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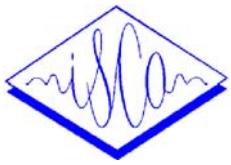

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An Intonational Typology of Swedish

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Abstract

The aim of this paper is to present a suitable framework for the description of intonational variation within Swedish. The speech data base used mainly consists of natural spontaneous speech collected from a large number of varieties of Swedish within the project SweDia 2000. The intonational typology discussed takes into account both potentially cross-linguistic and more language and dialect specific features. The main parameters of this typology are within utterance intonation focal accentuation and phrasing, and in word intonation word accentuation and compounding. A tentative taxonomy of Swedish intonation with a further specification of these tonal parameters is devised. Within this framework seven distinct intonational dialect types of Swedish are accounted for, an extension of the number of intonational types from earlier typologies. Interrelationships between different tonal features of the taxonomy for the different dialect types are discussed.

1. Introduction

The study of intonation in the Scandinavian languages has attracted considerable interest over the years. There may be several reasons for this interest. One reason is the presence of so-called word accents in these languages. Unlike many of the European languages Swedish, Norwegian, and Danish are characterized by having an opposition between two word accents. The word accents appear to play a central role in Scandinavian prosody. In Swedish and Norwegian, where their main phonetic correlate is tonal, they are called accent I and accent II, while in Danish the contrast is termed stød versus non-stød having a primary dynamic correlate. Another reason is that dialectal variation concerning intonation, particularly its phonetic realization, is quite large among varieties of Scandinavian languages. Therefore it is a great challenge for us to be able to account for this variation among quite distinct prosodic dialect types. A third, related reason is that because of this extensive prosodic variation among Scandinavian dialects they present an example, which is interesting from general, both theoretical and methodological perspectives.

There have been a number of attempts to typologize Scandinavian prosody. These include early typologies of the citation forms of the word accents in Swedish by Öhman [1] and Gårding [2] [3] based on Meyer's pioneer work [4] [5] and by Fintoft [6] and Fintoft et al. [7] for Norwegian. Later typological studies of Scandinavian intonation have extended the scope to also involve properties of utterance prosody as in Bruce & Gårding [8] and Riad [9] from a Swedish perspective, and by Grønnum [10] from a Danish perspective.

The present contribution has been made within the SweDia 2000 project context [11]. My specific role within this project, which is a general phonetics and phonology project, is to account for the intonational variation among the Swedish dialect types of Sweden and Finland. The SweDia 2000 speech database relevant for intonational research consists of spontaneous interviews with informants and elicited two word phrases by these speakers from more than 100 different places in Sweden and Finland, altogether more than 600 hours of speech from around 1200 speakers.

The ultimate goal of this research is to be able to account for the distinct intonational dialect types of natural Swedish and to do that in accordance with our basic intuition about it, i.e. to capture the tonal identity of a dialect type [12]. The more restricted goal of the present paper is to present a suitable framework for the description of intonational variation within a language and to apply it to a tentative typology of Swedish intonation.

2. Background

Our starting point is the accent typology proposed by Gårding [2] [3]. The data analyzed (Meyer's data) were disyllabic words stressed on the first syllable (citation forms) having accent I or accent II. According to this typology five distinct accent types are recognized for Swedish. These five types also typically occur in geographically distinct regions. They have later been classified as South, Central, East, West and Far East [8]. The criteria used in the typology are number of pitch peaks and their timing in relation to the syllables. A basic division is into single-peaked (Far East, South, Central) and double-peaked dialect types (East, West). Among the single-peaked dialects Far East (Finland) Swedish is singled out by its absence of the word accent distinction. The timing of pitch peak location of the two word accents will differentiate among the other dialect types within each category. Recent analysis of the elicited speech material from the SweDia 2000 data base basically confirms Gårding's division into five types for words (accent I or accent II) in phrase final position, equivalent to the citation forms of the accents in Meyer's data.

In Bruce & Gårding's [8] extended prosodic typology using laboratory speech data with more varied material the separation of the different linguistic contributions to the pitch contours was highlighted. The three main parameters used in the intonational typology were the pitch realization of focus, the pitch gestures of the word accents (in particular their timing), and the pitch patterns of compound words. In Bruce & Gårding's intonation model the single-peaked / double-peaked dichotomy was reinterpreted as a distinction in focal accent realization, so that double-peaked dialects have an extra pitch gesture added in focus, while single-peaked dialects have merely a wider pitch span as the reflex of a focal realization of an accented word. Thus this typology represents

an attempt to model word and utterance intonation for some selected varieties of Swedish.

3. Designing an intonational typology

The basic idea of my current effort is to be able to design a general framework for the description of intonational features characteristic of different languages and dialects. For such an intonational typology to have a more general validity it should include parameters that are likely to be both cross-linguistic (if not universal) as well as more language or dialect specific. A reasonable first dichotomy will then be the one between utterance (or post-lexical) intonation and word (or lexical) intonation.

Generally speaking features of word intonation are more likely to be language or dialect specific than those of utterance intonation. Thus it is well known that languages / dialects are clearly differentiated as to whether intonation is exploited for lexical distinctions or not. While word tones or word accents are part of the lexical phonology of a great number of languages, there are probably as many languages, which do not use intonation for lexical differentiation. Another process of word structure that can have intonational implications is compounding. It is a characteristic feature of for example Germanic languages / dialects to make a distinction between simplex and compound words, which may or may not be signaled intonationally. Apart from the differentiated exploitation of features of word intonation among languages and dialects, e.g. whether a certain language uses tonal word accents or not, there is also a wide range of possibilities in the specific phonetic realization of a particular feature of word intonation.

When discussing utterance intonation, my account will be restricted to its linguistic exploitation, thus excluding paralinguistic intonation. As the speech data analyzed consists mainly of monologue speech, features of dialogue intonation are also outside the scope of this study. In describing the linguistic usage of intonation on the utterance level, i.e. post-lexical intonation, the apparent division is into phrasing and accentuation, i.e. how successive lexical items are grouped into phrases and how these items are weighted by means of intonation. Even if there is a good deal of variation in the specific phonetic realization, prosodic phrasing is likely to be a cross-linguistic feature, and weighting by means of accentuation (intonational prominence) also seems to be exploited in many languages.

For accentuation on the utterance level we assume minimally a distinction between accented and unaccented items, but some languages may have a further differentiation of (phonological) levels of intonational prominence. In many accounts phrasing by means of intonation is modeled mainly as boundary signaling, i.e. in terms of H / L boundary tones. The other side of the coin is the signaling of coherence within a phrase, which should be taken into account more explicitly. Thus in my view, the way in which prominent lexical items are strung together within a phrase by means of pitch is an important aspect of intonational phrasing. It should be pointed out that there seems to be a fair degree of interaction between phrasing and accentuation (on the utterance level), which sometimes may even make it hard to decide what belongs to phrasing and what should count as accentuation.

Consequently, in the intonational typology I am devising here, parameters will be categorized into utterance intonation and word intonation, reflecting an order of more general to more specific, i.e. from cross-linguistic to potentially more language or dialect specific. It should be emphasized that this does not necessarily mean that the order of these parameters in our taxonomy will reflect the perceptual salience and thus the relative importance of the parameters for a specific language or dialect under examination. It is not unlikely that some part of word prosody with a lower ranking in this taxonomy, for example the word tones of a tone language, can be perceptually highly important for the impression of a particular language or dialect.

4. Tonal parameters of a Swedish typology

In the present context the input data explored for the purpose of designing a new typology consists of natural, spontaneous speech recorded within the SweDia 2000 project. Our current database is a small subset of the complete SweDia 2000 speech database and contains around seven hours of speech as produced by four speakers from each of the around 100 different places, where recordings have been made in Sweden and Finland.

In the light of this new data it is clear that the Bruce & Gårding typology [8] has to be partly revised and extended. The main parameters that seem to be relevant for the description of Scandinavian and Swedish intonation are within utterance prosody, focal accentuation and phrasing, and within word prosody word accentuation and compounding. Three of these four main parameters were used in the earlier typology, namely pitch realization of focus, pitch gestures of word accents, and pitch patterns of compounds. The specific patterns of phrase intonation that are now included were not explicitly taken care of in the Bruce & Gårding intonation model.

4.1. Focal accentuation

In the new tentative intonational typology phonological properties and features that are more clearly phonetic will be mixed. The first main parameter within utterance intonation to be discussed is focal accentuation. There appears to be a difference between dialect types in how they exploit the weighting of successive items. Some dialect types seem to have a clear differentiation into focal and non-focal accents, while other dialects have a more equal weighting (without a clear focus) of these items. Furthermore focal accentuation appears to have both local and global effects within its domain. The local effect of focus may, for example, be an extra pitch gesture (a local rise) added after the word accent gesture as in the double-peaked dialects, or a wider pitch range of the focal item as in the single-peaked dialects.

The global effect of focal accentuation may be how the post-focal items within the same domain are realized by means of pitch. There seems to be a distinction between a downstepping of successive post-focal items or instead a complete deaccentuation of such items. Thus in my current tentative taxonomy the major parameter focal accentuation will be subdivided into three minor parameters: distinct focal accent vs. equal weighting, extra pitch gesture in focus as opposed to a wider pitch range, and post-focal accents as realized preferably by means of downstepping vs. deaccentuation. The first one of these minor parameters is phonological, while the other two appear more phonetic. Initially these subcategories will be treated as potentially independent, even if it is quite likely that further study will reveal some interdependencies between them.

4.2. Phrasing

The second main parameter (of utterance intonation) in our tentative typology is phrasing. While our modeling of accentuation on the utterance level has reached a certain level of understanding, the intonational aspects of phrasing are less well understood and in need of further examination. Our basic assumption here is that specific and possibly distinct patterns of phrase intonation characterize different Swedish dialect types. What we consider as intonational phrasing is the kind of pitch course taken between two accented items as a means of signaling the coherence between these items. This tonal concatenation is most apparent in an environment of some distance (in terms of number of unstressed syllables) between two accented items, and particularly between a focal and a non-focal item. In our tentative account we will model this tonal concatenation as four distinct possibilities. The four concatenation types are: high plateau, low plateau, upslope and downslope (Figure 1).

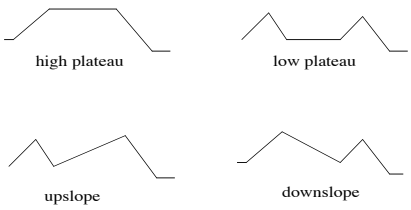

Figure 1. *Patterns of phrase intonation. Stylized pitch contours of four types of tonal concatenation.*

In a more crowded environment with a small distance between two successive accents these different concatenation types are much less separable. These different types of coherence signaling are all in contrast to signaling of a boundary, which is most typically a pitch drop to a L (boundary tone) close to the bottom of the speaker's pitch range. Tonal concatenation between accented items represents the only specification of phrase intonation in the current typology. It is not unlikely that a further specification within intonational phrasing may turn out to be called for.

4.3. Word accentuation

Turning now to word intonation, it is clear that properties of word accentuation appear to be characteristic of Swedish intonation. In our current typology a subdivision of word accentuation is made into a phonological and a phonetic category. The phonological specification is whether a certain dialect type has a distinction between two word accents or not, while the phonetic issue concerns the more specific timing of the pitch accent gesture (in relation to the primary stress). For those dialects that have the word accent distinction the pitch gesture of accent I always has an earlier timing than that of accent II, thus an early vs. late differentiation. But timing of pitch gestures are also relevant in accounting for the distinct dialect types. Our understanding here is that this is not continuously variable, nor a binary categorization (early vs. late), but that there are a limited number of time locations available. This means that for each of the two word accents (either accent I or accent II) we can order the dialects along the dimension early – late. In our current tentative taxonomy we are typologizing this as a four-way distinction: very early, early, late, very late. Even for dialects of Far East (Finland) Swedish that do not have the word accent distinction it seems to be meaningful to apply this categorization. Thus if we assume the pitch accent gesture of such a dialect type to be comparable to the accent I pattern of another dialect having the word accent distinction, dialects of Far East Swedish can be included in this categorization.

4.4. Compounding

In Swedish as in other Germanic languages as well compound words are distinct from simplex words by a difference in metrical structure. While simplex words have only one stress, compound words typically have two stresses: a primary one in the first element and a secondary stress in the final element of the compound [13]. One special case is dialects of North Swedish, where some compound types have final element stress, i.e. primary stress is located in the final element instead. Generally, however, a compound like a simplex word (in a prominent position of an utterance) has got only one word accent, tied to the primary stress.

Thus while compound words are typically metrically distinct from simplex words, they may or may not be distinct intonationally. In some dialect types the secondary stress may play an important role as a pitch synchronization point. In East (Svea) Swedish the secondary stress is the trigger for the focal accent rise, while in Central (Dalarna) Swedish it is the word accent fall (focal or non-focal), which is triggered by the secondary stress. For these dialect types in corresponding non-compound words instead these pitch gestures (rise and fall respectively) occur in immediate succession of the preceding word accent gesture. In the other dialect types compounds and simplex words are not differentiated intonationally. Thus it is clear that the intonational structure of compound words can be quite revealing for dialect identity [9].

5. A tentative taxonomy of Swedish intonation

Our general idea about tonal variation in Swedish is that basically the same intonational type covers a fairly large region with relatively minor internal variation. Using the framework for intonational typology discussed in section 4 it will be clear that more dialect types than those distinguished in the Bruce & Gårding typology can be identified. Thus when we look beyond word intonation in natural, spontaneous Swedish, East Swedish and Far East Swedish have to be further subdivided. A North Swedish type has been proposed earlier [13] [14], and a division of Far East into a Northern (East Botnia) and a Southern (South of Finland) subtype also appears called for. Table 1 shows how seven different dialect types of Swedish are accounted for by the tonal parameters discussed in the preceding section. The dialect types are arranged according to an estimation of their approximate geographical (latitudinal) location. The tonal features are arranged in accordance with the discussion in section 3.

As indicated in Table 1 dialects from the South and Far East do not regularly have a distinct focal accent but equal weighting of successive accents within a phrase. This does not mean, however, that these dialects cannot express a distinction between a focal and a non-focal accent, but they seem to do so only rarely in the natural spontaneous speech that we have been studying. When occasionally they do so, they may use a wider pitch range for the focal item. Another

means of showing unequal weighting in these dialects is the suppression of post-focal accents, i.e. deaccentuation. The yes/no in the post-focal accent column means that deaccentuation is an option that is used occasionally and in certain contexts.

Table 1. *A tentative taxonomy of Swedish intonational dialect types.*

Tonal feature	Utterance intonation				Word intonation		
	focal accentuation			phrasing	word accents		compound
Dialect type	distinct focal accent	extra focal peak	post-focal accent	tonal concatenation	word accent timing	word accent contrast	2ary stress = pitch synch
South	no	no	yes/no	low plateau	late	yes	no
West	yes	yes/no	yes	upslope	early	yes	no
Central	yes	no	yes/no	downslope	very late	yes	yes
East	yes	yes	yes	high plateau	very early	yes	yes
Far East S	no	no	yes/no	low plateau	late	no	no
Far East N	no	no	yes	high plateau	early	no	no
North	yes	yes	yes	downslope	very early	yes	yes/no

The remaining dialect types West, Central, East and North appear to have a clear distinction between focal and non-focal accents. This also implies that even if an utterance does not have a clear focus, a default focal accent is placed on the final accented item within the unit [10]. These dialect types with a distinct focal accent also seem to have an extra focal peak as the pitch correlate of focal accentuation. The exception here is the Central dialect type, which like South and Far East uses a wider pitch range for a focal item. The yes/no for the West (Göta) type means that an extra focal peak is used in phrase-final position, while in non-final position it is the post-focal accent (paradoxically enough) that is realized with a higher peak (wider range) than the focal item itself [15].

As can be seen in Table 1 three of the four dialect types with a distinct focal accent (West, East, North) also tend to keep post-focal accents, i.e. they have a kind of downstepping of post-focal accents instead of deaccentuation. Thus it is the dialects with an extra focal peak as the pitch realization of focus (double-peaked in the Gårding typology) that also exploit post-focal downstepping (instead of deaccentuation) as a means of downtoning accented words.

There are some interrelations to be found between phrasing and focal accentuation as well. A low plateau is the means of tonal concatenation used in the South and the southern variety of Far East, which also share features of focal accentuation, with no distinct focal accent, no extra focal peak, and deaccentuation as an option. The northern variety of Far East has got a high plateau instead as a means of tonal concatenation and shares this with the East dialect type. They also have the downstepping of post-focal accents in common but are otherwise distinct concerning focal accentuation.

Also for word accentuation and focal accentuation we can identify interrelations. Thus those dialects that have an extra focal peak as the pitch realization of focus (West, East, North) are dialects that have an early or very early word accent timing. Dialects that do not have this feature (extra focal peak), i.e. South, Central, Far East S, are characterized by a late or very late word accent timing. The Far East N variety is the exception having no extra focal peak but still an early word accent timing. It remains to be examined further which of the interrelations identified in Table 1 are merely coincident and for which there is a deeper connection.

6. Acknowledgments

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