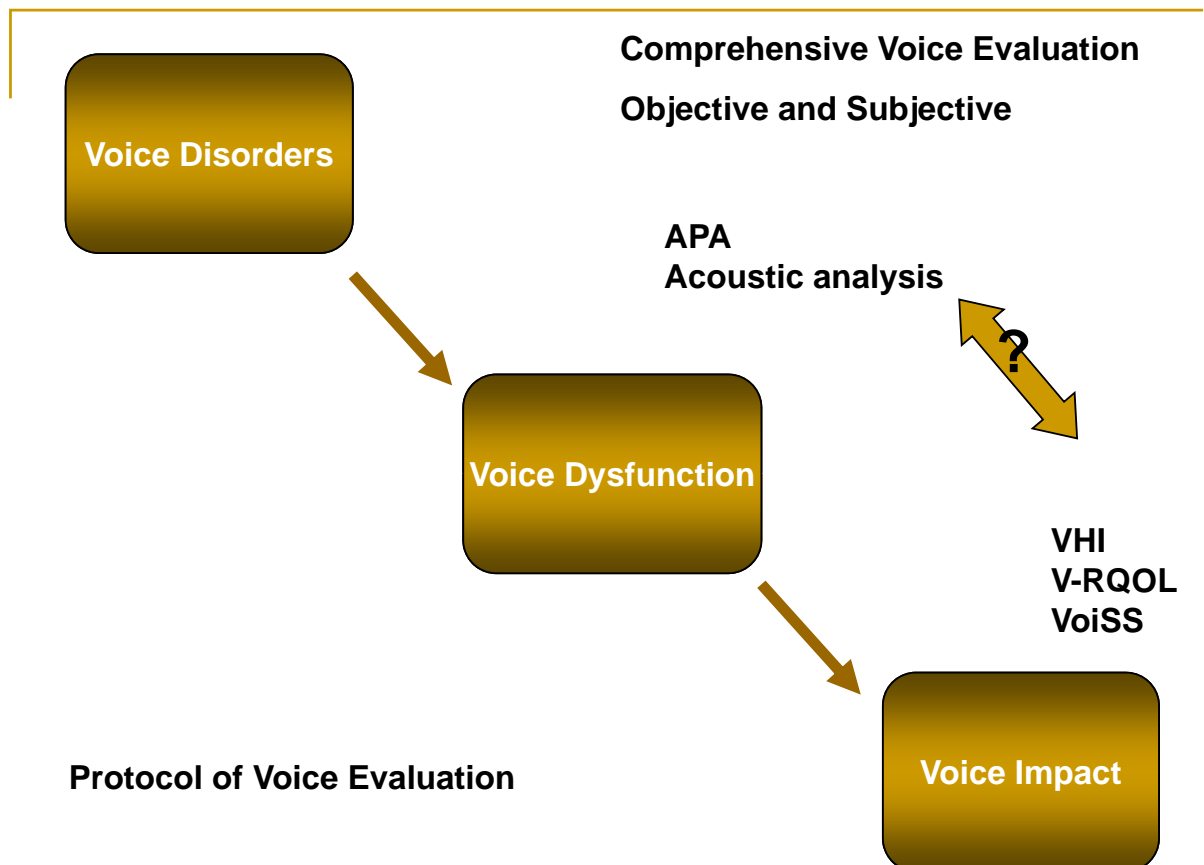


The Relationship Between Subjective Self-rating And Objective Voice Assessment Measures

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Aim of the Study

- Evaluate the relationship between patient self rating voice assessment and the objective voice measures.

- Subaims:
 - Validation of a self rating voice scale, reflecting main complaints and voice impact and quality of life.
 - Evaluate the reliability of objective measures including the Dysphonia Severity Index in reflecting the severity of voice change.
 - Determine the correlation between patient self rating voice assessments and the objective voice measures.

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Subjects

- Pilot study.
- Subjects:
 - Patients having voice disorders
 - Control (no voice complaints)

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Methodology:

Protocol of Voice Assessment ¹

■ Elementary diagnostic Procedures:

- Patient's interview
- Auditory perceptual assessment

■ Clinical diagnostic aids:

- Augmentation and documentation of the glottis using:
 - Videolaryngostroboscopic examination.
- Voice recoding

■ Additional diagnostic measures:

- Acoustic Analysis (Multi Dimensional Voice Program and Visipitch).
- Aerodynamic measures: (Voice Function Analyzer Aerophone II).

1.Kotby MN. 1986, Voice Disorders ,Recent Diagnostic Advances. Egyptian Journal of Otolaryngology, 3(1), 69.

Voice Quality Assessment

Quasiobjective: Auditory Perceptual Assessment (GRBAS)¹

- Seven judges: Interrater Reliability
 - G (Alpha=0.948, Correlation coefficient r=0.731)
 - R (Alpha=0.889, Correlation coefficient: r=0.881)
 - A (Alpha=0.427, Correlation coefficient: r=0.444)
 - S (Alpha=0.774, Correlation coefficient: r=0.751)

Objective Voice Measures

- Acoustic Measures (MDVP)

Aerodynamic Measures

Dysphonia Severity Index (DSI)²

- $(0.13 * \text{MPT}) + (0.0053 * \text{F0-high}) - (0.26 * \text{I-low}) - (1.18 * \text{jitter}) + 12.4$

1.Hirano M Clinical Examination of voice. Wein; New York: Springer;1981

2.Wuyts F.et al.(2000).The Dysphonia Severity Index: An Objective Measure of Vocal Quality bases on Multiparametric Approach. JSHR 43,796-809.

Voice Problem Self-rating Scale (VPSS)

- 40 Questions
- Scale: five-point scale
- Four Clusters:
 - Functional
 - Physical
 - Emotional
 - Phonasthenic
- Total score

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Reliability of VPSS

	Cronbach's alpha	Correlation coefficient
Functional	.922	.881
Physical	.712	.573
Emotional	.912	.944
Phonasthenic	.903	.824
Total	.854	.756

Alpha:>0.7 acceptable, >0.8 good and >0.9 excellent
Reliability coefficient = <0-0.25 weak, 0.25-0.75 moderate reliability, 0.75-<1strong
reliability and 1 is optimum.

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Internal Consistency and Item to total Consistency of VPSS

	Functional	Physical	Emotional	Phonasthenia
Physical	.852 (**)			
Emotional	.892 (**)	.878 (**)		
Phonasthenia	.559 (**)	.763 (**)	.679 (**)	
Total	.680 (**)	.961 (**)	.951 (**)	.810 (**)

**Correlation is significant at the 0.01 level (2-tailed).

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Convergent Validity with VHI⁽¹⁾

VHI \ VPSS	Social	Physical	Emotional	Total VPSS
Social	.902(**)	.804(**)	.842 (**)	
Physical	.714(**)	.898(**)	.772(**)	
Emotional	.835(**)	.829(**)	.935(**)	
Total VHI	Pearson's Correlation VHI and Total VPSS $r=.931$ $p=.000$			

** Correlation is significant at the 0.01 level (2-tailed)

(1)Jacobson, P ey al(1997): The voice Handicap Index (VHI): Development and Validation. American Journal of Speech-Language Pathology 6,66-70.

-
- Data management of:
 - APA(GRBAS)
 - MDVP: Acoustic parameters
 - Aerodynamic parameters
 - DSI
 - VPSS

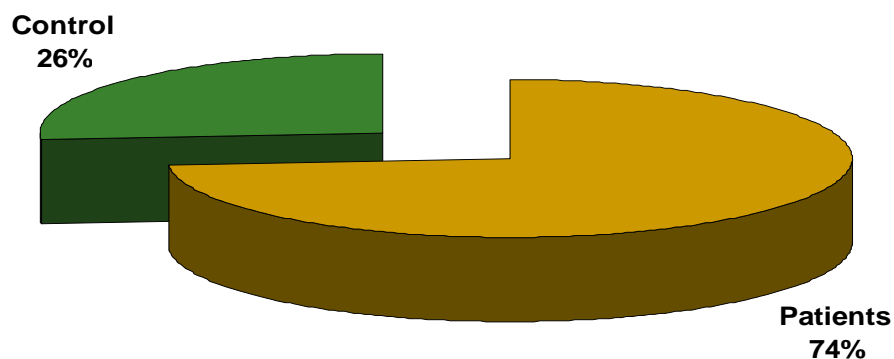
Statistical Analysis

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Results

Pilot study

Distribution of Studied Group

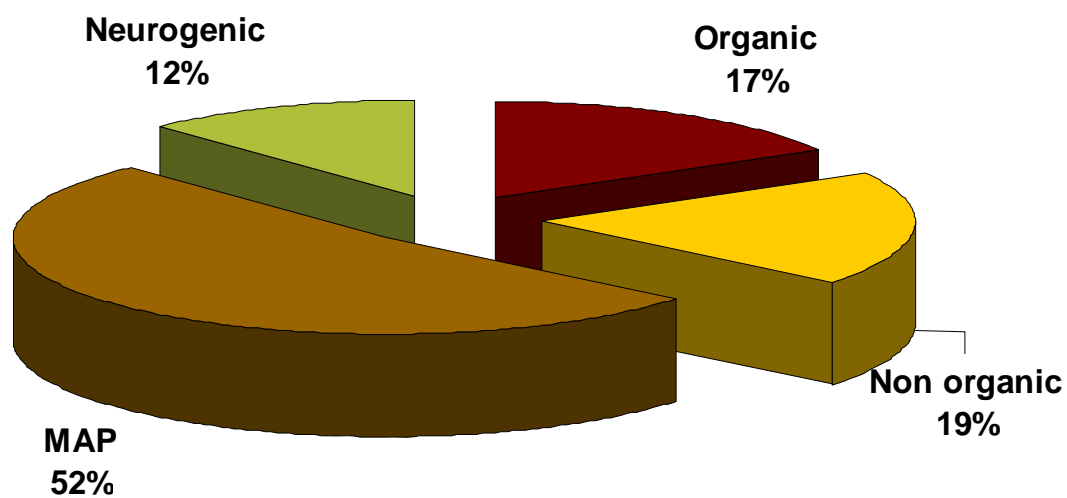


Control: Age: 36.4 ± 9.42

Patient: Age: 40.07 ± 14.92

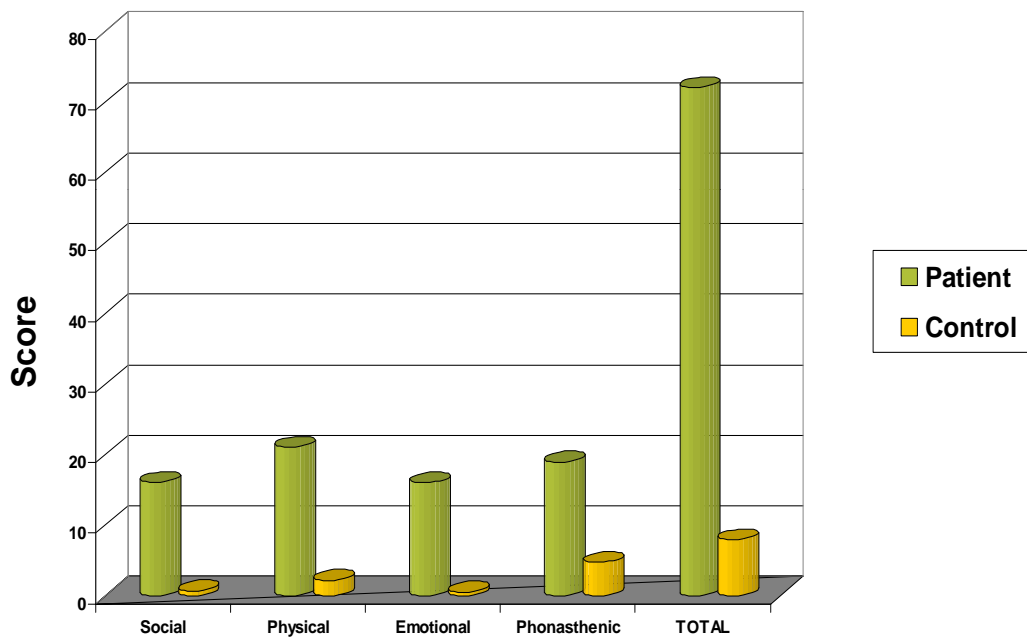
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Voice Categorical Distribution



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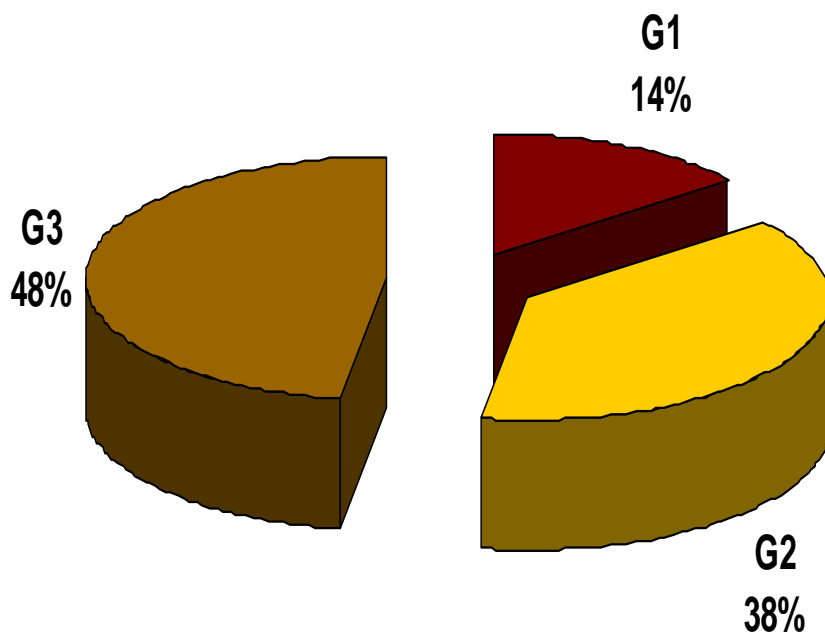
Patients Vs. Control



VPSS

VPSS mean scores were significantly different between Patients and Control

Distribution according to degree of Dysphonia



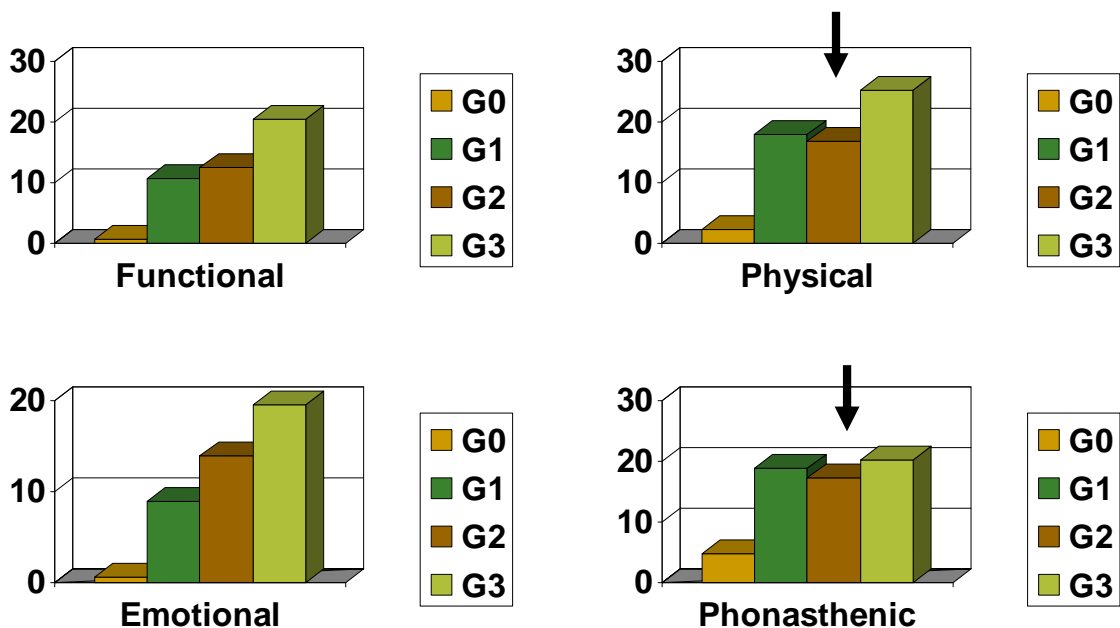
VPSS & GRBAS

	Functional	Physical	Emotional	Phon- asthenic	TOTAL
G	r=0.744** p=0.000	r=0.680** p=0.000	r=0.727** p=0.000	r=0.668** p=0.000	r=0.646** p=0.000
R	r=0.690** p=0.000	r=0.773** p=0.000	r=0.688** p=0.000	r=0.713** p=0.000	r=0.783** p=0.000
B	r=0.079 p=0.000	r=0.238 p=0.075	r=0.186 p=0.166	r=0.373* p=0.004	r=0.230 p=0.055
A	r=0.330* p=0.012	r=0.335* p=0.011	r=0.257* p=0.057	r=0.315* p=0.017	r=0.333* p=0.010
S	r=0.628** p=0.000	r=0.660** p=0.000	r=0.532** p=0.000	r=0.514** p=0.000	r=0.642** p=0.000

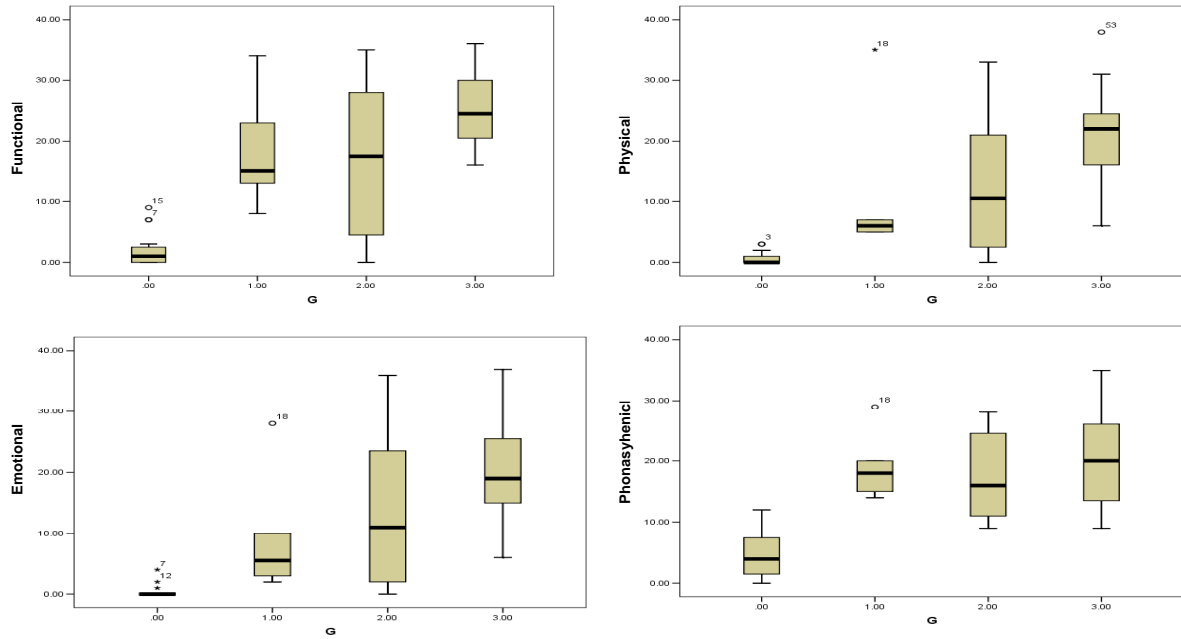
*Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

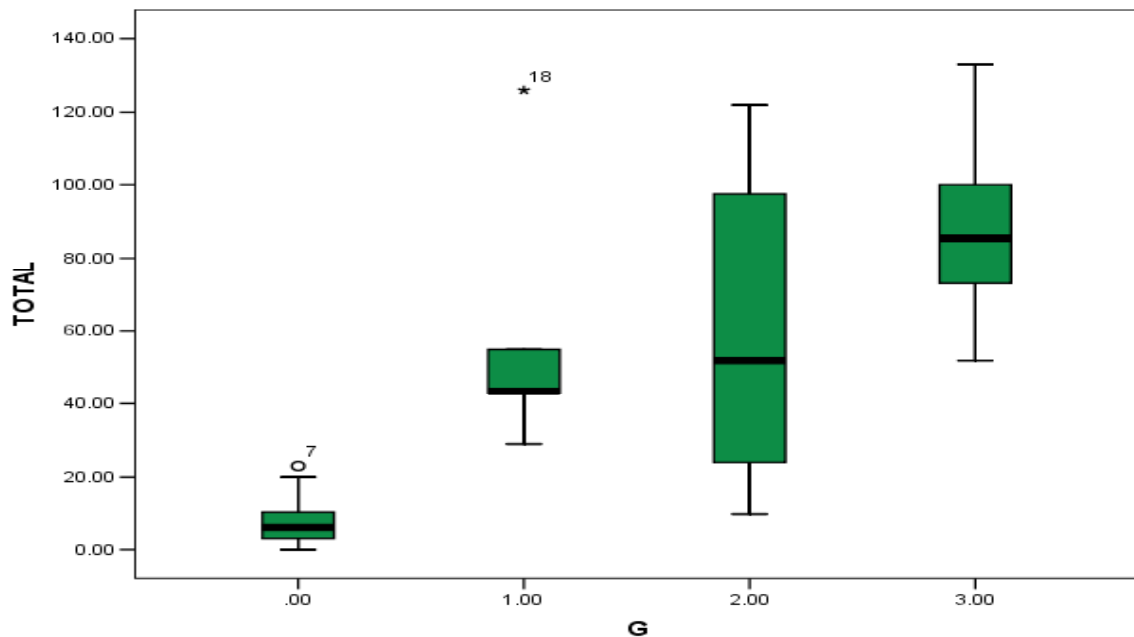
VPSS Clusters and Grade of dysphonia (G)



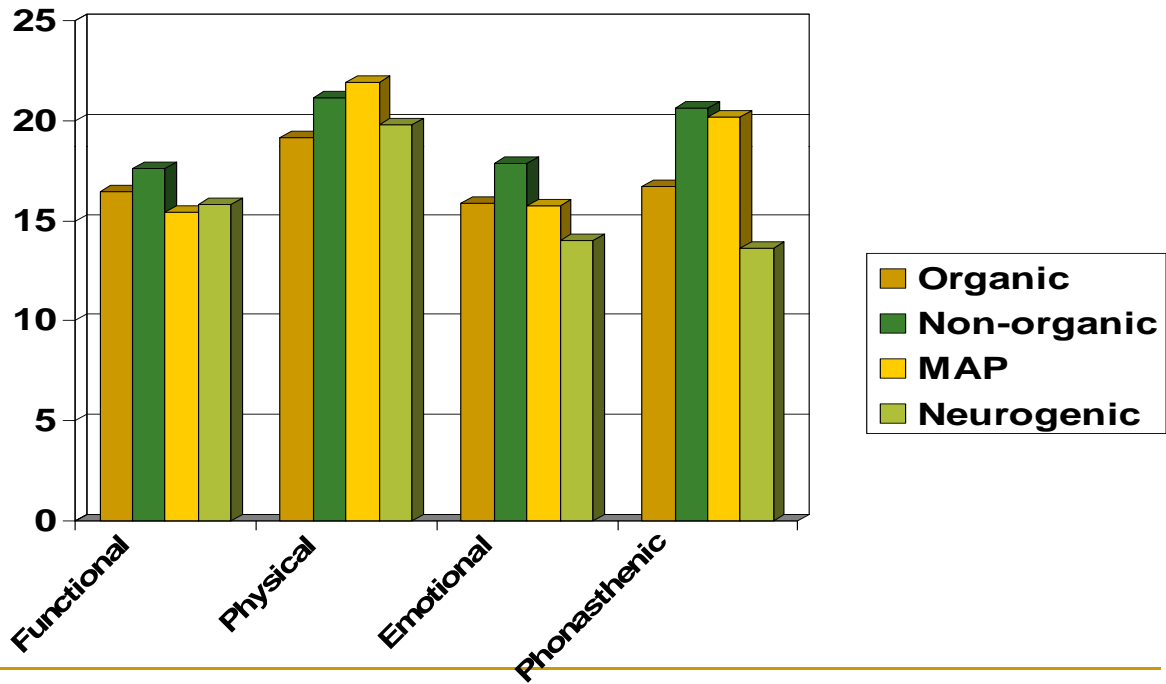
Boxplots for VPSS Clusters and G



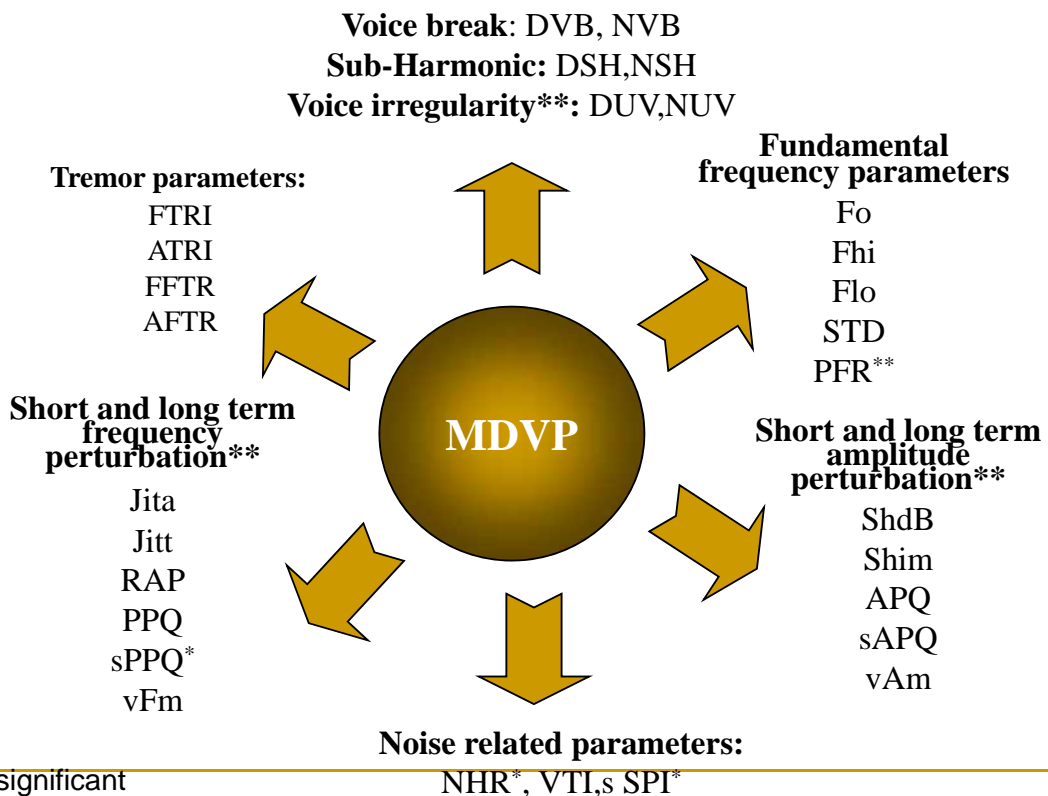
Boxplot For Total VPSS Score and G



VPSS in Various Voice Disorders



Acoustic Parameters: Patients Vs Control



*p<0.05 significant

**p<0.001 highly significant

Aerodynamic Measures: Patients vs control

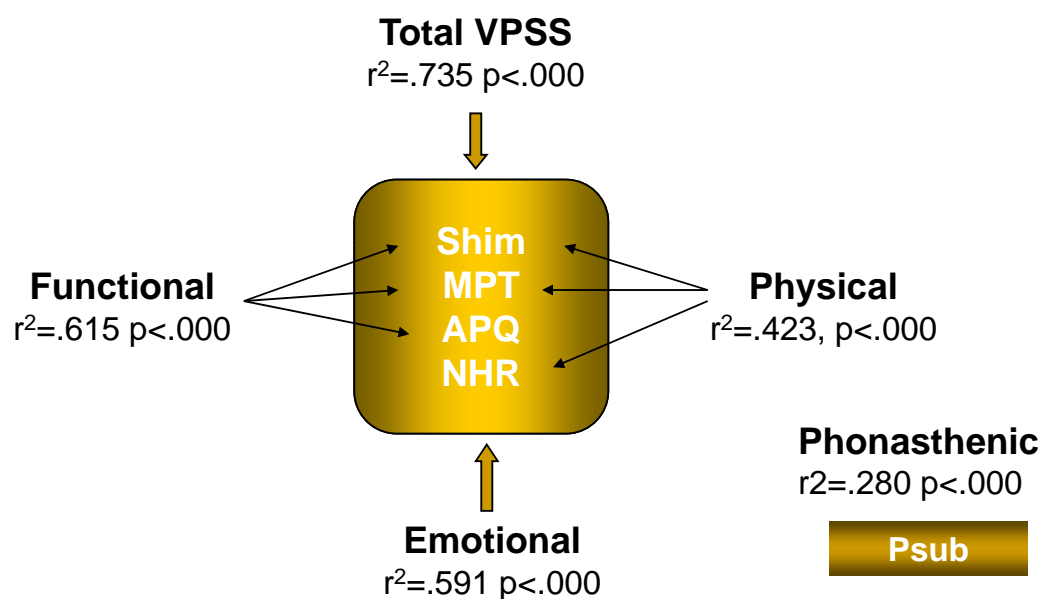
	t	P
MPT	3.526	.001
Max SPL	-3.420	.001
Phon SPL	-4.455	.001
Psub	3.482	.001
Mean Power	3.328	.002

Significant at $p = < 0.05$

Highly significant at $p = < 0.001$

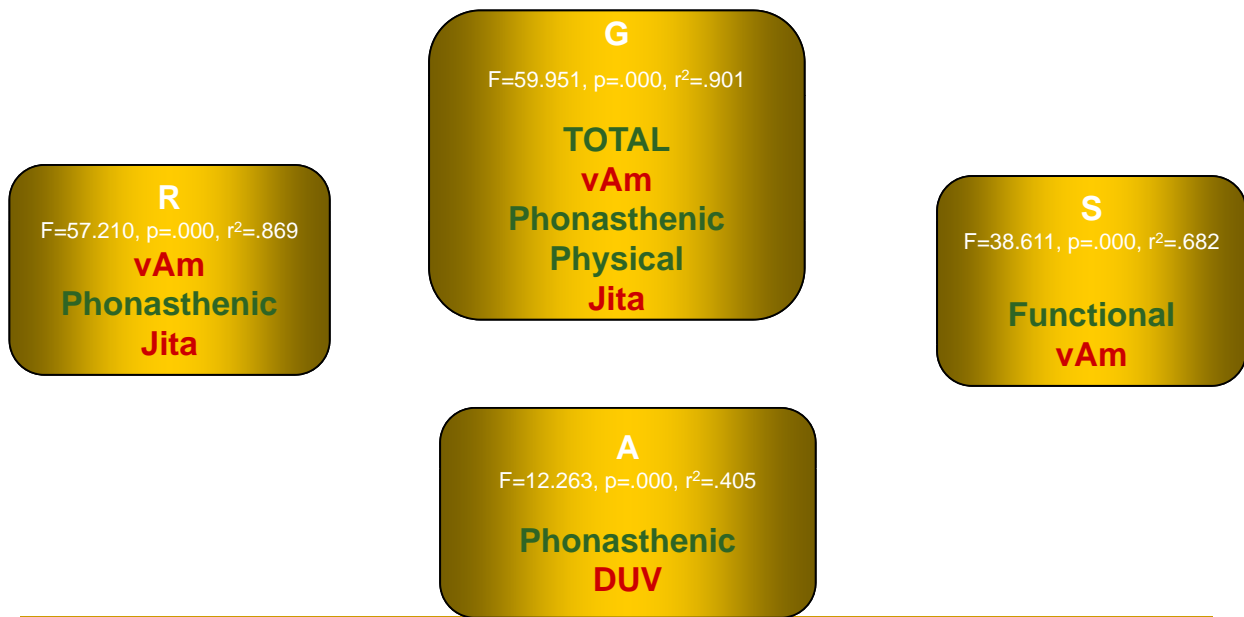
T-test

Predictor Parameters VPSS & Acoustic and Aerodynamic Measures



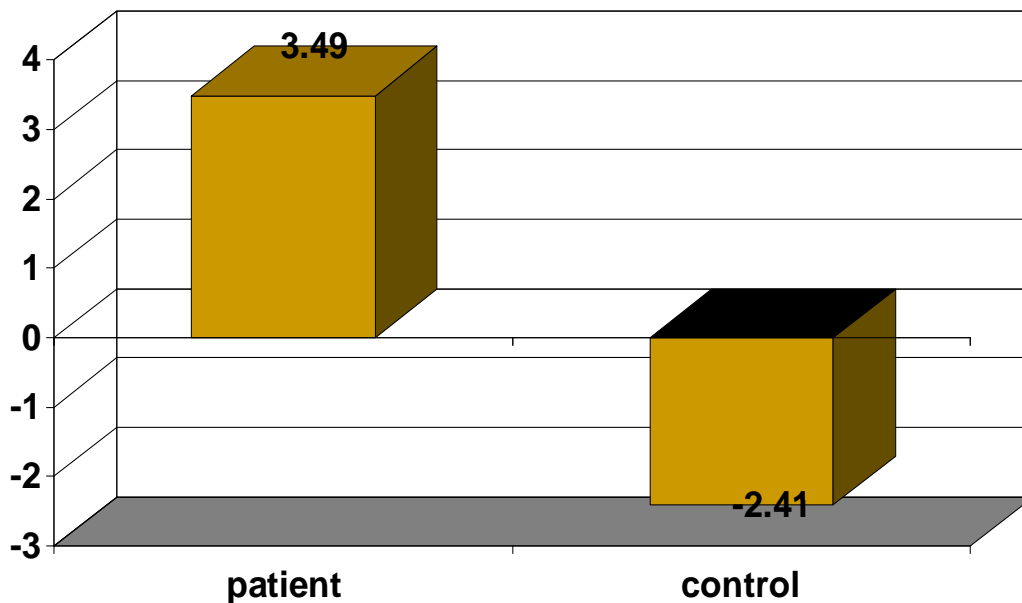
Stepwise Multiple Regression

Predictor Parameters: Acoustic measures and VPSS &



Stepwise multiple regression

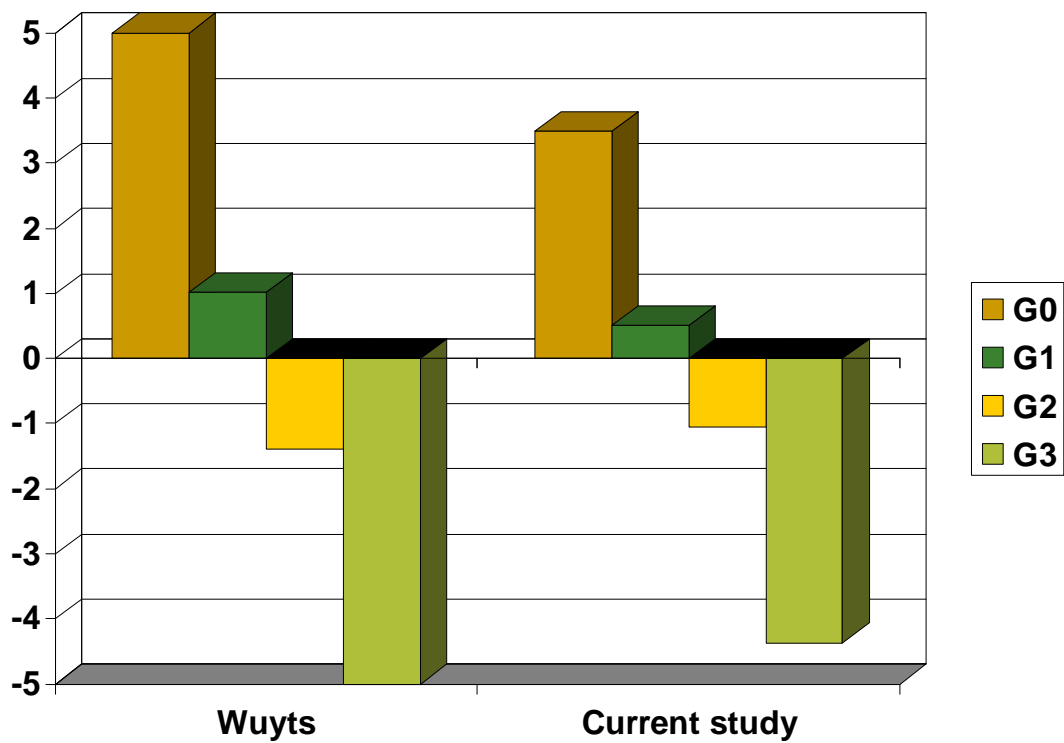
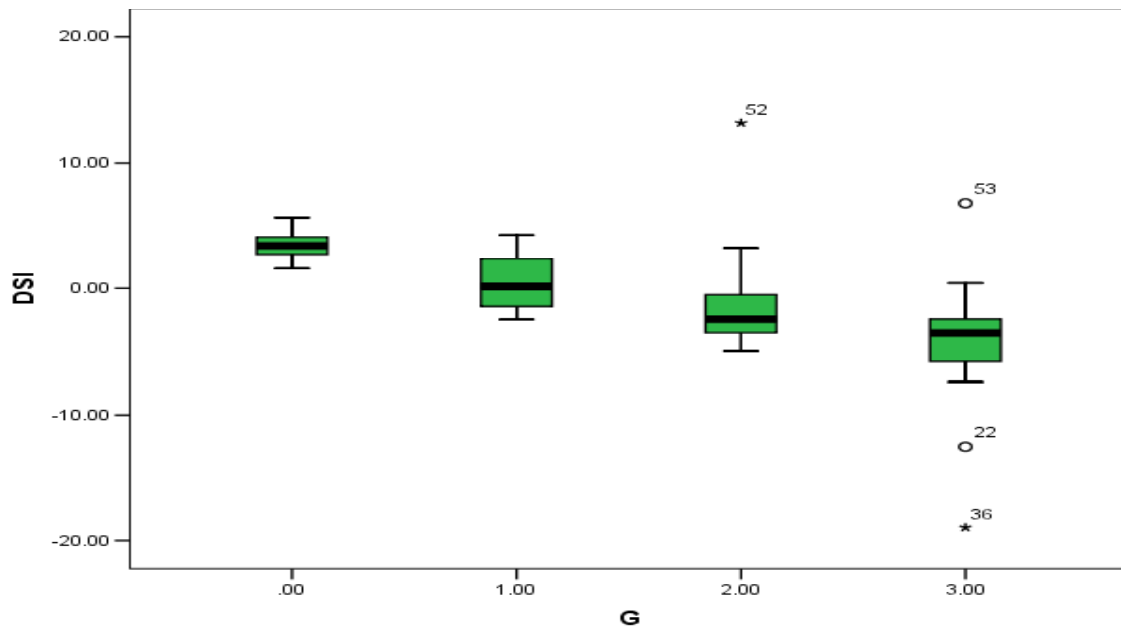
Dysphonia Severity Index: Patient Vs Control



t- value= 4.676, p=.000

Highly significant p=<0.001

Bloxplot For DSI and G



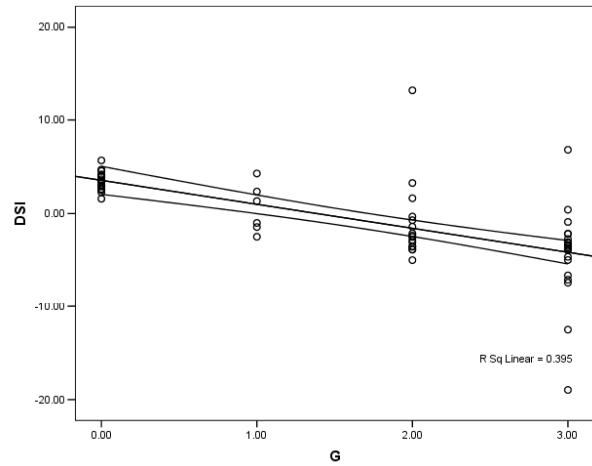
Wuyts F. et al. (2000). The Dysphonia Severity Index: An Objective Measure of Vocal Quality based on Multiparametric Approach. JSHR 43,796-809

DSI & GRBAS

- ANOVA

- F=11.772 P=.000

- Pearson's correlation

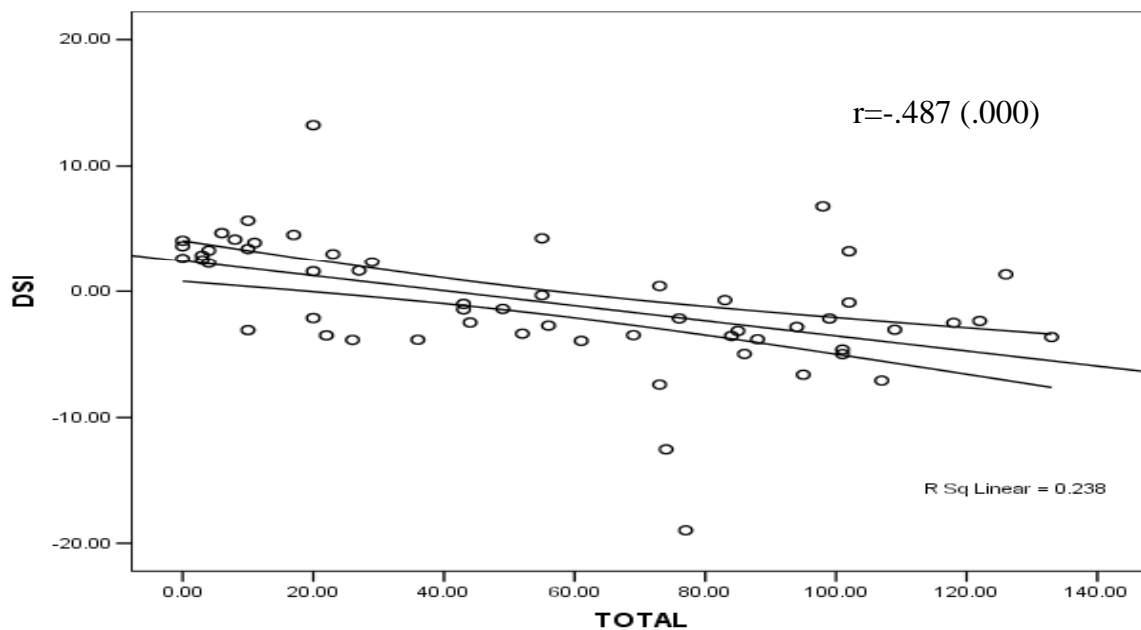


	G	R	B	A	S
DSI	r=0.628** p=0.000	r=0.680** p=0.000	r=0.307* p=0.000	r=0.452** p=0.000	r=0.567** p=0.000

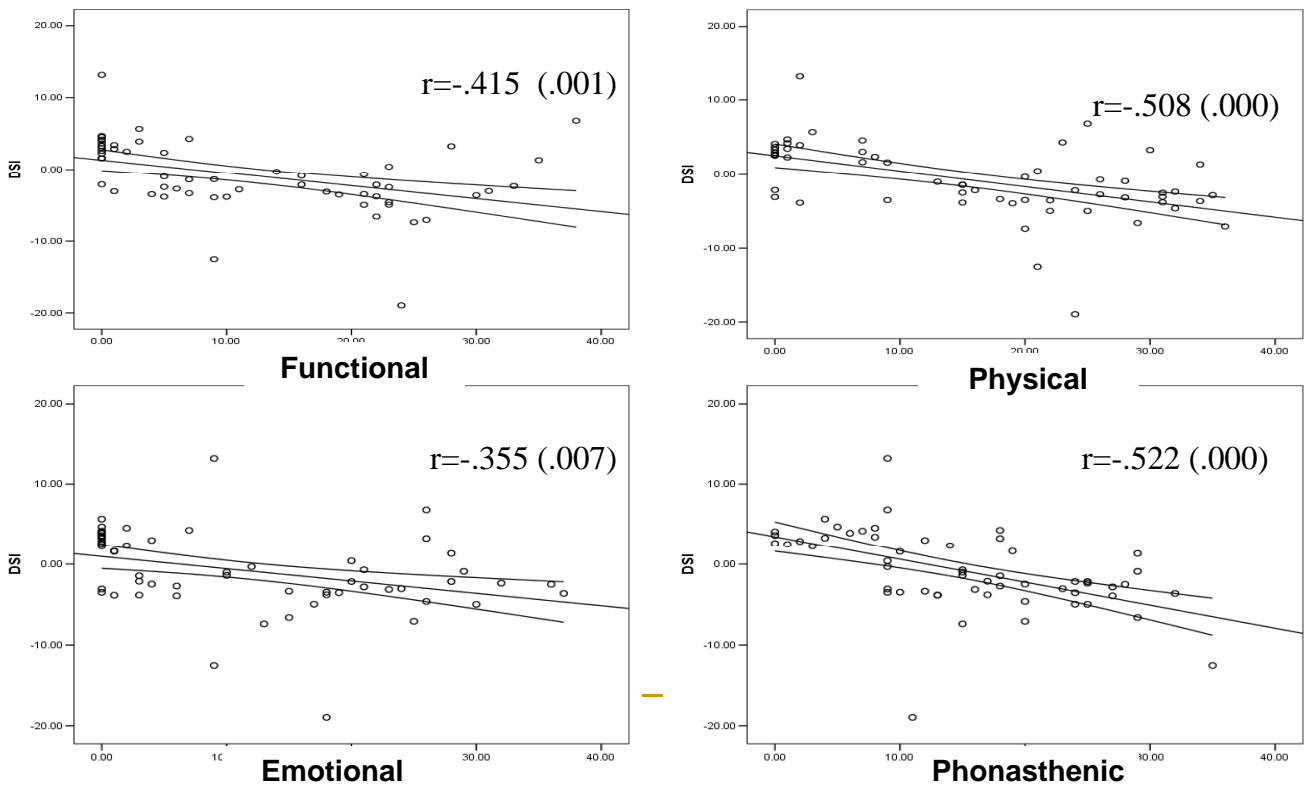
*Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

DSI & Total Score of VPSS



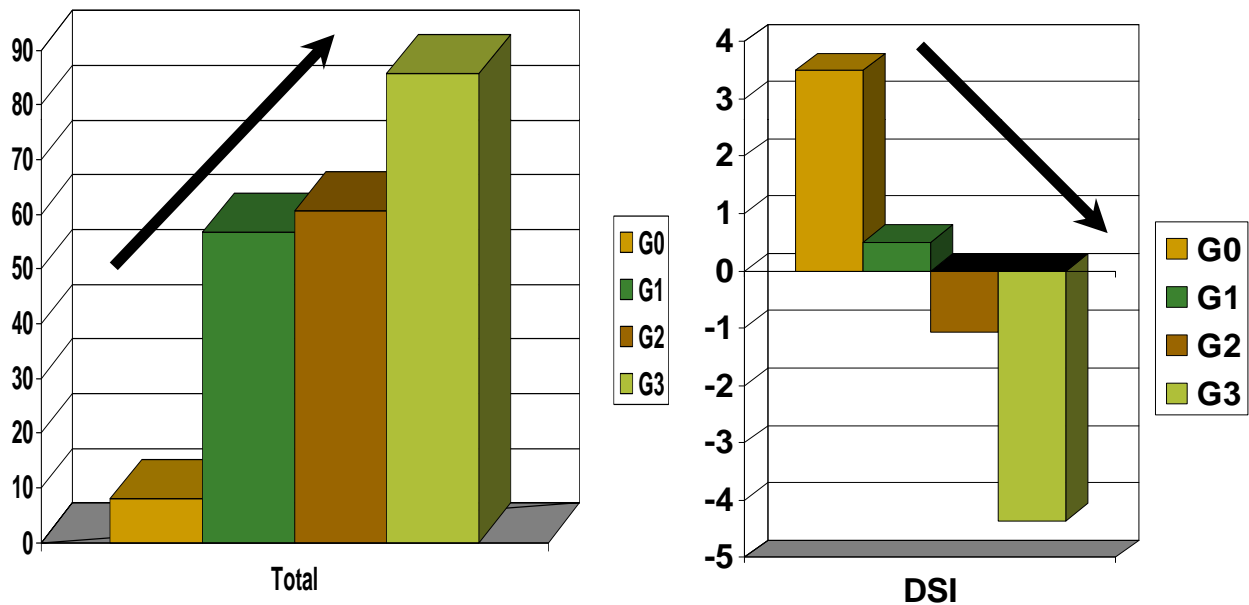
DSI & VPSS Clusters



Conclusion

- VPSS reflects impact of the problem on the patient. It is related to the overall grade of severity, roughness and strained quality of voice.
- VPSS is highly reflecting voice problems in both non-organic and minimal associated pathological lesions.
- Acoustic (Shim, APQ and NHR) and aerodynamic measures (MPT) contributed to Total VPSS and emotional Clusters Scores. Physical and functional clusters shared various combinations of these variables. Psub was the only predictor variable for Phonasthenic clusters scores.

Total VPSS Scores and DSI

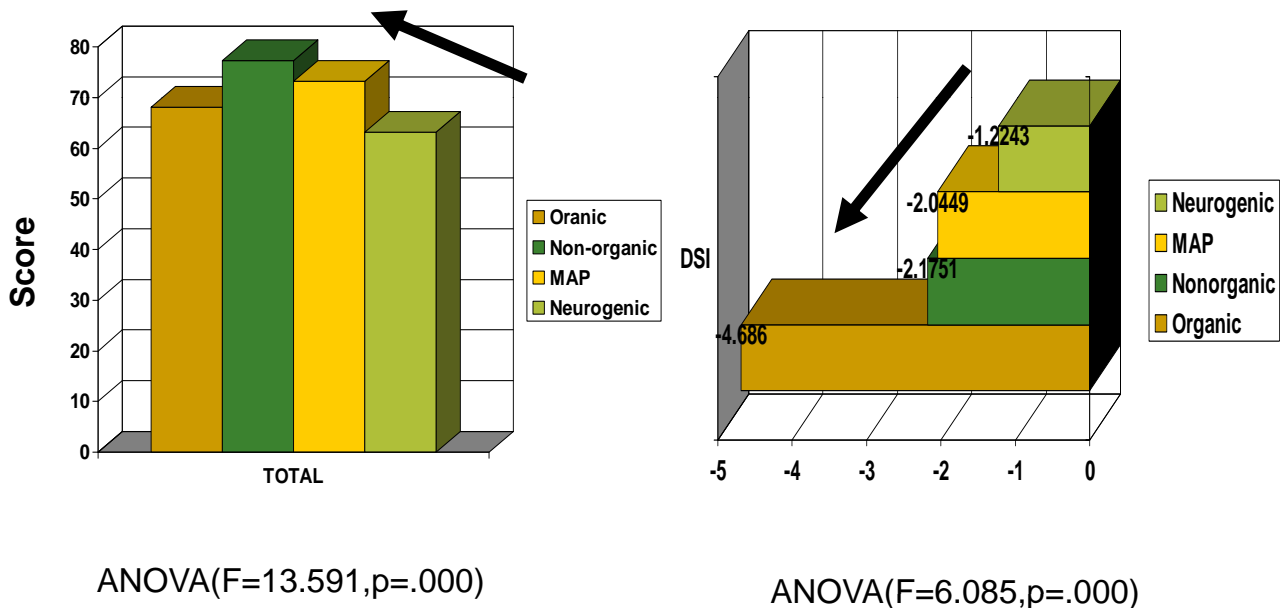


ANOVA. $F=24.733$, $p=.000$

Conclusion

- DSI significantly differentiate between patient and control and is significantly correlated to overall grade of dysphonia.
- DSI moderately correlates with Clusters of VPSS in particular physical and phonasthenic Cluster.
- DSI and VPSS may differentiate some of the voice disorders.

Mean Total Scores of VPSS in Various Voice Disorders



Recommendation

- VPSS is recommended as a tool for evaluating impact of voice problem.
- VPSS and DSI should be conducted on large dysphonic population having different vocal demands with different emotional and personality characters.
- Self rating scales should be integrated with objective measures for voice evaluation to develop a voice severity scoring scale.

Thank you

