

# Impersonation – reproduction of speech

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## Abstract

*The present paper is a study of one impersonator and one of his voice imitations in order to find out how he changes his own voice and speech behaviour in order to get close to the target voice. Preliminary results from the auditory and the acoustic analysis, focusing on speech style and intonation pattern, will be presented.*

## 1 Introduction

Voice quality, pitch register, intonation, other prosodic aspects of the voice and speech style seem to be important features to capture in order to succeed with a voice imitation as shown by the results in a previous perception test (Zetterholm 2000). The term speech style was used to refer to speech tempo, speech rhythm, articulation and continuity in that study. Some important features may be exaggerated and some less important features may be neglected in the voice imitation and the audience will still get the impression of a successful impersonation.

In the present study a comparison is done between the target voice, the voice imitation and the natural voice of an impersonator. The voice imitation investigated in this study was made by a different impersonator than the imitations used in the previous perception test. The focus of this study is on how the impersonator changes his own voice in order to get close to the voice and speech behaviour of the target speaker.

## 2 Material

In this study three recordings of the same speech material have been analysed. One recording with the original voice of the target speaker, Sten Broman, taken from public appearances, and two recordings with the Swedish professional impersonator Anders Mårtensson, one of which was recorded with the voice imitation of the target speaker's voice and one with the impersonator's own natural voice. The recordings by Anders Mårtensson were made particularly for this study, in a studio.

An auditory and an acoustic analysis were done as well as a comparison between the three recordings.

### 2.1 *The target speaker*

The target speaker Sten Broman was a well-known Swedish TV-personality in the seventies. He lived in Lund in south Sweden and he had a dialect from this area, according to the prosodic typology for Swedish dialects by Bruce & Gårding (1978). The dialect in Lund may differ from dialects in the neighbourhood depending on the influence from the university with students and teachers speaking a number of different dialects. Ingers (1970) describes the dialect as a southern variety of the Swedish standard language. The target speaker has a social dialect that reminds of the academy of Lund.

## 2.2 *The impersonator*

Anders Mårtensson lives in west Sweden and he has a dialect from the transition area between east and west of Sweden. He has been a professional impersonator for 10 years.

## 2.3 *The Swedish texts*

*Text 1:* Jag uppfattar det själv såsom att jag helt enkelt komponerar. Jag komponerar musik, jag komponerar mitt liv, jag komponerar mina kläder, jag komponerar min mat. Det är komposition alltihop.

*English translation:* The way I think about it is that I simply compose. I compose music, I compose my life, I compose my clothes, I compose my food. Everything is composition.

*Text 2:* Det där med s-et efter chef, det är alldeles galet. Om man säger chefsåklagare – vad betyder det? Det betyder chefens åklagare. Han sitter och åklagar sin chef hela tiden, bara angriper honom ideligen. Det är ju en fräck man, säkert inte omtyckt av sin chef. Men, chefsåklagare, det har vi mycket få egentligen. Offentliga sådana känner jag icke till, utan det är bland åklagare en som är den högste.

*English translation:* About that *s* after *chef*, that's totally crazy. If you say *chefsåklagare* (= chief's-prosecutor) – what does that mean? It means the chief's prosecutor. He prosecutes his boss the whole time, attacks him continuously. He's bold and brazen, certainly disliked by his boss. But, chiefprosecutors aren't really very common. I'm not aware of any public ones, rather there's one who's the head of all the prosecutors.

## 3 Results

### 3.1 *Auditory Analysis*

The target speaker has a characteristic speech style concerning speech tempo, pauses, rhythm and accentuation of words. There is great variation in speech tempo, some words are made extra prominent and prolonged and he speeds up the tempo in other phrases. He often places a short pause before an accentuated word. He seems to be aware of the importance of rhetorical speech. The impersonator captures the speech style in the voice imitation. It is not an exact copy of the target speaker concerning pauses but the overall impression is that the impersonator is successful, particularly in capturing the rhythm, the intonation and the stressed words and phrases. The impression of the recording with Mårtensson's own voice is that he is not that fast and has not the same rhetorical speech rhythm as the target speaker, Broman.

The regional and social dialect of Lund is obvious in the recordings of the target speaker as well as in the recording of the voice imitation. The characteristic [ɛ] and the slightly diphthongized vowel, i.e. the vowel å in 'åklagare' (prosecutor), are clear. The diphthongs in the social dialect of Lund, represented by the target speaker, are not as marked as they are in other dialects in south Sweden, probably depending on the influence of people from other dialect areas (Ingers 1970). His natural pronunciation of /r/ is with a trill [r] and there are no diphthongs in his dialect.

The tense and sometimes harsh voice quality of the target speaker is exaggerated in the impersonation. The pitch level is audibly higher in the voice imitation as compared to the target voice. The natural voice of Mårtensson has a lower pitch level and it is obvious that he really changes his own pitch.

The impersonator is able to keep voice quality, dialect and pronunciation throughout the voice imitation and is so close to the target voice that there are no passages where his own

voice or dialect is audible. There is a small difference between the three recordings concerning the words in the text, but it does not affect the overall impression.

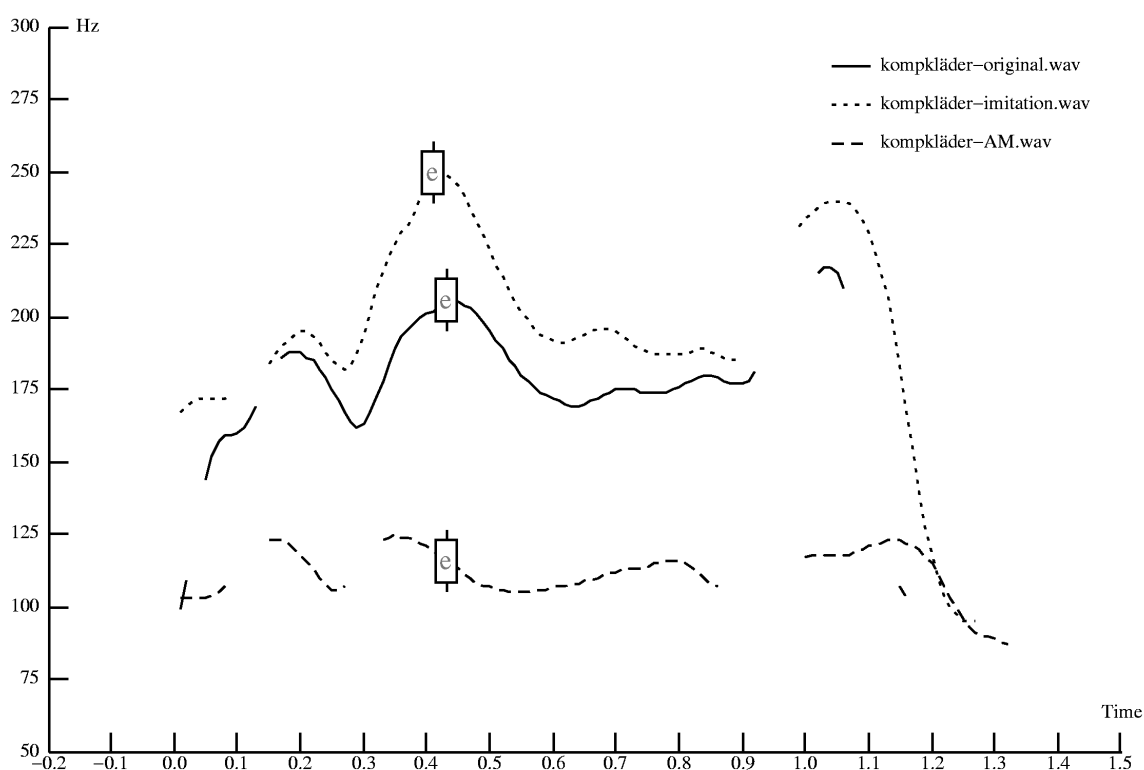
### 3.2 Acoustic Analysis

The speech analysis programme Praat was used for the acoustic analysis. Text 1 is about 12 sec. in all three recordings and Text 2 is about 30 sec. in all three recordings. The conclusion of this is that the impression of a slower speech tempo in the recording with Mårtensson's own natural voice may depend on the small variation in pitch and speech rhythm.

In the acoustic analysis the auditory impression of different pitch levels for the three recordings is confirmed. The fundamental frequency is higher in the impersonation as compared to the target voice in both texts, see Table 1. The high pitch may depend on the tense voice quality, which is exaggerated in the voice imitations. The difference between the target voice and the voice imitation is larger in Text 1. It is also clear that Mårtensson changes his own mean fundamental frequency in the voice imitation of Broman.

**Table 1.** F0 average and standard deviation in Text 1 and Text 2.

Text 1	F0 (Hz)	Std dev.	Text 2	F0 (Hz)	Std.dev.
Original	174	44	Original	176	48
Imitation	204	38	Imitation	186	49
AM	112	20	AM	121	32



**Figure 1.** The vowel [e:] in the word 'komponerar' (compose) in the phrase 'jag komponerar mina kläder' (I compose my clothes).

The F0 peak in the stressed syllable is earlier in east and west Swedish dialects than in south Swedish dialects (Bruce 1998). In words with accent I the peak is before the

stressed vowel in east and west Swedish dialects. In south Swedish dialects the peak is later in the stressed vowel.

In Text 1, the accent I-word ‘komponerar’ (compose) is used several times. The intonation pattern in the four phrases ‘Jag komponerar musik, jag komponerar mitt liv, jag komponerar mina kläder, jag komponerar min mat’ (I compose music, I compose my life, I compose my clothes, I compose my food) has been studied. The tonal peak is in the beginning of the vowel [e:] in the word ‘komponerar’ (compose), as expected, in the recording of the target speaker with the south Swedish dialect. In the recording of Mårtensson's own voice and dialect from the transition area between east and west of Sweden, the tonal peak is before the vowel, as expected. The intonation pattern in the voice imitation shows that the impersonator changes his own tonal pattern and uses the tonal pattern of the south Swedish dialect. This is the case in all phrases. One of the phrases is shown in Figure 1, ‘jag komponerar mina kläder’ (I compose my clothes).

#### 4 Discussion

Usually Mårtensson does not use exactly the same words, or even speak about topics characteristic to the target speaker in his voice imitations. At a seminar in Lund, he told us that as a starting point he thinks of the target speaker in terms of a caricature and it is not necessary to make an exact copy of the target speaker and that is not always the point. To be able to compare his voice imitation with the target voice it is, however, important to use the same text material.

The impersonator, Anders Mårtensson, is successful in the voice imitation of Sten Broman, as shown by the preliminary results in this study. It is obvious that he changes his own voice quality, pitch level and his own dialect, the pronunciation of the r-segment and the vowels as well as the intonation pattern. The auditory impression is confirmed in the acoustic analysis. The results in this study agree with the results of the perception test concerning the importance of voice quality, pitch level and intonation for a successful voice imitation. The impersonator, Mårtensson, proves that he changes his own voice and speech behaviour and gets close to the target speaker, Broman.

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