

Quantity and Preaspiration in Northern Swedish Dialects

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Abstract

Preaspiration is not unusual in connection with unvoiced consonants in Swedish. In all the 20 Northern Swedish dialects covered in this study unvoiced stops following stressed vowels are preaspirated to at least some extent, although preaspiration is not characteristic for all speakers. However, in two of the dialects preaspiration plays a more prominent and even normative role, being a means to maintain quantity distinctions. Preaspiration moreover fills this function in different ways in the two dialects. The description of this dependence on preaspiration for quantity distinctions is the topic of this paper.

1. Introduction

1.1. Complementary length and duration in Swedish

In Central Standard Swedish phonologically long and short vowels and consonants occur in a complementary pattern; a phonologically long vowel is followed by a short consonant, V:C, and a short vowel is followed by a long consonant, VC:. The long vs. short distinction is restricted to stressed syllables; in unstressed syllables all segments are phonologically short.

The phonological length distinction is maintained primarily by duration, the vowel occupying about 42% and 28%, respectively, of the total duration of the V:C and VC: sequence on words uttered in isolation in Standard Swedish. These percentages have been calculated from data in [2] and similar figures, 43% and 27%, holds for a Standard Swedish reference speaker included in our study. An additional feature that may contribute to the distinction is vowel quality. For some vowels vowel quality even appears to be more salient than duration, see e.g. [5].

Other varieties of Swedish, including the more local dialects are less well investigated and it is not clear to which extent they correspond to the standard pattern. The present study aims to investigate some aspects of the durational patterns in Northern Swedish dialects. These aspects concern the extent to which preaspiration, in addition to vowel and consonant duration, contributes to the manifestation of the phonological contrast.

The present study is based on data from 20 dialects spoken in Northern Sweden. It is part of an investigation which aims at the development of a typology for quantity in Swedish [9] within the large-scale dialect project SWEDIA 2000, see <http://www.swedia.nu>.

1.2. Preaspiration

Preaspiration is characteristic in the transition from a vowel to a following voiceless stop consonant in for example Icelandic, Scottish Gaelic and Faroese ([8] and references there). In Icelandic there is a three-way stop contrast in medial and final position, (1) a long (geminate) preaspirated voiceless stop and

(2) a long unaspirated voiceless stop (in both cases following a short vowel) and (3) a short aspirated voiceless stop (following a long vowel). Preaspiration, however, has mainly been studied as a feature for distinguishing voiced from voiceless consonants. In Lule Sami, investigated by Engstrand [3] as well as Norwegian, investigated by van Dommelen [1] preaspiration contributes to maintaining this distinction.

Helgason [6], [7] makes a distinction between normative, and non-normative preaspiration. Concerning the normative type he refers to the preaspiration occurring in the Swedish Gräsö dialect, spoken in a small area of Central Sweden. In contrast, the preaspiration occurring in Central Standard Swedish is regarded as non-normative, or optional (see also [4] for data on Central standard Swedish). Normative preaspiration according to Helgason [7] is obligatory and may also have a phonologically conditioned distribution while non-normative preaspiration is idiolectal and occurs irrespective of the specific phonological context. In line with this distinction, the preaspiration patterns occurring in e.g. Icelandic seem to be of the normative type, while Swedish, as well as Norwegian [1], show a less consistent picture with a mixture of normative and non-normative variants within their dialects.

In the Gräsö dialect preaspiration is longer in long consonants (following short vowels due to the complementary Swedish VC pattern). Helgason [6] reports average preaspiration intervals of 50 msec after short vowels and 37 msec after long vowels.

2. Preaspiration in Northern Swedish dialects

Figure 1 shows the extent of preaspiration in the 20 dialects covered in this study. The bars represent preaspiration duration in percent of the total interval of V and following C in monosyllabic Swedish words spoken in isolation (for more details of the material, see 3.1 below).

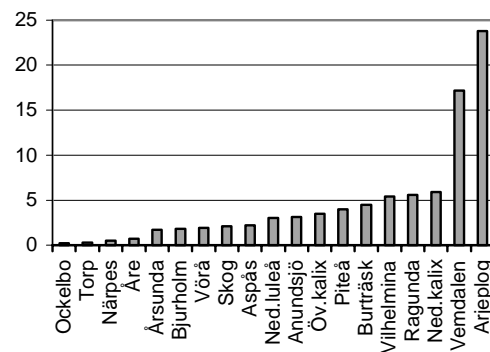


Figure 1: Preaspiration as a percentage of the total VC sequence in CVC words from the 20 dialects covered in this study.

Obviously, preaspiration is a widespread feature, although in the majority of the dialects it amounts to less than 5% of the total vowel-consonant sequence and probably cannot play any major role. In two dialects however – the dialects of Vemdalen and Arjeplog – preaspiration occupies considerably more of the VC sequence. This might indicate that preaspiration fulfills a function in these cases. In the next section we will analyze preaspiration and the durational patterns in these dialects, which are both located in the western part of Northern Sweden, although not very close to each other (see map in Figure 2).

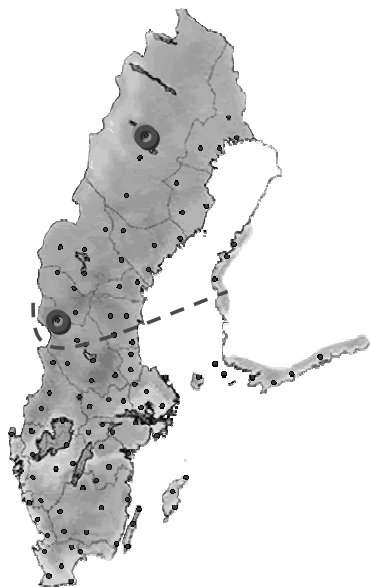


Figure 2: The area in which Swedish dialects are spoken. Black dots represent all the recorded dialects within SWEDIA 2000. Circled dots are Arjeplog (in the very north) and Vemdalen (further to the south and close to the Norwegian border). Northern Swedish dialect area above broken line.

3. Preaspiration in Vemdalen and Arjeplog: preliminary data

3.1. Material and speakers

The material was restricted to ten isolated words, all of which made up minimal CV:C - CVC: pairs like *tak* 'roof' - *tack* 'thanks' collected as part of the SWEDIA database. The words contained short and long variants of the vowels /i, y, u, o, a/ followed by either /t/ or /k/ and were preceded by single consonants, mostly stops. For each of the two dialects they were produced by three elderly male speakers. Each speaker produced each word at least three times.

3.2. Measurements

The recorded material was digitized and segmented. The VC sequence of the words, the focus of the study, was divided into three segments, vowel (V), preaspiration (h) and consonant (C). In order to make comparisons between speakers possible the raw durations of the segments were normalized. Thus, for every vowel-consonant sequence, the proportion of V, h and C, respectively, of the entire sequence was calculated.

3.3. Duration data

3.3.1. Vemdalen

Figure 3 shows the mean relative durations of vowels (grey) preaspiration (dark grey) and consonants (light grey) for each of the three speakers. (The same colour code is used in all figures presented here.)

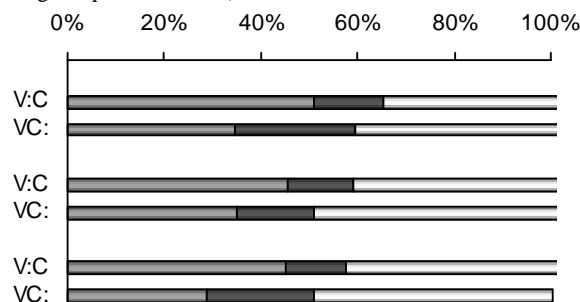


Figure 3: Normalised durations of the vowel, preaspiration and consonant in the VC sequence corresponding to Standard Swedish V:C and VC:. Mean values of at least three repetitions for each speaker from Vemdalen.

It is evident that preaspiration is longer in the VC: words for all speakers. However, a closer examination of the data revealed that three target minimal pairs did not follow the Standard Swedish pattern, resulting in deviant forms with voiced stops or homophones. These minimal pairs were for the moment excluded from further analysis.

Figure 4, accordingly, presents data for only three minimal pairs, /ta:k-tak:/, /lo:t-lot:/, /di:t-dit:/. As the three speakers were very consistent also in this respect, figure 4 presents pooled data.

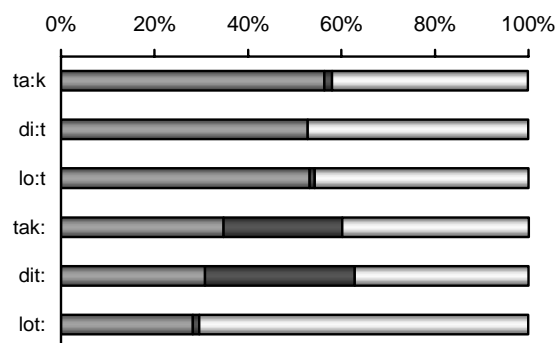


Figure 4: Normalised durations of the vowel, preaspiration and consonant in the VC sequence for three minimal word pairs. Mean values of at least three repetitions pooled for the three speakers from Vemdalen.

Figure 4 reveals three patterns, one for the target words with a long vowel and a following short consonant, and two different patterns for the words with a short vowel and a following long consonant. The difference within the second category does not concern the vowel which has about the same duration in all three words, but the following consonantal part, containing preaspiration in /tak:/ and /dit:/, but not in /lot:/. Thus the VC: contrast is accomplished in different ways for the different words.

In this particular case then, we end up with three different VC patterns (seen in figure 5). The vowel in the VhC pattern has about the same duration as V in the VC: pattern and the consonant has about the same duration as C in the V:C pattern. Thus, grouping the preaspiration with the vowel makes the pattern very similar to V:C in this dialect and grouping it with the consonant makes it similar to VC:.

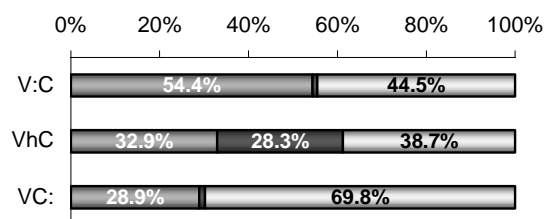


Figure 5: Duration patterns in Vemdalen

Interestingly the three patterns seem to correspond to those in Icelandic (see 1.2). Further investigation and a larger material will be necessary to reveal the triggering factors and the stability of the different patterns.

3.3.2. Arjeplog

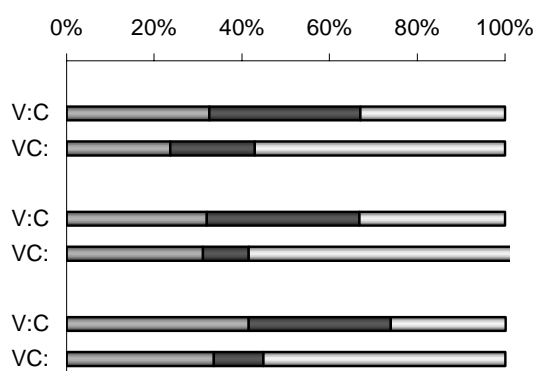


Figure 6: Normalised durations of the vowel, preaspiration and consonant in the VC sequence corresponding to Standard Swedish V:C and VC:. Mean values of at least five repetitions of the three speakers respectively from Arjeplog.

Figure 6 shows relative durations separately for the three speakers. Compared to Vemdalen, Arjeplog presents the opposite pattern; preaspiration is in all cases longer in the V:C as compared to the VC: sequence with a duration in the order of three times that of the preaspiration in the VC: sequence.

Figure 7 presents data for each specific word. The durations represent mean values of five or more repetitions of each word, pooled for the three speakers due to the more or less identical individual patterns.

Also in this respect Arjeplog differs from Vemdalen. In contrast to Vemdalen with three contrasting patterns, Arjeplog has only two, one with long preaspiration (in words having the V:C structure in Standard Swedish) and one with short aspiration (in words having the VC: structure in Standard Swedish). Obviously, this pattern is very stable and appears across all minimal pairs. (However, vowel quality seems to have some minor effect on preaspiration, as its duration gradually gets shorter the more open the vowel.)

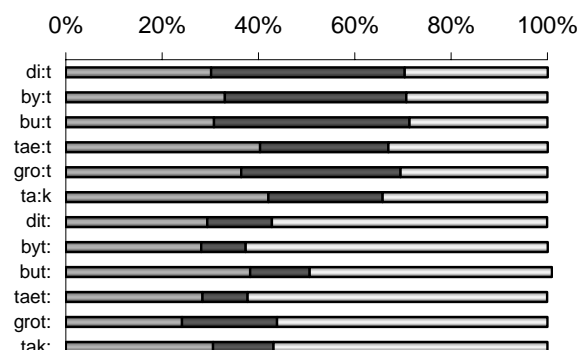


Figure 7: Normalised durations of the vowel, preaspiration and consonant in the VC sequence shown separately for each vowel. Mean values of at least five repetitions pooled for the three speakers from Arjeplog.

The manifestation of the V:C vs. VC: patterns in Arjeplog is shown in Figure 8. Thus, here preaspiration occurs in both categories, but it is almost three times as long when preceded by a phonologically long vowel as compared to a short one. Computed on the total data set the mean difference is highly significant ($F(1, 180) = 282,37, p < .0001$). To distinguish between the long vs. short preaspiration we use /H/ for the longer and /h/ for the shorter preaspiration duration.

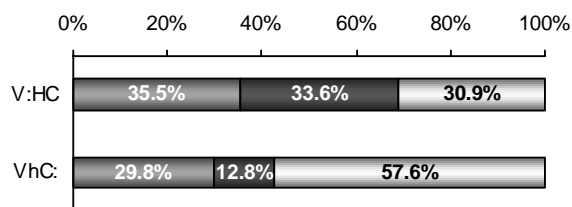


Figure 8: Duration patterns in Arjeplog.

4. Discussion

Comparing the Arjeplog and Vemdalen data with Standard Swedish, the following patterns emerge:

Stand. Swedish	Arjeplog	Vemdalen:
V:C	VHC	V:C
VC:	VhC	VC:, VhC

In Arjeplog as well as in Vemdalen there are quantity distinctions corresponding to those in Standard Swedish. In addition, in Vemdalen the counterpart of the Standard Swedish VC: appears as two separate patterns, VC: and VhC.

However, as has been shown the phonetic realization of the quantity distinctions differs from Standard Swedish with preaspiration playing a major role in the two dialects. In Standard Swedish the vowel occupies about 42-43% of V:C and about 27-28% of VC:. In contrast, in the Arjeplog data the relative durations are very similar in the two patterns corresponding to Standard Swedish V:C and VC (35% vs. 30%, respectively, of the total sequence). The distinction instead is brought about by a difference in preaspiration (34% vs. 13%, respectively for the V:C and VC: sequences) and also, consequently, the following consonant.

In Vemdalén, vowels have either long or short durations. The relative durations corresponding to the Standard Swedish V: and V are 50% and 30%, respectively. Here we have the additional complexity of a two-way contrast in the case of the short vowel duration, a contrast manifested by the presence vs. absence of preaspiration.

We can only speculate on why the two dialects present these specific quantity patterns. However, we have reasons to believe that a closer look at the historical development of the dialects of today will answer some of the questions posed by our data. It has been mentioned e.g. that preaspiration is a Saami substrate in the Arjeplog dialect [10].

In both dialects preaspiration can be considered normative (see 1.2 above). It appears as an obligatory feature at least for elderly people and it is moreover phonologically conditioned, at least in the Arjeplog case. Here quantity most reasonably is the triggering factor, longer preaspiration occurring in V:C and shorter in VC: sequences. However, in the case of preaspiration in the Vemdalén dialect, we have at the moment no explanation.

Summarizing, we have observed two dialects in which preaspiration plays a role for quantity distinctions, a role which, as far as we can see, has caught little, if any, attention up till now. Thus, both dialects employ preaspiration for distinguishing between V:C and VC: sequences, although the dialects use very different strategies to achieve this goal.

5. Conclusions

Detailed studies like the present one are necessary in order to understand how phonological quantity manifests itself over the Swedish-speaking dialect area. The conclusions to be drawn from the data presented here is that quantity distinctions and the complementary V:C and VC: patterns in Swedish are not brought about by durational characteristics of the vowel and consonant only. We have demonstrated that also preaspiration may play a prominent role in this respect. Thus, preaspiration can be added to the list of features contributing to the realization of phonological length in Swedish.

6. Acknowledgements

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7. References

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