

PERMISSIBLE AND NOT PERMISSIBLE VARIATIONS
IN PITCH CONTOURS

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Introduction

In a project, still at a very preliminary stage, the various functions of intonation are being studied, among others similarities and dissimilarities in pattern between languages, as well as characteristic variations in pattern between the sexes, between generations, and between individuals. In one of the pilot studies within the project, data from a small group of speakers of southern Swedish have been analyzed.

Data collected from more than one subject often seem to point in different directions, much to the investigator's dismay. We had the same experience. It was obvious, however, that a certain amount of variation in pitch patterns¹ was not only tolerated by listeners but felt to be perfectly acceptable.

Procedure

A group of four students of Phonetics, two male and two female, speaking roughly the same dialect and belonging to the same generation (age 26 to 36) spoke, or rather read the same simple piece of conversation, comprising statements and answers, questions (wh-questions, yes/no questions, and "echo-questions"), exclamations, admonitions and commands. The context did not invite strong emotional coloring, but a few utterances called for emphatic or contrastive stress.

Five students of Phonetics listened to the recordings. The recordings were all of good quality and had been made in an anechoic chamber at our institute. A possible source of error is the fact that the listeners were acquainted with the speakers.

Listeners were asked to judge whether the meaning of the utterances was transmitted satisfactorily or not, by marking each utterance with either a plus or a minus. Zeroes were also permitted, if need be, to indicate that a particular utterance was neither quite satisfactory nor entirely unacceptable. After comparing the recorded speech and listeners' responses we draw the conclusion that zeroes in the majority of cases meant that listeners had reasoned like this: "Well, this does sound rather strange. But

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I can hear this particular person saying it just this way - so I will put a zero." When asked, listeners confirmed this interpretation of the zeroes. The zeroes are interesting, we believe, because they indicate that some variations are tolerated in connection with a particular speaker. However, as they might be unacceptable, or ambiguous, to people unacquainted with the speaker, they have been classed as minuses in this report. This assumption is being tested.

Data were also analyzed instrumentally by means of a pitch meter device (FONEMA 3-channel, Phonetic Analysis Assembly and Siemens Mingograf 34T). Mingographic representations that were difficult to interpret were checked by means of narrow-band sonograms (Key Sonagraph 6061-A).

Results and discussion

In this report we will only discuss pitch contours. We are, however, well aware of the fact that speech always involves a subtle interplay between features of pitch, duration, and intensity. We expected to find some few, fairly clearly distinguishable pitch patterns: one pattern for statements (a moderately high or low precontour, a moderate rise on the stressed unit, a fall in pitch at the end, accompanied by falling intensity); one for questions (a high, even precontour and a finally rising pitch); one for "echo-questions" (a continuous rise); perhaps wh-questions would differ from yes/no questions by having a choice between a final rise and a fall. We assumed that exclamations and "commands" would show some similarities and differ from other types of utterances by a finally sustained pitch and intensity (Hadding-Koch, 1961).

We found that although these assumptions were on the whole borne out by our instrumental analysis, every speaker was, within limits, evaluated as a speaker "in his own right". The four speakers represent very different personality types. Listeners obviously made allowance for this fact, which also explains why different renderings of the same utterance were considered equally good. As several utterances were nevertheless refused, our next step was to try to map out the limits for permissible variations.

In the following, the female speakers will be referred to as A1 and A2 and the male speakers as B1 and B2. A few pertinent, characteristic features will be mentioned. A1 is a girl with common sense and great self-control. Her speech conforms well with the expected norms. A2 is a lively person and a bit of a bohemian. Very few of her utterances are entirely

"neutral" - they are all said with "feeling". B1, on the other hand, is "neutral" in the extreme. His speech is said to be unacceptable much more often than that of anybody else. After all, every utterance demands an intonation that follows its content like a glove. Less pitch movement than called for and you get indifference, fatigue or the like. B2 is a reasonable and amiable person - his intonation shows, by usually ending in a rise even in statements, that he is always willing to give the other person a chance to voice his/her opinion in the matter and to continue the conversation. In most conversational situations he is a strongly aware of the listener as most of us normally are only in "true" questions.² As a parenthesis we would like to add that we were conscious of the existence of this (universal?) listener-oriented pitch contour but had expected to find it among the female speakers, if at all, in the age-group in question (cf. Bolinger, 1964, 1972, 1973; Lakoff, 1972; Hadding and Studdert-Kennedy, 1974).

Mingograms and sonagrams of the speech of our four subjects were analyzed. Results:

Accepted norm: Statements and answers start on a medium or low pitch level, rise to a moderately high peak on the stress (or stresses, if several), and fall to lowest pitch within the speaker's range of voice, accompanied by a slowly falling intensity. This was as expected.

(1) A2: Jag ska träffa 'John i'dag (I'm meeting 'John to'day). Fig. 1a.

(2) A1: Det är en 'hund (It's a 'dog). Fig. 1c.

Permissible variations: Emphasis increases the height of the peak(s) and thus increases the size of the ups and downs of the utterance. Even a moderate extra emphasis or contrast may raise the pitch at the peak to very high. Cf. Figs 1c and 1d.

(3) A1: En "katt (A "cat). Fig. 1d.

Statements that expect or invite a reaction on the part of the listener may have a final rise. However, they show the medium or low initial pitch level of statements. This pattern is typical for B2. It occurs sometimes also in the speech of A1 and A2 in "introductory" statements (such as "I have got a 'cat", "I'm 'leaving 'now"), but is rare in responses to questions.

(4) B2: Jag ska 'träffa nån (I'm going to 'meet somebody). Fig. 1b.

Even a slight coloring of some attitude or other, viz., surprise, joy, indignation, disgust, has an immediate and noticeable effect on the pitch pattern. These effects will be discussed in a later report.

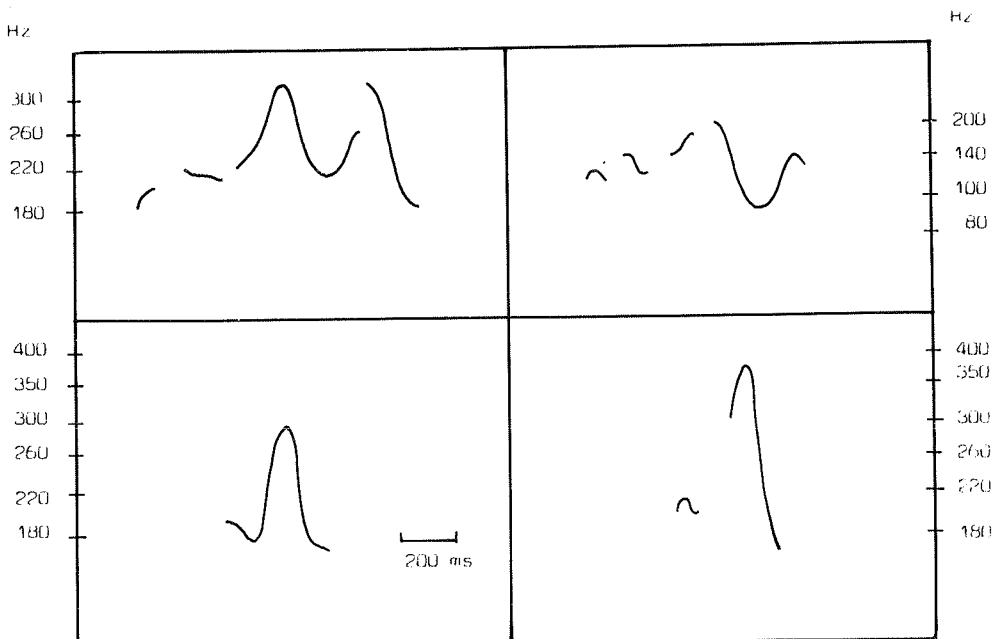


Fig. 1. F_0 -curves traced from mingograms. Statement contours.

Not permissible variations: The few statements that were found to be unacceptable showed pitch contours affected either by attitudes not compatible with the context or by a deviating placement of the stress(es).

Accepted norm: Wh-questions and yes/no questions differed from statements by having a raised even pitch in their initial part, followed by a fall and ending in a rise of varying size. The stressed syllable of wh-questions does not rise as much in pitch above the precontour as does that of statements – it could even be realized by a fall in pitch. Wh-questions thus do not seem to point at any particular part of the utterance as more important than the rest. Instead, the utterance as a whole forms an interrogative unit. Yes/no questions, on the other hand, often have a very high stress peak.

(5) A1: Vad har du 'där? (What have you got 'there?). Fig. 2a.

(6) B2: Varför 'inte? (Why's 'that?). Fig. 2b.

(7) A1: Har du 'också en katt? (Do you have a cat 'too?). Fig. 2c.

(8) B2: Kommer du 'hit i'gen i'dag? (Will you be coming 'back 'today?).

Fig. 2d.

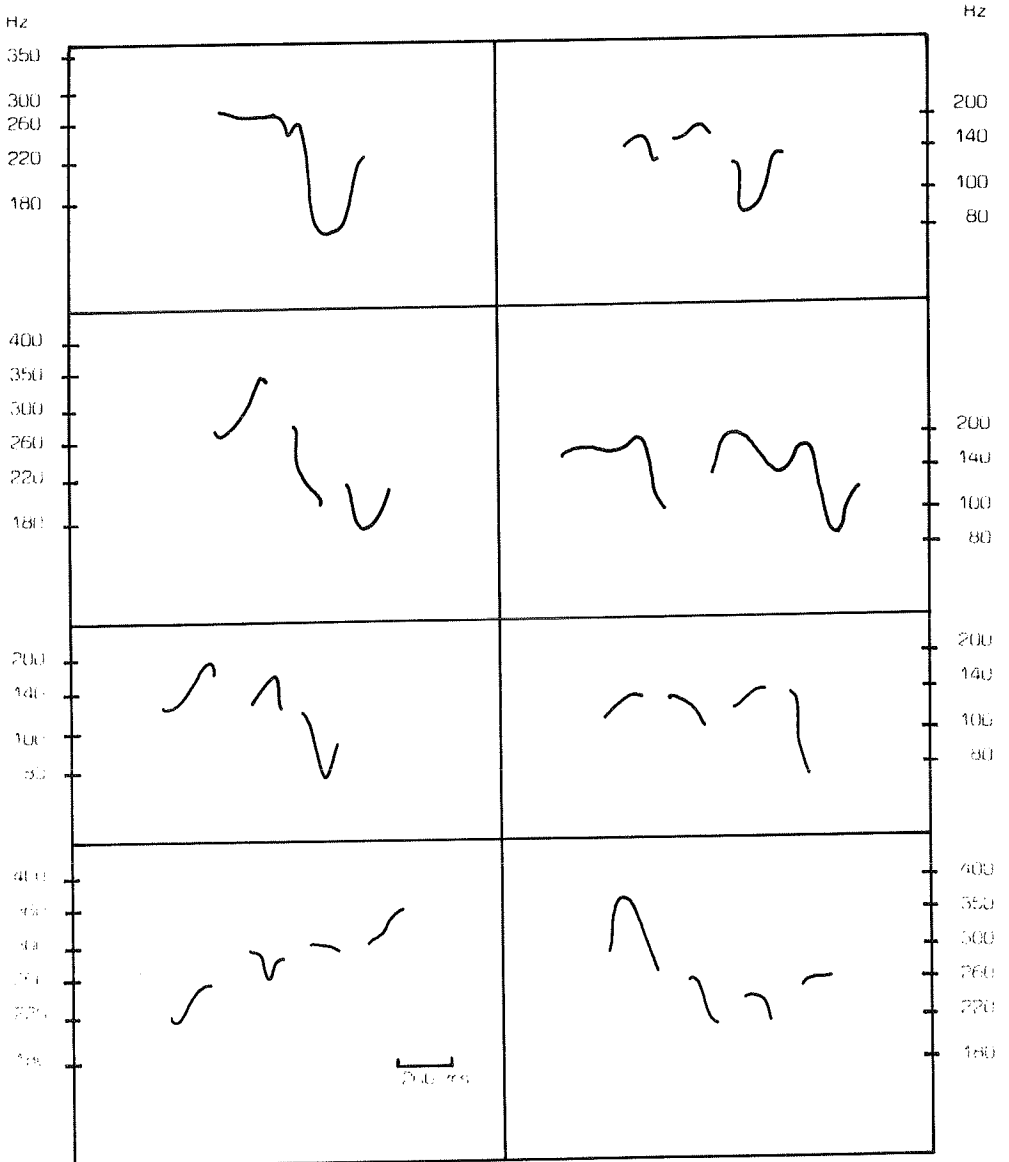


Fig. 2. Question contours, a, b = wh-questions; c, d, e = yes/no-questions; g = echo-question, - f = unaccepted wh-question; h = unaccepted echo-question.

Permissible variations: A final fall may occur in wh-questions instead of a rise but in combination with a raised precontour. This variation is only used by B1. In his statements the fall usually ends in a "creak" and the intensity falls at the same time. In the questions, however, the pitch of the fall is measurable throughout and the intensity is comparatively sustained.

(9) B1: Har du 'också en katt? (Do you have a cat 'too?). Fig. 2e.

The precontour may be moderately high. In that case the utterance must, in order to be accepted as a question, have marked dip in pitch preceding a marked final rise.

Not permissible variation: Utterances with a low or moderately high precontour and a low terminal fall are not accepted as questions - the speaker is not interested in the answer. Cf. footnote 2.

(10) B1: Vem ska du 'träffa? (Who are you 'meeting?). Fig. 2f.

Accepted norm: "Echo-questions" show a continuous rise from low or medium pitch to high. The stress is usually evenly distributed.

(11) A1: Vem ska du träffa? (literally: Who are you meeting?). Fig. 2g.

There are no permissible variations as no other type of contour conveys the echo-effect. Fig. 2h shows an utterance that was refused as an echo-question - the pitch curve is that of the corresponding wh-question, but with emphatic stress on vem.

(12) A2: "Vem ska du träffa? ("Who are you meeting?).

Norm: Exclamations usually lack the initially high pitch of questions. They may have the high peak of emphatic statements but end on a finally sustained pitch. They are often combined with some strong emotion that affects the contour in some way and are therefore not included in the present report. Their most consistent feature is the finally sustained pitch.

To sum up: A description of the pitch contour of statements as characterized by a final fall and, in contrast, as questions as characterized by a final rise does not cover the data found in the present study. Instead, under certain conditions, statements may end in a final rise and questions may have a final fall.

Personal idiosyncracies may, within limits, produce permissible variations. Permissible variations will be such as are caused by attitudes permissible within the semantic context of the utterance. Acquaintance with the speaker may increase the listener's tolerance to otherwise not permissible variations.

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