

Character Identity Expression in Vocal Performance of Traditional Puppeteers

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Abstract. A traditional puppeteer generally uses up to a dozen different marionettes in one piece. Each of them impersonates a character with its own typical voice manifestation. It is therefore very interesting to study the techniques the puppeteer uses to change his voice and their acoustical correlates. This study becomes even more interesting when a traditional style exists that has been respected by the puppeteers for more than a century. Thus we decided to make use of the fact that there are records available of several pieces played by Bohuslav Anderle (1913-1976) and we recorded parts of the same plays played by his son, Anton Anderle (1944), supplemented by his verbal description of personality features of the characters that the actor tries to express in their voices. A summary of variety of characters one puppeteer has to master is given and the psychological, aesthetic and acoustic-phonetic aspects of their personalities are discussed. The main goal of the paper is to present a classification of voice displays of characters, techniques of voice changes, and their acoustic correlates.

1 Introduction

Motto: “Academies of sciences and arts should record to a gramophone disc the pathetic speech of the folk puppeteers – at least the oldest ones – before they are gone.” [1]

It is well known, that expressive speech synthesis, speaker recognition, speaker verification and other areas of automatic speech processing can profit from using the experience of psychology, aesthetics, phonetics and phonology in speech research. All these disciplines can help to better understand a phenomenon we decided to explore – intentional change of voice by the speaker. There are two interesting special approaches to the research on intentional voice changes and voice imitation:

The first one we have called “**One voice – several speakers**”, is used to study voice imitation, and the second approach, that we call “**One speaker – several voices**”, studies actor’s voice when representing different characters.

This paper describes preliminary steps of our research following the second approach. A puppeteer who switches among a dozen of voices representing personalities of his characters seems to be an ideal object of such a research.

1.1 Marionette Theatre in Slovakia and the Anderle Family

A history of the folk puppet theatre in Slovakia goes back to the time of the Austro-Hungarian monarchy. The first written evidence of a puppet show in Bratislava is from the year 1609. The

greatest puppeteers often mastered 40–50 plays. The whole repertoire was generally played with one set of 15 - 20 puppets. The movement (animation) and voice (declamation) of all the puppets was generally realized by one puppeteer. Sometimes also other family members helped him with performances.

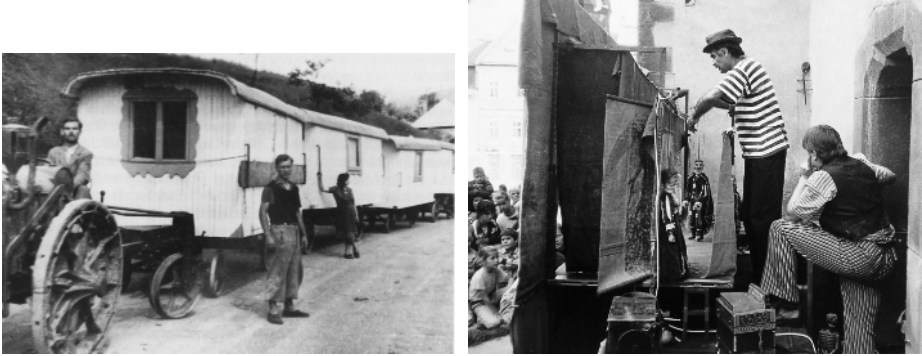


Fig. 1. a) Bohuslav, Vladimír, and Anna Anderle on their way to a next stop, 1943**b)** Anton Anderle on the backstage, 1994

More than twenty puppeteers were active in the inter-war period in Slovakia; but the communist regime has soon ruined this rich tradition. The only traditional folk puppeteer which is still performing today is Anton Anderle (*1944) who is a follower of the third generation of the famous Anderle family. His father Bohuslav Anderle (1913–1976) was a well known puppeteer who was able to perform 40 pieces.

As a talented boy Anton rehearsed the same plays which his father played at a big puppet theatre. In the seventies he tape-recorded his father's puppet pieces. After 1989 Anton has started playing the old father's repertoire again. At present Anton Anderle's theatre is one of the most popular traditional puppet theatres in Europe.

2 Personality – Character Identity

It is very difficult to separate speech features reflecting personality from those that express emotions, affect and attitude. We are aware of the fact that these four parts of expressiveness are in close correlation and that they share the same acoustic means. It is therefore unlikely to find a clear one-to-one relation between personality features and the acoustic features that represent them.

2.1 Traditional Psychological Classification of Personality Dimensions

In psychology research the Five Factor Model of personality is often being used [2,3]. The five factors are considered to be the basis of the personality space:

Table 1. Five Factor Model of personality with description and examples

Personality dimension	Our code [values]	Description	High level [1] (example adjectives)	Low level [-1] (example adjectives)
Neuroticism	N [1,0,-1]	Tendency to experience negative thoughts	Sensitive Nervous Insecure Emotionally distressed	Secure Confident
Extraversion	E [1,0,-1]	Preference for and behaviour in social situations	Outgoing Energetic Talkative Social	Shy Withdrawn
Openness to experience	O [1,0,-1]	Open minded-ness, interest in culture	Inventive Curious Imaginative Creative Explorative	Cautious Conservative
Agreeableness	A [1,0,-1]	Interactions with others	Friendly Compassionate Trusting Cooperative	Competitive
Conscientiousness	C [1,0,-1]	Organized, persistent in achieving goals	Efficient Methodical Well organized Dutiful	Easy-going Careless

2.2 Parameters of Voice Quality

A particular voice setting is usually described in terms of the degree of deviation from a “neutral” setting. The neutral setting is defined as a normal position relative to possible adjustments [4].

Using Laver’s classification scheme [4] it is possible to describe voice qualities.

2.3 Actor’s Classification, Aesthetic Concept, and Realization

Personal characteristic of the traditional characters of the folk puppet theatre is a complex of three interconnected levels: semantic, optical and auditive. The semantic level characterizes the character as to its function in the play. The optical layer represents all components of visual representation of a puppet (face, costume, material and animation). The auditive layer includes speech, music and all the sounds generated by actor and his puppets.

For deeper understanding of the actors notion of personality of his characters, we asked Anton Anderle to characterize their personality and to explain the techniques he uses to change his voice. The actor based the description on both psychological features of the character and the acoustic-phonetic means to express them.

3 Available Speech Data

At present we have two basic types of recordings available. The first one is a set of eight complete puppet plays played by Bohuslav Anderle. The second part of the database consists of parts of pieces that were played by Anton Anderle in 2006 to demonstrate the typology of voices. The actor’s natural voice and 21 voices of different characters have been recorded. This studio-quality record lasts about one hour.

Examples of the voices can be found at <http://ui.sav.sk/speech/voices.htm>.

Table 2. Laver’s classification scheme representing particular voice settings with our simple code

Suprelaryngeal Settings	Code	Laryngeal Settings	Code
Longitudinal axis:	LP	Simple phonation types:	MV
<u>Labial</u>	LD	Modal voice	F
Labial protrusion	RL	Falsetto	W
Labiodentalization	LL	Whisper	C
<u>Laryngeal</u>		Creak	
Raised larynx			
Lowered larynx			
Latitudinal axis settings:	CR	Compound phonation types:	WV
<u>Labial</u>	LS	Whispery voice	WF
Close rounding	TA	Whispery falsetto	CV
Lip-spreading	BA	Creaky voice	CF
<u>Lingual tip-blade</u>	RA	Creaky falsetto	WC
Tip articulation	DT	Whispery creak	WCV
Blade articulation	PA	Whispery creaky voice	WCF
Retroflex articulation	P	Whispery creaky falsetto	BV
<u>Tongue-body</u>	V	Breathy voice	HV
Dentalized	PH	Harsh voice	HF
Palato-alveolarized	LPH	Harsh falsetto	HWV
Palatalized	CJP	Harsh whispery voice	HWF
Velarized	OJP	Harsh whispery falsetto	HCV
Pharyngealized	RJP	Harsh creaky voice	HCF
Laryngopharyngealized	RJP	Harsh creaky falsetto	HWCV
<u>Mandibular</u>		Harsh whispery creaky voice	HWCF
Close jaw position		Harsh whispery creaky falsetto	
Open jaw position			
Protruded jaw position			
Retracted jaw position			
Velopharyngeal settings:	N	Overall muscular tension settings:	TV
Nasal	DN	Tense voice	LV
Denasal		Lax voice	

Table 3. Classification of the characters based on several elementary semantic oppositions

Criteria	One pole	code	Second pole	code
Sex	Male	XM	Female	XF
anthropological view	human	HH	Non-human	HN
Age	Old	AO	Young	AY
morality	Positive	MP	Negative	MN
Aesthetics	Tragical	ET	Comical	EC
Reflexion of ethnic	Our	RO	Foreign	RF
Social status	Noble	SN	Low	SL

Table 4. A shortened overview of the classification of basic types of voices given by the actor supplemented with our judgement of their personality dimensions (in code), speech quality description and its code, as well as some additional remarks

Name of the character	Actor's concept	Pers. code	Speech quality	Sp.Q code	Semantic features; other notes
Actor	Neutral, natural	E1, O1, A1	Middle pitched	MV	XM, HH;
Persian shah's daughter (Faust)	Young, gentle, judicious, relaxed, womanly, kindly, well-mannered	N-1, O1, A1	calm falsetto, low vocal effort	F	XF, HH, AY, MP, SN; The same as Donna Caroline (<i>Don Juan</i>)
Žabinka – Gašparko's wife (more pieces)	Hysterical, funny	N1, O-1,	Falsetto, resonant, sharp	RL, F	XF, HH, AY, MP, EC, RO, SL; Higher speech rate
Countess (Belengardo)	Angry, assertive, provocative, shrill	N1, E1, A-1	Falsetto, higher vocal effort	F	XF, HH, AO, MN, SN, Very high speech rate
Angel (Faust)	insisting	A1, C1	Falsetto, lower vocal effort	TV	XF, HN, MP; Special (urging) falling intonation contours
Faust (Faust)	Scholar, philosopher, serious	O1, C1	Modal effort, middle pitch	MV	XM, HH, AO, ET, SN; natural voice, pathetic
Gašparko (all pieces)	Funny, cheeky, liar	N1, E1, O1	Higher to modal pitch, raised larynx	RL, TV	XM, MP, EC, RO, SL; Lisping (s-š, c-č) Chatty, High sp. rate.
Belengardo (Belengardo)	Intrigant, self-assured, energetic, loud, self-confident,	E1, A-1, C1	higher throat res., wide mouth opening, hoarse	LS	XM, HH, AO, MP, SN;
King Meraldus (Turkish Island)	noble, serious, good, clever	N-1, A1, C1	Low pitched, thoroughly articulated	CR LP	XM, HH, AO, MP, SN;
Wagner (Iacquey) (Faust)	agreedable, peaceful	N-1, O-1, C1,	Low pitched,	LL, CR, LV	XM, HH, AO;
Mefistofeles (Faust)	Devilish, rigid	A-1, C1	exaggerated, low, husky,	LL	XM, HN, MN;
Škrhola (Two godfathers)	Lionhearted, able, vigorous, optimistic	E1, A1	Wide (smiling) mouth, strong voice, throat resonance.	LS	XM, HH, AO, MP, EC, RO, SL;
Trčko (Two godfathers)	Dull, a little bit simple-minded,	N1, E-1	Middle pitched, nasal	N	XM, HH, AO, EC, RO, SL; muttering
Spirit of Don Avenez (Don Juan)	Mysterious, threatening, frightening	N-1, C1	Breathy, low pitched	LL, BV,	XM, HN, ET, SN; low speech rate vowels strongly elongated.
Gypsy (Jánošík)	Subservient,	E1, C-1	Denasalization (m-b, n-d), lower register,	DN, BV	XM, HH, AY, RF SL; rising intonation contours instead of declining one.
Jew (Comeback to home)	cunning	E1, A-1, C1	creaky, less voiced with modal pitch and not loud	WCV	XM, HH, RF, SL; influenced by Jidish (jewish dialect) –

4 Acoustic Analysis

Longer sections of the particular voices for analyses were obtained by concatenation of the utterances spoken by the individual character. The fundamental frequency as a representative of pitch and register was measured by autocorrelation of the LP residual and also from cepstrum. The spectral tilt that is a correlate of loudness and vocal effort was derived from long time average FFT spectrum. Breathy and creaky voice qualities can be measured on

glottal pulses. We computed them by Discrete LP inverse filtering using Aparat [5]. A set of parameters is then measured from which the Normalized Amplit. Quotient is considered to be the most robust [6].

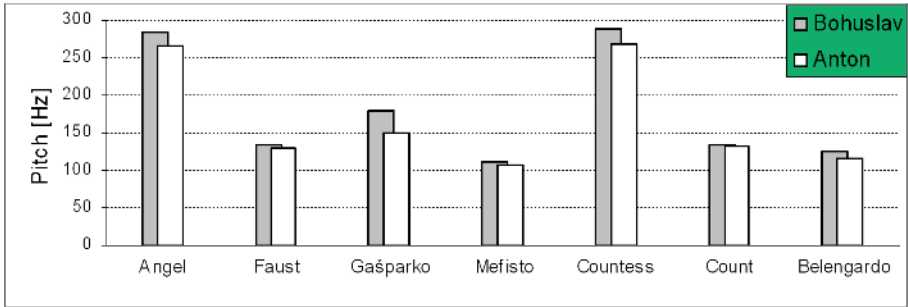


Fig. 2. Comparison of average fundamental frequency measured on longer speech utterances shows that the assignment of average F0 to the individual characters is very consistent with these actors

The full analysis of the results obtained by acoustical measurements, prosody analysis, statistical and cluster analysis of the material is out of scope of this paper and it will be published in our following works.

The following step in our research is to annotate the whole speech material orthographically to be able to use automatic signal annotation tools. Then we will be able to carry out measurements giving statistically verified results. We will try to record full versions of the plays in the interpretation of Anton Anderle. Experiments with “hyper-expressive” unit-selection synthesizer based on the database of recordings of puppet theatre performances can be one of the next steps.

5 Conclusion

This work represents an effort towards better understanding of the auditive display of personality dimensions. A special approach that studies intentional changes in the voice of a puppet player to present personalities of the individual characters is presented.

We have collected a speech material and created a database. We have adopted Five Factor Model of personality dimensions known from psychology and Laver’s classification scheme of the characteristics of voice quality. We added a semantic classification of the characters based on several elementary semantic oppositions. Together with a simple code for all three classification schemes it was possible to accomplish a description of all the characters from the puppet pieces.

We believe this research will contribute to the knowledge on acoustical aspects of personality which, together with emotions, affect and attitude belong to the main objects of expressive speech synthesis research.

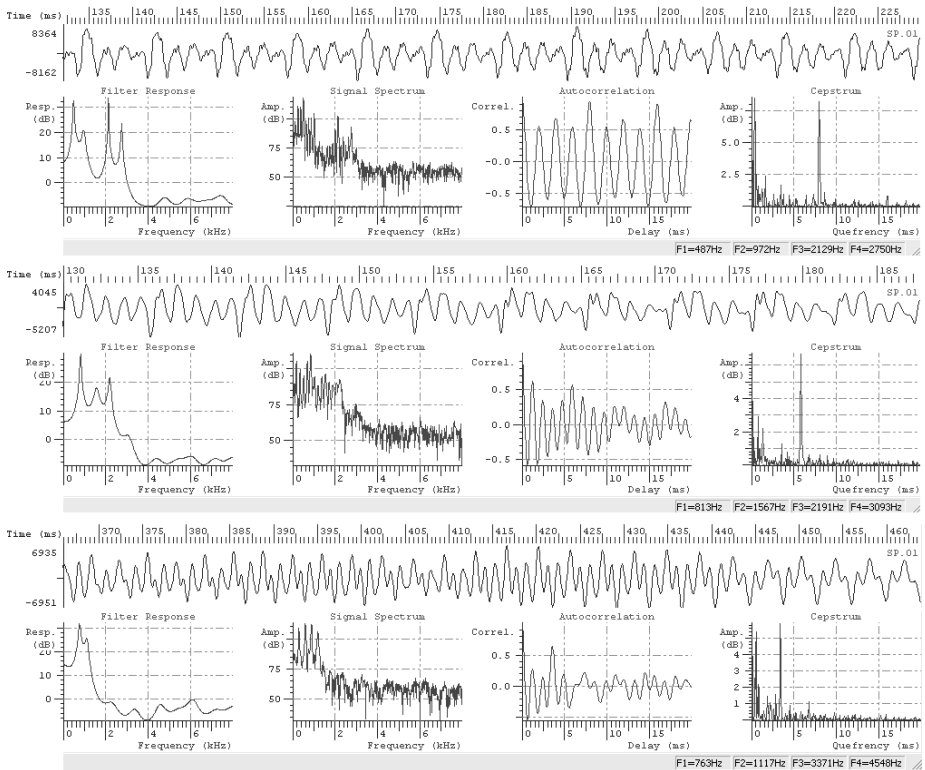


Fig. 3. Comparative measurement of vowel *a* from the same word uttered by low pitched voice Mefisto (top), neutral Faust (center) and falsetto voice Angel (bottom), uttered by B. Anderle. The LP filter response shows the formant positions. Dominant harmonics are evident from the signal spectrum. Autocorrelation function reflects the degree of periodicity and the dominant peak in cepstral function indicates the pitch period.

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The SFS software package [7] was used for some of the analyses (see Fig. 3.).

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