

The "Dysphonia Severity Index"

Wuyts FL, De Bodt MS, Molenberghs G, Remacle M, Heylen L, Millet B, Van Lierde C, Raes J, Van de Heyning PH. (2000). The dysphonia severity index: an objective measure of hoarseness based on a multi-parameter approach. *J Speech Hear Res*, 43: 1-13.

From an article by Dominique Morsomme

The D.S.I. or the dysphonia severity index is a measurement developed by Wuyts and al (1998). It is an objective measure of voice quality based on a multi-parameter approach. The D.S.I. is based on the weighted combination of the following selected set of voice measurements : highest frequency (F₀High in Hz), lowest intensity (I-Low in dB), maximum phonation time (MPT in s), and jitter (%). The equation for the index is constructed as follows:

$$DSI = 0.13 \times MPT + 0.0053 \times F_0\text{High} - 0.26 \times I\text{-Low} - 1.18 \times \text{Jitter} (\%) + 12.4.$$

The parameters chosen for the calculation of the D.S.I. were determined using a "stepwise logistic regression" procedure. The authors justify their use of the highest fundamental frequency by the fact that in 50% of dysphonia cases, the vocal folds present an excess mass of tissue. This mass on the vocal folds hampers vibrations, particularly at the highest frequencies. Consequently, the highest fundamental frequency decreases. In patients presenting dysphonia, there is an increase in glottal resistance and therefore greater pressure is necessary for vocal fold vibration and for maintaining the vibration. The result is a reduction in the lowest intensity. The jitter is a variable which, to a certain extent, reflects the degree of irregularity of the vocal fold. The maximum phonation time reflects the efficiency of mechanisms which are needed for vocal production; for example, subglottal pressure, airflow resistance and vocal fold closure. The author points out that these four variables are all clear signs of dysphonia.

The D.S.I. for perceptually normal voices equals +5 and for severely dysphonic voices -5. The more negative the patient's index, the worse his or her vocal quality. This index reflects the multidimensional character of the voice. It can be reproduced and correlated with the opinion of the clinician.

The D.S.I. therefore completes the examination of a dysphonic patient. De Bodt (1997) consequently describes a four-part examination: the examination of the larynx, the perceptual examination (G.R.B.A.S), the examination of the patient (V.H.I) and the D.S.I.

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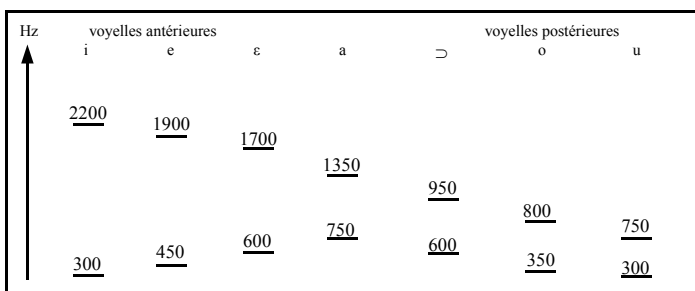
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FRANCE	ut	ut# réb	ré	ré# mib	mi fab	mi# fa	fa# solb	sol	sol# lab	la	la# sib	si utb	si# ut
U.S.A.	C	C# Db	D	D# Eb	E	F	F# Gb	G	G# Ab	A	A# Bb	B	B# C
ALLEMAGNE	c	c is d es	d	d is e es	e f es	e is f	f is g es	g	g is a es	a	a is b	h c es	h is c

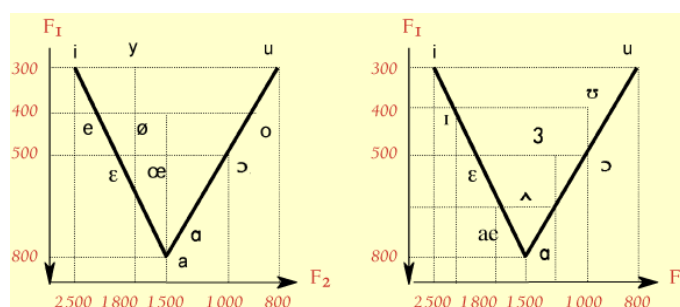
Tableau de représentation des notes de musique occidentales selon le pays

Octaves	0	1	2	3	4	5	6	7	8
ut	32.7	65.4	130.8	262	523	1047	2093	4186	8372
ut# ou réb	34.6	69.3	138.6	277	554	1109	2217	4435	8870
ré	36.7	73.4	146.8	294	587	1175	2349	4699	9397
ré# ou mib	38.9	77.8	155.6	311	622	1245	2489	4978	9956
mi	41.2	82.4	164.8	330	659	1319	2637	5274	10548
fa	43.7	87.3	174.6	349	698	1397	2794	5588	11175
fa# ou solb	46.2	92.5	185.0	370	740	1480	2960	5920	11840
sol	49.0	98.0	196.0	392	784	1568	3136	6272	12544
sol# ou lab	51.9	103.8	207.7	415	831	1661	3322	6645	13290
la	55.0	110.0	220.0	440	880	1760	3520	7040	14080
la# ou sib	58.3	116.5	233.1	466	932	1865	3729	7459	14917
si	61.7	123.5	246.9	494	988	1976	3951	7902	15804

Tableau des fréquences en Hz selon la note et l'octave



Valeur formantielle de quelques voyelles françaises



Triangle vocalique du français et de l'anglais

D'après WOISARD Virginie

In : Moyens d'investigation et pédagogie de la voix chantée. CORNUT et al - Editions Symétrie - Lyon - 2002

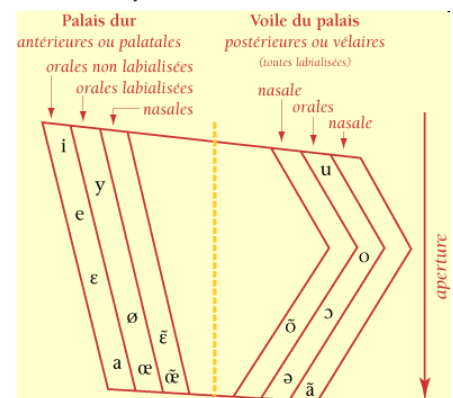
Age	Parole spontanée (Hz)	Lecture (Hz)	Lecture projetée (Hz)
7	256,82	265,41	
8	262,06	278,24	
9	249,20	274,65	
10	250,37	274,52	
11	241,15	277,40	305,45
12	229,75	261,60	284,15
13	237,19	261,24	291,81
14	219,25	234,70	273,50
15	226,20	242,00	266,55
16	217,65	240,35	282,80
17	213,80	234,15	262,35
18	222,43	236,14	227,43
19	213,30	228,90	248,05
20/29	217	240	282
30/39	189	215	253
40/49	188	211	258
51/60	184,89	200,53	233,21
61/70	179,55	192,50	216,32
71/80	181,17	190,00	218,57

Valeurs moyennes du fondamental laryngé chez la femme de 7 à 80 ans, pour chaque activité vocale, en français.

Age	Parole spontanée (Hz)	Lecture (Hz)	Lecture projetée (Hz)
7	260,80	274,28	
8	258,12	274,49	
9	244,03	273,62	
10	240,84	271,13	
11	227,67	260,86	293,05
12	233,60	259,50	299,90
13	185,65	213,70	234,75
14	166,60	181,80	204,35
15	138,39	152,52	175,35
16	123,05	141,45	160,85
17	114,05	125,71	150,43
18	125,60	134,45	160,00
19	118,40	130,30	144,80
20/29	108	118	153
30/39	108	118	160
40/49	106	121	152
51/60	104,37	117,39	143,93
61/70	109,79	121,64	153,76
71/80	111,33	123,03	139,37

Valeurs moyennes du fondamental laryngé chez l'homme de 7 à 80 ans, pour chaque activité vocale, en français.

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 Mémoires d'orthophonie réalisés sous la direction du Docteur Guy CORNUT



Trapèze vocalique des voyelles du français selon STRAKA