Voice Turbulence Index (VTI) is a component of the Kay Elemetrics Multidimensional Voice Program (MDVP). It provides a quantitative index of breathiness. VTI is an average ratio of the spectral inharmonic energy between 2800-5800 hertz (breath noise) and the spectral harmonic energy between 70-4500 hertz. (vocal fold vibration and associated harmonics) (Kay Elemetrics Corp, 2005).

This study established normative data for VTI because it is a somewhat experimental tool for voice analysis and normative data for this parameter have not been reported in the literature. VTI may be of interest for clinical assessment since breathiness is a common feature of disordered voices. Although VTI is not necessarily expected to correspond directly with perceptual judgments, a recent study by Bhuta, Patrick, and Garnett (2004), found that VTI was one of only a few acoustic parameters that correlated with perceptual voice ratings using the GRBAS scale (specifically, grade).

Subjects were mostly college-aged students who were enrolled in various undergraduate courses. Selection criteria included:
1. No history of recurring hoarseness or other voice problems.
2. Medical history free of any voice-related diagnoses.
3. Perceptually normal voice as judged by the examiner and a speech/language pathology student using the Consensus Auditory Perceptual Evaluation of Voice (CAPE-V).

Subjects n Mean (yrs.) Range
Men 12 22.2 19-24
Women 20 22.8 17-22

- Subjects were seated in a sound-proof booth and instructed to phonate the vowel /a/ for approximately 5 seconds per token. Five tokens were recorded per subject.
- Productions were monitored for a loudness level between 60-65 dB using a sound level meter positioned 18 inches in front of the subject.
- Recordings were made using an AKG model C420 head-mounted mic.
- Mouth-to-mic distance was maintained at approximately 4 cm.
- Microphone was positioned off-axis at 45 degrees from the mouth.
- Recordings were obtained using a Marantz DAT recorder with a sampling rate of 44.1 KHz.
- Audio files were transferred to a Dell Optiplex PC equipped with Kay Elemetrics MDVP Model 5950 (software v. 2.7.0).
- A 2-4 second steady state portion of each token was selected for MDVP analysis.

Descriptive statistics were calculated and the following values were obtained for males and females:
- Mean VTI value
- Standard Deviation
- Range

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>S.D.</th>
<th>Range</th>
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<tr>
<td>Males</td>
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<tr>
<td>Females</td>
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This study provided normative data for VTI. To date, normative data have not been published or otherwise widely disseminated. Consequently, the utility of VTI has been limited to within-client use (e.g., to evaluate change after treatment).

The normative data provided by this study will be useful to speech/voice clinicians who wish to compare a particular client’s VTI measure to a normal value.

References


Summary/Discussion
This study provided normative data for VTI. To date, normative data have not been published or otherwise widely disseminated. Consequently, the utility of VTI has been limited to within-client use (e.g., to evaluate change after treatment).

The normative data provided by this study will be useful to speech/voice clinicians who wish to compare a particular client’s VTI measure to a normal value.