HOW MANY INTONATION MODELS ARE THERE IN LUND?

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In this review of works on intonation which have emanated from Lund during the last two decades, my joint paper with Gösta Bruce from 1978 will serve as a vantage point from which I am going to look backwards and forwards according to the sketch presented in Figure 1. My review will end with an answer to the question given in the title.

Our paper of 78 is entitled "A prosodic typology for Swedish dialects". The title would have been more appropriate, had it shown that the typology was expressed in terms of a general, generative intonation model. Figure 2 illustrates how this model works for a neutral statement. The input is a sentence for which the segments and their durations are given and the intonation is missing. It is equipped with phonological markings for word prosody and sentence prosody and has in addition a label for dialect according to the four categories established earlier (Gårding 1970, Meyer 1954). This input sentence passes through an ordered set of generative rules, of which some differ according to dialect. The result is an intonation curve characteristic of the dialect marked in the input.

My comments about the rules will follow the order given by

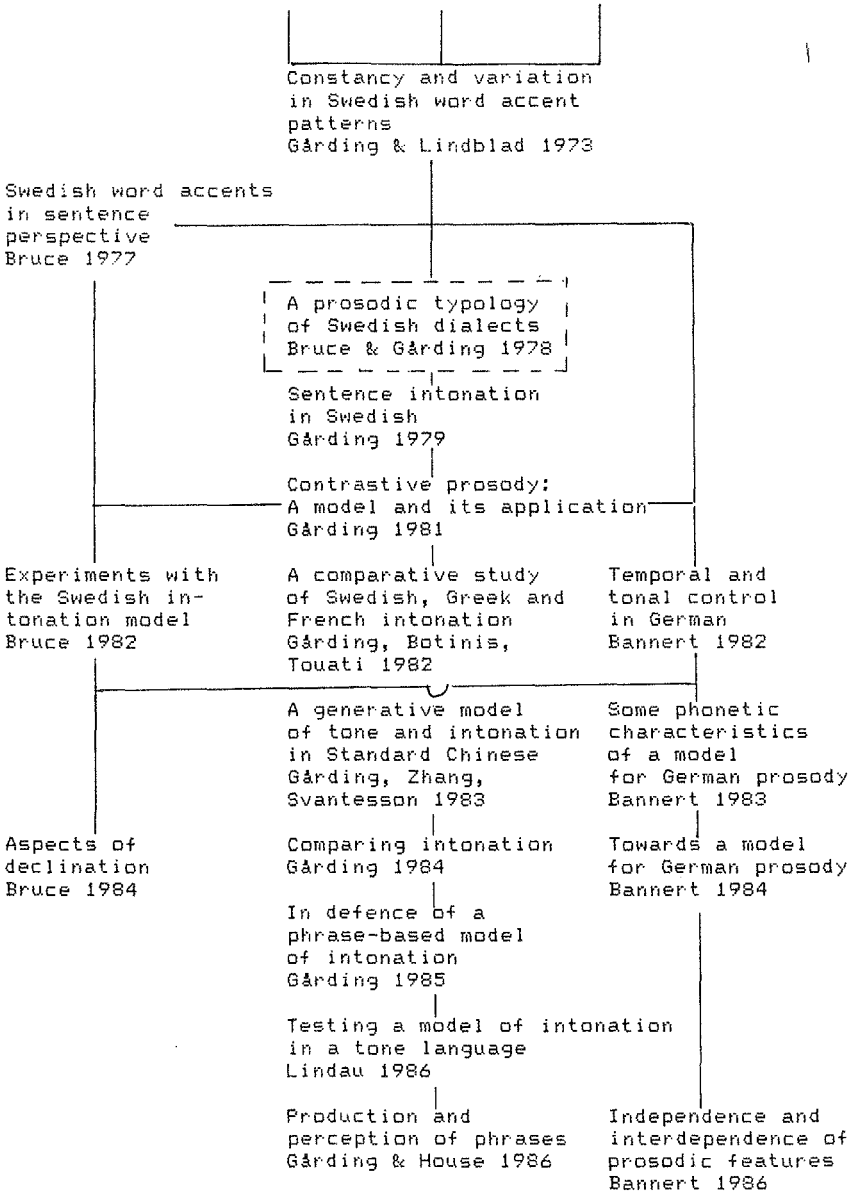


Fig.1 Interrelations between intonation analyses from Lund

For a complete bibliograhy see Gårding: Swedish Prosody, Summary of a project, Phonetica 39 (1982) and recent issues of Working Papers from the Department of Linguistics of Lund University.

Figure 2. In the paper of 78, the sentence intonation of rule 1 has for the first time received an autonomous global expression. (It will later be called tonal grid.) In Gårding and Lindblad 1973 there was no global expression for sentence intonation, only a local phrase-final one, and pitch levels which specified the rises and falls required by the accents. Nor was sentence intonation a variable in Bruce's 1977 dissertation about Stockholm Swedish. The auxiliary lines of his generative rules do not express sentence intonation, they are four pitch levels similar to the intonation levels of earlier works. To these levels he relates the pitch points that are relevant for a certain accent in a certain context in a certain position in a sentence which is all the time a statement.

The word accents of rule 2 in the model of 78 are analysed as combinations of highs and lows. This representation is taken over from Bruce's analysis and gives the model an important connection with phonological analyses of African and Asian tone languages. The pitch values of the highs and lows are obtained with the aid of the auxiliary lines. They are in other words determined by the sentence intonation. Bruce had transformed his highs and lows into pitch values by means of context rules.

For the sentence accent of rule 3 we used the same elicitation procedure as Bruce had done and the same term, focus, for its phonetic manifestation. Earlier, Lindblad and I had used contrast/emphasis.

The fourth rule concerns interpolation and this rule has correspondences in both the preceding works.

I shall now give an overview of work presented after 78 and start in alphabetic order with Bannert.

Example of input phrase: [nɔra lɔŋ:a nɛnːɔr] (A2, SA, A2) Statement

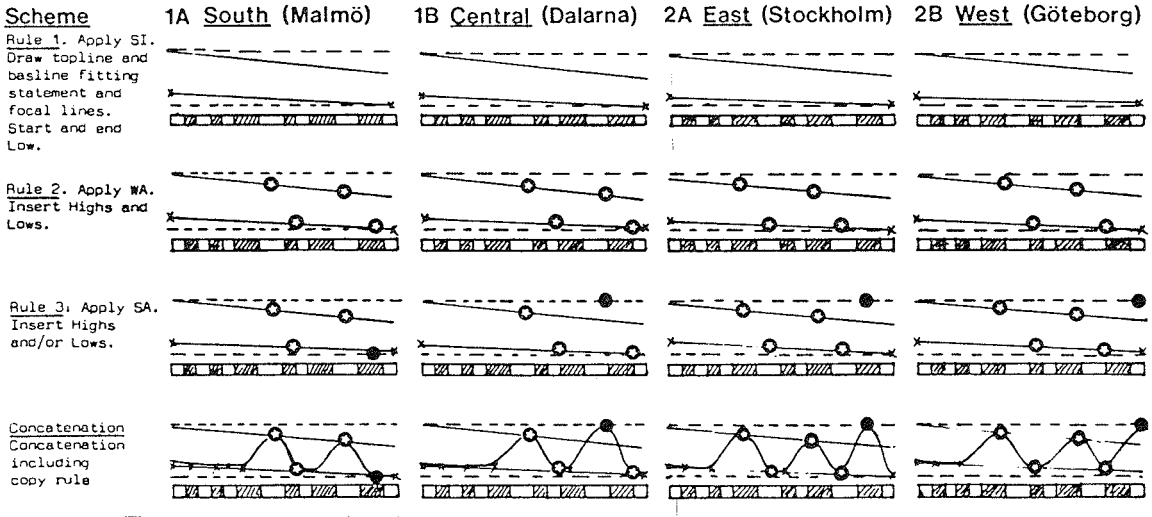


Fig.2 Intonation model for Swedish dialects. Bruce & Gårding 1978

In a paper from 1983 Bannert sketches a model of German intonation for statements and questions. As in the model of 78, the turning points of the intonation curve are generated in several steps. The first step generates the four characteristic levels of intonation (Fig.3). For statement intonation the curve is generated in the following way. All the accents are analysed as low points except the next to the last which is high. These low points, which are to become minima in the final curve, are placed on the pitch scale according to rules common to all the three intonation types analysed by Bannert. As in Gårding and Lindblad , minima and maxima of the intonation curve are fixed to certain segments and the curve is first generated as rises from minima and falls from maxima and in a final step by interpolation. Attitudes like emphasis are generated by enlarged rises. For questions the last part of the curve is modified. In a recent paper Bannert has sketched a comprehensive model which incorporates all the factors which are known to influence intonation and their mutual dependencies (Bannert 1986).

Bruce, in a paper from 1982, reports on a series of experiments in which he examines some of the predictions of the model of 78, in particular the influence of focus on the general direction of the intonation and the shape of the accents. Figure 4 shows a schematic figure summing up his results. Accents before focus are of the type rise-fall and after focus of the type plateau- fall. According to Bruce an intonation curve has both global and local features. The global aspect is apparent in the fact that the starting frequency of the first accent is dependent on the number of

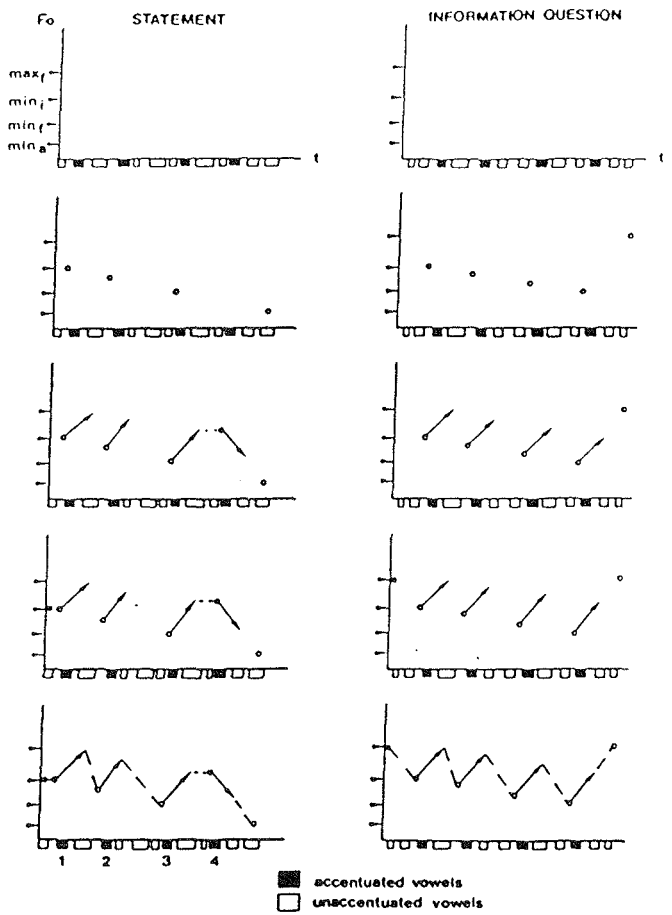


Fig.3 Intonation model for German. Bannert 1983

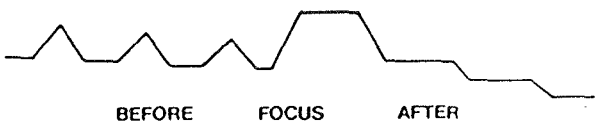
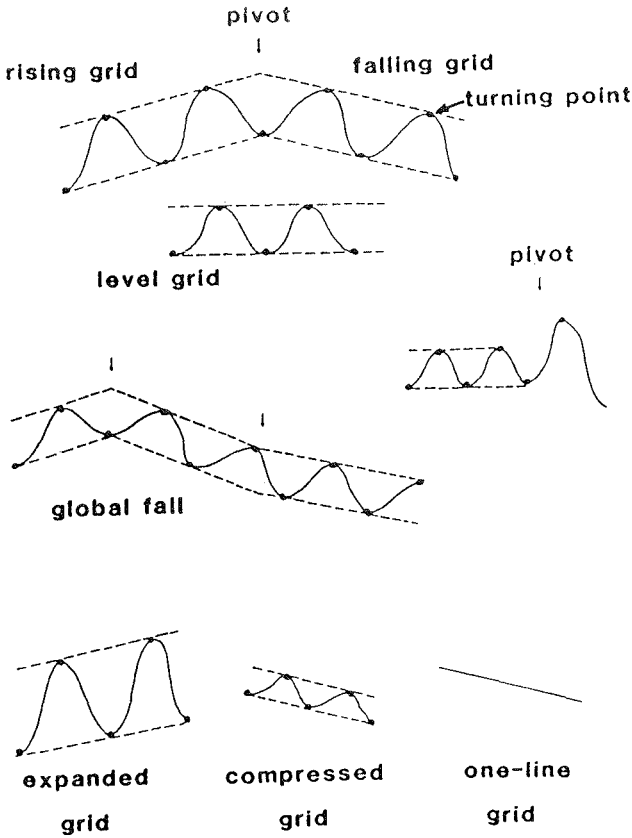


Fig.4 Downdrift in Swedish. Bruce 1982

upcoming accents and the local aspect is revealed by the constant frequency relations between neighbouring accents. He makes no attempt to incorporate these findings in a generative scheme. The generative aspect of the model of 78 has been abandoned in favor of a cautious and more descriptive attitude.

After 78 my main interest has been the interaction of sentence intonation and word intonation in different prosodic systems. Our material from the project "Swedish Prosody" showed that questions could be analysed in the same way as statements, i.e. by means of a set of auxiliary lines with a characteristic distribution for the particular sentence intonation and with the word accent rules unchanged (Gårding 1978).

The same method of analysis was tried in collaboration with Antonis Botinis and Paul Touati for Greek and French and in connection with the project "Phonetic descriptions of some non-European languages" for Hausa, Arabic and Standard Chinese in collaboration with Mona Lindau, Kjell Norlin and Jan-Olof Svantesson. Special attention has been paid to the exploration and definition of the tonal grid. A grid encompasses normally stressed accents and tones and shows the general direction of phrase and sentence intonation. Another concept connected with the grid is the pivot (Gårding 1982, Gårding, Botinis and Touati 1983) which denotes a place where the grid changes direction or width. The location of pivots is correlated to the syntactic structure or the information structure of the sentence. An important notion in my analysis which has been further examined is the turning point fixation which means that certain turning points in an intonation curve are fixed



Intonation parameters	Function	
	Semantic	Syntactic
turning points	words, morphemes	d:o
pivots	constituents (theme/rheme)	d:o (subject/predicate)
grid:direction	speech act type	sentence type
grid width, position	information weight (focus)	clause type

Fig 5. Concepts of the model and their communicative functions. Gårding 1984

to the segments and the grid in a regular way. Figure 5 shows the main concepts of the model and their communicative functions. Our analysis of different prosodic systems with the same method brings out the similarity across languages of the manifestation of speech act and makes it possible to compare the local manifestations bearing on tone and accent.

Mona Lindau applied the model to Hausa, a two-tone language, as part of our project work. In a paper from 1986 she presented an algorithm which generates statements and questions according to the main principles of the model: Sentence intonation is separated from word tones by means of a tonal grid. Tonal movements, rises or falls according to the tone, are assigned to the syllables via tonal points inserted into the grid.

Let me now finally return to the title of the paper: How many intonation models are there in Lund? All of them make use of turning points for the generation of intonation curves. In this respect there is one model. However, only in the model that I advocate are the local features of intonation subordinated to the global ones. For this reason it might be justified to say that there are two models, one with a grid which brings out the intonation planned and executed over phrase and sentence and one in which intonation is seen as a result of local rules or decisions.