

Aspects of Resonance

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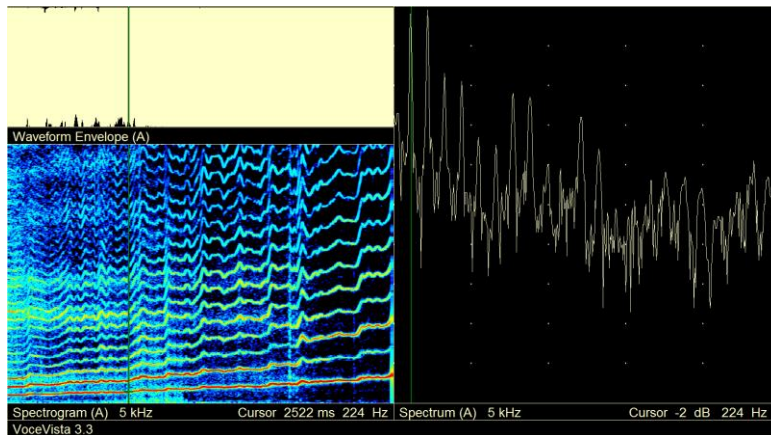
Abstract

A comparison has been made simultaneously of high speed films, acoustical analysis and overtone analysis with "VoceVista" and "Sygyt Ltd". The overtones software was compared with acoustical analysis. Till now formants from 1000 Hz-5000 Hz seems to be interesting using fundamental frequency of speech with 110Hz in males and 220 Hz in females. The variation of the 3 formants from 1000 Hz-5000 Hz was between 18-25% for normal persons. Glottal analysis tools from Erlangen showed no evidence of traditional acoustical voice analysis. With the new overtone analyzer (Sygyt Ltd.) we have a tool for measuring pathological voices combined with high speed films.

Material & Method

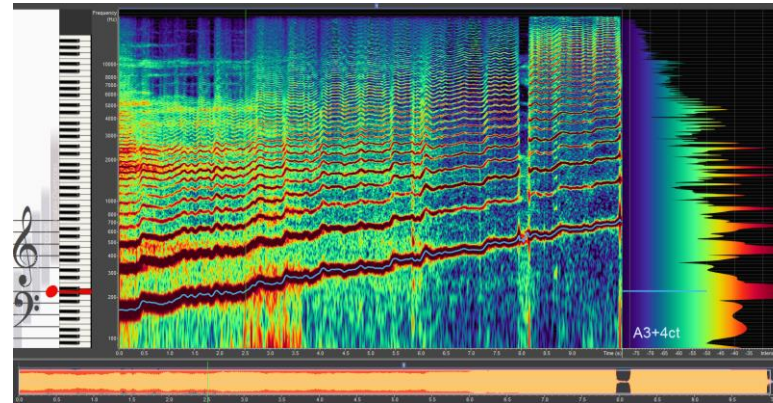
We have compared the "VoceVista" by Donald Miller with the newer software "Sygyt Ltd" which is easy to use and we have found them comparable. We compared 12 normal voices of persons without voice complaints with measures of "VoceVista" and "Sygyt Ltd". 12 persons were statistically enough in a prospective cohort study to characterize a normal material and it was used to identify major differences between the two systems.

Vocevista (up to 5000 Hz)



VERSUS

Overtone Analyzer (up to 20.000 Hz)



Results

Vocevista

Fx (Hz)	Fx (dB)	Fy (Hz)	Fy (dB)	Fz (dB)	Fz (dB)	Fx (Hz)	Fx (dB)	Fy (Hz)	Fy (dB)	Fz (Hz)	Fz (dB)
1546	38	2430	36	4662	23	1545	31	2433	35	4662	20
1558	28	2906	24	3886	16	1555	24	2874	33	3881	13
1113	38	2304	25	3525	18	1114	40	2304	20	3526	16
1552	48	2220	35	3766	25	1539	42	2201	26	3762	19
1762	30	2864	23	4350	14	1765	25	2869	22	4333	12
1762	29	2202	24	3929	24	1765	29	2201	21	3924	25
1768	19	3321	15	4247	17	1781	22	3321	23	4247	22
1624	22	2430	30	3243	30	1625	21	2470	25	3246	19
1576	28	2286	20	3122	20	1571	25	2255	22	3133	17
1546	35	2151	18	3327	20	1550	27	2131	21	3332	22
1251	20	2290	26	3868	22	1254	20	2217	24	3865	20
1095	28	3303	26	4079	24	1098	24	3305	23	4107	21

Overtone Analyzer – Sygyt Ltd.

Comparison

Nr.	Name	Gender	Age	Fo (Hz)	Fo (dB)	Fx (Hz)	Fx (dB)	Fy (Hz)	Fy (dB)	Fz (Hz)	Fz (dB)	Fz (dB)	
1	MP-B	K	75	220	-4	-1	-7	3	-1	862	0	-3	
2	ACA-B	K	25	220	-3	-3	-4	-32	9	-90	-5	-3	
3	LTC-B	K	40	220	0	1	2	0	-5	-1323	1	-2	
4	KJH-B	K	47	220	-2	-13	-6	-19	-9	-136	-4	-6	
5	SM-B	K	24	220	-4	3	-5	5	-1	188	-17	-2	
6	NBL-B	K	25	220	5	3	0	-1	-3	-143	-5	1	
7	AJ-B	M	24	110	0	13	3	0	8	932	0	5	
8	MSM-B	M	23	110	-2	1	-1	40	-5	-1152	3	-11	
9	BHA-B	M	22	110	6	-5	-3	-31	2	-898	11	-3	
10	MO-B	M	28	110	-4	4	-8	-20	3	-1523	5	2	
11	AH-B	M	16	110	6	3	0	-73	-2	141	-3	-2	
12	JJ-B	M	33	110	-4	3	-4	2	-3	28	28	-3	
				mean	1513.5	27.5	2548.42	245.833	3834.33	3834.83	188.333		
				sd	618.098	354.516	276.192	529.937	803.968	108.195	398.006		
				cv	0.40839	128.915	108.378	215.568	209.676	0.28214	211.331		
					0.75	-2.75	-10.5	-0.58333	-259.5	116.667	-2.25		
				Difference in percent of mean	0%	-10%	0%	-2%	-7%	0%	-12%		

Discussion and Conclusion

The results show that formant measures are possible routinely. A normal material has been presented with a variation of the 3 formants over 1000 Hz of 18-25%. Since the literature is calling for more evidence based studies, we refer to measuring the formants between 1000 Hz-5000 Hz in pathology. Formant analysis with the program "Sygyt Ltd." might be a tool not only for qualified singers, but also in pathology [1,2].

References

1. Pedersen M, Akram BH, Agersted AA (2015) Technology Advances in Diagnostics of Vocal Folds Function. Otolaryngology 5: 1-5.
2. Donald Gray Miller, (2008) Resonance in singing. Vocevista, Inside View Press.