cause of accent 2.

There are a number of descriptions of accent 2 which relate it to morphology, in a mostly functional perspective (Elert 1972, 1981; also Raffelsiefen 2007). Firstly, the accent distinction is taken to be important for the recognition of certain suffixes (Elert 1964: 28). Secondly, Elert identifies morphological complexity as a relevant generalization for accent 2 (Elert 1981: 44). In the latter case, accent 2 is taken to carry a connective function.

(p.233) 11.3 The lexical/morphological approach

In the morphological approach to accent assumed here, the fact that accent 2 only occurs in polysyllables is merely the synchronic consequence of the two most common ways in which accent 2 is assigned, namely from posttonic syllabic suffix to stressed root, and to forms that contain two or more stresses. Both these structures trivially contain at least two syllables. Diachronically, the size requirement is the consequence of the historical circumstances under which accent 2 arose (two adjacent stresses). The generalization over disyllabic forms (to the exclusion of trisyllabic initial stressed words) largely follows from this, as most suffixes are monosyllabic. The morphological view also brings out the following generalization: Almost all unstressed suffixes which contain a stable vowel (*-nad*, *-ig*, *-else*) correlate with accent 2, while all suffixes which lack a vowel (*-t*, *-s*) or contain an unstable vowel (*-n*/*-en* as in *trappa-n* 'the staircase' / *deg-en* 'the dough') are accent neutral, that is, lack a tonal specification. Again, there is a diachronic explanation for this in that stressed syllables survived the longest during the period of syncope (Riad 1998a). Today, these suffixes are unstressed, though stressed derivational suffixes have been borrowed into the language subsequently. Synchronically, then, the suffixes are posttonic, and carriers of a lexical specification for tone (accent 2-inducing, preaccenting). Thus, there is no expectation that accent 2 should occur in any other disyllables than those that contain the relevant suffixes or belong to the group of roots that are marked for accent 2. This is in accordance with the facts, and saves us from assuming a large set of exceptions.

The morphological view is also compatible with the markedness facts. The null hypothesis in a grammar of privative distinctions must always be that what is marked is also represented. Thus, we expect marked structure to be *more* structure, rather than the reverse. The morphological view of accent harmonizes with this. The suffixes come with a lexical tone that is assigned to a preceding stressed syllable, thereby causing the phonological representation to be richer for accent 2 than for accent 1. The lexical tonal information in roots and suffixes is illustrated in (242). Elsewhere, we mostly use the digit ‘2’ to indicate the presence of a lexical tone (cf. the rightmost column), but what that means in substance is ‘H’ for Central Swedish.

(242) Representation of tone in morphemes

/somᵚɑr, H/	[^{H}ˈsɔmːar]	‘summer’	acc. 2	^{2}ˈsommar$_{2}$
/feg/ /-ɑre, H/	[^{H}ˈfeːgarɛ]	‘more cowardly’	acc. 2	^{2}ˈfeg-are$_{2}$
/bɑndy/	[ˈbanːdʏ]	‘bandy’	acc. 1	^{1}ˈbandy
/feg/ /-is/	[ˈfeːgɪs]	‘coward’	acc. 1	^{1}ˈfeg-is

(p.234)

Tones are lexically represented as part of a morpheme. The phonological system then makes sure that it associates to a locally available primary stress in the output, the circumstances permitting.

The relevant tonal contrast can be studied only in polysyllables where there is at least one syllable following the primary stressed syllable. Final-stressed words (including monosyllables) can only ever have accent 1 on the surface, that is, no lexical tone. The accent contrasts that involve only root morphemes exhibit no synchronic alternations. A few pairs are cited in (243) (see 9.1).

(243) The accent distinction among roots

	Accent 1		*Accent 2*	
'σσ	^{1}'ketchup	‘id.’	^{2}'senap$_{2}$	‘mustard’
	^{1}'fänrik	‘second lieutenant’	^{2}'sommar$_{2}$	‘summer’
'σσσ	^{1}'syfilis	‘syphilis’	(^{2}'gyllen-e$_{2}$	‘golden’)
	^{1}'Kanada	‘Canada’		
σ'σσ	bo^{1}'lero	‘id.’	(ve^{2}'rand-a$_{2}$	‘id.’)

The space for a distinctive function of accent among roots is soon exhausted, and already when we look at trisyllables with initial or penultimate stress, it is impossible to find clean contrasting forms, let alone minimal pairs, as illustrated in (243). The accent 2 forms set in parentheses are disqualified as contrasts in that they have a stem vowel or inflection at the end, which might be the carrier of the lexical information. The point here is that the space for real tonal contrasts between root morphemes is largely limited to disyllables.

In one set of forms, roots ending in *-l*, *-r*, or *-n* preceded by unstable vowels, a contrast of a more minimal kind is in evidence.

(244) -l, -n, -r

^{1}'regel, ^{1}'regl-er	‘rule /pl.’	^{2}'regel, ^{2}'regl-ar	‘bolt /pl.’
^{1}'segel, ^{1}'segel-Ø	‘sail /pl.’	^{2}'spegel, ^{2}'spegl-ar	‘mirror /pl.’
^{1}'tiger, ^{2}'tig-rar	‘tiger /pl.’		

The traditional approach to this situation is to assume a difference between underlying monosyllables (*segl-* ‘sail’) and underlying disyllables (*spegel* ‘mirror’), which triggers the accent difference (based on the number of syllables).[3] This is also in harmony with a historical distinction between syncopating forms that undergo epenthesis and non-syncopating forms. In the present analysis, accent 2 is lexically specified in simplex forms, mostly in suffixes but also in a number of roots, including forms like ^{2}'*regel* and ^{2}'*spegel*. This makes the dependence on the underlying number of syllables less important, i.e. the **(p.235)** alternative representations /spegl, H/ and /spegel, H/ would be expected to behave similarly in the phonology, as synchronic epenthesis and syncope are triggered where needed by syllabification, and without particular heed to tonal structure. We have, however, chosen to represent all accent 2 roots as underlyingly disyllabic (/spegel, H/), in order to limit abstractness.

11.4 Distribution

11.4.1 Historical background

As mentioned, the functional load of the tonal accent distinction is very slender. The historical reason for this is the fact that the accent distinction originated not from another phonemic distinction, as in the many cases of tonogenesis from a voicing distinction, but from the reanalysis of the prosodic configuration of two clashing stresses (Riad 1998a). The typical (historical) context for clash at the time of origin was a monosyllabic root (arising from syncope in Germanic) and a following stressed morpheme, derivational or inflectional. This is the core prosodic context from which we get synchronic postlexical accent 2 today, though in Central Swedish it is more general, arising in any structure containing two stresses, also at a distance from each other. Clash is regularly resolved in Germanic languages by reducing the secondary stress. In Swedish, this stress clash resolution takes place without any effect on the tonal pattern, and with near-neutralization with unstressed syllables. Thus, the second syllables of ^{2}'*kvar*ˌ*skatt* 'residual tax' (secondary stress) and ^{2}'*forskat* 'researched' (no secondary stress) are indistinguishable in normal speech (see 6.3.1). We may assume that things were the same way, as a null hypothesis, at the time when lexical tones first developed. The crucial diachronic change is the permanent removal of the secondary stress in some suffixes, in response to the habitual clash recurring when stressed inflections and frequent derivational morphemes attach to monosyllabic roots (the roots having been shortened by syncope). This process takes place morpheme by morpheme and covertly, since the surface structure is identical, or nearly so, whether there is synchronic stress reduction or no stress in the first place. Thus, a postlexical tonal configuration emanating from stress clash was reanalysed as a lexical tonal configuration, emanating directly from the suffix. This process is ongoing to this day. While all the syllabic inflectional suffixes are unstressed today, the group of derivational suffixes fall into two categories, unstressed and stressed.[4] The stressed derivational suffixes generally **(p.236)** create compound-like structures when attaching to roots, but some of them exhibit incipient reduction in some contexts. This should be understood as part of the process towards losing their stress permanently (Riad 1998a, 2009b). For a case in point, see 11.9.

11.4.2 Present-day distribution

Much of the distribution of accent today is directly accounted for in the historical overview. The large and stable patterns of lexical accent 2 in the morphology are connected to suffixation, where nearly all syllabic suffixes correlate with accent 2 when attaching directly to a stressed monosyllabic root. These suffixes are also all posttonic, that is, they occur canonically directly after a stressed syllable (see 10.2.4).

(245) Syllabic, posttonic inflectional suffixes; lexical accent 2

Stem vowels:	nunna /nʉnᵘ-ɑ$_2$/ [^{2}ˈnɵnːa] ‘nun’, Anna /ɑnᵘ-ɑ$_2$/ [^{2}ˈanːa] (name), gubbe /gʉbᵘ-e$_2$/ [^{2}ˈgɵbːɐ̟] ‘geezer’, Arne /ɑrn-e$_2$/ [^{2}ˈɑːɳɐ̟] (name)
Plurals:	flickor /flikᵘ-ur$_2$/ [^{2}ˈflɪkːʊr] ‘girls’, påkar /pok-ɑr$_2$/ [^{2}ˈpokːar] ‘sticks’, dikter /dikt-er$_2$/ [^{2}ˈdɪkːtɐ̟r] ‘poems’
Infinitive, pres.:	tvätta /tvɛtᵘ-ɑ$_2$/ [^{2}ˈtʏ̟ɛtːa] ‘to wash’, hämtar /hɛmt-ɑr$_2$/ [^{2}ˈhɐ̟mːtar] ‘fetches’
Weak pret.:	spillde /spilᵘ-de$_2$/ [spɪlːdɐ̟] ‘spilled’, lovade /lov-ɑde$_2$/ [^{2}ˈlovadɐ̟] ‘promised’
Comp., sup.:	godare /gud-ɑre$_2$/ [^{2}ˈguːdarɐ̟] ‘tastier’, godast /gud-ɑst$_2$/ [^{2}ˈguːdast] ‘tastiest’

(246) Syllabic, posttonic derivational suffixes; lexical accent 2

Nominal:	tidning /tid-niŋ$_2$/ [^{2}ˈtiːdnɪŋ] ‘newspaper’, öring /ør-iŋ$_2$/ [^{2}ˈœːrɪŋ] ‘salmon trout’, lärare /lɛr-ɑre$_2$/ [^{2}ˈlærarɐ̟] ‘teacher’, marknad /mɑrk-nɑd$_2$/ [^{2}ˈmarːknad] ‘market’, vämjelse /vɛmj̩-else$_2$/ [^{2}ˈvɐ̟mjɐ̟̩lsɐ̟] ‘disgust’, motor /mut-ur$_2$/ [^{2}ˈmuːtʊr] or [^{2}ˈmuːtɔr] ‘engine’
Adjectival:	tokig /tuk-ig$_2$/ [^{2}ˈtuːkɪg] ‘crazy’, trevlig /trev-lig$_2$/ [^{2}ˈtreːvlɪg] ‘nice’

All suffixes canonically occur in posttonic position. There are very few exceptions in the derivational set, and they are caused by overriding phonotactic constraints (^{2}ˈ*heder-lig* ‘honest’, *^{2}ˈ*hedrlig*, cf. ^{2}ˈ*hedra* ‘to honour’, see (212)).

For the inflectional suffixes the situation is a little different. While they do exhibit posttonicity (see (211)), they are driven by the syntax and must therefore often show up further away from stress. This creates a prosodically non-optimal structure, and this is evidenced by the fact that accent 2 is then *not* assigned from the suffix. We return to this in 11.5.3.

(p.237) There are a few syllabic, but accent neutral suffixes. When no accent is assigned the result is accent 1.

(247) Syllabic, unstressed inflectional suffixes; accent neutral

Comparative: bättre /bɛtᵘ-re/ [^{1}ˈbɐ̟tːrɐ̟] ‘better’, högre /høg-re/ [^{1}ˈhøːgrɐ̟] ‘higher’

(248) Syllabic, unstressed derivational suffixes; accent neutral

Hypocoristic:	puck-o /pʉkᵘ-u/ [^{1}ˈpɵkːʊ] ‘idiot’, miffo /mifᵘ-u/ [^{1}ˈmɪfːʊ] ‘idiot’, Carr-o /kɑrᵘ-u/ [^{1}ˈkarːʊ] (name)
Hypocoristic:	komp-is /komp-is/ [^{1}ˈkɔmːpɪs] ‘buddy’, kondis /kond-is/ [^{1}ˈkɔnːdɪs] ‘fitness; café’, Svennis /svenᵘ-is/ [^{1}ˈsvɛ̟nːɪs] (name)
Nominal:	bandy /bɑnd-y/ [^{1}ˈbanːdʏ] ‘id.’, dandy /dɑnd-y/ [^{1}ˈdanːdʏ] ‘id.’, ^{1}ˈVick-y /vikᵘ-y/ [^{1}ˈvɪkːʏ] (name)

These suffixes are very few. The comparative *-re* occurs only in a small paradigm, the regular comparative *-are* $_{2}$ carrying lexical accent 2. Of the three derivational suffixes here, two are hypocoristic. The third one listed has unclear suffix status but correlates with accent 1 and can be used marginally for hypocoristic formation.

There are a number of suffixes which alternate between syllabic and non-syllabic form, and we take all of them to be accent neutral. There are no indications that e.g. consonantal suffixes would induce accent 2, and that would also be unexpected under the historical development assumed here. Likewise, unstable vowels should in the first instance be understood as epenthetic, and definitely so when they occur in a suffix. Note that ‘accent-neutral’ means precisely that. If there is other information in the structure that induces accent 2, then the accent-neutral suffixes do not inhibit the realization of accent 2.

(249) Unstressed derivational suffixes with unstable vowel; accent-neutral

Derivational:	komisk /kum-•sk/ [^{1}ˈkuːmɪsk] ‘comic’, bondsk /bund-•sk/ [^{1}ˈbʊnːdsk] ‘rural’, hälsing-sk /hɛls-iŋ$_{2}$-•sk/ [^{2}ˈhɛ̟lːsɪŋsk] ‘from Hälsingland’
Inflectional:	båten /bot-•n/ [^{1}ˈboːtɛ̟n] ‘the boat’, trappan /trɑpᵘ-ɑ$_{2}$-n/ [^{2}ˈtrapːan] ‘the staircase’, grytet /gryt-et/ [^{1}ˈgryːtɛ̟t] ‘the burrow’, mötet /møt-e$_{2}$-•t/ [^{2}ˈmøːtɛ̟t] ‘the meeting’

11.5 Factors that influence accent

The fact that accent 2 is lexically represented does not mean that it will always be expressed. There are some tonal alternations, the analysis of which has stirred some controversy. In this section we go through the factors that play a role in the **(p.238)** alternations that we find in Central Swedish. These factors can be broadly divided into three categories: lexical, prosodic, and grammatical. The factors are partly in conflict.

11.5.1 Lexical factors

The lexical specification of tone can only ever be accent 2, in the privative analysis given here. In the canonical case, the presence of a lexical tone will yield accent 2 in the output, and the absence of a lexical tone will yield accent 1. A lexical tone can be present in a root or in a suffix, and in a given maximal prosodic word, only one lexical tone can be expressed. When we get to the alternations later, we will see that information closer to the left edge is often more visible and influential on the resultant accent of a form than information to the right in the word. As far as lexical and grammatical information goes, this could be analysed as a positional faithfulness effect.

The analysis of accent 1 as the *absence* of a lexical tone means that, to the extent there is a conflict, it will be between the *expression* and *inhibition* of the accent 2 tone in some form.

One of the most important claims regarding the representation of lexical tone is that it mostly resides in suffixes, all of which are syllabic (Riad 2009a). This is, as we shall see, a lexical factor in itself, as it can be played out against prosodic factors with conflicting properties (see 11.6). Indeed, the best evidence for the locus of lexical tone comes from the variable interaction with anacrusis, but there are also sources like nickname formation where a disyllabic base may have accent 1 (^{1}'*Albin*), and the nickname, formed with the right suffix, may have accent 2 (^{2}'*Abb-e* $_{2}$).

11.5.2 Prosodic factors

Two stresses within the same maximal prosodic word: For Central Swedish, the presence of two stresses or more in a word yields accent 2. This amounts to a very general compound rule in CSw, see (126). The same rule holds for the many other dialects that have the connective type of accent, where the tonal contour associates with two tone-bearers in forms that contain more than one stress (see Fig. 9.7). In many dialects outside this area, the corresponding prosodic factor that often causes accent 2 is two stresses in clash. Thus, in South Swedish, bare nominal compounds consisting of two monosyllabic morphemes get postlexical accent 2, whereas forms with two stresses separated by an unstressed syllable do not automatically, see (250).[5]

(p.239) (250) South Swedish clash condition for postlexical tone (Bruce 1973, 1974, 1982, 1998)

Clash		*No clash*	
^{2}'blod-ˌprins	‘blood prince’	^{1}'taxi-ˌgris	‘taxi pig’
^{2}'mjölk-ˌhambo	‘milk hambo (dance)’	^{1}'bandy-ˌsolo	‘bandy solo’
^{2}'vax-ˌlök	‘wax onion’	^{1}'lax-chokˌlad	‘salmon chocolate’

[2]'tax-ˌhöna	‘dachs (hound) hen’	[1]'tand-ka̲ˌnal	‘tooth canal’

In CSw, these forms would all get accent 2.

Anacrusis (Auftakt): We refer to words beginning with one or more unstressed syllables as *anacrustic*. This prosodic configuration of non-initial stress apparently has an inhibiting effect on the realization of accent 2. Within Central Swedish, this is apparent in the alternation of forms containing the same accent 2-inducing suffix.

(251) Canonical vs. anacrustic shapes

Canonical:	/'trev-lig$_2$/	[[2]'treːvlɪg]	‘nice’
	/'knut-ɑ$_2$/	[[2]'knuːta]	‘to complain’
Anacrustic:	/pɛr'sun-lig$_2$/	[pæ[1]'ʂuːnlɪg]	‘personal’
	/kɑ'nut-ɑ$_2$/	[ka[1]'nuːta]	‘to canoe’

As seen, the suffixes *-lig* $_2$ and *-a* $_2$ induce accent in the canonical cases where the stress is initial, but fail to do so when there is anacrusis. The same inhibiting function of anacrusis is found in South Swedish, where it can be studied in compounds. Bare nouns with clash will fail to get accent 2 when there is anacrusis (*ba* [1]'*nan*ˌ*kust* ‘banana coast’).

11.5.3 Grammatical factors

The grammatical factors that influence accent assignment are locality and prosodic word structure.

Locality: We have already mentioned locality in conjunction with the discussion of stress factors and the behaviour of inflectional morphemes (10.5.1). The inflectional morphemes were found to be posttonic, just like many of the derivational morphemes, but due to the syntactic status of inflection, these suffixes must be realized even when their prosodic specification is not met, i.e. under non-locality with a stressed syllable. What happens in these instances is that accent assignment (from these suffixes) is inhibited. We interpret this as a sign of the suboptimal prosodic structure. We repeat a few forms here, where lexical tone is marked with a subscripted ‘2’, and tonally unmarked suffixes with a subscripted ‘0’.

(p.240) (252) No accent 2 assignment under non-locality

a.

sg.	[^{1}'bil]	‘car’	pl.	[^{2}'bil]-ar$_{2}$	acc. 2
	[^{1}'cir]kus	‘circus’		[^{1}'cir]<u>kus</u>]-ar$_{2}$	acc. 1
	[^{1}'kle]matis	‘clematis’		[^{1}'kle]<u>matis</u>]-ar$_{2}$	acc. 1
	[^{1}'komp]-is$_{0}$	‘chum’		[^{1}'komp]-<u>is</u> $_{0}$]-ar$_{2}$	acc. 1

b.

sg.	[^{1}'ros]	‘rose’	pl.	[^{2}'ros]-or$_{2}$	acc. 2
	[^{2}'kann]-a$_{2}$	‘jug’		[^{2}'kann]-or$_{2}$	acc. 2
	[^{1}'o]<u>per</u>]-a$_{2}$	‘id.’		[^{1}'o]<u>per</u>]-or$_{2}$	acc. 1
	[^{1}'ka]<u>mer</u>]-a$_{2}$	‘camera’		[^{1}'ka]<u>mer</u>]-or$_{2}$	acc. 1

When accent 2-inducing suffixes are strung together, accent 2 is always assigned, as long as the suffix nearest to the root is adjacent to the stress, see (253). The fact that a non-local accent 2-inducing inflection is suboptimally placed thus does not override a canonically placed derivational suffix.

(253) Posttonicity: Accent 2 assignment despite non-local inflections

[^{2}'tid]-ning$_{2}$	‘newspaper’	[^{2}'tid]-ning$_{2}$]-ar$_{2}$	‘newspapers’	acc. 2
[^{2}'trev]-lig$_{2}$	‘nice’	[^{2}'trev]-lig$_{2}$]-a$_{2}$	‘nice, wk’	acc. 2
[^{2}'sot]-ig$_{2}$	‘sooty’	[^{2}'sot]-ig$_{2}$]-e$_{2}$	‘sooty, wk’	acc. 2

We learn from this that the relevant information for tone assignment (or inhibition thereof) is read off the left edge of the word. That is also evident in the accent variation in Skåne compounds (Bruce 1974; Riad 2005).

Structure: The other grammatical factor affecting accent assignment relates to structure. Lexical tonal information is manifested only within the small structure of the minimal prosodic word, that is, over the domain of a root and its (non-tonic) suffixes. In larger prosodic word formations, accent is postlexically determined. There are two main cases which support this conclusion, compound formation and prefixation by pretonic prefixes.

Compound formation is the better-known case. Any two stressed morphemes that combine in a word will occasion postlexical accent 2 in the output form (126). Thus, the lexical specification (or absence thereof) of the morphemes put together has no effect on the output accent. The compound rule is entirely based on the stress information in the prosodic structure, where ‘more than one stress’ is the trigger. This is the only way that accent 2 is assigned postlexically in Central Swedish.

The same analysis can be given for forms with pretonic prefixes, but with a different result: accent 1, i.e. no lexical accent assigned. We looked at this pattern in 5.2.2. Some relevant data are repeated in (254).

(p.241) (254) Unprefixed and prefixed forms

^{2}'för-a$_{2}$	‘to lead’	för-^{1}'för-a$_{2}$	‘to seduce’
^{2}'man-ing$_{2}$	‘exhortation’	för-^{1}'man-ing$_{2}$	‘admonition’
^{2}'giv-en$_{2}$	‘given’	be-^{1}'giv-en$_{2}$	‘keen on; addicted’
^{2}'håll-are$_{2}$	‘holder’	be-^{1}'håll-are$_{2}$	‘container’

The suffixes in these forms are all accent 2-inducing, as can be readily seen in the leftmost column where they attach to canonical forms. However, when these forms contain either of the pretonic prefixes *be-* or *för-*, the output is accent 1. This has long been considered a puzzle (Lahiri et al. 2005a). The prosodic structure offers a solution, where the crucial empirical fact is syllabification, which signals that there is a prosodic word boundary between the minimal prosodic word and the pretonic prefixes (for the demonstration, see 5.2.2). In structural terms, this means that the pretonic prefixes are adjoined to the minimal prosodic word rather than incorporated into it.

(255) Projection of the prosodic word

(för-(^{1}'för-a$_{2}$)$_{\omega}$ $^{\min}$)$_{\omega}$ $^{\max}$	‘to seduce’
(be-(^{1}'håll-are$_{2}$)$_{\omega}$ $^{\min}$)$_{\omega}$ $^{\max}$	‘container’

Lexical tone can only be assigned within the minimal prosodic word, and it can only be expressed when the minimal and maximal prosodic words are coextensive. In the forms in (255), then, no lexical accent is assigned, as the lexical tone of the suffix is invisible, and the new structure with its single stress does not meet the postlexical compound accent generalization (which requires the presence of two stresses or more to be triggered). When there is only one stress, accent 1 is the default.

In a different approach, where accent 1 is considered lexically specified and accent 2 default, Lahiri et al. (2005a: 65) propose that the *prefixes* carry a lexical specification for accent 1, which then prevails over the general accent 2 rule of their system. The generality of the pattern certainly makes the connection with the prefixes tempting, but at the same time one must remember that these two prefixes are the only ones in the pretonic class, other prefixes being either unspecified or tonic. Thus, there is no tonal contrast among otherwise similar prefixes that can locate the putative lexical tonal information to the prefixes themselves. We submit instead that the result here, accent 1, is due to purely structural facts, relating to the pretonicity of these prefixes and the fact that such prefixes do not incorporate into the minimal prosodic word of the root, as evidenced by their separate syllabification. Default accent is assigned in these forms just as in any other form that carries accent 1. The crucial structural piece of information to note is that lexical accent only can be assigned within the **(p.242)** minimal prosodic word, and that the expression of it is dependent on its being coextensive with the maximal prosodic word.

One obvious advantage of this analysis is that it gives better profile to what is lexical and what is postlexical in accent assignment in Central Swedish. The cut-off point occurs neatly at the boundaries of the minimal prosodic word.

11.6 Tonal conflict: anacrusis vs. accent 2 in suffixes

In this section we shall look at the intriguing tonal alternations that come to the surface when we pitch anacrusis against tonally specified suffixes, inside the minimal prosodic word. The conflict follows from the fact that anacrusis favours accent 1 and posttonic suffixes induce accent 2. The very pattern we find, will provide further support for the localization of tonal information in suffixes, as we shall see that the interactional patterns follow the suffixes (rather than roots or disyllabicity). First, it is clear that the distribution of accent corresponds closely to the distribution of particular morphemes. Second, the conflict between anacrusis and suffix tone reveals a pattern of relative strength among accent 2-inducing suffixes. While surprising in itself, this pattern, too, points directly at the morphological boundedness of lexical accent to suffixes.

(256) The tonal accent distinction among inflected/derived forms

a.

	accent 1		*accent 2*	
'σσ	^{1}'feg-is$_{0}$	‘coward’	^{2}'spel-ning$_{2}$	‘gig’
	^{1}'myst-isk$_{0}$	‘mysterious’	^{2}'vän-lig$_{2}$	‘friendly’
'σσσ	^{1}'oper-a$_{2}$	‘id.’	^{2}'spel-are$_{2}$	‘player’
	^{1}'kamer-a$_{2}$	‘camera’	^{2}'fäng-else$_{2}$	‘prison’

b.

σ'σσ	bog^{1}'ser-a$_{2}$	‘to tow’	go^{2}'rill-a$_{2}$	‘id.’
	per^{1}'son-er$_{0}$	‘persons, people’	ve^{2}'rand-a$_{2}$	‘id.’
σσ'σσ	protes^{1}'ter-a$_{2}$	‘to protest’	pape^{2}'goj-a$_{2}$	‘parrot’
	mili^{1}'tär-en$_{0}$	‘the military’	kara^{2}'ok-e$_{2}$	‘id.’
σσ'σσσ	speci^{1}'ell-are$_{2}$	‘more special’	speci^{2}'al-are$_{2}$	‘a special (trick/dish)’
σσ'σσσσ	tradition-^{1}'nell-are$_{2}$	‘more traditional’	instrumen-^{2}'tal-are$_{2}$	‘an instrumental (player/piece)’

In the forms to the right, the suffix is always lexically marked for tone (subscripted '$_2$'), and this tone prevails in the output form (as marked with the superscripted '^{2}'). In the forms to the left, some suffixes are accent neutral, i.e. toneless (marked '$_0$'), others are lexically marked for tone, but they all come out with accent 1 (marked '^{1}'). The forms in (256a) have initial stress and those in (256b) have anacrusis. To account for this pattern a closer look at the tonally marked suffixes is warranted. It turns out that they fall into two categories: some suffixes can withstand anacrusis (call them 'strong' suffixes), whereas others yield to anacrusis ('weak' suffixes). The relative strength is indicated in table (257) as a ranking (left to right in falling order of dominance), with the various forms in the left-hand column. The resulting accent is marked for each factor, with the winning accents in unshaded cells, and the overridden accents in shaded cells.

(p. 243)

(257) Anacrusis vs. lexical specification in Central Swedish

		'Strong' suffixes *-are*$_{2,N}$, *-a*$_{2,N}$, *-e*$_{2,N}$, *-or*$_{2,pl}$, *-or*$_{2,N}$, *-ska*$_{2,N}$, *-ig*$_{2,A}$	Prosodic anacrusis	'Weak' suffixes *-(n)ing*$_{2,N}$, *-ande*$_{2,VAN}$, *-ar*$_{2,pl}$, *-a*$_{2,V}$, *-ar*$_{2,V}$, *-ade*$_{2,V}$, *-lig*$_{2,A}$, *-are*$_{2,comp}$, *-ast*$_{2,sup}$
a.	('glad-are$_2$)$_\omega$ 'happier'			**2**
b.	(speci'ell-are$_2$)$_\omega$ 'more special'		**1**	2
c.	('löp-are$_2$)$_\omega$ 'runner'	**2**		
d.	(speci'al-are$_2$)$_\omega$ 'a special'	**2**	1	
e.	(bog'ser-a$_2$)$_\omega$ 'to tow'		**1**	2
f.	(bog'ser-ing$_2$)$_\omega$ 'towing'		**1**	2
g.	(bog'ser-are$_2$)$_\omega$ 'tower'	**2**	1	

This chart reveals all the central generalizations. In canonical contexts, that is, when primary stress is word-initial (no anacrusis) and the suffix is adjacent to the stressed syllable (locality), accent 2-inducing suffixes always realize their accent. This accounts for accent 2 in non-anacrustic (257a) ^{2}'*gladare* and (257c) ^{2}'*löpare*. When these two homophonous suffixes, comparative *-are* $_{comp}$ and agent noun *-are* $_N$, occur in anacrustic forms like (257b) *speci* ^{1}'*ellare* $_{comp}$ and (257d) *speci* ^{2}'*alare* $_N$, their difference of strength becomes obvious. The comparative suffix is weak and the tone of the suffix is inhibited under anacrusis. The agent noun suffix is strong and the tone is manifest in the output, despite anacrusis.

(p.244) The same thing is concisely illustrated with three different derivational forms formed from the same root meaning ‘tow’. The verb infinitive *bog* ^{1}'*ser-a* $_{V}$ and the nominalization thereof, *bog* ^{1}'*ser-ing* $_{N}$, both end up with accent 1. Both suffixes yield accent 2 in canonical forms (^{2}'*odl-a* $_{2}$ ‘to cultivate’, ^{2}'*odl-ing* $_{2}$ ‘cultivation’), and it is thereby clear that it is the anacrusis that inhibits accent 2 from being realized in *bog* ^{1}'*sera* and *bog* ^{1}'*sering*. The agent noun form *bog* ^{2}'*ser-are* $_{N}$ ‘tower’, however, contains the strong *-are* $_{N}$ suffix, and so accent 2 prevails in the output form. This interaction shows that the accent variation follows the suffixes rather than any other factor. In particular, it will not do to reduce the accent variation to properties of the root (here *bogser-*). We contend that the tonal information indeed resides in the suffixes, but that the expression of that information is subject to interaction with the accent-inhibiting anacrusis and depends on the individual suffix’s strength.[6]

There are, of course, things unexplained here, in particular why it should be that anacrusis should inhibit the realization of a tone in a suffix on the primary stressed syllable. We have no real answer to this, but note that the same effect occurs in other Scandinavian dialects, and in somewhat different structures. We have already mentioned that anacrusis inhibits accent 2 in South Swedish compounds. In North Swedish, the pattern is much like Central Swedish, only the set of suffixes that resist anacrusis (the strong suffixes) is smaller. Another thing that is unexplained in a deep sense is why there should be a difference of strength of accent induction between suffixes. Autosegmental phonology would represent the presence of a tone, or not represent it when absent, but it is not common to index tones for *relative* presence, so to speak. Nevertheless, that is what seems to be the case here, and that is what warrants placing suffixes in two classes. Again, we have no explanation for this, but would point out that the distribution is not random.[7] The strong suffixes are all relatively nominal, whereas the weak suffixes are relatively verbal. This divide is manifest in many areas (see Smith 2001; Kabak and Plank 2007), and also in other areas of Scandinavian dialectology. For instance, in the distribution of accents in East Norwegian prefixed forms like ^{2}'*om*‚*sorg* ‘care’ and ^{1}'*om*‚*bringe* ‘to deliver’, the general tendency is for **(p.245)** nominal compounds to exhibit accent 2 and for verbal ones to exhibit accent 1, if there is a difference (for data, see e.g. Wetterlin 2010: 24ff.). These tendencies will, however, not reduce to a clean word class distinction. The divide is much finer than that and can be studied in suffixes belonging to the same category. There are two adjectival suffixes and two (homophonous) nominal suffixes that occur on either side of the divide, in Central Swedish.

(258) The strong/weak divide among accent 2-inducing suffixes in CSw

		‘Strong’	‘Weak’			
‘jellyish’	ge^{2}'lé-ig		-ig$_{2,A}$	-lig$_{2,A}$	profess-^{1}'or-lig	‘professorial’
‘morassy’	mo^{2}'ras-ig				per^{1}'son-lig	‘personal’
‘distracted one’	dis^{2}'trä-ing	-ing$_{2,N}$	-ing$_{2,N}$		bogs-^{1}'er-ing	‘towing’
‘nervous one’	ner^{2}'vös-ing				pre^{1}'dik-ning	‘sermon’

The *-ing* suffixes are both nominalizers. The *-ing* on the left-hand side refers to people and derives from adjectives (*disträ* ‘distracted’, *nervös* ‘nervous’), and should be considered a hypocoristic suffix (see 11.8). The *-ing* on the right is the regular and general nominalizer used with verbal bases (*bogsera* ‘to tow’, *predika* ‘to preach’).[8]

11.6.1 Central Swedish and North Swedish

The divide will occur in different places in different dialects, though this is a matter that remains to be fully worked out. In this section we make a comparison between Central Swedish and North Swedish (one speaker), showing that the divide between ‘strong’ and ‘weak’ may go in different places in different dialects. The grammar describing the situation must therefore be able to handle this kind of variation. The general point that we would want to make is that the divide should occur rather cleanly between suffixes, if indeed accent induction, weak or strong, is a property of suffixes. If there is ongoing change, things may be different, and also if there are subclasses of certain suffixes. (259) is a chart describing the differences on individual suffixes between a North Swedish variety and Central Swedish.

(p.246) (259) Anacrusis in Central Swedish (left bold line) and North Swedish (right bold line)

Word	Meaning	Suffixes carrying H tone	'Strong' suffixes	Prosodic anacrusis	'Weak' suffixes
göte'borg-are	'Gothenburgian'	*-are*$_{2,N}$	2	1	
pro'mill-e re'al-e	'id.' 'common gender'	*-e*$_{2,N}$	2	1	
kara'ok-e rege'ment-e	'id.' 'regiment'	*-e*$_{2,N}$	2	1	2
ve'rand-a, -or	'id.'	*-a*$_{2,N}$, *-or*$_{2,Pl}$	2	1	2
pro'fess-or	'id.'	*-or*$_{2,N}$	2	1	2
stu'dent-ska	'female student'	*-ska*$_{2,N}$	2	1	2
ge'lé-ig mo'ras-ig	'jellyish' 'boggy'	*-ig*$_{2,A}$	2	1	2
ka'las-a, ka'las-ar, ka'las-ade	'to party' pres. pret.	*-a*$_{2,V}$, *-ar*$_{2,V}$, *-ade*$_{2,V}$		1	2
profes'sor-lig per'son-lig	'professorial' 'personal'	*-lig*$_{2,A}$		1	2
pre'dik-ning ka'not-ing	'sermon' 'canoeing'	*-(n)ing*$_{2,N}$		1	2
stu'der-ande krum'bukt-ande	'student' 'fawning'	*-ande*$_{2,VAN}$		1	2
mi'nistr-ar	'ministers'	*-ar*$_{2,Pl}$		1	2
ner'vös-a, -e	'nervous'	*-a*$_{2,A}$, *-e*$_{2,A}$		1	2
speci'ell-are	'more special'	*-are*$_{2,comp}$		1	2
speci'ell-ast	'most special'	*-ast*$_{2,sup}$		1	2

This table shows how North Swedish has a more restricted set of strong suffixes, but that it is a subset of those that are strong in Central Swedish. Note that the divide appears to go through the suffix *-e* $_2$. My informant indicates that Latinate and/or uncommon words would seem to retain strength within the group of words that carry this suffix. Provisionally, we may take this to mean that the pattern is a snapshot of the process when the suffix *-e* $_2$ is shifting from the strong category to the weak category. The ending is originally that of the weak masculine (and late borrowings in *-e* $_2$ join that group, even though they may differ in plural). The originally weak feminine *-a* $_2$ appears to be fully shifted in the dialect (*ve* ^{1}'*rand-a* $_2$).

(p.247) To see just how transitions of suffixes take place, one would have to study more dialects and larger data sets. This would also allow us to see if the general pattern holds up, and if there are further subgroupings. We turn now to the other end of diachrony, that is, neologism and productivity of anacrustic forms with accent 2-inducing suffixes.

11.7 Neologism

The complexity of the accent distribution becomes more evident when we recognize that there are some accentual splits relating to a struggle between the entrenchment of patterns in the grammar and the productivity of some suffixes.

The relevance of productivity is evident in the verbal forms. Verbal suffixes are generally weak accent 2-inducers. But they are also very productive, and in neologisms they exhibit greater strength of accent induction. When we construct new, anacrustic verbs, these will be able to get accent 2 (with some optionality). So, in a putative neologism like *kara* ^{2}'*ok-a* $_{2}$ ‘to do karaoke’ (based on nominal *kara* ^{2}'*ok-e* $_{2}$), accent 2 is natural. However, an established form like *ka* ^{1}'*las-a* $_{2}$ ‘to feast on’ gets accent 1, while a semi-established form *ka* $^{1/2}$'*not-a* $_{2}$ ‘to canoe’ vacillates between accents 1 and 2. These verbs tend to have a slightly hypocoristic or at least neologistic ring to them.

Crucially, this possibility only concerns verbs that do not belong to the most productive class among the anacrustic verbs (the *-era* verbs). Any form—neologism or not—that includes the morph *-er-* must get accent 1 (*onomatopoeti* ^{1}'*s-er-a* $_{2}$ ‘to onomatopoeicize’, *kano* ^{1}'*t-er-a* $_{2}$ ‘to canoe’, cf. *bog* ^{1}'*s-er-a* $_{2}$ ‘to tow’).

11.7.1 Entrenchment

The degree of entrenchment of a pattern is thus clearly of some importance, and the regularity appears to be that accent 2 is in general stronger in productive patterns. However, regular base properties tend also to interact with suffixes in a regular way. On top of this, there are most likely real analogical effects. There is a suffix *-ska* $_2$ which means ‘female associated with [the root meaning]’ and it strongly induces accent 2 in forms like *profes* ^{2}'*sorska* ‘wife of professor’, *rek* ^{2} '*torska* ‘wife of headmaster’, *fran* ^{2}'*syska* ‘French woman’, and *itali* ^{2}'*enska* ‘Italian woman’. However, there is another accent-neutral suffix *-(i)sk* which is adjectival and which in the weak form and in the plural overlaps with the female-denoting nominal suffix, i.e. in forms like *itali* ^{1}'*enska* ‘Italian, adj.’, *ameri* ^{1} '*kanska* ‘American, adj’, *ku* ^{1}'*banska* ‘Cuban, adj.’. As it turns out, in a phrase like *en itali* $^{1/2}$'*enska i Paris* ‘an Italian woman in Paris’, either accent is **(p.248)** possible, while accent 2 would be expected. This is hardly due to ambiguity regarding the status of the nominal suffix as weak or strong, but rather to the analogical influence of the adjectival ending, which is homophonous and semantically not too distant. When the distance is greater, e.g. as between agent noun *-are* and comparative adjectival *-are* $_2$, there is no trace of such interference. In a fuller investigation of the interaction, other such dependencies could be expected to surface.

11.8 Superstrength or rebracketing

The hypocoristic suffix *-ing* $_2$ (see (258)) typically takes adjectives as base, e.g. ^{2} '*snygg-ing* $_2$ ‘handsome one’, ^{2}'*dumm-ing* $_2$ ‘stupid/mean one’, ^{2}'*blek-ing* $_2$ ‘pale one’, and so on. We saw that it is a strong suffix in that accent 2 prevails in anacrustic forms: *ner* ^{2}'*vös-ing* $_2$ ‘nervous one’, *dis* ^{2}'*trä-ing* $_2$ ‘distracted one’, *ci* ^{2} '*vil-ing* $_2$ ‘civil (non-military) one’. Furthermore, it would seem that this suffix also overrides forms that have anacrusis by virtue of pretonic prefixes: *be-* ^{1} '*kväm* ‘comfortable; lazy’ and *för-* ^{1}'*näm* ‘noble; snotty’ come out as *be-* ^{2}'*kväm-ing* $_2$ ‘lazy one’, *för-* ^{2}'*näm-ing* $_2$ ‘snotty one’. The fact that the accent that normally results from adjoined structures (accent 1) can be overridden must be connected to the fact that the base is non-verbal, but also to the fact that the forms as such are neologistic (though clearly acceptable). Only under these circumstances can hypocoristic *-ing* $_2$ show this ‘superstrength’. It might also be possible to explain this as a rebracketing of the prefix + root *förnäm* and *bekväm*. The forms associate with weak suffixes (*be-* ^{1}'*kväm-lig* $_2$ ‘comfortable’, *för-* ^{1}'*näm-lig* $_2$ ‘fine, superior’), which should predictably lead to accent 1, under either explanation (adjoined structure or anacrusis, pure and simple). With strong suffixes it is difficult to provide a good example that is not also a neologism. It is at any rate a rare phenomenon. There is another prefixed form *be-*^{1}'*kant-ing* $_2$ ‘acquaintance’ which is an established form unlike the two others, and which has accent 1. Here both the sense of neologism and the hypocoristic quality appear absent.

11.9 Suffixes in flux

There is more to say for individual suffixes in combination with anacrusis, especially regarding those that are changing from stressed to accent 2-inducing. As long as they are stressed, accent 2 will result postlexically, via the presence of two stresses, see (126). When stress is permanently lost, accent 2 is induced directly via lexical marking in the suffix. Loss of stress is a process that has been going on since the Viking age, suffix for suffix, and under the covers of **(p.249)** synchronic clash reduction (Riad 1998a). All then-stressed inflectional suffixes have now lost their stress and become accent 2-inducing (if they still retain their vowel) or neutral. Several derivational suffixes have entered the language since, and have not yet made this transition, e.g. -ˌ*skap*, -ˌ*full*, -ˌ*lös*, -ˌ*bar*. Examples of suffixes that are in transition today are -ˌ*sam* and -ˌ*het*, both of which are quite frequent. A less frequent one is -ˌ*lek*. Their ambivalent status is visible in the way the rules of the language apply variably to them according to factors like frequency and shape of a form. These are typical signs of an ongoing change. Some of the alternations are listed in (260), where ‘ˌ’ indicates presence of the stress in relation to the rule (mentioned in parentheses) and ‘$_0$’ indicates when the rule does not ‘see’ the stress, and the morpheme is, for all intents and purposes, unstressed. When the morpheme could be either stressed or not, we mark this as ‘$_{(ˌ)}$’. For a richer set of data, see Riad (2009b).

(260) Alternations with suffixes in transition

a.

^{2}'lång-$_{(ˌ)}$sam	^{2}'jätte-ˌlång-$_0$sam	^{2}'jätte-$_{(ˌ)}$lång-ˌsamma	(frequent form)
‘slow’	‘very slow’	‘very slow, pl.’	
^{2}'smitt-$_{(ˌ)}$sam	^{2}'jätte-$_{(ˌ)}$smitt-ˌsam	^{2}'jätte-$_{(ˌ)}$smitt-ˌsamma	(infrequent form)
‘contagious’	‘very contagious’	‘very contagious, pl.’	

b.

^{2}'artig,het	‘politeness’	vs.	di^{1}'rekt$_{0}$het	‘immediacy’	(anacrusis vs. lexical tone)
^{2}'jäm,lik,het	‘equality’	vs.	fi^{1}'entlig$_{0}$het	‘hostility’	(anacrusis vs. lexical tone)

c.

	be^{1} 'tänk-$_{0}$sam-$_{0}$het	‘caution’	(as in (b.), but with weak morphemes sequenced)
	ge^{1} 'men-$_{0}$sam-$_{0}$het	‘community’	
	för^{1} 'drag-$_{0}$sam-$_{0}$het	‘tolerance’	
vs.	be^{2}'tydelse ‚lös‚het	‘meaningless’	(as in (b.), but with strong morpheme intervening)
	för^{2}'‚sum‚bar ‚het	‘negligence’	

d.

	^{1}'part-isk-$_{0}$het	‘partiality’
	his^{1}'tor-isk-$_{0}$het	‘historicity’
vs.	^{2}'möjlig‚het	‘possibility’
	^{2}'bruk‚bar‚het	‘usefulness’

In (260a) we see that the suffix *-sam* attracts the final tone in compound rule formation when the form is either inflected (*jättelångsamma*) or infrequent (*jättesmittsam*). In (260b) the suffix *-het* which is normally stressed (cf. *jämlikhet*), yields to the anacrusis, as if it were a weak accent 2-inducing (unstressed) suffix. In (260c) we have *-sam* and *-het* in sequence following at the end of a form containing a pretonic prefix. Only if they are considered unstressed will accent 1 **(p.250)** be the result, as in the first three forms (e.g. *be* ^{1}'*tänksamhet*). If another suffix is added, one which is not in the process of losing its stress, accent 2 by the compound rule ensues (*be* ^{2}'*tydelse*‚*lös*‚*het*). In (260d) finally, we have an instance of *-het* showing sensitivity to locality (*partiskhet*), where the medial syllable is the accent neutral suffix *-isk*. This is a signal of *-het* being a) not stressed, and b) posttonic.

This situation may look messy—how are we to understand that a suffix is stressed, unstressed, and marked for a lexical tone? We would assume that this is quite normal for the transitional period, and that individual forms may exhibit one or the other form. When the change is better implemented, the suffix would reconstitute itself according to a general and coherent pattern, where the expectation would be an unstressed, posttonic, accent 2-inducing suffix, like the others that have trodden the same path: *-ig* $_{2}$, *-lig* $_{2}$, *-nad* $_{2}$, *-a* $_{2}$, *-or* $_{2}$ . . .

11.10 Lexicalizing content morphemes

There is an interesting asymmetry between the way inflectional and derivational suffixes reduce, and the way more contentful morphemes reduce, over time. Many derivational suffixes are originally content words, of course, but they develop into proper suffixes, and when they reduce by virtue of regularly occurring in stress clash, they always acquire lexical tone, hence become accent 2-inducers. The same thing will have happened with inflectional suffixes, but those changes all happened long ago. Today we are left with the static generalization that nearly all syllabic inflectional suffixes carry lexical tone, and hence induce accent 2 in canonical forms. With derivational suffixes we can study the dynamics as they take place, as we have already seen. The common outcome for suffix reduction is loss of stress, posttonic status, and lexical tone.

Now, there is another class of morphemes that also reduce in similar prosodic circumstances (stress clash), but which do not acquire lexical tone in the process, and which do not obviously become posttonic. These are content morphemes like *-bär* ‘berry’, when used to classify berries, and elements like *-son* ‘son’, *-man* ‘man’ and *-britt* in personal names, *-stad*, *-sta* ‘stead’, *-torp* ‘croft’, and *-bo* ‘dwelling’ in place names, and a few other scattered morphemes like *-gård* ‘yard’, *-dag* ‘day’, *-man* ‘man’, and *-bo* ‘dweller’ when used within other naturally limited domains, such as the weekdays and items related to a farm. These elements do reduce stress, but only in the clash context, and do not induce accent 2. Some examples are given in (261) and (262).

(p.251) (261) Names with reducing morphemes, and contrasts

	Reduction under clash	No clash	Outside semantic domain
a.	^{1}'Gun-$_{0}$Britt, ^{1}'Ing-$_{0}$Britt	^{2}'Eva-ˌBritt, ^{2}'Ulla-ˌBritt	––
b.	^{1}'Tor-$_{0}$Leif, ^{1}'Odd-$_{0}$Leif	––	––
c.	^{1}'Jans-$_{0}$son, ^{1}'Bengts-$_{0}$son	^{2}'Johans-ˌson, ^{2}'Anders‚son	^{2}'styv-ˌson ‘stepson’
d.	^{1}'Berg-$_{0}$man, ^{1}'Ed-$_{0}$man	^{2}'Hårle-ˌman, ^{2}'Kinna-ˌman	^{2}'brand-ˌman ‘firefighter’
e.	^{1}'Karl-$_{0}$stad, ^{1}'Halm-$_{0}$stad	^{2}'Grebbe-ˌstad, ^{2}'Färje-ˌstad	^{2}'stor-ˌstad ‘big city’
f.	^{1}'Möln-$_{0}$bo, ^{1}'Rim-$_{0}$bo	^{2}'Vamling-ˌbo, ^{2}'Kulla-ˌbo	^{2}'sval-ˌbo ‘swallow nest’

(262) Semantic groups, and contrasts

	Reduction under clash	No clash	Outside semantic domain
g.	^{1}'blå-$_{0}$bär ‘blueberry’ ^{1}'tran-$_{0}$bär ‘cranberry’ ^{1}'krus-$_{0}$bär ‘gooseberry’	^{2}'åker-ˌbär ‘arctic bramble’ ^{2}'fågel-ˌbär ‘wild cherry’	^{2}'ät-ˌbär ‘berries to eat’
h.	^{1}'fre-$_{0}$dag ‘Friday’ ^{1}'tis-$_{0}$dag ‘Tuesday’ ^{1}'var-$_{0}$dag ‘weekday’	(^{2}'fre-ˌdagen ‘the Friday’)	^{2}'fri-ˌdag ‘free day’
i.	^{1}'sam-$_{0}$bo ‘cohab’ ^{1}'sär-$_{0}$bo ‘live-apart’ ^{1}'mam-$_{0}$bo ‘live w/ mum’	––	^{2}'Flen-ˌbo ‘person who lives in the town of Flen’

In analysing these forms within the system, we must recognize that they alternate between stressed and unstressed, also within the same domain. This points to a synchronic analysis that is not unlike that of some pronouns, which alternate between stressed and unstressed status. The forms to the left in (261) and (262) should then be analysed as cases of incorporation into the minimal word, a situation that we have seen with unstressed and posttonic suffixes, and in syntax also with destressed pronouns (see 6.1). The incorporation of pronouns was diagnosed via *h*-deletion, as /h/ is not allowed outside the initial positions of feet and/or prosodic words. The resultant accent of the output is invariably accent 1, which further points to a difference vis-à-vis suffixation. Thus, even if the pronouns may carry lexical tone, which gets realized as accent 2 in stressed form (*henne* $_{2}$ ‘her’, *honom* $_{2}$ ‘him’), they do not induce accent 2 when incorporation takes place.

(263) Incorporation under clash, and contrasts

a.

'Karl(s) 'stad →	^{1}('Karl$_{0}$stad)$_{\omega}$ $^{\text{min/max}}$	[^{1}'kɑːlstɑ·d]	(name)
cf.	^{2}(('Grebbe)$_{\omega}$(ˌstad)$_{\omega}$)$_{\omega}$ $^{\text{max}}$	[^{2} 'grɛ̟bːɛ̟stɑːd]	(name)

b.

'blå 'bär →	^{1}('blå$_{0}$bär)$_{\omega}$ $^{\text{min/max}}$	[^{1}'bloːbæ·r]	‘blueberry’
cf.	^{2}(('fågel)$_{\omega}$(ˌbär)$_{\omega}$)$_{\omega}$ $^{\text{max}}$	[^{2}'foːgɛ̟lˌbæːr]	‘wild cherry’

(p.252)

c.

'gav 'henne$_2$ →	^{1}('gav$_{wa\ 0}$ ~~henne$_2$~~)$_{\omega}$ $^{min/max}$ ('MJÖLK $_{fa}$)$_{\omega}$ $^{min/max}$
	[^{1}'gɑːvɛnɛ'mjø̟lːk] ‘gave her MILK’
cf.	^{1}('gav$_{wa}$)$_{\omega}$ ^{min} ^{2}('HENNE$_{2,\ fa}$)$_{\omega}$ $^{min/max}$ ('mjölk$_{wa}$)$_{\omega}$ $^{min/max}$
	['gɑːv^{2}'hɛnɛ'mjø̟lːk] ‘gave HER milk’

Note that traces of stress remain in the second elements of *Karlstad* and *blåbär*. We also saw this effect in (197) where stresses were removed from tonic morphemes, under the pressure of Culminativity.

Notes:

([1]) The term *preaccenting* is often used in conjunction with culminative prominence in systems like Greek, Basque, and Japanese (for a comparison, see Riad 2012). Note that in the Swedish context, *preaccenting* only refers to the placement of lexical tone, on top of (culminative) stress, which we accounted for in chapter 10 with terms like *tonic, posttonic, pretonic*, and *unspecified*.

([2]) Indeed, it is sometimes called the ‘polysyllabicity accent’ (Sw *flerstavighetsaccent*), e.g. Molde and Wessén (1968), or the ‘disyllabicity accent’ (Sw *tvåstavighetsaccent*), e.g. Nyström (1997).

([3]) As demonstrated by Eliasson (2012), the main contrast is with /l/.

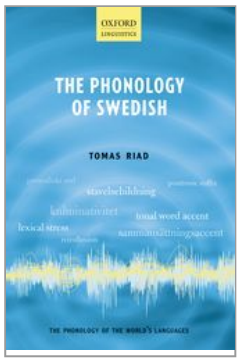
([4]) This is in fact the content of the morphological notions ‘cohering’ (unstressed) and ‘non-cohering’ (stressed) used by some researchers (e.g. Kristoffersen 2000).

([5]) The examples are taken from an investigation carried out with nonsense words (Bruce 1974).

([6]) There is also some ERP evidence for the markedness of accent 2 in suffixes. Roll et al. (2010) found an asymmetric pattern in the integration of conflicting information from F0 in the stressed syllable and type of suffix (neutral or accent 2-inducing). An accent 2 curve in the stressed syllable followed by a mismatch in the suffix (accent neutral) was harder to integrate than an accent 1 curve in the stressed syllable, followed by a mismatch in the suffix (accent 2). This was interpreted as the lexical status of accent 2, located to suffixes, versus the default status of accent 1.

([7]) And it could of course be modelled, e.g. in a cognitive linguistic model of the grammar and lexicon.

([8]) Another illustration of the difference between strong and weak suffix is offered by name formation from infinitives. The *-era* verbs *ser* ^{1}'*vera* ‘to serve, wait on’ and *ku* ^{1}'*rera* ‘to cure’ form the bases for two company names *Cervera* and *Curera*, which however get accent 2: *Cer* ^{2}'*vera* and *Cu* ^{2}'*rera*. The suffix is *-a* $_{2}$ in both cases, but is infinitive *-a* $_{2}$ in the verbs (weak), and nominal *-a* $_{2}$ in the names (strong), hence the difference in accent behaviour.



The Phonology of Swedish
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Print publication date: 2013
Print ISBN-13: 9780199543571
Published to Oxford Scholarship Online: January 2014
DOI: 10.1093/acprof:oso/9780199543571.001.0001

Intonation

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DOI:10.1093/acprof:oso/9780199543571.003.0012

Abstract and Keywords

The intonation of Swedish is understudied but has recently received increasing attention. In this chapter some of the recent findings are reported, together with a number of typical structures. The chapter tries to demonstrate the contribution of lexical and intonational tones, respectively, to the resulting output. There are two prominence levels, known as word accent and focus accent. In both of them accent 1 and accent 2 are distinct. in addition, there are boundary phenomena, such as a final L or H boundary tone, and an initiality accent. The chapter contains many panels demonstrating a variety of structures, such as narrow focus, plateau formation, word accent used in focus function, deaccenting, tonal assimilation, etc. At the end of the chapter the hierachical perspective on phrasing is commented on, where all elements are incorporated into maximal prosodic words.

Keywords: focus, boundary tone, word accent, focus accent, initiality accent, plateau, prominence level

The intonational system of Central Swedish has received more research attention than any other Swedish variety, but remains far less well studied than major varieties of several of the other Germanic languages. Like in most other North Germanic varieties, the presence of a lexical word accent distinction adds some interesting qualities to the intonational system, and provides a lot of information about the signalling of prominence in general. There is a perception – not very well-grounded – that the presence of the tonal accent distinction would somehow lock the intonation system into place, leaving little room for variation and the development of an interesting intonation system as in the other Germanic languages (Gussenhoven and van der Vliet 1999: 99). However, recent work by Hansson (2003), Roll (2006), Roll, Horne, and Lindgren (2009, 2010), Ambrazaitis (2009), and Myrberg (2010) shows rather clearly that there is plenty to discover and understand about this system. Swedish might also turn out to be an important source for hypotheses that are useful for the understanding of the other Germanic languages. The presentation in this chapter relies mostly on Myrberg (2010).

12.1 Introduction

The presence of the tonal accent distinction (described in chapter 9) greatly enriches the sources of evidence for the study of the intonational system. For any given intonational context one can systematically vary accent 1 and accent 2 and thereby get a clearer idea of what contributions are made by lexical and intonational information, respectively. The distinction also helps identify what tonal information is categorical, and what is the result of phonetic implementation. This is clearly a methodological advantage. There are two levels of prominence, as identified in the seminal work of Bruce (1977). These levels were called ‘word accent’ and ‘sentence accent’ in Bruce (1977). Later on, the term ‘focus accent’ was used for the higher prominence level (Bruce 1998, 2007a). Myrberg (2010) refers to them as ‘prominence level 1’ for the lower prominence level and ‘prominence level 2’ for the higher prominence level, respectively. We shall use the terms ‘word accent’ (wa) and ‘focus accent’ (fa), but stay neutral with respect **(p.254)** to what functions they may serve in information structure. In the hierarchical structure of intonation, the word accent is head in the maximal prosodic word (ω^{max}, see 5.2), and the focus accent is head in the prosodic phrase (ϕ, see 12.2.1). The prominence levels are distinguished by shape changes of melodic content, again a methodological advantage in comparison with other Germanic languages. And keeping the levels apart is also greatly helped by the fact that there are two parallel sources of evidence represented by the tonal accent distinction.

The double, two-way distinctions are repeated from (184) in the summary table in (264).

(264) Accents and prominence levels

Prominence level	*Accent 1*	*Accent 2*	*Accent 2 in compounds*	*Typical functions*
Focus accent	L*H	**H***LH	**H***L*H	focus, contrastive topic
Word accent	HL*	**H***L	**H***L	given material, second occurrence focus (post-focally), new material (non-final in the phrase)

Accents can only ever associate to stressed syllables, the tbu in Central Swedish. Both accent melodies have distinct properties at both levels. Thus, the fact that there are two different accent melodies (accent 1/acute and accent 2/grave) is of no importance to the level of prominence as such (Bruce 2005: 411). The distinctive tonal material of accent 2 is marked in bold in (264), setting it apart from the intonation part shared with accent 1. Accent 2 is tonally richer than accent 1 in most instances and across dialects. This falls out straightforwardly if the distinction is taken to be privative, with accent 2 containing an extra tone in addition to the shared tonal material that occurs in both accent melodies.[1]

At the focus accent level, the privative nature of the distinction is particularly clear. The shared tone in the focus accent is the LH rise. In accent 1, this is all there is and the first tone associates to the stressed syllable, hence L*H. In accent 2, there is the additional, initial H tone which takes precedence in association, hence **H***LH. In compounds there are two or more stressed syllables available, **(p.255)** i.e. more than one tone-bearing unit, and this allows for the association also of the L tone, hence H*L*H (see 5.2.1, 9.2.2 for illustration). In compounds, then, the later part of the contour, located at the last tbu, will look much like an accent 1 contour.

At the word accent level, the melodic content as such is similar between the accents, a HL fall in both cases. The timing, however, is different (Bruce 1977). In accent 1, the HL fall precedes the association point with a leading H, hence HL*. In accent 2, the extra tone instantiating privativity is always H, and it always takes precedence over intonational tones, hence H*L. Assuming now that the word accent is HL we can understand the result in accent 2 as a superposition of HL onto an associated lexical H* resulting in H*L, by coalescence of the H tones.[2]

In the further description of CSw intonation, we will assume the tonal representations from (264), and describe the function and distribution of these tonal sequences in the sentence level intonation in greater detail. We will describe first the distribution and function of focus accent. Thereafter we move on to a left-edge tonal phenomenon, which we will refer to as ‘initiality accent’ (following Myrberg 2010, 2013). Initiality accents are functionally left-edge markers, but behave phonologically much like prominences, and are tonally very similar to focus accents. After discussing the initiality accent, we turn to the function and distribution of word accents.

12.2 Intonation tones—the linear perspective

12.2.1 Focus accent (fa)

The focus accent is realized as L*H for accent 1 and H*LH for accent 2, as shown in (264). The focus accent is head of the prosodic phrase (cf. below). Two examples of focus accent are given in Fig. 12.1, one for accent 1 and one for accent 2.

The focus accent is assigned to the rightmost word in an information structurally focused constituent. The distribution of the focus accent is very similar to that of the nuclear accent in English (e.g. Selkirk 1995). Thus, it is oriented towards the right edge of a phrase.

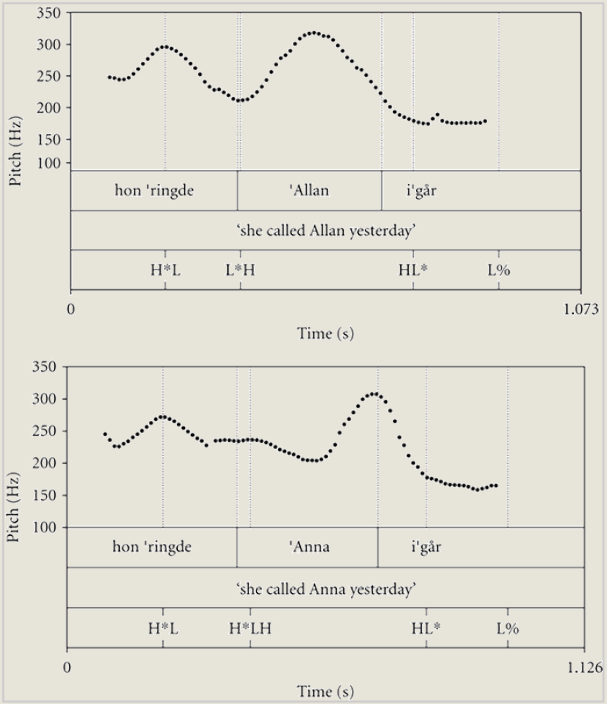


Fig. 12.1. Focus accent. The utterances are replies to the question *Vad gjorde hon igår?* 'What did she do yesterday?'. The focus accent falls on the object of the answer sentence.

(p.256) The distribution of focus accents in Swedish sentences is determined by factors relating both to the information structure and to the syntactic structure of a sentence. In addition, speech style, speech rate, and individual speaker preferences influence the distribution of focus accents. While much remains to be understood, there are also a number of patterns which are very stable, and which reveal that focus accents in Swedish are functionally closely related to strong pitch accents in other Germanic languages (see Myrberg 2010: ch. 3 for a systematic comparison; Selkirk 1984, 1996; Gussenhoven 1992; Féry 1993).

Note that the adverbial *igår* 'yesterday' does not receive the focus accent, as this constituent is given. The upper panel shows focus accent 1 (L*H), the lower panel shows focus accent 2 (H*LH).

Elicited speech

(p.257) Focal accents appear, almost obligatorily, on the last word of constituents which are focused in information structure.[3] They also appear obligatorily on contrastive topics, that is, the case where the topic contains a focus (Krifka 2008). This is illustrated in (265).

(265) Contrastive topic

Vad gör dina syskon? 'What do your siblings do?'

[Min [syster GREta]$_{Focus}$]$_{Topic}$ [pluggar fySIK]$_{Focus}$, och [min [bror HANS]$_{Focus}$]$_{Topic}$ [har fått jobb som MÅLare]$_{Focus}$.
'My sister Greta studies physics and my brother Hans has got a job as a painter.'

Contrastive topics get a focus accent (as opposed to initiality accent). This is seen in the fact that it occurs on the last stress of the focused constituent within the topic (*Greta*).

In all-new sentences, focus accent obligatorily shows up in parallel positions to nuclear accents, as described for other Germanic languages. Thus, it generally appears on the final word in the sentence, but is also to some extent conditioned by syntactic structure. Focus accents are avoided on given material following an earlier focus accent, while word accents occur regularly in post focal position (e.g. Fig. 12.1).[4]

It is a stable generalization that the focus accent appears on the rightmost word in the prosodic phrase where it appears, and we therefore assume that there is a pressure for prosodic phrases to be right-headed. This rightward tendency of the focus accent is also parallel to the behaviour of pitch accents in the other Germanic languages (e.g. Féry and Samek-Lodovici 2006).

The final peak of the accent 2 focus accent and the single peak of the accent 1 focus accent contour, i.e. the prominence tones, have been assumed to be parallel in terms of their function, as well as in their association. These peaks have been described as variable both in terms of their alignment with the segmental string, and in terms of the height of their scaling, though the factors conditioning this variation are not well charted (e.g. Bruce 1987; Heldner 2001; Fant and Kruckenberg 2008).

(p.258) 12.2.2 Initiality accent (IA)

In CSw, prominence tones also mark the left edge of phrases. The same contour as that which appears on focally accented words also occurs initially in many utterances. Myrberg (2010) calls it an initiality accent (IA) and characterizes it as a left-edge prominence marker. The fact that the IA is the same tonal contour as the focus accent can be established by studying its phonological behaviour. The IA associates to a stressed syllable, and it occurs in both accent 1 and accent 2 in accordance with lexical and postlexical information, just like the focus accent does. The fact that the initiality accent associates with a stressed syllable means that it can appear a few syllables into the phrase, when the phrase-initial syllables are unstressed (phrasal anacrusis, 12.3.1). Furthermore, the association pattern in compounds is the same for IA as for focus accent. When there are two stressed syllables (or more) available as tone-bearing units, accent 2 is regularly assigned (by postlexical rule), with two association points, one for the initial accent 2 tone (H*), and one for the prominence lending part (L*H). Finally, the IA connects to a following HL accent by plateau formation, just like the focus accent (see section 12.2.5). Together, these properties indicate that, in terms of its phonological behaviour, the IA is better described as a type of accent than as a boundary tone, as has previously been suggested (Horne 1994; Roll et al. 2009: 58f.).

However, while the initiality accent exhibits a phonological behaviour that is very similar to that of the focus accent, it is functionally different, and we therefore put it in a category of its own. The initiality accent does not depend on information structure, but is entirely based in prosody. It signals the beginning of the intonation phrase, as can be inferred from the fact that it is assigned to the *left*most stressed word of its domain (while focus is the *right*most stressed word of its domain). The domain of the initiality accent is the intonation phrase (ι, see later in this section).

Fig. 12.2 is an example of the initiality accent (Myrberg 2010: 54). The first stress of the phrase occurs on ^{2}'*dåliga* ‘bad’, which gets accent 2. The initial H*LH is clearly seen. The most prominent word of the sentence is ^{2}'*åt*,*gärdas* ‘be attended to’, a compound which gets accent 2 and which attracts the focus accent H*LH.

The fact that the IA does not constitute a focus in this utterance follows from the fact that there already is a focus, and that there is no sensible contrastive interpretation of the utterance, either internally (e.g. one where *dåliga* ‘bad’ were contrasted with *åtgärdas* ‘be attended to’), or within the larger context given (e.g. as answer to the question *Which old reparations must be attended to*?).[5]

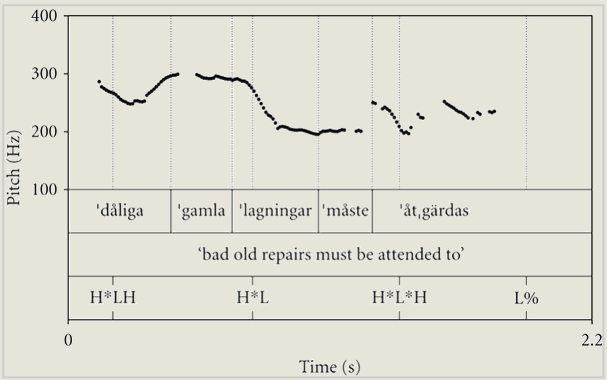


Fig. 12.2. Initiality accent (IA) on the accent 2 word ^{2}'*dåliga* ‘bad’, i.e. the H*LH contour. The focus accent of the phrase is on the final word ^{2}'*åt,gärdas* ‘be attended to’.

From Myrberg (2010: 54)

(p.259) The phonology of the IA requires it to associate to a stressed syllable, which in turn must occur in the first syntactic XP within the intonation phrase (ι). It occurs in the first prosodic phrase (ϕ) of the intonation phrase (ι). The hierarchical relationship is discussed in section 12.3.

The initiality accent is a characteristic correlate of structural main clauses in Swedish (Roll 2006; Roll et al. 2009). In embedded clauses (which do not appear initially in a main clause) it is much less common. However, in embedded clauses which exhibit main clause word order, the initiality accent is nearly obligatory. Such clauses (with complementizer *att* ‘that’), which are thus structurally main clauses, occur after non-factive matrix verbs. The word order difference between main and subordinate clauses in Swedish is diagnosed by introducing an adverbial (italicized) in the embedded/subordinate clause.

(266) Subordinate clause vs. embedded main clause. Example from Roll et al. (2009)

a. Subordinate clause:
Berättaren menar alltså [att vandalerna *inte* intog Gallien av en slump.]
‘the storyteller thinks thus that the Vandals *not* conquered Gaul by chance’

b. Embedded main clause:
Berättaren menar alltså [att vandalerna intog *inte* Gallien av en slump.]

‘the storyteller thinks thus that the Vandals conquered *not* Gaul by chance’

(p.260) Roll et al. (2009) find a tendency for a tonal event (his boundary tone, our initiality accent) to show up at the beginning of the embedded clause in (266b) where it facilitates syntactic processing. In an event-related potentials (ERP) experiment, Roll shows that this tone does not get in the way of interpretation if introduced in the subordinate clause (266a). For a panel and a structural representation, see Fig. 12.3 and (274).

The initiality accent is also syntagmatically influenced by the closeness to a (functional) focus accent, and may fail to occur in cases of conflict, as the focus accent has precedence. If there is narrow focus on the subject, and if there is only one stress available, it will be claimed by the focus accent, which is obligatory in narrow focus (as in most utterances). But even in a subject that is longer and contains more than one stress, an initiality accent is much less likely to show up if the focus accent is also within the subject, compared to when the focus accent is located in the VP. The behaviour is partly attributable to prominence clash. Here, the type of focus matters. Myrberg (2010) finds that narrow focus on the subject has a stronger tendency to inhibit an initiality accent than does a focus accent which is not grounded in a narrow focus, but which appears on the subject in addition to the nuclear accent in an all-new sentence. The likelihood of initiality accent showing up in the same syntactic constituent as a focus accent increases with the length of the constituent.[6]

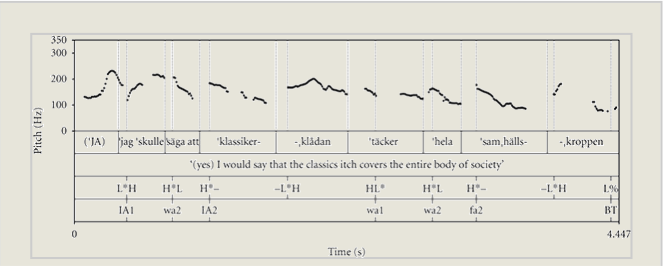
Conversely, prominence clash does not seem to occur across the boundary between the preverbal constituent (Spec,CP) and the rest of the clause. Even really short utterances like *Anna vände* ‘Anna turned’, or indeed *Jan grät* ‘Jan cried’, will regularly exhibit both an initiality accent and a focus accent. Clauses containing a single pronoun in the Spec,CP will however not get an initiality accent, as pronouns are not stressed.

12.2.3 Word accent (wa)

The word accent represents the lowest tonally marked prominence level. The word accent has a higher degree of prominence than simple stress and a lower degree of prominence than the focus accent. Simple stress has primarily non-tonal correlates, and the higher prominence focus accent is instantiated tonally by the L*H for accent 1 and H*LH for accent 2, whereas the word accent is realized with the tonal contours HL* for accent 1 and H*L for accent 2. The word accent has been considered as the realization of the lexical word accents since Bruce (1977), and hence the term ‘accented’ or ‘word accented’ has been used for this prominence level. However, Myrberg (2010) points out that the word accent can hardly be the straight realization of lexical information for three reasons. First, **(p.261)** the lexical distinction is privative with accent 2 as the marked member. Yet *both* accent 1 and accent 2 words exhibit word accents in the same positions in utterances. Thus, accent 1 forms carrying a word accent must receive it by some postlexical procedure.[7] Second, not all instances of accent 2 are lexical, as compounds get postlexical accent 2 based on prosodic information (two stresses), in Central Swedish (see 5.2.1).[8] Third, the word accent does not occur on all stressed syllables that could express a tonal distinction. Thus, even exempting the focus accent instances, there are a number of stressed words that do not always exhibit word accent. This means that – if HL is taken to be assigned to every prosodic word as a default – deaccenting of HL takes place outside of the lexicon, giving evidence of wider influence on this accent than simply lexical information. Alternatively, one could think of word accent assignment as selective, and postlexical, with the same empirical outcome.

These facts establish the word accent as a true *prominence* level. It is instantiated independently of the lexical status of the tonal accent distinction. That in turn opens up the question of a putative information structural function for word accents. If, for instance, it can be shown that there is extra high scaling of a certain word accent (outside reset positions), then that might require interpretation in terms of information structure. For a discussion of this, see Myrberg (2010: 96), and Myrberg (in prep.).

(p.262) Fig. 12.3 contains a panel showing three word accents (^{2}'*säga* ‘to say’ H*L, ^{1}'*täcker* ‘covers’ HL*, ^{2}'*hela* ‘entire’ H*L), and two focus accents (^{2}'*klassiker* ˌ*klådan* ‘the classics itch’, ^{2}'*sam*ˌ*hälls*ˌ*kroppen* ‘ the body of society’), as realized in compounds, i.e. H*L*H.



In this example each accent is clearly visible. Other times the word accents can be harder to notice visually in the F0 contour. A useful way of diagnosing the presence of word accents in context is by looking at them in the post-nuclear area, where they participate in plateau formation, discussed in 12.2.5.

Fig. 12.3. Word accents and compound focus accents. *Jag skulle säga att klassikerklådan täcker hela samhällskroppen.* 'I would say that the classics itch covers the entire body of society.'

The bottom tier marks the initiality accents (IA), the focus accent (fa), the word accents (wa) and the boundary tone (BT).

Spanarna, SR

While most stressed words usually contain at least a word accent there are systematic exceptions. In the account here, we will consider these as *deaccented* rather than *unaccented*. This is descriptively convenient, as it is easier to state generalizations for the absence of word accents than for the presence of word accents.[9] This is in turn due to our limited knowledge of the pragmatics or information structure of the word accent. The generalizations for deaccenting are as given in (267) (see Myrberg 2010: 81ff.; Myrberg and Riad 2013).

(267) Deaccenting

a. Verbs, especially auxiliaries, are often deaccented (e.g. *har* 'has', *ska* 'will, shall', *måste* 'must').
b. In so-called lexicalized phrases, the main prominence typically occurs on an adverbial, preposition, or noun, while elements preceding it are necessarily deaccented: *spela FOTboll* 'to play football', *ont i MAgen* '(lit.) ache in the stomach', *ligga I* 'to work hard, (lit. lie in)'.
c. So-called particle verbs have the same characteristic prosody as lexicalized phrases, but are not lexically fixed in the same way: *slippa/ tvinga UNdan* 'to get/force away', *tvinga/lägga PÅ* 'to force/put on', gå/ titta UT 'to go/look out'
d. Certain adjectives and pronouns are regularly deaccented in attributive position: *gammal* 'old', *liten* 'little', *små* 'little, pl.', *någon* 'any/some', *ingen* 'no' (but not *ung* 'young', *stor* 'big').[10]

We return to deaccenting in 12.3.

12.2.4 Functions of the word accent

The word accent occurs by default on any material that does not receive a focus accent. This also means that word accents are retained on given and unfocused **(p.263)** material in a sentence. Thus, in (268) the word *kakan* receives a word accent even though it is contextually given (note however, that Bruce 2007b suggests that some dialects do deaccent word accents post focally). As a result, the distinction between deaccented and HL-accented is maintained in given material. In this respect, Central Swedish appears to differ from other Germanic languages, where given material is often described as being completely deaccented (see discussion in e.g. Ladd 2008). Deaccenting, then, appears to be lexically or constructionally driven as reported in (267).

(268) Given material

A: Jag vet att John stal en kaka. Vad gjorde han sen?
'I know that John stole a cookie. What did he do then?'

B: Han [lämnade tillBAka [kakan]$_{\text{Given}}$]$_{\text{Focus}}$
'He returned (lit. left/gave back) the cookie.'

In general, word accents do not appear as markers of focused material. However, this can happen with the special type of focus known as Second occurrence focus (SOF), exemplified in (269). SOF has been discussed in the literature on English and German, because it regularly fails to receive the nuclear prominence in the sentence (Partee 1999). This prominence instead falls on another focus in the sentence, sometimes referred to as the First occurrence focus, FOF. The SOF can appear after the FOF, as in (269), but may also appear before the FOF (see Rooth 1996; Féry and Ishihara 2009). When post-nuclear, the SOF is most commonly realized as a word accent in Swedish, as in the last sentence of (269).

(269) Post-nuclear Second occurrence focus (example is due to Beaver, Clark, Flemming, Jaeger, and Wolters 2007)

Både Sid och hans medbrottslingar skulle ha nämnts i rättegångsförhandlingarna idag.
Men svaranden nämnde bara SID i rättegångsförhandlingarna idag.
'Both Sid and his accomplices should have been mentioned in court today.
But the defendant only mentioned Sid in court today.'
Till och med [ÅKLAgaren]$_{\text{FOF}}$ nämnde bara [Sid]$_{\text{SOF}}$ i rättegångsförhandlingarna idag.
'Even the prosecutor only mentioned Sid in court today.'

Myrberg (2010: 94ff.) observes that SOF in *pre*-nuclear position tends to get realized with the focus accent.

(p.264) (270) Pre-nuclear Second occurrence focus

> Sven och Ylva ska flytta. De undrar om de har råd att betala en flyttfirma för att hjälpa dem. Flyttfirman säger att bara en flyttare inte ens kostar tusen kronor, fast kostnader för en bil tillkommer.
> ‘Sven and Ylva are moving. They wonder if they can afford to pay a moving company to help them. The moving company says that only one mover doesn’t even cost a thousand crowns, but there are some extra charges for the car.’
> Eftersom de bara behöver [EN]$_{SOF}$ flyttare behöver de inte ens betala [två tusen KROnor]$_{FOF}$
> ‘Since they only need one mover they don’t need to pay even two thousand crowns.’

It would appear that SOF is accompanied by some phonetic boosting when realized with the word accent (Myrberg 2013).

Sometimes, the word accent can function as head of the intonation phrase, where we would normally have expected a focus accent. Ambrazaitis (2009: ch. 6, 115ff.) studies this property in confirmation sentences. Myrberg (2010) notes that this type of contour occurs in a wider context than in confirmation sentences, an observation that amounts to a hypothesis that the use of the word accent in this nuclear function is somehow connected to information structural givenness. Our illustration (from Myrberg 2012: 92) is not a straight confirmation sentence, but provides the preceding statement with a narrower exemplification. The preceding context is given in (271) and the panel in Fig. 12.4.

(271) Preceding context for Fig. 12.4

> Det som är jättebra—hehe, om nånting är bra med de här skadorna—det är det att de är så specifika, de här insekterna
> ‘what is really good—hehe, if there is anything good about these damages—is that they are really limited, these insects’.

As Myrberg shows, a word accent can co-occur with an initiality accent and still be the head of the intonation phrase (Myrberg 2010: 90f.).

12.2.5 Plateau formation

A prominent realizational property of the focus accent, as well as initiality accent, is plateau formation, whereby the last H tone of the L*H/H*LH contour forms a high plateau to the following word accent (i.e. HL* or H*L). An instance of plateau formation after an initiality accent was given in Fig. 12.2 where the plateau stretches from the initiality accent on ^{2}'*dåliga* 'bad', across the word ^{2}'*gamla* 'old', which is deaccented in this context, over to the H*L accent on ^{2}'*lagningar* 'reparations'. An instance of plateau formation beginning at a focus **(p.265)**

accent was seen in Fig. 9.4, where the plateau begins at focused ^{2}'*egen* 'own' and ends at the following HL* accent on *regi*'*on* 'id.'. Fig. 12.5 is another instance of such a plateau, stretching across several unaccented words.

Plateau formation is an interpolation between two high tones, but may look phonetically somewhat different for initiality and head accents, respectively. Initiality accents tend to spread out to the right more freely, leading to a later timing of the last H (Horne, Hansson, Bruce, and Frid 2001). This yields **(p.266)** relatively shorter plateaus and sometimes leads to total tonal assimilation of the last H in an initiality accent, with the following HL. Tonal assimilation is illustrated in Fig. 12.6.

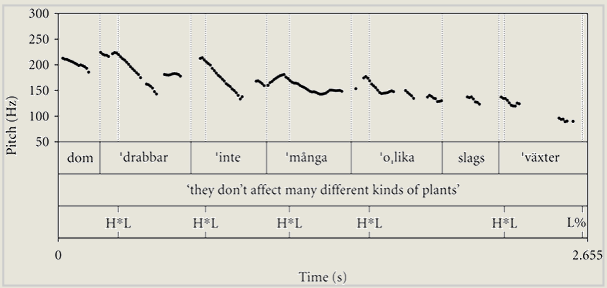


Fig. 12.4. Intonation phrase with HL accents only. *Dom drabbar inte många olika slags växter*. 'They don't affect many different kinds of plants'.

From Myrberg (2010: 92)

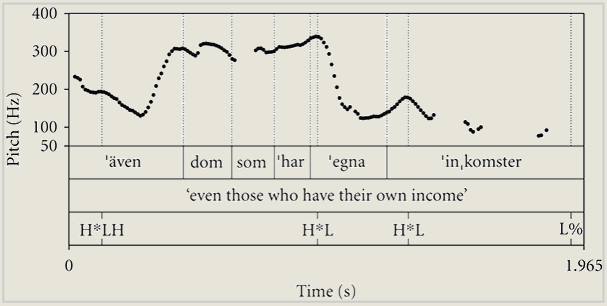


Fig. 12.5. Plateau formation. The focus accent is on ^{2}'*även* 'even' exhibiting the H*LH contour typical of focused accent 2 words. The next accent is the word accent H*L on ^{2}'*egna* 'own'. Several unaccented syllables occur under the plateau.

From Myrberg (2010: 80)

Plateau formation only takes place when the focus accent and the following word accent are within the same intonation phrase, see 12.3.1.

12.2.6 Final boundary tone in the intonation phrase

The intonation phrase ends in a boundary tone, which may be L% or H%. The L% boundary tone is often found directly after a focus accent, as e.g. under narrow focus (and may then be followed by an ι-external area, Myrberg 2010: 106ff.). This fact exposes the functional contrast between the focus accent and the initiality accent, as the latter cannot be followed by a boundary tone. A focus accent will thus sometimes be followed by a plateau (if a HL follows), sometimes by a boundary tone, whereas an initiality accent will always be followed by interpolation to a following H, be it realized as a plateau or as tonal assimilation.

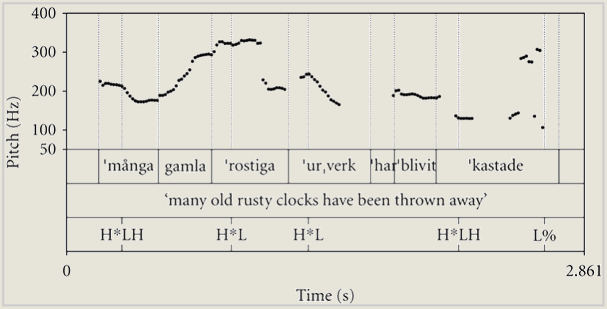


Fig. 12.6. Tonal assimilation. Initiality accent on the accent 2 word ^{2}'*många* 'many'

The last H of the initiality accent contour H*LH on ^{2}'*många* 'many' assimilates to the H of a following H*L accent on ^{2}'*rostiga* 'rusty'. The focus accent of the phrase is on the final word ^{2}'*kastade* 'thrown away'.

From Myrberg (2010: 57)

The L% is regular in most types of utterances, including questions. The H% tone may signal continuation (e.g. in list intonation), and sometimes a question (House 2004). All figures seen so far in this chapter exemplify utterances with a final L%. Fig. 12.7 is an example of a question with a H% boundary tone. When it occurs in questions, H% is strongly correlated with polar (yes/no) questions (House 2004). A *wh*-question with a L% boundary tone is given in Fig. 12.8.

(p.267) 12.3 Tonal sequences—the hierarchical perspective

The hierarchical organization of prosodic structure involves several layers. Myrberg (2010) finds evidence for three categories above the prosodic word, all defined in tonal terms: the accent phrase (AP), the prosodic phrase (ϕ), and the intonation phrase (ι). We shall assume here that the accent phrase reduces **(p. 268)** to the (maximal) prosodic word (ω), and will leave it out of the discussion (see Myrberg and Riad 2013). We will briefly discuss the hierarchical relations between these categories, and how they connect with the lower part of the prosodic hierarchy.

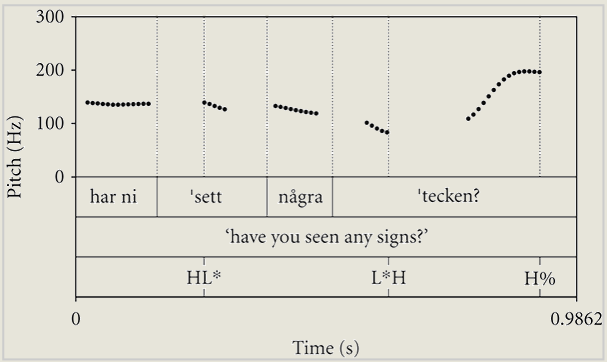


Fig. 12.7. Polar question with a H% boundary tone. *Har ni sett några tecken?* 'Have you seen any signs?'

Spanarna, SR

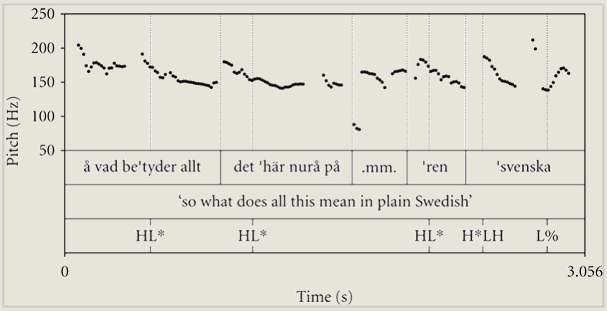


Fig. 12.8. *Wh*-question with a L% boundary tone. *Och vad betyder allt det här nu då, på ren svenska?* 'So what does all this mean now, in plain Swedish?'

Vetandets värld, SR

Beginning from the top, the intonation phrase (ι) is characterized by markers of edges. It can therefore be described as a *delimitative* domain. The initiality accent belongs to the intonation phrase, where it appears as a left edge prominence. The right edge of the intonation phrase is marked by a boundary tone, H% or L%. The right phrase edge is also where the head of the phrase usually occurs. There is no categorical tonal correlate of the head of the intonation phrase, over and above those going with the prosodic phrase. The focus accent which constitutes the head of the intonation phrase is inherited from the prosodic phrase, where it originates. Thus, no accent is part of the defining criteria for the intonation phrase. The initiality accent, however, is part of its definition but it is not obligatory in all intonation phrases (and it is *not* the head of the intonation phrase).

The intonation phrase dominates the prosodic phrase (ϕ), which is primarily a culminative domain. The defining characteristic of the prosodic phrase is the presence of a focus accent which constitutes its head. The focus accent of the rightmost prosodic phrase becomes the head also of the intonation phrase (ι), which contains it. The fact that a focus accent in the ϕ is obligatory, makes the prosodic phrase categorically different from the maximal prosodic word below it. The edges of the prosodic phrase are not clearly signalled.

The prosodic phrase dominates one or more prosodic words. Each maximal prosodic word is defined as carrying a word accent, which may be supplanted with a focus accent if so required by information structure, or an initiality accent, if so required by syntactic and prosodic structure. The prosodic word is hence a culminative domain, headed by an accent.

The highest projection of the prosodic word is the carrier of exactly one word accent. As just mentioned, a prosodic word sometimes happens to carry the focus accent (if it is the head of the prosodic phrase), or the initiality accent (if it is at the left edge of an intonational phrase), but there will only ever be one accent per maximal prosodic word.

Seen as a prominence marker or initiality marker, the accent is in principle intonational in character, hence postlexical. When we talk about the accent *distinction*, we refer to a melodic distinction that involves lexical tone in interaction with the accentual markers of the intonational system. In CSw, the lexical tone is only assigned inside the minimal prosodic word, typically from a suffix to a root (see 11.5). There is just one single lexical tone (H in Central Swedish), **(p.269)** which shows up in a subset of all instances referred to as ‘accent 2’, i.e. the ones stemming from morphemes carrying the lexical tone. As we have seen, there is also a postlexical source of accent 2, based on the number of stresses (compounds and similar structures), see 9.1. In dialects other than Central Swedish, lexical tone can also affect the resulting accent of compounds (Bruce 1974). In no dialect, however, can there be more than one word accent in a compound, and that probably points at a structural similarity across dialects, regarding their domains in the prosodic hierarchy.

Deaccenting happens, and we analyse this as incorporation into prosodic words, such that the output structure always exhibits the one-to-one relation of one maximal prosodic word and one word accent (Myrberg and Riad 2013). Below the maximal projection, prosodic words are defined by metrical culminativity (one stress per ω^{min}) and domain of syllabification (see 5.1).

At this point, the direct connection between the prosodic word and the higher domains of intonation structure, via the word accent and, at times, the focus accent or initiality accent, provided by the higher phrasal domains is perhaps more of a hypothesis than an established fact (Riad 2012; Myrberg and Riad 2013). However, a major virtue of this model is that it explicitly connects the intonational structure with the morpho-syntactic structure.

Previous models of Swedish and Norwegian intonation have tended to model the intonational categories only, i.e. intonational prominence and phrasing. The alignment with morpho syntax, however, is largely unexpressed or very understated. These models have included domains with somewhat similar definitions like we have for the maximal prosodic word here, i.e. a unit with an accent at the word level as their head. The category is known under different names, e.g. the Tonal Foot (Fretheim and Nilsen 1989; Nilsen 1992), the Accentual Phrase (Kristoffersen 2000; Abrahamsen 2003), and the Prosodic Word (Bruce 1998; Heldner 2001; Hansson 2003; Ambrazaitis 2009). For Danish, the corresponding unit is referred to as the Prosodic Stress Group (Grønnum Thorsen 1988; Hansson 2003: 14).

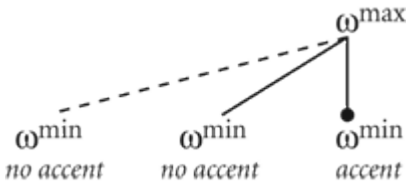
We achieve a more realistic general picture (descriptively, at least), by connecting the intonational properties to the prosodic word, whose alignment with morphosyntax is explicitly discussed in chapters 5, 7, and 10. As mentioned before, there is also the possibility of there being another level of structure between the prosodic word and the prosodic phrase, but it would then be a category with much the same properties as the maximal prosodic word, and therefore substituting for it, i.e. the prosodic word group, as proposed by Vigário (2003, 2010). As far as I can see, all that is said here would be fully compatible with such an analysis.

(p.270) 12.3.1 Structural illustrations

We turn now to the illustration of a few sentences as analysed in this framework. We will assume, provisionally, that all relevant categories exhaustively parse the structure they dominate.[11] In particular, this means that an utterance is fully parsed with prosodic words, where each (maximal) prosodic word contains exactly one accent.

Let us look first at how unaccented material should be incorporated in prosodic structure. Sentences containing unaccented and indeed unstressed words are very common, of course. In Fig. 12.2, for instance, every word is a prosodic word, hence stressed, but some words are not accented. This means that not every word is a maximal prosodic word of its own. Rather, the prosodic words which are unaccented (as well as function words which do not form prosodic words) are incorporated into a maximal prosodic word nearby. We have already seen some cases of incorporation in chapter 5, both in word formation and syntax. Now we should look at a few other cases where incorporation regularly occurs. Examples are given in (272), adapted from Myrberg and Riad (2013), where this structure and analysis is proposed. There are several cases that exhibit this structure containing deaccented prosodic words.

(272) Incorporation in phrasal structure



a.

(('Röda$_2$)	^{1}('Korset))$_\omega$ ^{max}	'Red Cross' (name)

b.

('röda$_2$)	^{2}('mattan))$_\omega$ ^{max}	'red carpet' (lexicalized phrase)

c.

(('hela$_2$)	('långa$_2$)	^{1}('dagen))$_\omega$ ^{max}	'all day' (three-word lex. phrase)

d.

(('hoppa$_2$)	^{1}('upp))$_\omega$ ^{max}	'to jump up' (particle verb)

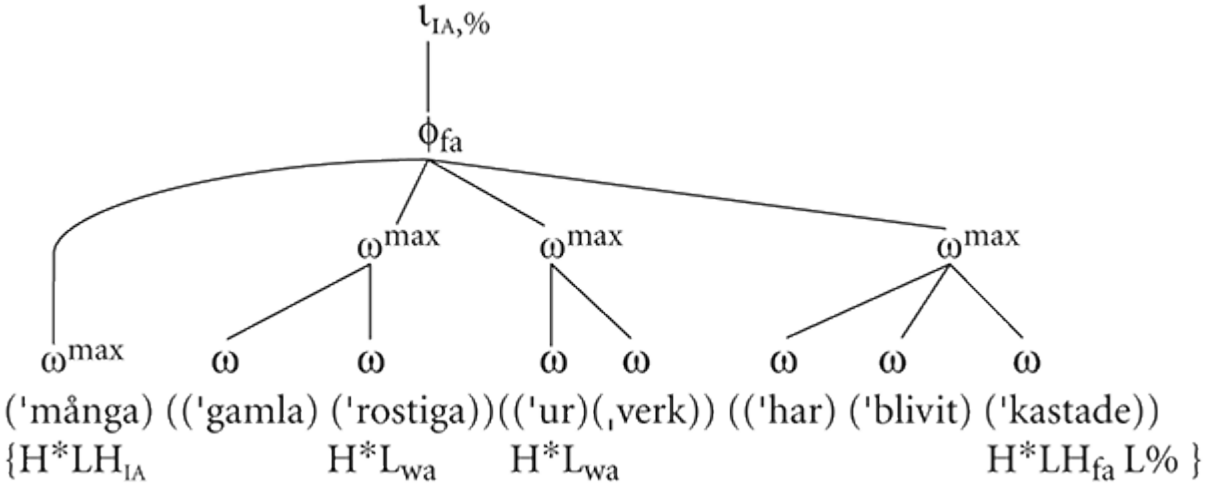
e.

(('laga$_2$)	^{1}('kopiatorer))$_\omega$ ^{max}	'to fix copying machines' (reg. phrase)

These cases are analysed as maximal prosodic words, where, however, the headedness of the phrase is retained (for arguments, see Myrberg and Riad 2013). It is a mixed bag of cases that get prosodically organized in this way: names, lexicalized phrases, particle verbs, and regular phrases.

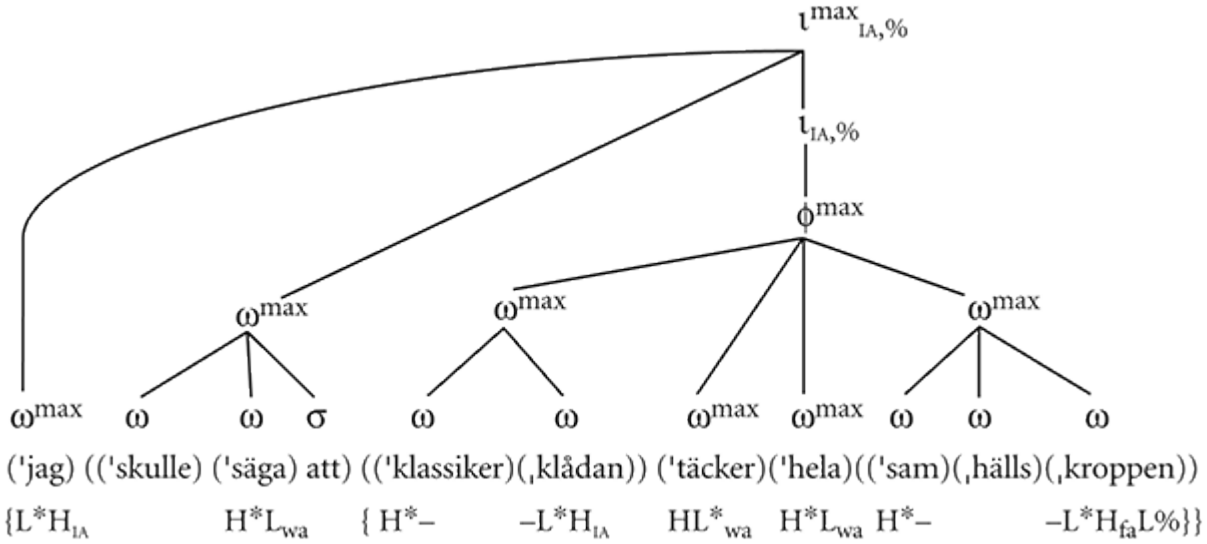
(p.271) The prosodic structure of the sentence in Fig. 12.6 is given in (273). It contains a few incorporations at the phrasal level, as a result of deaccenting. In *gamla rostiga* 'old rusty', *gamla* 'old' is regularly deaccented, and in *har blivit kastade* 'have been thrown (away)', the auxiliaries are deaccented, also a very common thing (see (267)). There are four accents in this sentence, hence four maximal prosodic words, but there is only one focus accent (*kastade*, H*LH), hence the sentence is one single prosodic phrase. There is also one initiality accent to the left and one boundary tone to the right, indicating that the whole sentence forms a single intonation phrase. We bracket prosodic words in the text and mark the accents below the words that carry them. The initiality accent ('IA'), the focus accent ('fa'), and the boundary tone ('%') are marked on the categories where they originate as well as on the melodic elements in the bottom row (where intonation phrase boundaries are also marked with curly brackets). All other tones are word accents ('wa').

(273) One ι, one ϕ, four ω^{max}



In the next example we have an embedded main clause, a structure that can normally be diagnosed by looking at initiality accents. As shown by Roll et al. (2009) and Myrberg (2010), initiality accents show up primarily in the beginning of main clauses, including cases like (274), where a syntactic subordinate clause is transformed into a main clause.[12] Thus, there is an embedded main clause within the larger main clause. This yields a structure where there are in fact two initiality accents, each at the beginning of a main clause. To model this, we need a recursive intonation phrase. (274) is the structural rendering of Fig. 12.3.

(p.272) (274) Projecting ι, one ϕ



The unstressed complementizer *att* 'that' does not form a prosodic word by itself, but adjoins to the preceding verb, in this example. If *att* were followed by a proper, subordinate clause, the phrasing would more likely be to the right.

Phrases can often begin with a sequence of unstressed syllables, so-called phrasal anacrusis. This is exemplified in Fig. 12.9. Fig. 12.9 also shows how a syntactic phrase is broken off into two intonation phrases. The evidence for this is the L% tone in the middle.

The structural analysis of Fig. 12.9 is given in (275).

(275) Projecting ι, one ϕ

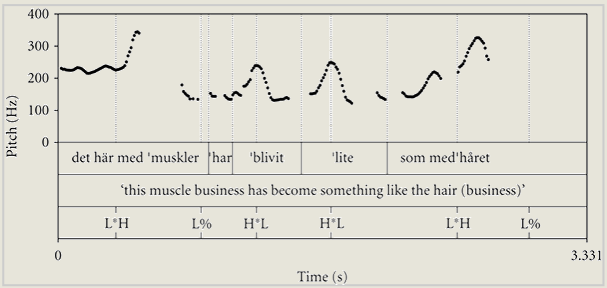
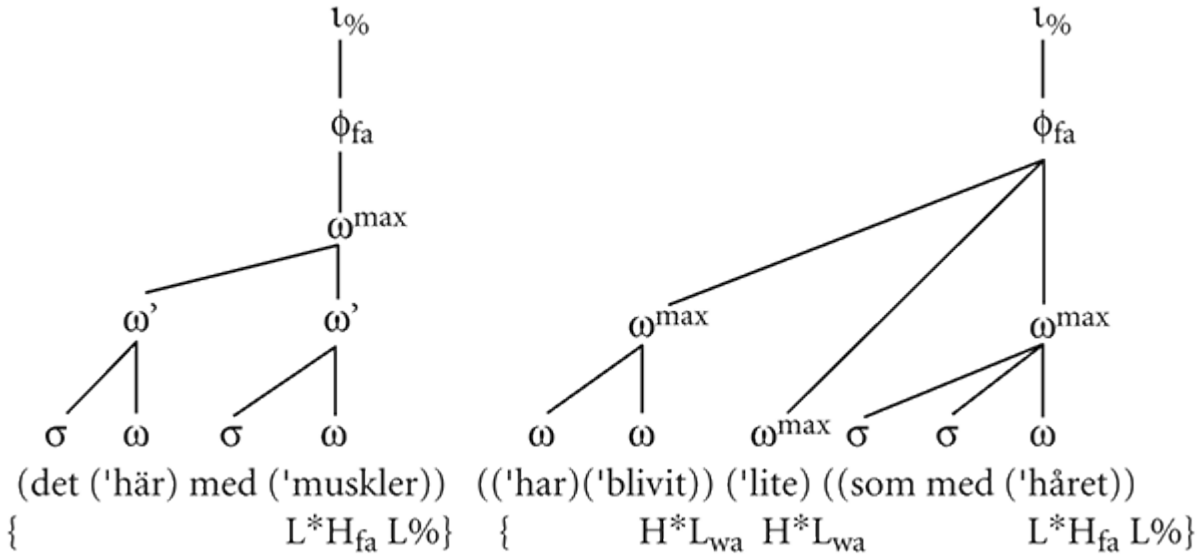


Fig. 12.9. Phrasal anacrusis (underscored): *det här med muskler har blivit lite som med håret* 'this muscle business has become something like the hair (business)'

This example also illustrates the insertion of a boundary in the middle of the phrase, yielding two intonation phrases.

Kropp & själ, SR



Plateau formation occurs in (274) between the initiality accent and the following word accent (see Fig. 12.3), where the two accents are within the same intonation phrase. In (275), however, no plateau can be formed between the first focus accent and the following word accent, since they are not in the same intonation phrase.

(p.273) Many things remain unexplored in CSw intonation, and in particular, the options available to the speakers in any given sentence are far from fully understood. Myrberg (2010) identifies optional phrasings of several of her test sentences. Ambrazaitis (2009) and Myrberg (in prep.) also find that the focus function can be expressed with either the word accent or the focus accent in certain circumstances.

Optionality is also in evidence with some tonal effects relating to the lexical accent. For instance, we saw that the adjunction of prefixes *be-* and *för-* in morphology obligatorily entailed accent 1, i.e. (för-^{1}('därv-a_2)) ‘to ruin’, (be-^{1}('tal-a_2)) ‘to pay’. Accent 1 here is simply the default when word accent is assigned to a structure containing a single stress. Lexical accent 2, stemming from the infinitive suffix, is inhibited. In the corresponding structure in syntax, we found that adverbial *för* ‘too, overly’ had a similar effect, see (135). However, beyond the most common cases, this accent effect in syntax is variable and hence to some extent optional. The lower the frequency of the adjective, the less likely the change of accent becomes (Sara Myrberg, p.c.).

(276) Adjunction in syntax

obligatory	(för (^{1}'liten$_2$))	‘too small’
	(för (^{1}'vän-lig$_2$))	‘too kind’

optional	(för (^{1}'dy-ig$_{2}$)) or (för (^{2}'dy-ig$_{2}$))	‘too muddy’
	(för (^{1}'egen$_{2}$)) or (för (^{2}'egen$_{2}$))	‘too odd’

(p.274)

This variation is hardly caused by structural differences, but rather by the degree of entrenchment. The adjunction of the adverb to the following prosodic word allows for the treatment of the structure as a whole as a single prosodic word, which in turn causes the choice of accent.

A similar case is evident when we sometimes find compound prosody in the syntax, see (134). This is also due to regular prosodic incorporation, which creates what is prosodically a word structure in syntax, which can subsequently become entrenched or reinterpreted, if other properties warrant the identification of a (word) pattern. Thus, it is not surprising that the so-called particle verbs (*komma in* ‘to come in’, *kila hem* ‘to dash home’), which always have a deaccented verb and accented particle, have come to develop compound prosody in several dialects, sooner than other structures like verb + object (*laga kopiatorer* ‘to fix copying machines’, *tvätta lakanen* ‘to wash the sheets’). This change, however, has not yet occurred in Central Swedish.

Notes:

(^{1}) The argumentation for a privative analysis and the asymmetries that are predicted are mostly carried out in chapters 9 and 11, where it is demonstrated, among other things, that accent 2 must be (partly) lexical and located in suffixes in order for the pattern of ‘accent strength’ in CSw morphology to be properly understood.

(^{2}) This general analysis keeps constant the fact that it is a L tone that always associates when no lexical tone is present, in both prominence levels, and irrespective of overall accent. The word accent contour of accent 1 is HL*, and the focus contour of accent 1 is L*H, and that same contour shows up in the last stressed syllable of focused compounds, too.

(^{3}) For exceptions to this general pattern see Ambrazaitis (2009) concerning confirmation sentences, and Myrberg (in prep.) concerning second occurrence focus.

([4]) In contrast with nuclear accents in other Germanic languages, however, focus accents may also appear on constituents earlier in a sentence, without there being a narrow focus constituent there (Myrberg 2010: 61–63, 68). The most common locus for such an early focus accent is the last word of the initial, preverbal constituent in the sentence (Spec,CP, Sw *satsbas* ‘clause base’), but other patterns are also possible. Focus accented words are written in uppercase in this example: *Skillnader i LÖNEAVTALEN kan påverka möjligheten att få TJÄNSTLEDIGT.* ‘Differences in agreements on wages may affect one’s possibility of taking a leave of absence’.

([5]) If the subject '*dåliga* '*gamla* '*lagningar* ‘bad old repairs’ had been the contrastive topic of this sentence, it would have received focus accent on '*lagningar*, the rightmost stressed word in the domain.

([6]) Granted the analysis, this is another argument for the fact that IA and focus accent are the same type of phonological object, and that both actually lend prominence to the stress they occur on.

([7]) Of course, if one could defend the position that the tone accent distinction is represented as equipollent, the first argument given here is countered.

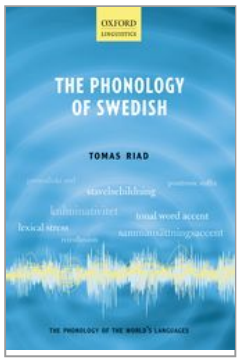
([8]) Thus, even if one does not accept the privative analysis, there is no way around the fact that some accents must be assigned postlexically.

([9]) Some pronouns that regularly show up as unaccented are lexically unstressed (e.g. *den, det* ‘it’, cf. *d*-continuization discussed in chapter 4). Some of the pronouns in the list below may belong to this group in which case they are not strictly speaking deaccented, but unaccented due to lack of stress.

([10]) When free-standing, the pronouns do get accented *någon* ‘someone’ and *ingen* ‘no one’.

([11]) The only level where there is clearly defective structure in this respect is foot structure (see 6.1). As argued in chapter 6, it might be that the foot is not truly integral to the prosodic hierarchy.

([12]) In this particular instance, there is no sign other than the IA to tell us that the clause beginning with the complementizer *att* is really a main clause. If a sentence adverbial were inserted, word order would give the structure away.



The Phonology of Swedish
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Print publication date: 2013
Print ISBN-13: 9780199543571
Published to Oxford Scholarship Online: January 2014
DOI: 10.1093/acprof:oso/9780199543571.001.0001

Syllables and phonotactics

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DOI:10.1093/acprof:oso/9780199543571.003.0013

Abstract and Keywords

The chapter looks at the central syllable generalizations for onsets and nuclei, and then turns to an overview of phonotactic patternings in initial and final clusters. A distinction is made between morphologically simple and morphologically complex clusters in final position.

Keywords: onset, sonority, cluster, initial, final, phonotactics, syllables

In this chapter we look at the syllable structure of Swedish with a view to the central phonotactic patterns. The distribution of segments in syllables has been studied mainly by Sigurd (1965), a dissertation devoted entirely to Swedish phonotactics, and Loman (1967), a review and commentary of Sigurd (1965). The general patterns are typical of a Germanic language, that is, with fairly high demands on the sonority of syllable nuclei and admittance of complex clusters in onsets and codas.

13.1 Obligatoriness of onsets

Unlike German, insertion of a glottal stop is non-obligatory (though fully possible) in stressed vowel-initial syllables: *äntligen!* [^{2}ˈɛ̟n:tlɪgɛ̟n] or [^{2}ˈʔɛ̟n:tlɪgɛ̟n] ‘at last!’, *anka* [^{2}ˈaŋ:ka] or [^{2}ˈʔaŋ:ka] ‘duck’. Epenthetic onsets are more likely to occur in careful or emphatic speech, but their use also varies idiolectally. The distribution of the glottal stop appears to obey prosodic word structure more readily than the simple distinction between stressed and unstressed. To see this consider the data in (277), where the contrasts according to intuition are demonstrated.

(277) Epenthetic glottal stops (optional)

a.

äntligen	('ʔäntligen)$_{\omega}$	‘at last’	init. stress in ω^{min} and ω^{max}
anka	('ʔanka)$_{\omega}$	‘duck’	

b.

beakta	(be-('ʔakta)$_{\omega}$)$_{\omega}$ $_{max}$	‘to consider’	init. stress in ω^{min}, not in ω^{max}
beivra	(be-('ʔivra)$_{\omega}$)$_{\omega}$ $_{max}$	‘to prohibit’	

c.

armé	(ʔar'mé)$_{\omega}$	‘army’	unstressed init. in ω^{min} and ω^{max}
irriterad	(ʔirri 'terad)$_{\omega}$	‘irritated’	

d.

ruin	*(ru'ʔin)$_{\omega}$	‘bankruptcy’	non-init. stress in ω^{min}
seans	*(se'ʔans)$_{\omega}$	‘séance’	

e.

realism	*(reʔa'lism)$_{\omega}$	‘id.’	prestress non-init. in ω^{min}
toalett	*(toʔa'lett)$_{\omega}$	‘toilet’	

(p.276)

f.

Göinge	*('göʔinge)$_{\omega}$	place name	poststress non-init. in ω^{min}
toa	*('toʔa)$_{\omega}$	‘toilet’	

The canonical case for glottal stop insertion is the stressed word-initial syllable. This is the case in (277a) and also in (277b), where the initial unstressed syllable is a prefix, which does not cosyllabify with the stem (see 5.2.2). In both of these cases the onsetless syllables are initial in the minimal (but not necessarily the maximal) prosodic word. In (277c) we have the case of initial but unstressed syllable. Here, too, glottal stop insertion is intuitively natural. In the remaining three cases, however, where the onsetless syllable is stressed or unstressed but not initial in the prosodic word, insertion is not admitted. The result, then, is that the correct characterization of glottal stop insertion is ‘initial in the minimal prosodic word’.

13.2 Sonority in syllable nuclei

In Central Swedish, stressed as well as unstressed syllables must have a vowel in the nucleus, hence the sonority demands on nuclei are relatively high.

(278) Sonority: syllable nuclei are vowels

stressed syllable	unstressed syllable
smet [sme:t] ‘batter’	randig [^{1}'ran:dɪg] ‘striped’

Phonotactics challenges syllabification in a few areas with different behaviours as a result. Epenthesis is triggered in cases where the challenging sequence contains a coronal liquid or nasal, i.e. /r/, /l/, or /n/. Epenthesis in conjunction with either of these segments gives rise to surface alternations like those in (279), where epenthetic vowels are underscored, and the positions where they are absent are marked with a bullet.

(279) Epenthesis

-r	[1]'kad̲er	‘cadre’	[2]'kad•r-ar	‘cadres’
	[1]'kad̲er-n	‘the cadre’		
	[1]'väd̲er	‘weather’	[1]'väd•r-et	‘the weather’
	[1]'vint̲er	‘winter’	[2]'vint•r-ar	‘winters’
	[1]'vint̲er-n	‘the winter’		
	[1]'fönst̲er	‘window’	[1]'fönst•r-et	‘the window’
	[2]'broder	‘brother’	[2]'bröd■r-a-ˌskap	‘brotherhood’
	[2]'broder-n	‘the brother’		
	[1]'rod̲er	‘rudder’	[1]'rod•r-et	‘the rudder’

(p.277)

-l	[1]'segel	‘sail’	[1]'seg•l-et	‘the sail’
			[2]'seg•l-a	‘to sail’
	[1]'regel	‘rule’		
	[1]'regel-n	‘the rule’	[1]'reg•l-er	‘rules’
	[2]'spegel	‘mirror’	[2]'speg■l-ar	‘mirrors’

-n	[1]'tecken	‘sign	[1]'teck•n-et	‘the sign’
	[1]'socken	‘parish’	[1]'sock•n-en	‘the parish’
			[2]'sock•n-ar	‘parishes’

The forms on the left mostly exhibit accent 1. Many previous analyses have taken the correlation between epenthesis and accent 1 to be one where the underlying form is monosyllabic, and hence not eligible for accent 2, i.e. /kadr/, /vɛdr/, etc. (e.g. Öhman 1966; Teleman 1969; Linell et al. 1971; Hellberg 1974). Epenthesis will not affect accent, whether it takes place within a stem (e.g. /regl/ > [^{1}'reːgɛ̲l] 'rule'), or occurs in a consonantal suffix (e.g. /mag-•sk/ > [^{1}'mɑːgɪsk] 'magical'). If disyllabic forms exhibit accent 2, the assumption is that the vowel is underlying, either within the stem (e.g. ^{2}'*broder* 'brother', ^{2}'*spegel* 'mirror'), or in a vocalic suffix which is lexically specified for accent 2 (e.g. /sukn-ɑr$_{2}$/ > [^{2}'sʊkːnar] 'parishes'). However, these forms will undergo syncope when vocalic endings or linking vowels are added (e.g. ^{2}'*bröd*■*r-a-*‚*skap* 'brotherhood', ^{2}'*speg*■*l-ar* 'mirrors'). This indicates that we need both syncope and epenthesis to make the account for the correlations (Eliasson 1972; Hellberg 1974: 110ff.).[1]

We can see in (279) that the definite articles of the two genders trigger different behaviours. It would appear that the neuter form is in fact syllabic /-et/, whereas the common gender form is just the consonantal /-n/ (Riad 2003b). If this is true for CSw, then it explains most of the variable outcome, e.g. *regɛ̲l-n* 'the rule' vs. *seg•l-et* 'the sail'. If a common gender stem ends in /n/, as in *sockɛ̲n* 'parish' or *bottɛ̲n* 'bottom', the grammar would seem to be somewhat undecided regarding whether to epenthesize a vowel (*sock•n-en, bott•n-en*), or just add final *-n*, in which case there will be neutralization with the indefinite form (*sockɛ̲n-n* > *sockɛ̲n, bottɛ̲n-n* > *bottɛ̲n*). Long /nᵘ/, i.e. [nː], can only be phonetically expressed in stressed syllables (see 8.5).

In the dialects of Uppland and Södermanland where the standard variety is rooted, syllable nuclei constituted by the sonorants /n/ and /l/ are tolerated, if unstressed.[2] A comparison of CSw and Uppland forms is given in (280).

(p.278) (280) Sonorant nuclei in unstressed syllables

	CSw	Uppland dialect	Gloss
/bot-n/	[^{1}'boːtɛ̲n]	[^{1}'boːtn̩]	'the boat'
/bot-n-s/	[^{1}'boːtɛ̲ns]	[^{1}'boːtn̩s]	gen.
/ɟet-n/	[^{1}'jeːtɛ̲n]	[^{1}'jeːtn̩]	'the goat'
/vɑtᵘ•n/	[^{1}'vatːɛ̲n]	[^{1}'vatːn̩]	'water'
/spɑtel/	[^{2}'spɑːtɛ̲l]	[^{2}'spɑːtɽ]	'spatula'
/spɑtel/ /-n/	[^{2}'spɑːtɛ̲ln]	[^{2}'spɑːtɽn]	def.
/spɑtel/ /-n/ + /s/	[^{2}'spɑːtɛ̲lns]	[^{2}'spɑːtɽns]	def.sg.gen.
/sprɑtᵘ•l/	[^{1}'sprɑtːɛ̲l]	[^{1}'sprɑtːɽ]	'floundering'

	CSw	Uppland dialect	Gloss
/nɑg•l/	[^{1}ˈnɑːgɛ̯l]	[^{1}ˈnɑːgɽ]	‘nail’
/nɑg•l/ /-n/	[^{1}ˈnɑːgɛ̯ln]	[^{1}ˈnɑːgɽn]	def.sg.
/nɑgl-ɑr$_{2}$/	[^{2}ˈnɑːglar]	[^{2}ˈnɑːgɽar]	pl.
/lʉd-en$_{2}$/	[^{2}ˈlʉːdɛ̯n]	[^{2}ˈlʉːdn̩]	‘hairy’
/lʉd-en$_{2}$/ + /t/	[^{2}ˈlʉːdɛ̯t]	??^{3}	‘hairy, neut.’

Sonorant nuclei show up only under favourable conditions. For instance, it would appear that only so-called ‘thick’, cacuminal pronunciations of /l/ will work as nucleus. This is normally a retroflex flap [ɽ] rather than the velarized [ɬ] of many English varieties, or the retroflex lateral /ɭ/ which is common in many varieties as the output of the retroflexion rule (see 4.1), since that would have assimilated a following coronal. The test case is *spatel-n-s* ‘of the spatula’ where the output is [^{2}ˈspɑːtɽns] rather than *[^{2}ˈspɑːtɽn̪s̪], *[^{2}ˈspɑːtɭn̪s̪], or *[^{2}ˈspɑːtn̪s̪]. Sonorants other than the coronal /l/ and /n/ seem less amenable to forming a nucleus in the Uppland dialect.

The third member of the group of sonorant segments that trigger epenthesis or admit syncope is /r/. However, this phoneme never shows up as vocalic or syllabic in CSw. Instead, /r/ triggers the retroflexion rule before coronals (see 4.1).

Epenthesis will only occur under the requirement of relatively low sonority in the consonant preceding a final /n/. Thus, a preceding sonorant will not trigger epenthesis.

(281) No epenthesis under high sonority[4]

hamn	[hamːn]	‘harbour’	but	vap̲en	[vɑːpɛ̠n]	‘weapon’
moln	[moːln]	‘cloud’		rutten	[rʊtːɛ̠n]	‘rotten’
vagn	[vaŋːn]	‘wagon’		vak̲en	[vɑːkɛ̠n]	‘awake’
dogm	[dɔgːm]	‘dogma’				
spasm	[spasːm̩]	‘id.’				
rytm	[rʏtːm̩]	‘rhythm’				
logaritm	[lɔgaˈrɪtːm̩]	‘logarithm’				

(p.279)

With /l/ and /r/, there are no corresponding final clusters, except [rl] which are subject to coalescence by the retroflexion rule. Other final clusters with high sonority, i.e. with sonorants other than the coronal ones, do not exhibit epenthesis, and exhibit no sonority effect. The generalization is thus that place of articulation is a highly relevant conditioning factor for epenthesis. Some examples are given in (282) where all the forms remain monosyllables.

(282) Non-epenthesizing clusters

film	/film/	[fɪlːm]	‘id.’
larm	/lɑrm/	[larːm]	‘noise; alarm’
bälg	/bɛlj̯/	[bɛ̟lːj]	‘bellows’
varg	/vɑrj̯/	[varːj]	‘wolf’
tämj	/tɛmj̯/	[tɛ̟mːj]	‘tame, vb imp.’
tänj	/tɛnj̯/	[tɛ̟nːj]	‘stretch, vb imp.’

The forms in (283), which are hard to come by, illustrate the absence of syncope with consonants other than the coronal sonorants.

(283) Absence of syncope

golem	‘id.’	golem-en	*gol■m-en	‘the golem’
		golem-ar	*gol■m-ar	‘golems’
harem	‘id.’	harem-en	*har■m-en	‘the harems’

The use of epenthesis is thus limited to a final coronal sonorant (except /r/) that follows a non-sonorant consonant. The use of sonorants as syllable nuclei is limited to some dialects, and only very few sounds (allophones of /l/ and /n/), in unstressed position. Otherwise, challenging phonotactics is tolerated rather than amended.

13.3 Phonotactics

Just as in the other Germanic languages, the tolerance for complex onsets and codas is quite high in Swedish. The phonotactics of Swedish has been extensively studied by Sigurd (1965), where the admissible sequencing is primarily studied in word-initial and word-final position, whereafter word-medial clusterings are considered. Sigurd makes many observations regarding the phonological and morphological properties (of the root, mainly) that influence syllabification. A number of factors are involved.

(p.280) Stress/no stress. The status as stressed or unstressed matters for syllabification, by virtue of the fact that stressed syllables are necessarily heavy, while unstressed syllables are all treated as light (see 8.1). The lightness of unstressed syllables does not manifest as a requirement on syllables to be open. Rather it is visible in the ban on long segments in unstressed syllables, vowels as well as consonants. The outcome of segmentally identical assimilation processes may thus vary quantitatively between stressed and unstressed conditions (see 4.7 *glad*, neut. *glatt* /glɑd-t/ > [glatː] ‘happy’, *korkad*, neut. *korkat* /korkɑd-t/ > [^{2}ˈkɔrːkat] ‘stupid’, *[^{2}ˈkɔrːkatː]).

Quantity. Quantity matters in that stressed syllables are necessarily heavy, i.e. bimoraic. There will be either a long vowel or a short vowel followed by a moraic consonant within the stressed syllable (8.1). This will influence the permitted number of consonant segments following the vowel, fewer consonants being admitted after a long vowel than after a short vowel.

Sonority. Sonority and segment sequencing is important, sonority rising the closer to the nucleus one gets from either margin. Nevertheless, within the coda, there are variant orderings of consonant sequencing (*tips* ‘tip’, *visp* ‘whisk’), telling us that sonority alone cannot determine phonotactic structure.

Place of articulation. While in many descriptions one typically states that a language admits such and such a number of consonants in sequence within the onset or coda, the fact is that the licence for coronal consonants is typically greater than for other consonants, again in tautomorphemic codas (*konst* ‘art’, **konsp*, $^{?}$ *konsk*). This is seen also in pronunciation effects like *hemskt* ‘terrible’ [hɛ̧mːskt] > [hɛ̧mːs•t], *halvt* ‘half, neut.’ [halːft] > [halː•t], where the weeding is primarily done amongst non-coronals.

Morphology. Inflection and derivation (to some extent) may add consonantal morphemes at the end of words occasioning clusters within the coda. Sigurd divides his discussion of these things into primary and secondary consonant sequences, the latter being the ones that are morphologically complex, and where greater phonotactic complexity is allowed. For instance, the sequences [rmst] and [ndsk] only occur in derived and inflected forms, e.g. *närmst* 'nearest' and *bondsk* 'rustic' (Sigurd 1965: 67).

Number of consonants. The raw number of consonants may be of relevance, but probably only with regard to the distinction between the unmarked single consonant in the onset, and greater numbers of consonants which are all marked. And there may be something similar in the coda, although the presence of any consonant there is phonologically marked.

(p.281) 13.4 Initial consonant sequences

Words can begin in zero, one, two, or three consonants. Of the eighteen consonant phonemes, all but /ŋ/ may begin a syllable. When there are clusters, the general ordering of segments follows sonority according to the general schema in (284), which is based on Sigurd (1965: 58) but not identical to it.

(284) Sonority sequencing of segments that participate in clustering

4	3b	3a	2	1	0
s	t	d	n	l	V
	p	b	m	r	
	k	g			
	f		v	j	

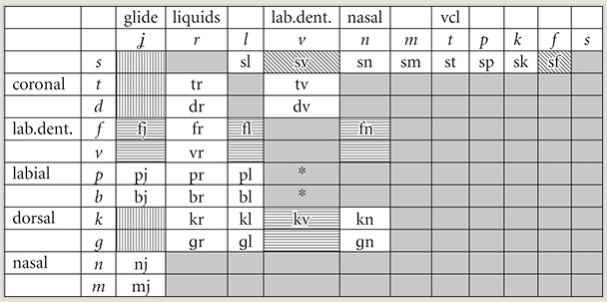
This schema captures pretty much all the legitimate combinations of consonants in onsets. The vertical line marks the boundary between voiceless and voiced segments. Voiceless consonants always precede voiced consonants in onsets, rather as expected.

13.4.1 Clusters of two consonants

Whenever the first segment is /s/, any segment selected from group 3 is unaspirated, and the distinction between aspirated and unaspirated is neutralized. Therefore they have been placed in the same group. For this reason, too, the voiced stops have been left out of the horizontal row of Fig. 13.1. The three consonant phonemes /h, ʂ, ɕ/ do not participate in any onset clusters (and /ŋ/ is **(p.282)** disallowed anyway). These have been left out of (284) as well as Fig. 13.1, where the legitimate onset combinations of two consonants are charted.

In the vertical column, marking the first member of clusters, the sonorants /j, r, l/ are left out as they never precede another consonant in onsets.

The clusters that would fit in the cells marked with vertical bars have existed historically, and to some extent still do in some dialects, but they have subsequently undergone palatalization or partial deletion. These cells are thus empty for a reason, so to speak. There are spellings indicating previous clusters, but which have now changed/reduced to fricatives, see (285).



		glide	liquids		lab.dent.	nasal		vcl				
		j	*r*	*l*	*v*	*n*	*m*	*t*	*p*	*k*	*f*	*s*
	s			sl	sv	sn	sm	st	sp	sk	sf	
coronal	*t*		tr		tv							
	d		dr		dv							
lab.dent.	*f*	fj	fr	fl		fn						
	v		vr									
labial	*p*	pj	pr	pl	*							
	b	bj	br	bl	*							
dorsal	*k*		kr	kl	kv	kn						
	g		gr	gl		gn						
nasal	*n*	nj										
	m	mj										

Fig. 13.1. Initial sequences of two consonants

(285) Spellings and historical reductions

‹sjö›	[ɧøː]	‘lake’
‹tjäna›	[^{2}ˈɕɛːna]	‘to serve’
‹djur›	[ʝʉːr]	‘animal’
‹kjol›	[ɕuːl]	‘skirt’
‹gjuta›	[^{2}ˈʝʉːta]	‘to mould’

More sounds than those included in Fig. 13.1 are involved in the lenition and loss processes. Some discussion of this is to be found in 4.12.1 (also see Eliasson 2005: 1122ff.).

The cells marked with horizontal bars indicate combinations that would appear to involve neutralization. For the position before /v/ only the coronals make a voicing distinction ([tv]~[dv]). The labials admit no combination (*[pv]~*[bv]), and the velars only have the voiceless stop in cluster with [v] ([kv]~*[gv]). This could be seen as a naturally reduced distribution. A similar situation occurs with the labiodentals where [fj] is admitted, but not *[vj]. Here the coronals and velars have all undergone lenition/reduction as remarked above, and the labials remain, where a voicing distinction is in evidence for [pj] and [bj], but not for the, presumably more marked, labiodental articulations mentioned.

A voicing contrast between the two labiodentals is intuitively closer at hand in the position before /l/ where foreign names like *Vladimir* and *Vladivostok* present little articulatory difficulty. This cluster is perhaps better viewed as an accidental gap.

In the position before the nasal /n/, the combination with [f] is fine (*fnysa* ‘frown’), whereas the ?[pn] and ?[mn] are both clearly marginal and only show up in Greek loans of questionable integration (*pneumatisk* ‘pneumatic’, *mnemoteknisk* ‘mnemotechnical’).

The cells with slanted bars indicate a voicing contrast between the labiodentals following /s/. Sigurd does not include [sf] in the legitimate/central combinatory system. It occurs in very few forms, but they are at least in the common domain: *sfär* /sfɛr/ ‘sphere’ and *sfinx* /sfinks/ ‘sphinx’. Rather, he suggests that these forms **(p.283)** are usually pronounced [sv].[5] However, there appears to be a rather robust, intuitive contrast between *sfär, sfinx*, on the one hand, and forms like *svärmor* /svɛr+mur/ ‘mother in law’ and *svart* /svɑrt/ ‘black’, on the other. Even if there is some devoicing of /v/ in the position following /s/ the distinction between /v/ and /f/ in that position is clear (see also 3.3.1 for the corresponding distribution in codas).

The phoneme /s/ combines with stops in forms like *stat* ‘state’, *spel* ‘game’, *skata* ‘magpie’, and in three consonant clusters: *stryk* ‘beating’, *spjuver* ‘rogue’, *skvätta* ‘splash’. In the position after an /s/ postaspiration of stops is inhibited, and so a putative distinction between aspirated and unaspirated stops is neutralized there, a fact noted by Aurén (1869). The fate of voicing in this position is an open issue, as one could not really test it, but it does have some consequences for the judgement of [voice] as an underlying feature or not (see 3.1).

Some combinations are ruled out due to articulatory constraints. Thus, coronal stops /t, d/ will not combine with /l/ just as they do not in the other Germanic languages, hence /*dl, *tl/. The nasals do not combine with any other sonorant than /j̯/, hence we find /nj̯, mj̯/ but no other combinations, i.e. /*nv, *ml/, etc.

As seen in Fig. 13.1, combinations with voiceless segments as second member of clusters is limited, essentially, to a preceding /s/. This raises an issue with respect to the status of the clusters [st, sp, sk] within the system. Sigurd (1965: 62f.) notes that the distribution of these sequences largely mimics that of the second member alone. To see this, we should first look at the triconsonantal initial clusters.

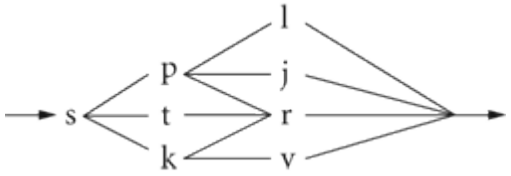
13.4.2 Clusters of three consonants

The triconsonantal clusters all begin with /s/, which is hence the furthest to the left in (284). Some examples are given in (286) and a flow chart in (287).

(286) Triconsonantal onset clusters (Sigurd 1965: 57)

spr	sprallig	‘lively’	*str*	strand	‘beach’	*skr*	skruva	‘to screw’
spl	splittra	‘to shatter’				*skv*	skvätta	‘to splash’
spj	spjuver	‘rogue’						

(287) Triconsonantal onset clusters, flow chart



(p.284) Sigurd (1965: 62) mentions that the patterning of /sp, st, sk/ is strikingly similar to that of /p, t, k/ and /b, d, g/, a fact noted also by Vogt (1942) and Haugen (1956) who propose to consider them as unit phonemes or affricates. The basis for this observation is clear from the table in (288).

(288) Onset distribution of /sp, st, sk/ as compared with /p, b, t, d, k, g/

	r	*l*	*v*	*j*	*n*
sp	spr	spl	–	spj	–
p	pr	pl	–	pj	–
b	br	bl	–	bj	–
st	str	–	Ø	–	–
t	tr	–	tv	–	–
d	dr	–	dv	–	–
sk	skr	Ø	skv	–	Ø
k	kr	kl	kv	–	kn
g	gr	gl	Ø	–	gn

The chart exposes the parallelism of phonotactic distribution between single consonants and pairs with respect to following consonants in onsets. Gaps are marked ‘Ø’. In three cases it is the triconsonantal cluster that is missing (*[stv], *[skl], *[skn]), which is as expected if there is at least some increase of markedness for combination with /sp, st, sk/ compared to the single stops. The last missing one is *[gv].

The parallel distribution of triconsonantal and biconsonantal clusters in (288) is not reflected in all phonological behaviour, however. That is, it is not obvious that /st/ should be treated as a single consonant (e.g. /s͡t/). In word-medial position (e.g. *kasta* ‘to throw’), the most regular behaviour for these sequences is to split into separate syllables, especially if the first syllable is stressed and weight by position is involved. Cosyllabification as onset is natural in morphologically complex forms, when there is a morphological boundary before /s/, and when the quantity of the stressed syllable is not at stake. Possible examples of this are given to the right.

(289) medial /st/, /sk, /sp/

kas.t-a	[^{2}'kasːta]	‘to throw’	frys.-t-a/fry.s-t-a	[^{2}'fryːsta]	‘frozen’
fres.t-a	[^{2}'frɛ̟sːta]	‘to tempt’	Fre.-sta	[^{1}'freːsta]	(place name)
fis.k-a	[^{2}'fɪsːka]	‘go fishing’	löp.-sk-a	[^{2}'løːpska]	‘to be on heat’
ves.p-a	[^{2}'vɛ̟sːpa]	‘scooter’	Loob.-sk-a	[^{2}'luːbska]	(name) ‘of Loob’

If /st/, /sk/, /sp/ were unitary segments for the purposes of phonotactics, we would expect the existence of morphemes like $^{+}$ *ve.spa* [^{2}ˈvɛːspa] or $^{+}$ *ka.sta* [^{2} ˈkaːsta], where a *long* vowel would allow for these sequences to form onset to the following syllable.

(p.285) 13.4.3 Marginal initial sequences

Some initial consonant sequences occur only marginally in Swedish and should perhaps not be considered as an integrated part of the phonology. To establish the status as marginal, Sigurd appeals to various tendencies to adjust the sequences in pronunciation, a good criterion.

(290) Marginal initial sequences

	Words	Pronunciation	Adjustment	Misnomer	Gloss
ʂl	schlager	[ˈ[1]ʂlɑːgɛ̯r]	[ˈ[1]slɑːgɛ̯r]		‘song hit’
ʂv	Schweiz	[ʂvɛjːts]	[svɛjːts]	[svɛɪtʃ]	‘Switzerland’
ʂn	schnitzel	[ˈ[2]ʂnɪtːsɛ̯l]	[ˈ[2]snɪtːsɛ̯l][6]		‘id.’
ʂm	Schmidt	[ʂmɪtː]	[smɪtː]		name
ps	psykologi	[psʏkɔlɔˈgiː]	[sʏkɔlɔˈgiː]	[pʏskɔlɔˈgiː]	‘psychology’
ts	tsar	[tsɑːr]	[sɑːr]		’id.’
ks	xylofon	[ksʏlɔˈfoːn]	[sʏlɔˈfoːn]		‘xylophone’
dj	djonk	[djɔŋːk]	--		‘junk’
kj	kiosk	[kjɔsːk]	[ɕɔsːk]		‘id.’
stj	steward	[ˈ[1]stjuːaɖ]	--		‘id.’
skl	skleros	[sklɛ̯ˈroːs]	--		‘sclerosis’
vl	Vladimir	[ˈ[1]vladːɪmiːr]	hist. *Valdemar*		name
pt	ptolemeisk	[ptɔlɛ̯ˈmeːɪsk]	--		‘Ptolemaic’
pf	pfennig	[ˈ[1]pfɛ̯nːɪɕ]	[ˈ[1]fɛ̯nːɪɕ]		‘id.’
tw	twist	[twɪsːt]	[tvɪsːt]		‘id.’
pn	pneumatisk	[pnɛ̯v[1]ˈmɑːtɪsk]	--		‘pneumatic’
mn	mnemoteknisk	[mnɐ̯mʊ[1]ˈtɛ̯kːnɪsk]	[mɐ̯mʊˈtɛ̯kːnɪsk]		‘mnemonic’

Whether the speaker uses [ɦ] or [ʂ] as prevocalic allophone for /ʂ/, the marginal clusters above, where /ʂ/ precedes a prevocalic consonant must be pronounced at one of the non-dorsal places of articulation [ʂ] or perhaps [ʃ]. This is in itself a testimony to the marginal status of the cluster. A common adjustment of these forms is to replace [ʂ] with [s], where a legitimate cluster results. The initial sequence of *Sri Lanka* is illegitimate [sr], a major challenge. There are no reductions of the cluster ($^{+}$[s•ɪ…] or $^{+}$[•rɪ…]), or substitutions of consonant ($^{+}$[frɪ…] or $^{+}$[slɪ…]) that seem satisfactory. One hears instead either (‘bullet-biting’) [srɪ^{1}'laŋka], or [sɪ̱rɪ^{1}'laŋka], with uncharacteristic epenthesis.

(p.286) 13.5 Final consonant sequences

In word-final clusters it is relevant to heed morpheme structure, since there are several consonantal suffixes which contribute to cluster formations that are more complex than in uninflected or underived forms.[7] To express this, Sigurd introduces a distinction between primary and secondary sequences, where the secondary sequences are admitted only in morphologically complex forms, and primary sequences are admitted in uninflected and underived forms, plus any morphologically complex forms that happen not to challenge the sequencing admitted in monomorphemes. The idea is to look for a cut-off point for what is phonologically basic or natural.

Root morphemes can end in zero, one, two, or three consonants. The only two consonants that cannot occur word-finally are /h/ and /ɕ/.[8] Morphologically complex forms can end in up to eight consonants, if you pick the right surname (*Herbst*) and derive an adjective, and make it agree with neuter (*-sk-t*), and then (re-)nominalize the adjective such that it can be put in the genitive (*-s*). The result, provided by Noreen (1903–1907, II: 84), is *Herbstskts* ‘in a Herbst-like fashion (gen.)’. This is not very enlightening regarding the phonology of codas, but is rather a consequence of morphological concatenation.

13.5.1 Final clusters of two consonants

We look first at two-consonant clusters, and primarily morphologically simple forms, i.e. roots. The boundary between morphologically simple and complex is not completely straightforward, due to some derivational endings that look variably transparent in different forms. Some are clearly complex forms synchronically (*frãsch-t* [frɛːʂt] ‘fresh, neut., *bi'sarr-t* [bɪ'sarːt] ‘bizarre, neut.’), others are rather borderline cases (*mängd* [mɛŋːd] ‘set’, *bygd* [bʏgːd] ‘settled countryside’).[9]

We present the sequencing in two charts, divided according to place of articulation of the second consonant. These are based on Sigurd's combination analysis (1965: 76), but with some changes. The order between segments is such that the vertical column indicates the first consonant and the horizontal row the second consonant, counting from the vowel. The basic principle of organization is place of articulation, where we keep the coronals together in Fig. 13.2, and palatals, dorsals, and labials in Fig. 13.3.

(p.287) A postvocalic consonant will be long if the vowel is short, otherwise short. Length on the part of the vowel radically limits the consonant clustering at the end of the root syllable. The main lexical content of the admissible forms are forms with a short root vowel, but we shall keep track of the few forms with a long vowel in Fig. 13.2 by marking the vowel with a macron. This brings out the correlation between vowel length and morphological complexity.

		cor.						
		r	*l*	*n*	*d*	*t*	*s*	*ʂ*
cor.	*r*		sōrl	firn	kurd	bi'sarr-t	borr-s	marsch
	l			mōln	eld	spalt	vals	
	n				and	bunt	luns	lunch
	d						stād-s	
	t						vits	klatsch
	s					kast		
	ʂ					frȧsch-t	gā̈ge-s	
pal.	*j*			online[10]	fröjd	flöjt	majs	
dor.	*ŋ*			ugn	mängd	char'mant	ny'ans[11]	
	g				bygd	blȳg-t[12]	dāg-s	
	k					pakt	lax	
lab.	*m*			hamn	rymd	tomt	trams	
	v				hävd	strȧv-t	rȧv-s	
	b					snabb-t	kṻb-s	
	p					kopt	raps	
	f					lyft	hyfs	
		r	*l*	*n*	*d*	*t*	*s*	*ʂ*

Fig. 13.2. Final sequencing according to place of articulation. Final coronals.[101112]

Grey cells are sonority violations, bolded cells mark the morphologically complex forms and the questionably complex forms (bold dashed), slanted lines mark cells where distinctive voicing/aspiration does not harmonize (excluded tautomorphemically), white cells are attested or gaps due to minor restrictions (or accidental). Vowel length is marked with a macron in these orthographic forms.

In several instances, there are assimilations, such as retroflexion (see 4.1). This rule causes coalescence of /r/ and a following laminal, thereby reducing the **(p.288)** number of segments. But there are some conditions under which retroflexion does not take place. Where /r/ + laminal clusters are provided in the chart, retroflexion is either inapplicable or applies optionally (*firn* [fɪrːn] 'id.', *kurd* [kʉrːd] 'Kurd', *sōrl* [soːrl] or [soːɭ] 'murmur').

The charts exhibit some systematic gaps that are due to generalizations formulated here. Combinations of the same segment constitute an impossibility by the logic of the chart (**tt*, **vv*, etc.) and are shaded black.

Coronals. We may note first that many cells are filled in the two columns in Fig. 13.2 where /t, s/ occur as second member of a cluster. This follows from a combination of the fact that voiceless segments occur further away from the nucleus than voiced ones, and the fact that coronal segments enjoy a privileged status, by being easier to combine with other places of articulation than dorsal and labial. Also the fact that there are morphemes constituted by /t/ and /s/, with several meanings such as neuter, adverb for *-t*, and genitive, passive for *-s*, plays into filling these columns. In these columns, too, we find several cases of clusters following a long vowel, which are overwhelmingly morphologically complex (e.g. *blȳg-t* [blyːgt] ‘shy’). The very few exceptions to this have a coronal cluster after the long vowel, mentioned below.

Voicing/aspiration. Segments that are distinctively marked for either voicing or aspiration strongly tend to harmonize within the coda, such that contrasting values are avoided. This constraint does not apply in morphologically complex forms with a long vowel. Thus, if the two moras are taken by the vowel, there may be a contrast in the coda (e.g. *blȳg-t* [blyːgt] ‘shy, neut.’, beside *rāk-t* [rɑːkt] ‘straight, neut.’), whereas if the first consonant is in the second mora, harmony must hold (*lag-d* [lagːd], *lag-t* [lakːt], *[lagːt] ‘lain, neut.’). In some cases there are alternative forms with a shortened vowel (e.g. *dāg-s* [dɑːgs] or *dag-s* [dakːs] ‘day, gen.’, the latter in compounds like *dagsmarsch* ‘a day’s march’, *dagstidning* ‘newspaper’), but then there is devoicing of the /g/ to [k] (['dakːsˌmarːʂ], ['dakːsˌtiːdnɪŋ]). Equally with *gubbs* [gɵpːs] ‘(colloq.) geezers’ (from *gubbe* [gɵbːɛ̟] ‘old man’) and *stadsvandring* ['statːsˌvanːdrɪŋ] ‘(guided) tour in the city’ (from *stad* [stɑːd] ‘city’).

Weight. The fact that forms like *rå̈v-s* [rɛːvs] ‘fox, gen.’, *kūb-s* [kʉːbs] ‘cube, gen.’, *blȳg-t*, etc.) are also morphologically complex bears witness to a quantitative requirement on syllables whereby consonant clusters following long vowels are extremely limited in Swedish roots. The most regular context is /ln/ where the three extant roots all have a long vowel in the standard language: *mōln* [moːln] ‘cloud’, *āln* [ɑːln] ‘ell’, *tēln* [teːln] ‘head rope’, less commonly *tēst* [teːst] (or [tɛ̟ːst]) ‘wisp of hair’.

(p.289) Some of the empty cells in the charts are due to a few other constraints on sequencing.

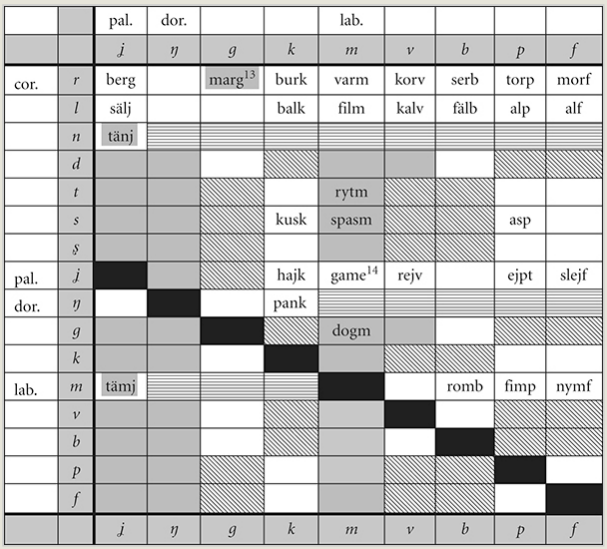


Fig. 13.3 Final sequencing according to place of articulation. Final palatals, dorsals, and labials.[13][14]

Grey cells are sonority violations, slanted lines mark cells where distinctive voicing/aspiration does not harmonize (excluded tautomorphemically), horizontal lines mark nasal assimilation or prohibited sequences involving nasals, white cells are attested or gaps due to minor restrictions (or accidental).

*Obstruent-Sonorant. Some cells would contain sequences that have what looks like the wrong sonority order between segments, e.g. obstruents preceding sonorants (**pr*, **dn*, etc.). We mark these grey to show that they are largely ruled out in principle. There are a couple of exceptions, namely forms like *rytm* and *dogm*, originally Greek borrowings which would appear to defy the general system.

(p.290) Nasals and place harmony. The nasal /n/ will assimilate to a following place of articulation. Thus, it is impossible to find [n] before a labial or a dorsal in the same coda. Combination of the other nasals is not free either. Labial [m] cannot be followed by any of the velars, and dorsal [ŋ] cannot be followed by any of the five labials [m, v, b, p, f]. We mark the illegitimate combinations with horizontal lines in Fig. 13.3. The import of place of articulation can be seen in a few different ways. Coronal consonants combine with other places of articulation in nasal coda clusters (Sigurd 1965: 78).

(291) Coda clusters involving a postvocalic nasal

	labial	coronal	dorsal
lab	mb, mp, mf	md, mt, ms, mn	–
cor	–	nd, nt, ns	–
vel	–	ŋd, ŋt, ŋs, ŋn	ŋk

We see here the bias towards tolerating coronal segments better than both labials and dorsals in final two-member clusters. Differently put, in clusters involving a nasal, a following obstruent should be homorganic with the nasal unless it is coronal, in which case it will combine with all nasals. So, if there is going to be more than one place of articulation, the second had better be coronal. This is not surprising, since more complex clusters occasioned by consonantal suffixes are typically coronal dominant, too, but it reminds us of the fact that phonotactics is not really about the counting of positions, but of the content of positions.

Gaps. The white areas in Fig. 13.2 and Fig. 13.3 are what might be broadly characterized as gaps, when not filled with words. Some of these are due to finer restrictions on sonority and/or co-occurrence in codas (e.g. [bd], [dg], [tk], [vb], [ŋg], [sf]), [ʂf]), while others are more truly accidental ([lʂ] and several others ending in /ʂ/, [lg]).

In Fig. 13.4 we make the combinatory pattern visible in a different way, by organizing the segments according to sonority, rather than place of articulation (as in Fig. 13.2 and Fig. 13.3). The basic idea is to follow the often-made observation that sonority falls away from the syllable nucleus. This is an essentially inductive procedure, whereby the segments are organized with a view to getting as many of the sequences as possible above the black diagonal, as things above the diagonal will be a combination of falling sonority in the coda. One expectation would be that anything that ends up below the diagonal should already have the corresponding mirror order above the diagonal, i.e. with the less (or equally) marked sonority profile. Otherwise, things below the diagonal should be somehow exceptional. The different generalizations are marked in the same way as before.

(p.291) The forms *asp* [asːp] ‘aspen’, *kusk* [kʊsːk] ‘coachman’, *klatsch* [klatːʂ] ‘crack!’, and *kast* [kasːt] ‘throw’ occur at the bottom right of the chart, which means that one of the two most versatile coronal segments /t/ and /s/ are involved, together with other low sonority segments, so the markedness of these forms is relatively low. There are many forms with either order of these segments, not least because both *-t* and *-s* are also suffixes.

		cor.	cor.	pal.	dor.	lab.	cor.	lab.	dor.	lab.	cor.	lab.	lab.	dor.	cor.	cor.	cor.
		r	*l*	*j*	*ŋ*	*m*	*n*	*v*	*g*	*b*	*d*	*f*	*p*	*k*	*ʂ*	*t*	*s*
cor.	*r*		sôrl	berg		varm	firn	korv	marg	serb	kurd	morf	torp	burk	marsch	bi'sarr-t	borr-s
cor.	*l*			sälj		film	möln	kalv		fälb	eld	alf	alp	balk		spalt	vals
pal.	*j*					game	online	rejv			frödjd	slejf	tejp	hajk		flöjt	majs
dor.	*ŋ*						ugn				mängd			pank		char'mant	ny'ans
lab.	*m*			tämj			hamn			romb	rymd	nymf	fimp			tomt	trams
cor.	*n*			tänj							and				lunch	bunt	luns
lab.	*v*										hävd					stråv-t	råv-s
dor.	*g*					dogm					bygd					blÿg-t	dåg-s
lab.	*b*															snabb-t	kŭb-s
cor.	*d*																stăd-s
lab.	*f*															lyft	hyfs
lab.	*p*															kopt	raps
dor.	*k*															pakt	lax
cor.	*ʂ*															fråsch-t	gäge-s
cor.	*t*					rytm									klatsch		vits
cor.	*s*					spasm							asp	kusk		kast	
		r	*l*	*j*	*ŋ*	*m*	*n*	*v*	*g*	*b*	*d*	*f*	*p*	*k*	*ʂ*	*t*	*s*

Fig. 13.4. Two-place codas organized according to sonority

The forms *rytm* [rʏtːm̩] ‘rhythm’ and *spasm* [spasːm̩] ‘id.’ stand out as more deviant here, sonority-wise, even though they also involve the segments /t/ and /s/. Besides *rytm*, there are two words ending in *-ritm* (*logaritm* [lɔgaˈrɪtːm̩] ‘logarithm’, *algoritm* [algʊˈrɪtːm̩] ‘algorithm’). Forms ending in *-sm* are significantly more numerous, because of the suffix *-ism* (*kubism* [kʉˈbɪsːm̩] ‘cubism’, *bilism* [bɪˈlɪsːm̩] ‘car-driving’, *pacifism* [pasɪˈfɪsːm̩] ‘id.’, and many more), besides a few **(p.292)** scattered other forms like *sarkasm* [sarˈkasːm̩] ‘sarcasm’, *bombasm* [bɔmˈbasːm̩] ‘bombast’, and *paroxysm* [parɔkˈsʏsːm̩] ‘id.’.

The two forms *tämj* [tɛ̧mːj] ‘domesticate, imp.’ and *tänj* [tɛ̧nːj] ‘stretch, imp.’ exemplify the reverse order for segments that are really close in sonority, much like the low sonority cases. The final sequence [mj] is exhausted with *tämj*, while there are a few more forms in final [nj], besides verbal *tänj* and *vänj* [vɛ̧nːj] ‘get used to, imp.’, there are two nouns: *kampanj* [kamˈpanːj] ‘campaign’ and *kastanj* [kasˈtanːj] ‘chestnut’. This testifies to the markedness at least of final [mj] (Sigurd 1965: 126fn.).

All of these forms have corresponding forms with the unmarked order (*raps* [rapːs] ‘colza’, *lax* [lakːs] ‘salmon’, *vits* [vɪtːs] ‘joke’, *frȃsch-t* [frɛːʂt] ‘fresh, neut.’, *tomt* [tɔmːt] ‘lot’, *trams* [tramːs] ‘nonsense’, *online* [ɔnˈlajːn] ‘id.’, and *game* [gɛ̧jːm] ‘id.’). This is not the case with the form *dogm* [dɔgːm] ‘dogma’ which lacks a corresponding putative form **domg*. In fact, /g/ is never second in a coda cluster, except in the odd form *marg* [marːg] ‘margin’. The same thing goes for /ŋ/ indicating that the pattern is general. It takes a voiceless velar to qualify as second member of a coda cluster.

13.5.2 Final clusters of three consonants

Final clusters of three consonants in monomorphemic forms are few, and in many of the forms that could be considered as morphologically basic, there is a history of derivation preceding, and the connection to another form is often clear. This indicates that the phonologically natural space for roots is really quite limited in codas. Here we present a modified list based on information given in Sigurd (1965). However, we shall stay with a more formal definition of the morphemes, much as we have done in chapter 10, and analyse e.g. the ending *-sk* as a suffix even when the root will look highly bound (as in *spot-sk* [spɔtːsk] ‘impudent’). The goal here is to get a grip on the coda structure in simple morphemes. While Sigurd is more inclusive with regard to some basic forms, he treats others as marginal where we would admit them into the core.[15]

(292) Coda clusters: C_{voiced} C_{voiced} C_{voiced}

Derived		Derived	
/rm-d/	värm-d [væːmd] ‘warm, ptcp.’	/ɭj-d/	följ-d [fø ˩ lːjd] ‘consequence’
/rv-d/	ärv-d [æːvd] ‘inherit, ptcp.’	/mn-d/	hämn-d [hɛ̧mːd] ‘revenge’
/rj-d/	snärj-d [snæːjd] ‘snare, ptcp.’	/mj-d/	tämj-d [tɛ̧mːjd] ‘tame, ptcp.’
/lv-d/	välv-d [vɛ̧lːvd] ‘arch, ptcp.’	/nj-d/	tänj-d [tɛ̧nːjd] ‘stretch, ptcp.’

(p.293)

For the all-voiced clusters there are only derived forms. The cluster /mnd/ regularly reduces to [md]: *hämnd* [hɛ̧mːd], *nämnd* [nɛ̧mːd] ‘board’. Also the clusters containing two voiced and one voiceless consonant are all derived.

(293) Coda clusters: $C_{voiced}\,C_{voiced}\,C_{voiceless}$

Derived		Derived	
/rm-t/, /rm-s/	varm-t [varːmt] ‘warm’, värm-s [væːms] ‘warm, pass.’	/mn-t/, /mn-s/	nämn-t ‘mentioned’, namn-s ‘name, gen.’
/rv-t/, /rv-s/	kärv-t [ɕæːvt] ‘rough’, arv-s [arːvs] ‘inheritance, gen.’	/mj-t/, /mj-s/	tämj-t [tɛ̧mːjt] ‘domesticated’, (pass.)
/rj-t/, /rj-s/	sörj-t [sœːjt] ‘grieved’, korg-s [kɔrːjs] ‘basket, gen.’	/mb-s/	bomb-s [bɔmːbs] ‘id. gen.’
/rb-t/, /rb-s/	superb-t [sʉˈpæːbt] ‘superb’, verb-s [væːbs] ‘verb, gen.’	/md-s/	rymd-s [rʏmːds] ‘space, gen.’
/rg-s/	dramaturg-s [dramaˈtɵːgs] ‘id. gen.’	/ŋn-t/, /ŋn-s/	lugn-t [ləŋːt] ‘calmly’, vagn-s [vaŋːns] ‘wagon, gen.’
/lm-s/	film-s (id. gen.)	/ŋd-s/	längd-s [lɛ̧ŋːds] ‘length, gen.’
/ln-s/	aln-s [ɑːlns] ‘ell, gen.’	/nj-t/, /nj-s/	tänj-t [tɛ̧nːjt] ‘stretched’, (pass.)

Derived		Derived	
/lv-t/, /lv-s/	själv-t [ɧʂl:ʏt] ‘self’, skalv-s [skal:vs] ‘quake, gen.’	/nd-s/	band-s [ban:ds] ‘ribbon, gen.’
/ɭj-t/, /ɭj-s/	följ-t [fø ˩ l:jt] ‘has followed’, älg-s [ʂl:js] ‘moose, gen.’	/vd-s/	hävd-s [hʂv:ds] ‘custom gen.’
/lb-s/	bulb-s [bɵl:bs] ‘id. gen.’	/ɻd-s/	höjd-s [høj:ds] ‘height, gen.’
/ld-s/	våld-s [vɔl:ds] ‘violence, gen.’	/gd-s/	bygd-s [bʏg:ds] ‘cultivated land, gen.’

(294) Coda clusters: C_{voiced} $C_{voiceless}$ $C_{voiceless}$

Simple		Derived	
/rpt/ / lts/	excerpt [ʂk'sær:pt] ‘id.’	/rp-t/, / rp-s/	skärp-t [ɧær:pt] ‘bright’, torp-s [tɔr:ps] ‘summer cottage, gen.’
	ebenholts [^{2} 'e:bʂnɘhɔl:ts] ‘ebony’	/lt-s/	fält-s [fɛl:ts] ‘field, gen.’
/ŋks/	sfinx [sfɪŋ:ks] ‘sphinx’	/ŋk-s/	bank-s [baŋ:ks] ‘bank, gen.’
/nts/	chintz [ɧɪn:ts] ‘id.’	/nt-s/	kant-s [kan:ts] ‘edge, gen.’
/ŋst/	hiŋst [hɪŋ:st] ‘stud’	/rk-t/, / rk-s/	märk-t [mær:kt] ‘marked’, märk-s [mær:ks] ‘is noticed’
/ŋkt/	punkt [pʊŋ:kt] ‘dot’	/nʂ-s/	lunch-s [lʊn:ʂs] ‘lunch, gen.’
/rft/	lärft [lær:ft] ‘linen’	/rf-s/	turf-s [tʊr:fs] ‘id., gen.’
/ɻst/	geist [gaj:st] ‘go; drive’	/rʂ-s/	marsch-s [mar:ʂs] ‘march, gen.’
/kst/	text [tʂk:st] ‘id.’	/lf-t/, /lf-s/	hälf-t [hʂl:ft] ‘half-part’, cf. *halv* ‘half’,
			golf-s [gɔl:fs] ‘golf, gen.’
/rkt/	infarkt [ɪn'far:kt] ‘infarct’	/lp-t/, /lp-s/	hjälp-t [jʂl:pt] ‘helped’, hjälp-s [jʂl:ps]
/nst/	dunst [dʊn:st] ‘vapour’	/lk-s/	kalk-s [kal:ks] ‘limestone, gen.’

Simple	Derived	
	/l-st/	svul-st [svɵlːst] ‘swelling’, cf. *svälla* ‘to swell’
	/m-st/	in-kom-st ['ɪŋːˌkɔmːst] ‘income’, cf. *komma* ‘to come’
	/v-st/	gröv-st [grøːʏ̯st] ‘coarsest’
	/g-st/	läg-st [lɛːgst] ‘lowest’
	/l-sk/	fal-sk [falːsk] ‘false’
	/b-sk/	lyb-sk [lʏbːsk] ‘of Lübeck’
	/d-sk/	nid-sk [niːdsk] ‘niggardly’ obs.
	/ʝf-s/	sleif-s [slɛ̯jːfs] ‘strap, gen.’
	/ʝp-s/	tejp-s [tɛ̯jːps] ‘tape, gen.’
	/ʝk-s/	strejk-s [strɛjːks] ‘strike, gen.’
	/ʝt-s/	flöjt-s [fløjːts] ‘flute, gen.’
	/mf-s/	nymf-s [nʏmfːs] ‘nymph, gen.’
	/mt-s/	tomt-s [tɔmːts] ‘lot, gen.’
	/mp-s/	pump-s [pɵmːps] ‘pump, gen.’
	/ŋ-t-s/	häng-t-s [hɛ̯ŋːts] ‘hanged, gen.’
	/v-t-s/	gräv-t-s [grɛːʏ̯ts] ‘digged, gen.’
	/b-t-s/	snabb-t-s [snabːts] ‘quickly, gen.’
	/g-t-s/	lag-t-s [lagːts] ‘laid, pass.’

(p.294)

There are many derived forms, and the last segment is mostly a separate morpheme *-t* or *-s*. Morphemes like *-st* and *-sk* also occur. One might note here that the overlap between simple and derived clusters is quite small (the four items at the top of (294)), even though the dominance of final *-t* and *-s* is common to both columns.

There are quite a few adjectives ending in *-sk*. The monosyllabic ones often do not admit meaningful decomposition. Thus, if one strips off the suffix, what is left is a cranberry morpheme. Formally, however, they form part of a fairly complex system of realizations of the single morpheme /-sk/, as *-sk* or *-isk* (Riad 1999).

(295) Coda clusters: $C_{voiceless}$ $C_{voiceless}$ $C_{voiceless}$

Derived	Derived		
/fs-t/	räfs-t [rɛ̟f:st] ‘inquisition’	/ft-s/	saft-s [saf:ts] ‘soft drink, gen.’
/ps-t/	näps-t [nɛ̟p:st] ‘rebuke’	/pt-s/	recept-s [rɛˈsɛ̟p:ts] ‘recipe, gen.’
/p-sk/	glup-sk [glɵp:sk] ‘greedy’	/tʂ-s/	klatsch-s [klat:ʂs] ‘crack, gen.’
/t-sk/	spot-sk [spɔt:sk] ‘impudent’	/kt-s/	vikt-s [vɪk:ts] ‘weight, gen.’
		/st-s/	häst-s [hɛ̟s:ts] ‘horse, gen.’
		/sp-s/	asp-s [as:ps] ‘aspen, gen.’
		/sk-t/, /sk-s/	frisk-t [frɪs:kt] ‘fresh’,
			brosk-s [brɔs:ks] ‘cartilage, gen.’
		/ʂ-t-s/	fräsch-t-s [frɛ:ʂts] ‘fresh, gen.’

(p.295)

Sigurd characterizes the four forms to the left in this list as simple, and one can easily understand why, as the forms are mostly archaic, rare, or in an unclear semantic relationship with the root in other words (*räfsa* /rɛfs-ɑ$_2$/ ‘to rake (leaves)’, *näpsa* /nɛps-ɑ$_2$/ ‘to rebuke’, *glupa* /glʉp-ɑ$_2$/ ‘to gobble’). We stick here to a formal definition and therefore categorize them all as derived. The categorization is naturally related to the purpose.

13.5.3 Longer codas

There are also codas consisting of four, five, and six segments. They do not appear to add much in the way of an understanding of the phonotactics of Swedish, as they are all morphologically complex. Some examples are given in (296).

(296) Longer sequences

4	/rm-st/	närm-st	[nærːmst]	‘nearest’
	/kst-s/	text-s	[tɕ̟kːsts]	‘id., gen.’
5	/lm-sk-t/	skälm-sk-t	[ɧɛ̟lːmskt]	‘roguish’
6	/lm-sk-t-s/	skälm-sk-t-s	[ɧɛ̟lːmskts]	‘roguish, gen.’

13.6 Syllables and phonotactics

The constraints on codas are firmer in word-medial position, which is a better place than the word-final position, for identifying the central constraints on CSw syllable structure. The weight structure of stressed syllables admits two moras. When these two moras are filled by a long vowel, there are severe limitations on further segments within the same syllable, within the morpheme. There are almost no forms like *[lɑːm.tɛ̯] or *[priːm.sa] where a long vowel is followed by a consonant that must syllabify as coda. There are some interesting exceptions though, indicating that there are things to learn here. A few forms like *moln* [moːln] ‘cloud’ and *aln* [ɑːln] ‘ell’ that we have seen before are already unusual in that they have long vowels before a following tautomorphemic cluster. They therefore naturally admit a coda also word-medially, in inflected forms like *molnet* [^{1}'moːl.nɛ̯t] ‘the cloud’ and *alnar* [^{2}'ɑːl.nar] ‘ells’. But note that both postvocalic consonants are coronal, a fact that is part of the licence. Thus, for the purposes of vowel lengthening under stress, the coronal sequence [ln] is treated as a single consonant.[16] We have seen this sensitivity to **(p.296)** place of articulation rather than to actual number of consonants before, in conjunction with permissible consonant clusters between the vowels of nicknames, see (159).

13.7 Distribution of vowels in stressed and unstressed syllables

The phonotactic distribution of vowels relates to stress and positions before and after the stressed syllable. In this section we provide a variant of the overview given by Sigurd (1965: 145). The main modification is that we assume that /o/ and /u/ can be separated outside of the stressed syllable. Also, we assume that /ɛ/ may occur in prestress position. It is notoriously difficult to separate the /e/ and /ɛ/ phonemes in unstressed position, but we may use the presence of vowel lowering as an argument for, at least, the existence of unstressed /ɛ/. In other unstressed positions, we have assumed underlying /e/.[17]

(297) The occurrence of vowels

$V_{\text{any distance}}$	V_{stressed}	V_{post1}	V_{post2}	V_{post3}
i	i(ː)	i	i	
e	e(ː)	e	e	e
ɑ	ɑ(ː)	ɑ	ɑ	ɑ
o	o(ː)	o	o	
u	u(ː)	u	u	
~~ʉ~~	~~ʉ~~(ː)	~~ʉ~~	~~ʉ~~	
y	y(ː)	y		
ø	ø(ː)			
ɛ	ɛ(ː)			
ɑ~~ʉ~~	ɑ~~ʉ~~	(ɑ~~ʉ~~)		
e~~ʉ~~	e~~ʉ~~			

The diphthongs may occur in prestress position, but in poststress position they are very limited. The diphthong /ɑʉ/ may occur in names (*Schartau* [ˈʃaʈːaʊ]), while /eʉ/ appears obligatorily to be pronounced [ɛv] in this position (*Orfeus* [ˈɔrːfɛ̟vs]). In (298), examples have been inserted in all the cells for unstressed positions.

(p.297) (298) Exemplification of unstressed vowels[18]

$V_{\text{any distance}}$	V_{stressed}	V_{post1}	V_{post2}	V_{post3}
m[ɪ]'nut	i(ː)	'gumm[i]	'hederl[ɪ]g	
l[e̞]'gal	e(ː)	'pojk[ɛ̝]	'överst[ɛ̝]	'tidigar[ɛ̝]
s[a]'liv	ɑ(ː)	'flick[a]	'överst[a]	'överstarn[a]
s[ɔ]l'dat	o(ː)	'någ[ɔ]t	'pickol[ɔ]	
p[u]'mada	u(ː)	'jumb[ʊ]	'badersk[ʊ]r	
m[ʉ]'sik	ʉ(ː)	'käng[ʉ]ru	'opi[ɵ]m	
t[ʏ]'rann	y(ː)	'band[ʏ]		
fl[ø̞]j'tist	ø(ː)			
p[æ]r'vers	ɛ(ː)			
[aʉ]to'mat	ɑʉ			
n[eʉ]'tral	eʉ			

Many more examples can be found in Lyttkens and Wulff (1916). Some of the forms they cite are obsolete, but the collection and organization of forms is very useful.

Notes:

([1]) The reason for syncope to occur (rather than accepting **spegelar*) is the tendency towards disyllabic forms, the unmarked shape of Swedish prosodic words (Riad 1999, 2003). Not all dialects implement this unmarkedness to the same extent, e.g. South Swedish occasional [2]'*spegelɐ̯n* ‘the mirror’.

([2]) This is also a difference vis-à-vis Urban East Norwegian (Kristoffersen 2000: 126), one of the standard varieties of Norwegian, where vocalic sonorants are entirely normal.

([3]) It is not possible to test the ability for a /t/ to follow a nuclear /l/ or /n/. There are two inflectional forms that appear to add a /-t/. For nouns, there is the neuter definite article, which would however seem to be underlyingly /-et/ (rather than just /-t/), in contrast with the common gender /-n/, as mentioned above. This means that the definite form comes out as [[1]'vatːnɛ̯(t)] ‘the water’ and [[1]'spratːlɛ(t)] ‘the floundering’, rather than putative *[[1]'vatːn男t] or *[[1]'spratːl男t]. For adjectives, there is the neuter suffix /-t/, which, however, regularly assimilates totally to forms ending in the nasal /n/. Thus, /[2]'lʉ̟den/ ‘hairy’ followed by the neuter agreement /-t/ comes out as [[2]'lʉ̟ːdɛ̯t] rather than *[[2]'lʉ̟ːdɛ̯nt] or putative dialectal *[[2]'lʉ̟ːdn男t].

([4]) Cf. varieties of English where *film* may be disyllabic (Irish English), and *rhythm* is always disyllabic.

([5]) The pronunciation dictionaries NSU and SSU indicate both pronunciations.

([6]) Sometimes also spelled ‹snitsel›.

([7]) There are no equivalent prefixes in Swedish.

([8]) An exception to this would be the occasional pronunciation of *match* ‘id.’ as [matːɕ] beside regular [matːʂ]. Both forms might however be seen as (borrowed) affricates.

([9]) Many of the forms ending in *-d* are old derivations for which the relationship to a base form is tenuous or non-existent, e.g. *många* ‘many’ ~ *mängd* ‘set’; *bygga* ‘to build’ ~ *bygd* ‘settled countryside’; *rymma* ‘to contain’ ~ *rymd* ‘space’; OSw *hava* ‘to have; to own’ ~ *hävd* ‘custom’.

([10]) Not included in Sigurd (1965). Other borrowed forms are *deadline* and *pipeline*, and names like *Klein* [klaj:n], *Frankenstein* ['fraŋkɛ̯n,ʂtaj:n], *Mathlein* [mat'lɛ̯j:n], *Alamein* [ala'mɛ̯j:n], *Hussein* [hɵ'sɛ̯j:n], some of which have become quite familiar. An alternative analysis here would be to consider the [j] as vocalic and part of the nucleus rather than the coda. If so, one should reasonably consider this for the entire row of codas. Decisive phonological arguments in either direction are missing.

([11]) The dorsal nasal in *charmant* 'gallant' and *nyans* 'nuance' is partly idiolectal, but widespread.

([12]) There are forms here with a short vowel, too, e.g. *styggt* 'naughty, neut.'

([13]) *Marg* [mar:g] is a short form of *marginal* [margɪ'nɑ:l] 'margin', and that is the reason, presumably, that the final segment is pronounced as [g] rather than [j]. Sigurd also cites *sarg* 'the boards (ice hockey)' in this group. However, the most widespread pronunciation here is [sar:j]. If that is a change, then it is an indication that [rg] is not a natural coda in Swedish.

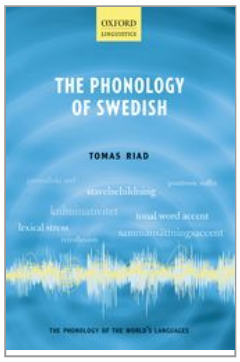
([14]) Pronunciation is [gɛ̯jm] or [ge:m] 'game (set & match)'.

([15]) We have modified Sigurd's (1965: 84ff.) lists due to the rule of retroflexion in Central Swedish, whereby there is coalescence of an /r/ and a laminal. Coalescence means that there is really only one segment to count. This concerns forms like *torsk* [tɔʂ:k] 'cod', *törst* [tœʂ:ʈ] 'thirst', and *harts* [haʈ:ʂ] 'resin', which are pronounced [tɔʂ:k], [tœʂ:ʈ], and [haʈ:ʂ] in CSw. These codas thus contain only two segments.

([16]) It would thus be treated as 'extrametrical' just like any non-moraic final consonant: /ɑ‹ln›/ [ɑ:ln] 'ell', /ɑ‹l›/ [ɑ:l] 'alder', /lɑ‹m›/ [lɑ:m] 'lame'. Note that there are no other forms ending in /ln/ where the /l/ is long. Thus, there is no reason to assume that these forms are exceptional, only that they form a minor pattern.

([17]) This is simply a practical decision. The real status of /e/ and /ɛ/ in several positions is not answered by classical phonemic analysis.

([18]) Translations: *minut* 'minute', *legal* 'id.', *saliv* 'saliva', *soldat* 'soldier', *pomada* 'pomade', *musik* 'music', *tyrann* 'tyrant', *flöjtist* 'flautist', *pervers* 'perverted', *automat* 'id.', *neutral* 'id.', *gummi* 'rubber', *pojke* 'boy', *flicka* 'girl', *något* 'something', *jumbo* 'id.', *känguru* 'kangaroo', *bandy* 'id.', *hederlig* 'honest', *överste* 'colonel', *översta* 'uppermost', *pickolo* 'piccolo', *baderskor* 'female bath attendants', *opium* 'id.', *tidigare* 'earlier', *överstarna* 'the colonels'.



The Phonology of Swedish
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Print publication date: 2013
Print ISBN-13: 9780199543571
Published to Oxford Scholarship Online: January 2014
DOI: 10.1093/acprof:oso/9780199543571.001.0001

Orthography

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DOI:10.1093/acprof:oso/9780199543571.003.0014

Abstract and Keywords

In this final chapter, the correspondence between phonemes and graphemes is illustrated. The chapter has the character of a catalogue with exemplification, looking both at phoneme to grapheme correspondence, and grapheme to phoneme correspondence. There is also a discussion of the representation of quantity in the orthographic system of Swedish.

Keywords: orthography, phonemes, graphemes, correspondence, quantity

The orthography of Swedish is basically phonemic, aiming at a clean correspondence between graphemes and phonemes. This ideal is not fully reached, in part due to the competing interest of preserving paradigmatic morphological coherence. In addition, orthographic reform inevitably lags behind phonological change. The distance between written and spoken Swedish is, however, fairly small compared to e.g. French, English, Danish, and German. Orthographic reforms in the last 250 years have gone some way towards achieving this state of affairs. Teleman (2002a: 72f.) notes that the notion of standardization as a goal in orthography was widely shared already in the early eighteenth century. The linguist Sven Hof emphasized the practical importance of consistency in spelling in his *Swänska Språkets Rätta Skrifsätt* (*The right writing of the Swedish language*, 1753), but equally important was the widespread sentiment that consistency of spelling was part of the beauty, indeed honour, of a language. Also, the notion of a close correspondence between the carefully spoken and written forms of a language was strong, if not always easy to apply (Teleman 2002a: 82ff.). The Swedish Academy was involved in a reform proposed in Leopold (1801), where the author argued for sensitivity to the contemporary as opposed to the etymological. He proposed a general, usage-based policy for spelling in the areas where there was disagreement. The proposals were taken up in texts produced by the Academy, but more importantly, it was employed in Carl Jonas Love Almqvist's *Svensk rättstafningslära* (*Swedish spelling grammar*, Almqvist 1829) which was widely used in schools and thereby came to be highly influential.

The publication of the first edition of the authoritative and strongly normative word list of the Swedish Academy (*Svenska Akademiens ordlista*, SAOL) in 1874, retained the spelling of Leopold, at the time clearly a conservative stance. Following a period of debate, a number of simplifications in spelling were made in a proposal by the minister of education, Fridtjuv Berg, in 1906, where the spelling of /t/ and /v/ were homogenized as ‹t› and ‹v›, ousting previous spellings like ‹dt› and ‹hv, fv, f› (Teleman 2003: 77ff.). The general effect of these changes was a cleaner relationship between phonology and orthography. They were adopted in the eighth edition of SAOL (1923).

(p.300) As well as being the result of policy and reform, the relative closeness of spelling and sound structure in modern Central Swedish is due to the simple fact that phonological change has been limited, in comparison with e.g. English and Danish, in the period where the orthography has stabilized. Some back vowels have undergone vowel shift, but less extensively than in English, and without much diphthongization, unlike the case in Faroese.[1] The main sounds that occasion variable spelling are /ʂ, ɕ, ʝ, ŋ/. Of these, /ʂ/ and /ɕ/ result largely from sound changes in the last 250 years, fully phonemic status being quite recent, at least for /ɕ/.

In the following, an overview of the relationship between orthography and phonology is given, where we first summarize the main phoneme-to-grapheme correspondences that we have discussed more fully in conjunction with the individual phonemes. We then look at the grapheme-to-phoneme correspondences, and finally at the orthographic representation of quantity.[2]

14.1 Phoneme to grapheme correspondence

In the charts in this section, the term ‘elsewhere’ will indicate the most general correspondence between phoneme and grapheme, while minor distributions and rules are indicated separately, with a description. The term ‘singleton’ will be used for lexemes that are single, or almost single, representatives of a particular spelling.

(299) The vowel phonemes

	Phoneme	Grapheme	Examples	Conditions
1	/ɑ/	‹a›	‹tam› [tɑːm] ‘tame’, ‹lack› [lakː] ‘varnish’	Elsewhere
		‹e›	‹cendré› [sanˈdreː] ‘ash blonde’	Before ‹n› in loans
2	/u/	‹o›	‹bord› [buːɖ] ‘table’, ‹skjorta› [ˈ²ɧʊʈːa] ‘shirt’	
3	/o/	‹å›	‹låta› [ˈ²loːta] ‘to let’, ‹sådd› [sɔdː] ‘sowing’	
		‹o›	‹Polen› [ˈ¹polɛ̯n] ‘Poland’, ‹bolma› [ˈ²bɔlːma] ‘to puff’	
4	/ʉ/	‹u›	‹bur› [bʉːr] ‘cage’, ‹brunn› [brʊnː] ‘well’	
5	/e/	‹e›	‹mesig› [ˈ²meːsɪg] ‘wimpish’, ‹test› [tɛ̯sːt] ‘id.’	
6	/i/	‹i›	‹lipa› [ˈ²liːpa] ‘to blubber’, ‹vissen› [vɪsːɛ̯n] ‘faded’	
7	/y/	‹y›	‹myra› [ˈ²myːra] ‘ant’, ‹sylt› [sʏlːt] ‘jam’	
8	/ɛ/	‹ä›	‹väga› [ˈ²vɛːga] ‘to weigh’, ‹vägg› [vɛ̯gː] ‘wall’, ‹värk› [værːk] ‘ache’	
		‹e›	‹erhålla› [ˈæːrˌhɔlːa] ‘to obtain’, ‹verk› [værːk] ‘work’	Sometimes before ‹r›
9	/ø/	‹ö›	‹lösen› [ˈ¹løːsɛ̯n] ‘ransom’, ‹löss› [lø̯sː] ‘lice’	
		‹y›	‹fyrtio› [ˈ²fœʈːɪ] ‘40’	Very marginally, before ‹r›

(p.301)

(300) Sonorant consonants

	Phoneme	Grapheme	Examples	Conditions
10	/j̟/	‹j›	‹jama› [ˀˈjɑːma] ‘to miaow’	
		‹g›	‹genast› [ˀˈjeːnast] ‘immediately’	
		‹dj›	‹djungel› [ˈˈjʉŋːɛ̟l] ‘jungle’	
		‹gj›	‹gjuta› [ˀˈjʉːta] ‘to cast’	
		‹lj›	‹ljus› [jʉːs] ‘light’	
		‹hj›	‹hjärna› [ˀˈjæːɳa] ‘brain’	
		‹y›	‹yoga› [ˀˈjoːga] ‘id.’	
11	/r/	‹r, rr›	‹rak› [rɑːk] ‘straight’, ‹torr› [tɔrː] ‘dry’	
12	/l/	‹l, ll›	‹blå› [bloː] ‘blue’, ‹piller› [ˈˈpɪlːɛ̟r] ‘pill’	
13	/m/	‹m, mm›	‹mim› [miːm] ‘mime’, ‹timme› [ˀˈtɪmːɛ̟] ‘hour’	
14	/n/	‹n, nn›	‹nu› [nʉː] ‘now’, ‹nynna [ˀˈnʏnːa] ‘to hum’	
15	/ŋ/	‹ng›	‹sång› [sɔŋː] ‘song’	
		‹g›	‹dygn› [dʏŋːn] ‘day’	Only before ‹n›

(301) Obstruent stops consonants

	Phoneme	Grapheme	Examples
16	/p/	‹p, pp›	‹påk› [poːk] ‘cudgel’, ‹loppa› [ˀˈlɔpːa] ‘flea’
17	/b/	‹b, bb›	‹bil› [biːl] ‘car’, ‹kubbe› [ˀˈkɵbːɛ̟] ‘block’
18	/t/	‹t, tt›	‹tolv› [tɔlːv] ‘12’, ‹potta› [ˀˈpɔtːa] ‘potty’
19	/d/	‹d, dd›	‹säd› [sɛːd] ‘seed’, ‹padda› [ˀˈpadːa] ‘toad’
20	/k/	‹k, ck›	‹krok› [kruːk] ‘hook’, ‹lock› [lɔkː] ‘lid’
		‹ch›	‹och› [ɔkː] ‘and’
21	/g/	‹g, gg›	gnaga› [ˀˈgnɑːga] ‘to gnaw’, ‹gnägga› [ˀˈgnɛ̟gːa] ‘to neigh’

(302) Obstruent fricative/approximant consonants

	Phoneme	Grapheme	Examples	Conditions
22	/h/	‹h›	‹hund› [hɵnːd] ‘dog’, ‹hatt› [hatː] ‘hat’	
23	/f/	‹f, ff›	‹fasa› [^{2}ˈfɑːsa] ‘horror’, ‹tofflor› [^{2}ˈtɔfːlʊr] ‘slippers’	
24	/v/	‹v, vv›	‹våt› [voːt] ‘wet’, ‹vovve› [^{2}ˈvʊvːɐ̟] ‘doggie’	
		‹w›	‹watt› [vatː] ‘id.’, ‹webb› [vɐ̟bː] ‘web’	
		‹u›	‹Sundquist› [^{2}ˈsɵŋːˌkvɪsːt] (name)	
25	/s/	‹s, ss›	‹soppa› [^{2}ˈsɔpːa] ‘soup’, ‹passa› [^{2}ˈpasːa] ‘to fit’	
		‹c›	‹cykel› [^{1}ˈsʏkːɐ̟l] ‘bicycle’	
		‹z›	‹zebra› [^{2}ˈseːbra] ‘id.’	
26	/ɕ/	‹k, ki›	‹kisa› [^{2}ˈɕiːsa] ‘to squint’, ‹kiosk› [ɕɔsːk] ‘id.’	
		‹kj, tj›	‹kjol› [ɕuːl] ‘skirt’, ‹tjuta› [^{2}ˈɕʉːta] ‘to howl’	
		‹ch›	‹chips› [ɕɪpːs] ‘crisps’	
27	/ʂ/	‹ch›	‹chef› [ɧeːf] ‘boss’	
		‹che›	‹apache› [aˈpaʂː] ‘id.’	
		‹g›	‹giraff› [ɧɪˈrafː] ‘giraffe’	
		‹ge›	‹prestige› [prɐ̟sˈtiːʂ] ‘id.’	
		‹j›	‹jetong› [ɧɛˈtɔŋː] ‘jetton’	
		‹sc›	‹fascist› [faˈɧɪsːt] ‘id.’	
		‹sch›	‹schottis› [^{1}ˈɧɔtːɪs] (dance)	

Phoneme	Grapheme	Examples	Conditions
	‹sh›	‹shoppa› [^{2}ˈɧɔpːa] ‘to shop’	
	‹si›	‹division› [dɪvɪˈɧuːn] ‘id.’	
	‹sj›	‹sjö› [ɧøː] ‘lake’	
	‹sk›	‹skön› [ɧøːn] ‘comfortable’	
	‹skj›	‹skjuts› [ɧʉsː] ‘ride’	
	‹ssi›	‹mission› [mɪˈɧuːn] ‘id.’	
	‹ssj›	‹ryssja› [^{2}ˈrʏʂːa] ‘fish trap’	
	‹sti›	‹suggestion› [sʊgɛ̟ˈɧuːn] ‘id.’	
	‹stj›	‹stjärna› [^{2}ˈɧæːɳa] ‘star’	
	‹ti›	‹position› [pʊsɪˈɧuːn] ‘id.’	
	‹(t)i›	‹nation› [natˈɧuːn] ‘id.’	When pronounced as [tɧ]
	‹gi›	‹religiös› [rɛ̟lɪˈɧøːs] ‘religious’	
	‹ige›	‹beige› [bɛːʂ] ‘id.’	
	‹je›	‹damejeanne› [damɛ̟ˈɧanː] ‘carboy’	
	‹shi›	‹fashionabel› [faɧʊ^{1}ˈnɑːbɛ̟l] ‘fashionable’	
	‹stg›	‹östgöte› [^{2}ˈœɧːˌøːtɛ̟] ‘person from Östergötland’	
	‹xi›	‹reflexion› [rɛ̟flɛ̟kˈɧuːn] ‘id.’	When pronounced as [kɧ]

Phoneme	Grapheme	Examples	Conditions
	‹xj›	‹Växjö› [^{2}ˈvɛ̟kːˌɧøː] (place name)	When pronounced as [kɧ]

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14.2 Grapheme to phoneme correspondence

The presentation in this section draws on Garlén (1984: 157ff.), but is organized somewhat differently. The vowel graphemes all represent both long and short allophones.

(303) ‹a› to ‹c›

	Grapheme	Phoneme	Examples (orthographic)	Position
1	‹a›	/ɑ/	‹mat› [mɑːt] ‘food’, ‹hall› [halː] ‘id.’, ‹bara› [^{2}ˈbɑːra] ‘only’	
2	‹b›	/b/	‹bur› [bʉːr] ‘cage’, ‹stab› [stɑːb] ‘staff’, ‹klibba› [^{2}ˈklɪbːa] ‘to be sticky’	
3	‹c›	/s/	‹cell› [sɛ̟lː] ‘id.’, ‹cigarr› [sɪˈgarː] ‘cigar’, ‹cyniker› [^{1}ˈsyːnɪkɛ̟r] ‘cynic’	Before tautomorphemic ‹e, i, y›
4		/k/	‹café [kaˈfeː] ‘id.’, ‹clementin› [klɛ̟mɛ̟nˈtiːn] ‘clementine’, ‹Jamaica› [ja^{2}ˈmajːka] (name),	
			‹centaur› [kɛ̟nˈtaʊr] ‘id.’, ‹cimbrer [^{1}ˈkɪmːbrɛ̟r] ‘Cimbri’	Elsewhere, including some exceptions to the above and except the cases below
5	‹c›	/ɕ/	‹cembalo› [^{1}ˈɕɛ̟mbalʊ] ‘id.’	Some individual forms
6	‹cc›	/ks/	‹accent› [akˈsɛ̟nːt] ‘id.’, ‹acceptera› [aksɛ̟p^{1}ˈteːra] ‘to accept’, ‹accessoar› [aksɛ̟sʊˈɑːr]^{3} ‘accessory’	Before tautomorphemic ‹e, i, y›

	Grapheme	Phoneme	Examples (orthographic)	Position
7	‹ch›	/ʂ/	‹chef› [ʃeːf] ‘boss’, ‹chark› [ʃarːk] ‘deli’, ‹chic› [ʃɪkː] ‘id.’	Primarily French loans, where the corresponding pronunciation is fricative /ʂ/ or /ʃ/
8	‹ch›	/ɕ/	‹charter› [ˈ[1]ɕɑːʈɚr] ‘id.’, ‹chips› [ɕɪpːs] ‘crisps’, ‹check› [ɕɛ̞kː] ‘id.’, ‹poncho› [ˈ[1]pɔnːɕɔ] ‘id.’	Primarily English and Spanish loans, where the corresponding pronunciation is affricate /t͡ʃ/[4]
9	‹ch›	/kː/	‹Loch Ness› [lɔkˈnɛ̞sː], ‹Bloch› [blɔkː] (names), ‹och› [ɔkː] ‘and’	Some names; conjunction *och*
10	‹ck›	/kː/	‹lock› [lɔkː] ‘lid’, ‹tack› [takː] ‘thanks’, ‹vicka› [ˈ[2]vɪkːa] ‘to wobble’	

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Foreign words in general tend to be imported without much change in spelling: ‹mousse› [mʊsː] ‘id.’, ‹chef› [ʃeːf] ‘boss’. Successful spelling adjustments are relatively few, and usually result in parallel forms rather than replacements: ‹jos› vs. ‹juice› [juːs] ‘juice’, ‹schysst› vs. ‹juste› [ʃʏsːt] ‘just; OK’. Replacements include ‹tejp› [tɛ̝jːp] ‘tape’, ‹mejl› [mɛ̝jːl] ‘(e)mail’.

(304) ‹d› to ‹f›

	Grapheme	Phoneme	Examples (orthographic)	Position
11	‹d›	/d/	‹dag› [dɑːg] ‘day’, ‹led› [leːd] ‘joint’, ‹möda› [ˀ²ˈmøːda] ‘effort’, ‹sudda› [ˀ²ˈsʊdːa] ‘to erase’	All positions
12	‹dj›	/ʝ/	‹djup› [jʉːp] ‘deep’, ‹djur› [jʉːr] ‘animal’, ‹djärv› [jærːv] ‘bold’	Initial only
13	‹dj›	/dʝ/	‹Djibouti› [dʝɪˀ¹ˈbuːtɪ] (name), ‹djonk› [djɔŋːk] ‘junk’, ‹djinn› [dʝɪnː] ‘jinn’	Some singular words
14	‹e›	/ɑ/	‹cendré› [sanˈdreː] ‘ash blonde’, ‹engagemang› [aŋgaɧɛ̧ˈmaŋː] ‘commitment’, ‹ensemble› [aŋˀ¹ˈsambɛ̧l] ‘group’	Some French loans, position before nasal
15	‹e›	/e/ [eː]	‹leva› [ˀ²ˈleːva] ‘to live’, ‹te› [teː] ‘tea’, ‹mes› [meːs] ‘wimp’	Long vowel in most positions except before /r/ in a few forms

	Grapheme	Phoneme	Examples (orthographic)	Position
16	‹e›	/ɛ/ [æː]	‹erkänna› [^{2}ˈæːrˌɕɛ̯nːa] or [^{2}ˈeːrˌɕɛ̯nːa] ‘to confess’, ‹erhålla› [^{2}ˈæːrˌhɔlːa] or [^{2}ˈeːrˌhɔlːa] ‘to obtain’, ‹Per› [pæːr], ‹Erland› [^{1}ˈæːrland] (names), ‹konsert› [kɔnˈsæːr] ‘concert’	Before /r/, optional in some forms, obligatory in others
17	‹e›	/ɛ/ [æ]	‹berg› [bærːj] ‘mountain’, ‹verk› [værːk] ‘work’	Before /r/ (always)
18	‹e›	/ɛ/ (or /e/)	‹sett› [sɛ̯tː] ‘has seen’, ‹lett› [lɛ̯tː] ‘has smiled’	Regional variation. In CSw the short /ɛ/ and /e/ are not distinguished.[5]
19	‹f›	/f/	‹ful› [fʉːl] ‘ugly’, ‹kuf› [kʉːf] ‘odd customer’, ‹biff› [bɪfː] ‘beef’, ‹chefa› [^{2}ˈʃeːfa] ‘to boss’, ‹kaffe› [^{2}ˈkafːɛ̯] ‘coffee’	

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(305) ‹g› to ‹hj›

	Grapheme	Phoneme	Examples (orthographic)	Position
20	‹g›	/ʝ/	‹gena› [ˈ[2]jeːna] ‘to take a short-cut’, ‹gissa› [ˈ[2]jɪsːa] ‘to guess’, ‹gyro› [ˈ[1]jyːrʊ] ‘id.’, ‹gälar› [ˈ[2]jɛːlar] ‘gills’, ‹gölar› [ˈ[2]jøːlar] ‘pools’	Initial in prosodic word or foot, before ‹e, i, y, ä, ö›
21		/ʝ/	‹älg› [ɛ̟lːj] ‘moose’, ‹galge› [ˈ[2]galːjɛ] ‘hanger’, ‹helg› [hɛ̟lːj] ‘holiday’, ‹arg› [arːj] ‘angry’, ‹berg› [bærːj] ‘mountain’, ‹bärga› [ˈ[2]bærːja] ‘to salvage’	Following tautomorphemic ‹l› or ‹r›
22	‹g›	/ŋ/	‹agn› [aŋːn] ‘bait’, ‹lugn› [ləŋːn] ‘calm’, ‹vagn› [vaŋːn] ‘wagon’	Tautomorphemic between a vowel and ‹n›[6]
23	‹g›	/ʂ/	‹geni› [ɧɛ̟ˈniː] ‘genius’, ‹generad› [ɧɛ̟ˈneːrad] ‘embarrassed’, ‹logi› [lɔˈɧiː] ‘housing’	Initial position of French loanword or stressed syllable, before ‹e, i›
24	‹ge›	/ʂ/	‹garage› [gaˈrɑːʂ] ‘id.’, ‹gage› [gɑːʂ] ‘fee’, ‹sergeant› [sɛ̟ˈɧant] ‘id.’	Final position or before other vowel grapheme

	Grapheme	Phoneme	Examples (orthographic)	Position
25	‹gi›	/ʂ/	‹religiös› [rɛ̟lɪˈɧøːs] ‘religious’	As exception to 20, before other vowel grapheme
26	‹g›	/g/	‹god› [guːd] ‘good’, ‹groda› [^{2}ˈgruːda] ‘frog’, ‹glas› [glɑːs] ‘glass’, ‹låg› [loːg] ‘low’, ‹ögon› [^{2}ˈøːgɔn] ‘eyes’, ‹hugga› [^{2}ˈhɵgːa] ‘to chop’	Elsewhere Exceptions to 21 above are mostly loanwords or names
			‹Belgien› [^{1}ˈbɛlːgɪ̟ɛn], ‹Helga› [^{2}ˈhɛ̟lːga] (names), ‹helgon› [^{2}ˈhɛ̟lːgɔn] ‘saint’, ‹Borgå› [^{2}ˈbɔrːˌgoː] (name), ‹embargo› [ɛ̟m^{1}ˈbarːgɔ] ‘id.’, ‹largo› [^{1}ˈlarːgɔ] ‘id.’, ‹allergi› [alɛ̟rˈgiː] ‘allergy’ ‹prognos› [prɔgˈnoːs] ‘prognosis’, ‹diagnos› [dɪagˈnoːs] ‘diagnosis’	Exceptions to 22 are a few morpheme-initial Greek loans
27	‹gj›	/j/	‹gjuta› [^{2}ˈjʉːta] ‘to cast’, ‹ingjuta› [^{2}ˈɪnːˌjʉːta][7] ‘to instil’	Morpheme-initial

	Grapheme	Phoneme	Examples (orthographic) Position
28	‹h›	/h/	‹huvud› [^{2}ˈhʉːvəd] ‘head’, ‹behöva› [bɛ̝^{1}ˈhøːva] ‘to need’
29	‹hj›	/j̊/	‹hjort› [jʊʈː] ‘deer’, ‹hjärta› [^{2}ˈjæʈːa] ‘heart’

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(306) ‹i› to ‹ng›

	Grapheme	Phoneme	Examples (orthographic)	Position
30	‹i›	/i/	‹ila› [^{2}ˈiːla] ‘to hasten’, ‹sida› [^{2}ˈsiːda] ‘side’, ‹imma› [^{2}ˈɪmːa] ‘dew’, ‹snitt› [snɪtː][8] ‘cut’	
31	‹j›	/ʂ/	‹jasmin› [ɧasˈmiːn] ‘jasmine’, ‹projekt› [prʊˈɧʂkːt] ‘project’, ‹journal› [ɧʊˈɳɑːl] ‘case book’	Many French loans
32	‹j›	/ʝ/	‹jul› [jʉːl] ‘Christmas’, ‹boj› [bɔjː] ‘buoy’, ‹väja› [^{2}ˈvɛjːa][9] ‘to veer’	Generally
33	‹k›	/ɕ/	‹kela› [^{2}ˈɕeːla] ‘to pet’, ‹kila› [^{2}ˈɕiːla] ‘wedge’, ‹kyla› [^{2}ˈɕyːla] ‘to chill’, ‹känna› [^{2}ˈɕʂnːa] ‘to feel’, ‹kök› [ɕøːk] ‘kitchen’	Morpheme-initially before ‹e, i, y, ä, ö›
34	‹kj›	/ɕ/	‹kjol› [ɕuːl] ‘skirt’, ‹kjusa› [^{2}ˈɕʉːsa] ‘narrow valley’, ‹kjortel› [^{2}ˈɕʊʈːʂl] ‘kirtle’	Morpheme-initial (few)

	Grapheme	Phoneme	Examples (orthographic)	Position
35	‹k›	/k/	‹kål› [koːl] ‘cabbage’, ‹lok› [luːk] ‘(train) engine’, ‹klister› [[1]ˈklɪsːtɛ̟r] ‘glue’, ‹krök› [krøːk][10] ‘bend’	Elsewhere
			‹kefir› [kɛ̟ˈfiːr] ‘id.’, ‹kille› [[2]ˈkɪlːɛ̟] ‘guy’, ‹kis› [kiːs][11] ‘fellow’	Exceptions to 33
36	‹l›	/l/	‹lök› [løːk] ‘onion’, ‹mal› [mɑːl] ‘moth’, ‹kola› [[2]ˈkoːla] ‘toffee’, ‹boll› [bɔlː][12] ‘ball’	Generally
37	‹lj›	/ʝ/	‹ljud› [jʉ̟ːd] ‘sound’, ‹ljus› [jʉ̟ːs] ‘light’, ‹ljung› [jʊŋː] ‘heather’	Morpheme-initial position
38	‹m›	/m/	‹mamma› [[2]ˈmamːa] ‘mummy’, ‹lam› [lɑːm] ‘lame’, ‹kom› [kɔmː] ‘come’	
39	‹n›	/ŋ/	‹fond› [fɔŋːd] ‘fund’, ‹chans› [ɧaŋːs] ‘chance’, ‹genant› [ʝɛ̟ˈnaŋːt] ‘embarrassing’	In French loans the spellings ‹nd, ns, nt› may correspond to /ŋd, ŋs, ŋt/

	Grapheme	Phoneme	Examples (orthographic)	Position
40	‹n›	/n/	‹naken› [^{2}ˈnɑːkɛ̯n] ‘naked’, ‹fjun› [fjʉːn] ‘down’, ‹låna› [^{2}ˈloːna] ‘to borrow’, ‹tunna› [^{2}ˈtʉnːa] ‘barrel’	Elsewhere, including alternative pronunciation to 39
			‹fond› [fɔnːd] ‘trust’, ‹chans› [ɧanːs] ‘chance’, ‹genant› [ɧɛ̯ˈnanːt] ‘embarrassing’	
41	‹ng›	/ŋ/	‹tung› [tʉŋː] ‘heavy’, ‹finger› [^{1}ˈfɪŋːɛ̯r] ‘id.’	When tautomorphemic
42	‹ng›	/ŋg/	‹tango› [^{1}ˈtaŋːgʊ] ‘id.’, ‹Kongo› [^{1}ˈkɔŋgʊ] (name)	Exceptions to 41 are loans

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(307) ‹o› to ‹shi›

	Grapheme	Phoneme	Examples (orthographic)	Position
43	‹o›	/o/	‹polyfon› [pɔlʏˈfoːn] ‘polyphonic’, ‹mikrob› [mɪˈkroːb] ‘microbe’, ‹despot› [dɛ̧sˈpoːt] ‘id.’, ‹neuros› [nɛ̧vˈroːs] ‘neurosis’, etc.	Most stressed endings of foreign origin mostly before tautomorphemic ‹v› when corresponding to a short realization
			‹hov› [hoːv] ‘court’, ‹lov› [loːv] ‘holidays’, ‹sova› [^{2}ˈsoːva][13] ‘to sleep’,	
			‹skoja› [^{2}ˈskɔjːa] ‘to joke’, ‹torr› [tɔrː] ‘dry’, ‹lock› [lɔkː] ‘lid’	
44	‹o›	/u/	‹metod› [mɛ̧ˈtuːd] ‘method’, ‹harmonisk› [har^{1}ˈmuːnɪsk] ‘harmonic’, ‹station› [staˈʃuːn] ‘id.’,	Some stressed endings of foreign origin
			‹bo› [buː] ‘to live’, ‹ode› [^{2}ˈuːdɛ] ‘id.’, ‹mor› [muːr] ‘mother’	When corresponding to the long realization (except before ‹v›)
45	‹p›	/p/	‹pil› [piːl] ‘arrow’, ‹gap› [gɑːp] ‘opening’, ‹löpa› [^{2}ˈløːpa] ‘to run’, ‹knoppas› [^{2}ˈknɔpːas] ‘to bud’	

	Grapheme	Phoneme	Examples (orthographic)	Position
46	‹q›	/k/	‹Qvennerstedt› [^{2}ˈkvɛ̟nːɛ̟ʂˌtɛtː], ‹Quisling› [^{2}ˈkvɪsːlɪŋ] (names)	Marginally used in names and loans
47	‹r›	/r/	‹ruta› [^{2}ˈrʉ̟ːta] ‘square’, ‹bur› [bʉ̟ːr] ‘cage’, ‹nära› [^{2}ˈnæːra] ‘near’, ‹borra› [^{2}ˈbɔrːa] ‘to drill’	
48	‹s›	/s/	‹sila› [^{2}ˈsiːla] ‘to sieve’, ‹bas› [bɑːs] ‘bass’, ‹väsa› [^{2}ˈvɛːsa] ‘to wheeze’, ‹vässa› [^{2}ˈvɛ̟sːa] ‘to sharpen’	
49	‹sc›	/ʂ/	‹crescendo› [krɛ̟^{1}ˈʃɛ̟nːdʊ] ‘id.’, ‹fascist› [faˈʃɪsːt] ‘id.’	Some loans
50	‹sc›	/s/	‹scen› [seːn] ‘late’, ‹obscen› [ɔbˈseːn] ‘obscene’	Exceptions to 49
51	‹sch›	/ʂ/	‹schack› [ʃakː] ‘chess’, ‹dusch› [dəʃː] ‘shower’	When tautomorphemic
52	‹sch›	/sk/	‹schizofren› [skɪtsʊˈfreːn] ‘schizophrenic’, ‹scherzo› [^{1}ˈskɛ̟rtsʊ] ‘id.’	Exceptions to 51
53	‹sh›	/ʂ/	‹shopping› [^{1}ˈʃɔpːɪŋ] ‘id.’, ‹shunt› [ʃʊnːt] ‘id.’	A few loans
54	‹shi›	/ʂ/	‹fashionabel› [faʃʊ^{1}ˈnɑːbɛ̟l] ‘fashionable’	A few loans

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(308) ‹si› to ‹tj›

	Grapheme	Phoneme	Examples (orthographic)	Position
55	‹si›	/ʂ/	‹kollision› [kɔlɪˈɧuːn] ‘collision’	Intervocalically, loans
56	‹sj›	/ʂ/	‹sjunka› [ˀˈɧʊŋːka] ‘to sink’	Morpheme-initially
57	‹sk›	/ʂ/	‹sked› [ɧeːd] ‘spoon’, ‹skiva› [ˀˈɧiːva] ‘record’, ‹skytte› [ˀˈɧʏtːɛ̧] ‘shooting’, ‹skär› [ɧæːr] ‘pink’, ‹skön› [ɧøːn] ‘comfortable’,	Morpheme-initially before ‹e, i, y, ä, ö›[14]
			‹människa› [ˀˈmɛ̧nːɪɧa] ‘human being’, ‹marskalk› [ˀˈmaʂːˌalk] ‘marshal’	Individual exceptions
58	‹skj›	/ʂ/	‹skjuta› [ˀˈɧʉːta] ‘to shoot’, ‹skjorta› [ˀˈɧʊʈːa] ‘shirt’	Morpheme-initially (few)
59	‹ssi›	/ʂ/	‹passion› [paˈɧuːn] ‘id.’, ‹mission› [mɪˈɧuːn] ‘id.’	Intervocalically, loans
60	‹ssj›	/ʂ/	‹hyssja› [ˀˈhʏʂːa] ‘to shush’, ‹ryssja› [ˀˈrʏʂːa] ‘fish trap’	Intervocalic tautomorphemic

	Grapheme	Phoneme	Examples (orthographic)	Position
61	‹stg›	/ʂ/	‹gästgivargård› [^{2}ˈjɛʄː ˌɪvarˌgoːɖ] ‘inn’	Reduced compounds
62	‹sti›	/ʂ/	‹suggestion› [sɵgɛ̟ˈʄuːn] ‘id.’, ‹kongestion› [kɔnjɛ̟ ˈʄuːn] ‘congestion’	Intervocalic in some loans
63	‹stj›	/ʂ/	‹stjärna› [^{2}ˈʄæːɳa] ‘star’, ‹stjärt› [ʄæʈː] ‘bottom’	Morpheme-initially
64	‹t›	/t/	‹tal› [tɑːl] ‘number’, ‹get› [jeːt] ‘goat’, ‹smitta› [^{2} ˈsmɪtːa] ‘to infect’	
65	‹ti›	/ʂ/	‹position› [pʊsɪˈʄuːn] ‘id.’	Some words ending in *tion*
		/tʂ/	‹motion› [mɔtˈʄuːn] ‘fitness’	Other words ending in *tion*
66	‹tj›	/ɕ/	‹tjock› [ɕɔkː] ‘fat’, ‹tjata› [^{2}ˈɕɑːta] ‘gnat’	Morpheme-initially

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(309) ‹u› to ‹ö›

	Grapheme	Phoneme	Examples (orthographic)	Position
67	‹u›	/ʉ/	‹ful› [fʉːl] ‘ugly’	
68	‹u›	/v/	‹Quist› [kvɪsːt] (name)	Few
69	‹v›	/v/	‹vas› [vɑːs] ‘vase’, ‹stav› [stɑːv] ‘staff’	
70	‹w›	/v/	‹watt› [vatː] ‘id.’	
71	‹x›	/ks/	‹tax› [takːs] ‘dachshund’	
72	‹xi›	/kʂ/	‹reflexion› [rɛ̟flɛ̟kˈɧuːn] ‘id.’	Singleton, alt. spelling[15]
73	‹xj›	/kʂ/	‹Växjö› [ˈ²vɛ̟kːˌɧøː] (name)	Singleton
74	‹y›	/y/	‹yla› [ˈ²yːla] ‘to howl’, ‹syssling› [ˈ²sʏsːla] ‘duty’	
75	‹y›	/ø/	‹fyrtio› [ˈ²fœʈːɪ] ‘40’	Singleton
76	‹y›	/ʝ/	‹yoghurt› [ˈ¹joːgɵʈ] ‘id.’	
77	‹z›	/ts/	‹Schweiz› [ʂvɛjːts] ‘Switzerland’, ‹pizza› [pɪtːsa] ‘id.’	
78	‹z›	/s/	‹zulu [ˈ¹sʉːlʉ̟] ‘id.’, ‹zink› [sɪŋːk] ‘zinc’	
79	‹å›	/o/	‹mås› [moːs] ‘gull’, ‹fålla› [ˈ²fɔlːa] ‘to fold’	
80	‹ä›	/ɛ/	‹klä› [klɛː] ‘dress’, ‹mätt› [mɛ̟tː] ‘full’	
81	‹ö›	/ø/	‹snö› [snøː] ‘snow’, ‹kött› [ɕø̟tː] ‘meat’	

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14.3 The orthographic marking of quantity

Swedish phonology employs complementary quantity in stressed syllables, making either vowel quantity or consonant quantity predictable. In 8.4 we concluded that the most restrictive theory would consider consonant quantity as the main underlying distinction, and vowel quantity as predictable. This situation is rather directly reflected in the spelling system, where short and long consonants are mostly represented by single and double graphs, respectively.

(310) Single and double graphs for short and long consonants

‹såpa›	/sop-α_2/	[^{2}'so:pa]	‘soft soap’	‹soppa›	/sop$^{\mu}\alpha_2$/	[^{2}'sɔp:a]	‘soup’
‹stapla›	/stɑpl-α_2/	[^{2}'stɑ:pla]	‘to pile up’	‹stappla›	/stɑp$^{\mu}$lα_2/	[^{2}'stap:la]	‘to stagger’
‹gata›	/gɑt-α_2/	[^{2}'gɑ:ta]	‘street’	‹fatta›	/fɑt$^{\mu}\alpha_2$/	[^{2}'fat:a]	‘to grasp’
‹vitna›	/vitn-α_2/	[^{2}'vi:tna]	‘to whiten’	‹vittna›	/vit$^{\mu}$nα_2/	[^{2}'vɪt:na]	‘to testify’

Idiosyncratically, the regular orthographic marking of the long /kᵘ/ is ‹ck› as in ‹släcka› /slɛkᵘ-ɑ$_2$/ [^{2}'slɛ̩kːa] ‘to extinguish’, ‹tack› /tɑkᵘ/ [takː] ‘thank you’.

The spelling of long /j̩ᵘ/ is normally singular ‹j› as in ‹skoja› /skoj̩ᵘ-ɑ$_2$/ [^{2}'skɔjːa] ‘to joke’, ‹haj› /hɑj̩ᵘ/ [hajː] ‘shark’. In coda position as well as in intervocalic position directly following stressed syllables, /j̩/ is always long in CSw. In Finland-Swedish it may be short intervocalically (8.1 fn). Another phoneme which is always long in stressed syllables is /ŋ/ which is rendered as ‹ng› where phonemic: ‹tunga› /tʉŋᵘ-ɑ$_2$/ [^{2}'tøŋːa] ‘tongue’, ‹pingvin› /piŋvin/ [pɪŋ'viːn] ‘penguin’. Often [ŋ] is the result of assimilation, with no effect on spelling: ‹lugn› /lʉgn/ [løŋːn] ‘calm’, ‹magnesium› /mɑgnes-iʉm/ [maŋ^1'neːsɪøm] ‘id.’, ‹länk› /lɛnk/ [lɛ̩ŋːk] ‘link’.

In the regular case, the alternation between single and double representation of a consonant grapheme, is only found in connection with stressed syllables, that is, where there is also a quantitative phonological difference. There are, however, exceptions in both directions, both due to externally determined spelling (e.g. loan), and to graphonomic rules. We find doubly represented short consonants e.g. in loanwords: ‹terrass› /tɛrɑsᵘ/ [tɛ'rasː] ‘terrace’, ‹kollektion› /kolɛk-ʂun/ [kɔlɛ̩k'ɧuːn] ‘collection’, and we also find singly represented consonants, where a long consonant is underlying: ‹kam› /kɑmᵘ/ [kamː] ‘comb’, ‹kom› /komᵘ/ [kɔmː] ‘came’, ‹vän› /vɛnᵘ/ [vɛ̩nː] ‘friend’, ‹man› /mɑnᵘ/ [manː] ‘id.’. The latter case is due to an orthographic rule that says that long /mᵘ/ and /nᵘ/ are spelled with a **(p.311)** single sign, when final.[16] Hence, we get a paradigmatic spelling alternation where there is no corresponding phonological or phonetic alternation, cf. ‹kammar› /kɑmᵘ-ɑr$_2$/ [^{2}'kamːar] ‘combs’, ‹kommer› /komᵘ-•r/ [^{1}'kɔmːɛ̩r] ‘comes’, ‹vänner› /vɛnᵘ-er$_2$/ [^{2}'vɛ̩nːɛ̩r] ‘friends’, ‹mannen› /mɑnᵘ-•n/ [^{2}'manːɛ̩n] ‘the man’.

Phonological consonant length may result also from weight by position (8.4.3), and in these cases, length is not marked in monomorphemes: ‹vind› /vind/ [vɪnːd] ‘wind’, ‹gäst› /j̩ɛst/ [jɛ̩sːt] ‘guest’, ‹guld› /gʉld/ [gølːd] ‘gold’, ‹vinst› /vinst/ [vɪnːst] ‘profit’. The presence of two different consonants serves as an indicator of the fact that the vowel cannot be long, much as a pair of identical graphic consonants would. The fact that the first of these consonants is pronounced as long (or half-long) is due to the exceptionless regularity of the quantity system of Swedish, where any consonant that carries a mora is also phonetically long.

In word-medial position, the orthographic marking reflects phonotactics. If the sonority profile is such that the first consonant must be part of the coda of the first syllable, no indication of length is given (311a). If the phonotactics is such that the cluster would form a legitimate onset (13.4), then ambiguity arises and separate ways of marking the quantity are used where there is variation (311b, c). For more examples, see (170).

(311) Word-medial clusters

a. ‹vända› /vɛnd-α$_2$/ [^{2}'vɛ̟n:da] ‘to turn’, ‹fläkta› /flɛkt-α$_2$/ [^{2}'flɛ̟k:ta] ‘to fan’, ‹slitsa› /slits-α$_2$/ [^{2}'slɪt:sa] ‘to slit (open)’, ‹kasta› /kɑst-α$_2$/ [^{2}'kas:ta] ‘to throw’
b. ‹stapla› /stɑpl-α$_2$/ [^{2}'stɑ:pla] ‘to heap’, ‹levra› /levr-α$_2$/ [^{2}'le:vra] ‘to coagulate’, ‹vakna› /vɑkn-α$_2$/ [vɑ:kna] ‘to wake up’, ‹mygla› /mygl-α$_2$/ [^{2}'my:gla] ‘to wangle’
c. ‹stappla› /stɑp$^{\mu}$l-α$_2$/ [^{2}'stap:la] ‘to stagger’, ‹offra› /of$^{\mu}$r-α$_2$/ [^{2}'ɔf:ra] ‘to sacrifice’, ‹fnittra› /fnit$^{\mu}$r-α$_2$/ [^{2}'fnɪt:ra] ‘to giggle’, ‹tråckla› /trok$^{\mu}$l-α$_2$/ [^{2}'trɔk:la] ‘to baste’, ‹uggla› /ʉg$^{\mu}$l-α$_2$/ [^{2}'ɵg:la] ‘owl’

In (311a), then, the postvocalic consonant is long, but not orthographically marked, as this information can be inferred from the phonotactic organization of the segments involved. For the medial cluster [st] of ‹kasta› this might not seem obvious, as this is a common onset in the beginning of words. Morpheme-medially, however, it turns out not to show up after a long vowel, and hence the behaviour is predictable within the Swedish system.

Notes:

([1]) Notes on orthography are given in conjunction with the presentation of individual phonemes in chapters 2 and 3.

([2]) Their exposition below is very surface-near and is intended as a guide to spelling rather than as a full account for the phonological underpinnings of graphonomy (for which, see Hellberg 1974). Thus, no attempt at integrating orthography with phonology in the grammar is made here.

([3]) *Accessoar* is increasingly pronounced as [asɛ̟sʊ'ɑ:r], without the [k]. There is also a substandard pronunciation of *acceptera* as [asɛ̟p[1]'te:ra].

([4]) A few words can have either pronunciation: *chans* ['ɕaŋ:s], ['ʃaŋ:s], *choke* ['ɕo:k], ['ʃo:k], *match* [mat:ɕ], [mat:ʂ].

([5]) As a consequence of this, it is not obvious what underlying vowel should be set up for individual forms. A few inflected forms are used as examples of morphophonologically warranted /e/.

([6]) The form ‹champagne› is pronounced [ʃam'pan:j].

([7]) The form ‹Gjallarhornet› ‘Gjallarhorn (ON yelling horn)’ is pronounced [^{2}'gjal:arˌhu:ɳɛ̟t] or [^{2}'jal:arˌhu:ɳɛ̟t].

([8]) The grapheme ‹i› is also part of sequences that represent /ʂ/ and /ɕ/.

([9]) The grapheme ‹j› is also part of sequences that represent /j̟/, /ʂ/, and /ɕ/.

([10]) The grapheme ‹k› is also part of sequences ‹sk› and ‹skj› that represent /ʂ/.

([11]) There are some ‹k› forms which vary between /k/ and /ɕ/, e.g. ‹kex› [kɕ̟kːs] or [ɕɕ̟kːs], ‹kiosk› [kɪɔsːk] or [ɕɔsːk]. The latter pronunciation would be said to correspond to a grapheme sequence ‹ki›.

([12]) The grapheme sequence ‹rl› normally corresponds to the phonological context for retroflexion (4.1). In some common forms, retroflexion involving /l/ is not instantiated: ‹värld› [væːɖ] ‘world’, ‹karl› [kɑːr] ‘man’ and then the grapheme ‹l› is in fact silent.

([13]) There are two forms with /u/ here, ‹lov› [luːv] ‘tack’ and ‹hov› [huːv] ‘hoof’, which are homographic with two of the forms given above.

([14]) Some exceptions are loans like *skeptisk* [skɕ̟pːtɪsk] ‘sceptical’, *skiss* [skɪsː] ‘sketch’.

([15]) The more frequent spelling is ‹reflektion›.

([16]) So are short /m/ and /n/, obviously. The rule is not exceptionless. For ‹m› one learns the three exceptions in school: ‹lamm› ‘lamb’, ‹ramm› ‘battering ram’, and ‹damm› ‘dam’. For ‹n› there are more: ‹spann› ‘pail’, ‹grann› ‘handsome’, ‹vinn› ‘win, imp.’, etc.