

TONAL INTERACTION BETWEEN ATTITUDE AND GRAMMAR

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1 INTRODUCTION

From time to time the effect of different attitudes and emotions on spoken language has been a subject of interest to linguists, e.g. Hadding-Koch (1961) in her study on southern Swedish intonation. The following is an account of a preliminary investigation into how different attitudes may effect the tonal pattern of declarative and interrogative sentences in Swedish. Several factors can be taken to influence fundamental frequency (F_0) which is the primary acoustic correlate of intonation. Some possible factors are: (a) grammatical sentence structure (which is a result of factors such as position of sentence accent (SA) and declarative or interrogative function of the sentence); (b) attitude of the speaker; and (c) sentence context. Here I will deal with points (a) and (b) and investigate in what way a certain grammatical structure and a certain attitude of the speaker will interact to yield a specific F_0 -contour. In this study context will not be changed for a given combination of grammatical structure and attitude, except for SA. Of course attitude of the speaker may also affect other speech parameters than F_0 such as duration, intensity, formant frequencies and voice quality.

2 THE MEANINGS OF INTONATION

Cruttenden (1979a) assumes that the meanings of intonation, particularly those associated with the basic division between rising and falling tunes, can be ascribed to a level of abstraction higher than grammar, attitude, lexis or discourse. Meanings associated with falling tunes are labelled 'strong'

while meanings associated with rising tunes are labelled 'weak'. He also states (1979b, p.18) that "the use of fall and rise to mark one dimension of meaning will imply its use to mark certain other dimensions, e.g. if the difference between fall and rise is used to mark an attitudinal distinction between neutral and deferential, it will also be used to mark the distinction between statement and question". Further, if there is a conflict of applicability between different dimensions of meaning demanding usage of 'strong' tunes in one dimension and usage of 'weak' tunes in another, then "a required attitudinal usage will always overrule a required grammatical usage" (Cruttenden 1979b, p.18).

3 THE MEANINGS OF INTONATION IN SWEDISH

Now the distinction between terminal rise and fall can be used to signal the distinction between declarative and interrogative function also for Swedish sentences. However, a description of Swedish interrogative intonation involves the change of several parameters, as is shown by Gårding (1979, p.215). She concludes that the most important cue to interrogative intonation is probably the extra widening of the frequency register in connection with the SA manifestation. However, the perceptual relevance of this assumption has not yet been tested. Bredvad-Jensen (1980) describes tonal correlates of the interrogative function in a southern Swedish dialect. She uses three main correlates to describe the interrogative function of both yes/no and wh-questions, and for yes/no questions she needs an additional tonal correlate. These will be presented in connection with Fig.2. The results are similar to Gårding's but described in different terms. It seems clear that for the southern Swedish dialect reported here, sentence intonation exhibits more than one parameter of importance in the tonal curve, making clear the distinction between declarative and interrogative function. Therefore it seems natural to assume that, for Swedish, the two assumptions made by Cruttenden (1979b, p.18) probably cannot be applied without adapting them to these new conditions.

It seems plausible that fall-versus-rise is one of several parameters which can be used to mark both the attitudinal and the grammatical distinctions and it also seems likely that not all of these parameters are used simultaneously and to the same extent to mark these distinctions. When listening to Swedish I can easily tell a deferential declarative utterance (= 'weak' category for attitudinal reasons) from a question (= 'weak' category for grammatical reasons). Is this so for contextual (and other) reasons only or is there some tonal evidence which can explain the perceptual impression?

4 PROCEDURE

The recorded speech material is shown in Table 1.

Statement		Manne lämnar nallarna. Manne is leaving the teddy-bears.
Yes/no question	SVO- question	Manne lämnar nallarna? Manne is leaving the teddy-bears?
	VSO- question	Lämnar Manne nallarna? Is Manne leaving the teddy-bears?

Table 1. The speech material. SVO refers to unreversed word order and VSO refers to reversed word order.

The sentences were first uttered in a neutral way, then the informant was asked to talk with a polite attitude and finally with a determined attitude. The informant was given imagined situations as a help to elicit the demanded attitude. She had no trouble following the instructions. The attitudes are chosen to fit in the two categories discussed by Cruttenden, the polite attitude as an example of the 'weak' category and the determined attitude as an example of the 'strong' category.

For each sentence the position of sentence accent (SA) was systematically varied, so that either of the three words in the sentences receive SA. Thus for each sentence listed above there were three different versions with SA either in initial, medial or final position, which amounts to a total of $3 \times 3 = 9$

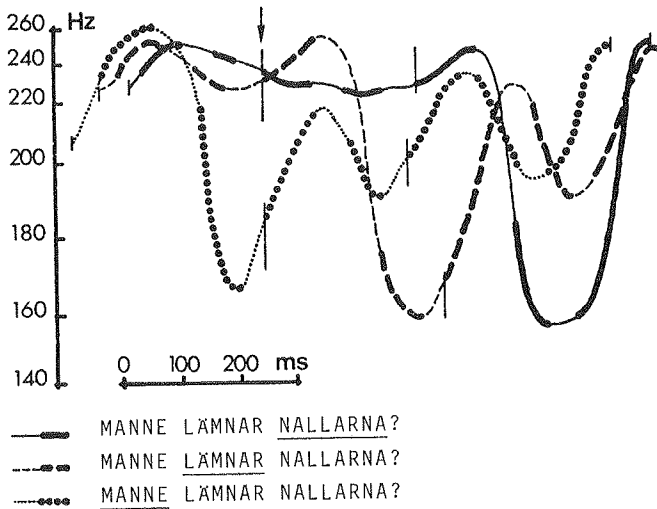


Figure 1. The effect of sentence accent on the tonal contour of neutral SVO-questions. Sentence accented words are underlined.

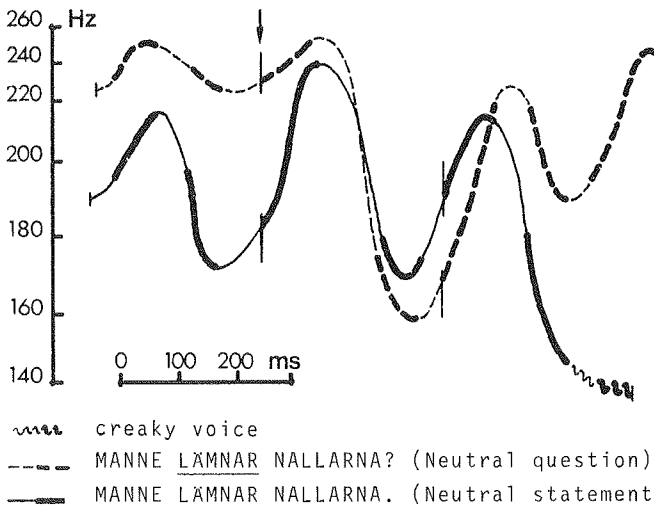


Figure 2. The effect of interrogative function. A comparison of neutral SVO-questions and structurally corresponding neutral statements. SA in the medial position.

sentences, each recorded five times. Each sentence was preceded by a context sentence, which is a question which is designed to elicit the appropriate SA in the following sentence. An example of a question/question pair is (SA position in italics): Manne gör vaddå med nallarna? Manne *lämnar* nallarna? ('Manne is doing what with the teddy-bears? Manne *is leaving* the teddy-bears?') For a more thorough discussion of the sentence accent concept and its use see Bruce (1977, p.20-24). Here SA and focus will be treated as equivalent concepts.

To obtain continuous Fo-contours which are fairly undisturbed by segmental factors, the test words are composed of sonorant consonants and vowels of the same degree of opening, here non-high vowels.

The main informant, whose tonal contours will be shown in the figures, is a female, non-phonetician student from Halmstad, which belongs to the south dialect area in Sweden. The tonal contours of a female phonetician from the same dialect area (myself) will be used as a reference.

5 ANALYSIS AND DISCUSSION OF Fo-CONTOURS

Explanation of notation used in connection with the figures.

The word which receives SA is underlined in the text. The arrow points to a common line-up point in the time domain for the contours involved, here the first CV-boundary in the medial word. A vertical bar indicates the first CV-boundary in each of the last two words in each sentence. Thick contour lines indicate vowels and thin contour lines indicate the consonantal part of the contour.

The position of SA governs the course of the Fo contours as can be seen in the neutral question contours in *Fig.1*. A very wide frequency range is manifested in connection with the sentence accented word. The prefocal contour varies within a very limited frequency range and the postfocal contour is in between. The contours also lie within the same frequency ranges. In the following I shall concentrate the analysis on the sentences

with SA in the medial position.

In *Fig. 2* the neutral statement with SA in the medial position is compared to the corresponding SVO-question. These sentences are structurally identical only differing in grammatical function, i.e., declarative versus interrogative. The statement belongs to the 'strong' and the question to the 'weak' category on the grammatical level. Now this difference in function greatly influences the tonal contour, as was pointed out in Bredvad-Jensen (1980). Four points of comparison can be set up:

(a) The wide interval in connection with SA for the statement (see Bruce and Gårding 1978, p.222-223) is still wider for the question.

(b) The prefocal and postfocal Fo-contours in the question are compressed in comparison with the statement contour.

(c) The question contour is characterized by a higher overall frequency level in comparison with the statement.

(d) The question terminates with a rise and the statement with a fall, which is very pronounced, ending in a creaky voice.

Points (a) and (d) can be called local features in the sense that these modifications influence only certain smaller parts of the Fo-contour. On the other hand point (b) and (c) can be called global features implying an influence on a larger part of the Fo-contour. Looking at the meaning distinction on the grammatical level and its tonal correlates it seems as if we tentatively could refer to the 'strong'-'weak' dichotomy using the above mentioned points (a) to (d), as a way of specifying the tonal distinctions found on the grammatical level.

In *Fig. 3* the neutral SVO-question is compared with the corresponding VSO-question, where the interrogative function is also marked by the reversed word order. The similarities between the two Fo-contours are apparent, apart from the difference in degree of the frequency range in connection with SA. But still, the tonal Fo-contour of the VSO-question is clearly distinct from the statement contour and the same points of comparison are valid for both the VSO and for the SVO-question.

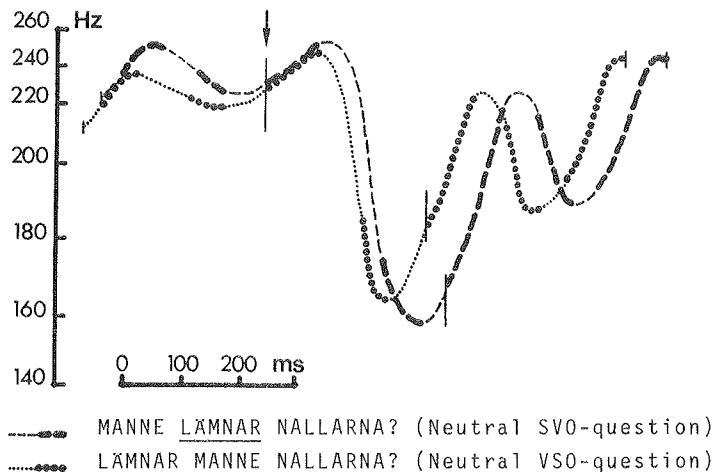


Figure 3. The effect of reversed word order on questions.
SA in the medial position.

In Fig.4 a neutral statement is compared with a polite statement. A neutral statement belongs to the 'strong' category but for the polite statement we arrive at a *tonal conflict*. In the attitudinal dimension the sentence must belong to the 'weak' category and in the grammatical dimension it must belong to the 'strong' category. According to Cruttenden, a required attitudinal usage will always overrule a required grammatical usage, but for the polite statement the conflict is resolved in a different way, as can be seen in Fig.4. The wide frequency range in connection with SA is still wider for the polite statement and this is the same as point (a) above. For the other points we find no similarities between the neutral question and the polite statement, but rather a tendency in the opposite direction for point (b), implying a frequency expansion outside focus too. The statement contour is modified by the attitude, but the shape of the contour is more similar to the neutral statement than to the question contours in Fig.5.

Figure 5 also exhibits a case of *tonal conflict* for the determined question, which belongs to the 'weak' category in the grammatical dimension but belongs to the 'strong' category in

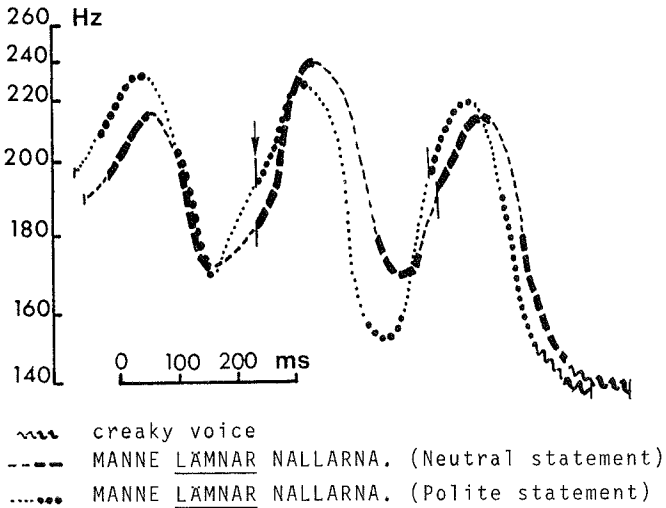


Figure 4. The effect of polite attitude on statements.
SA in medial position.

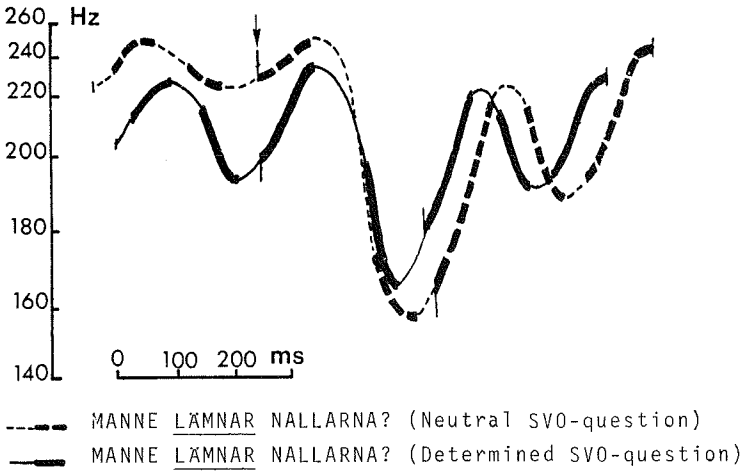


Figure 5. The effect of determined attitude on SVO-
questions. SA in medial position.

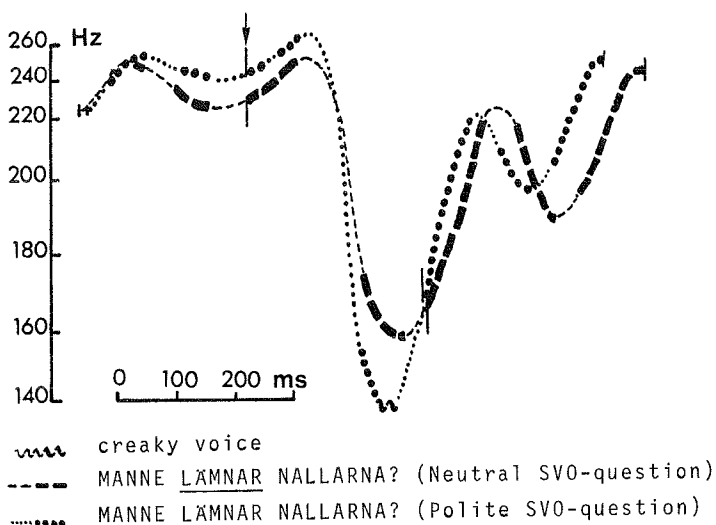


Figure 6. The effect of polite attitude on SV0-questions.
SA in medial position.

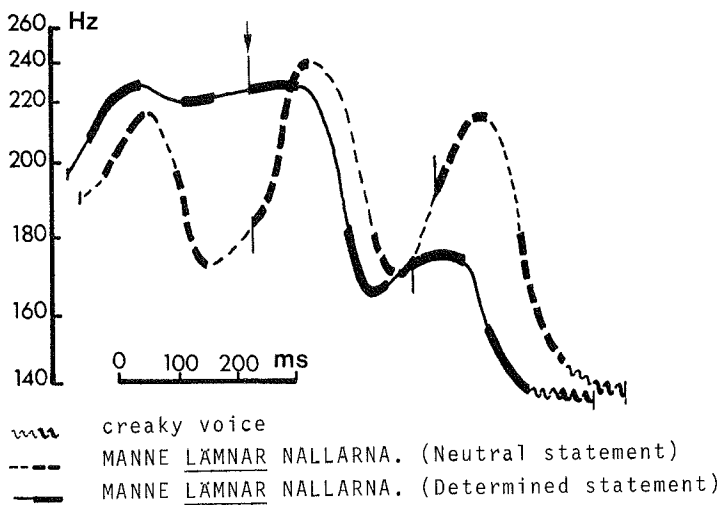


Figure 7. The effect of determined attitude on statements.
SA in medial position.

the attitudinal dimension. The conflict is solved in such a way that both 'weak' and 'strong' demands are satisfied. In comparing the determined question with the neutral question we find: (a) that the SA frequency range is compressed just as for the corresponding statement; (b) less prefocal compression, but more than for the statement; (c) not as high overall frequency level, but higher than for the statement; and (d) a somewhat less marked final rise.

Thus we have found for the two cases of *tonal conflict* related here, that attitudinal considerations do not overrule grammatical ones, but modify the tonal curve. This modification will not extinguish the grammatical character (statement versus question) exhibited in the Fo-contours. The whole pattern will never be changed; only range changes are shown.

Is it possible to detect a *tonal strengthening* effect in Fo-contours if a sentence belongs to the same category for both grammatical and attitudinal reasons? In the polite question in *Fig. 6*, which belongs to the 'weak' category for both grammatical and attitudinal reasons, the strongest tendency is point (a), the frequency expansion in connection with SA. The Fo-contour seems to be a strengthening of the pattern for the neutral question. This frequency-expansion parameter is also the one which is mostly affected by the polite attitude, cf. *Fig. 4*.

In *Fig. 7* we also have a possible candidate for a *tonal strengthening* effect, as the determined statement belongs to the 'strong' category for both grammatical reasons (declarative function) and for attitudinal reasons (determined attitude). Going from polite to neutral attitude achieves a compression in connection with SA, but could going from neutral to determined attitude achieve a further compression for SA? How can a strengthening effect be achieved without damaging the impression of the medial focus position? As can be seen in *Fig. 7*, a radical frequency compression in the prefocal and postfocal parts of the contour is achieved, probably emphasizing the impression of SA fall and adding to the impression of finality in this utterance. Thus it seems as if a frequency compression outside focus is not reserved for interrogative expressions only.

		TONAL PARAMETERS			
		FREQUENCY RANGE IN CONNECTION WITH SA (a)	PREFOCAL AND POSTFOCAL CONTOUR (b)	OVERALL FREQUENCY LEVEL (c)	TERMINAL RISE OR FALL (d)
'WEAK' USAGE	QUESTION	expanded	compressed	higher	rise
	POLITENESS	expanded	compressed (Q) expanded (S)	no change (S) higher (Q)	no change
'STRONG' USAGE	STATEMENT	compressed	expanded	lower	fall
	DETERMINATION	no change (S) compressed (Q)	expanded (Q) compressed (S)	no change (S) lower (Q)	no (little) change

Table 2. Tendencies in the relations between the tonal parameters and their different usages. S= for statements, Q= for questions.

6 SUMMARY

Two different attitudes, besides neutrality, were investigated, namely an attitude of politeness and one of determination. The effect of these attitudes on the tonal contour was related to the effect of declarative versus interrogative function of a sentence. The dichotomy between 'strong' and 'weak' meanings was adapted from Cruttenden. 'Strong' meanings include statements in the grammatical dimension and determined attitude in the attitudinal dimension whereas 'weak' meanings include questions and polite attitude. Table 2 summarizes the discussion of the 'strong' and 'weak' usages of the tonal parameters. It was found that there was no simple one-to-one correspondence for either the 'weak' tonal correlates or for the 'strong' tonal correlates used in the different dimensions. This is contrary to the assumptions of Cruttenden but in accordance with the assumptions made in section 3. Cases of *tonal conflict*, i.e. 'weak' and 'strong' demands simultaneously in different dimensions, also showed that attitudinal considerations do not overrule grammatical ones, but modify the tonal contour in such a way that the grammatical character of the contour is preserved. Cases of *tonal strengthening* showed that the non-focal frequency compression may not be an interrogatory feature per se. Rather it seems as if it helps to emphasize the character displayed especially in the frequency range changes

in connection with sentence accent, for both questions and statements. A preliminary answer to the question raised in section 3 is that, yes, for this person it seems as if not only context, syntax, etc., but also the character of the tonal contours explain the perceptual impression.

7 CONCLUDING REMARKS

The relations between the different tonal parameters are the same for the VSO- and the SVO-questions, though differences in degree may occur. This is also valid for the relations exhibited in the sentences with SA in either the initial or final position, where some minor adjustment in connection with sentence accent position is shown. Also, the data from my own speech exhibit the same relations as the material from the main informant.

The perceptual importance of the different tonal parameters has not been studied yet, but is of course crucial to the interpretation of the data presented here. At present more data is being collected and perceptual experiments are planned.

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