

Severity Cutoffs for Perceptual Voice Qualities

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What is a Voice Disorder

A voice disorder (dysphonia) occurs when an individual's vocal quality, pitch, and/or loudness are insufficient for their daily needs (ASHA, n.d.). To determine the presence and characteristics of a voice disorder, various assessments are conducted including **auditory perceptual**, visual perceptual, acoustic, and aerodynamic measurements.

Consensus Auditory-Perceptual Evaluation of Voice (CAPE-V)

The CAPE-V is a visual analog scale that numerically rates various vocal qualities along a continuum from 0-100 based on what the experienced listener hears. It is used to describe the severity of a voice problem based on auditory-perceptual attributes. Attributes include: **Overall Severity**, **Breathiness**, **Roughness**, **Strain**, and **Pitch/Loudness**.

Purpose

For the purpose of our research, we focused on determining cutoff ranges for auditory perceptual measurements made on a visual analog scale (VAS). Since VAS are continuous, comparisons to categorical scales are necessary to determine boundaries of different severities (normal vs. mild; mild vs. moderate, etc.).

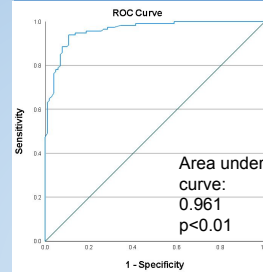
Research Question

What are the CAPE-V cutoff ranges which indicate normal, mild, moderate, and severe severities for overall severity and breathiness?

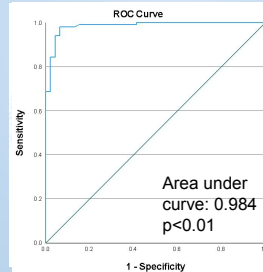
Methods

- We analyzed 296 voice samples from the Perceptual Voice Qualities Database (Walden, 2020) representing a wide range of ages and severities of dysphonia.
- Ratings for the samples were completed using the CAPE-V and the GRBAS scale (a scale that allows categorization of severity) by experienced listeners as part of the PVQD.
- Ratings from both scales were used to determine the cut-off points that maximized a balance between sensitivity and specificity.

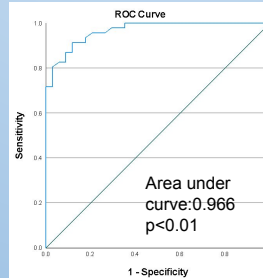
Overall Severity



Normal to Mild

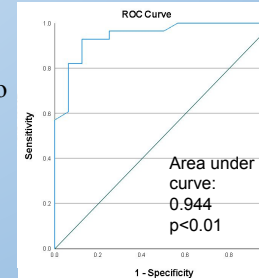
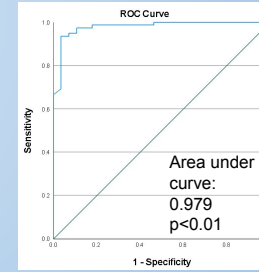
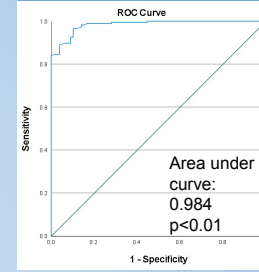


Mild to Moderate



Moderate to Severe

Breathiness



Data Analysis

We employed the Receiver Operating Characteristic (ROC) statistical procedure to develop cut off scores.

The results provided numerical ranges for normal, mild, moderate, severe rating in overall severity of voice disturbances, as well as the vocal quality breathiness.

Discussion

The cut-off values determined by the analysis can be used clinically to better communicate with clients, families, peer professionals, and third party payers. The ranges for overall severity are: normal 0-15, mild 16-39, moderate 40-69 and severe 70-100. The ranges for breathiness are: normal 0-14, mild 15-34, moderate 35- 68 and severe 69-100.

An area under the curve measurements greater than 0.9 is considered excellent, greater than 0.8 is considered good, greater than 0.7 is considered fair and greater than 0.6 but less than 0.7 is considered poor. **All are excellent.**

Use of the cut-off scores allows speech clinicians to use one measure that can provide both a high level of specificity as well as provide categories of severity. This helps patients and third party payers better understand vocal pathology severity levels to document impairment as well as progress in therapy.

Selected References

American Speech-Language-Hearing Association. (n.d.). *Voice Disorders*. (Practice Portal). Retrieved February, 28, 2023, from www.asha.org/Practice-Portal/Clinical-Topics/Voice-Disorders/.

Walden, Patrick R. (2022). "Perceptual Voice Qualities Database (PVQD)", Mendely Data, V4, doi: 10.17632/9dz247gnyb.4

Consensus Auditory-Perceptual Evaluation of Voice (CAPE-V)

Name: _____ Date: _____

The following parameters of voice quality will be rated upon completion of the following tasks:

- Sustained vowels, 'a' and 'i' for 3-5 seconds duration each.
- Spontaneous production:
 - The blue area is on the key again.
 - How loud did he hit him?
 - He was only a year old.
- Spontaneous speech in response to: "Tell me about your voice problem." or "Tell me how your voice is functioning."
- We eat eggs every Easter.
- We usually make brown souffles.
- Fred will keep it for you.
- Fred will keep it for you.

Legend: C = Continuous I = Intermittent
 M = Mildly Deviant MO = Moderately Deviant
 S = Severely Deviant

Overall Severity _____ C I _____ /100

Roughness _____ C I _____ /100

Breathiness _____ C I _____ /100

Strain _____ C I _____ /100

Pitch (Indicate the nature of the abnormality): _____ C I _____ /100

Loudness (Indicate the nature of the abnormality): _____ C I _____ /100

_____ C I _____ /100

_____ C I _____ /100

COMMENTS ABOUT RESONANCE: NORMAL OTHER (Provide description): _____

ADDITIONAL FEATURES (for example, dysphonia, fry, falsetto, asthma, aphonia, pitch instability, tremor, nasality, or other relevant features): _____

Clinician: _____

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