A Comparison of Habitual Pitch and Derived Optimum in Normal Speakers

K. Lenée Moseley
Eastern Illinois University
Pitch is an important element in the evaluation of the human voice. (Boone & McFarlane, 1988)

- Habitual Pitch
- Optimum Pitch
  - 25% Method to determine derived optimum $F_o$ (Fairbanks, 1940,1966)
Derived Optimum $F_0$ Method

- Fairbanks (1940, 1966) and Pronovost (1942) performed early preliminary research regarding the method of derived optimum pitch for determining optimum $F_0$ and each agreed with the 25% Method.
Questioning Derived Optimum $F_0$ Method

- Britto and Doyle (1990) compared the habitual and derived optimum fundamental frequency values in normal young adult speakers.
- Britto and Doyle concluded “very few speakers produced a habitual pitch that corresponded to 25% of their respective range above the lowest produced frequency.”
Purpose

- The purpose of this study was to replicate portions of Britto and Doyle’s (1990) research and to determine if there is a significant difference between the habitual pitch of normal speaking males and females and the optimum pitch predicted using the 25% Method.
Subjects

- Twenty adult males (M age = 21.25) and twenty adult females (M age = 20.75) served as subjects in this study.
- Each subject met the following criteria:
  - Between 18 and 22 years of age
  - Lifelong nonsmoker
  - No history of laryngeal pathology
  - No evidence of voice abnormalities (i.e. breathiness, hoarseness, hypernasality, etc.)
  - No formal vocal training
  - No history of speech/language reading problems
  - English as his or her Native language
- All subjects attended Eastern Illinois University.
Pitch Evaluation

- All recordings were made in a quiet environment using the Visi-Pitch III/Sona-Speech (Model 3900, Kay Elemetrics).
- Obtaining Habitual Pitch
- Calculating Derived Optimum Pitch
Results

The percentage of agreement and disagreement between habitual $F_o$ measures and derived optimum $F_o$ measures.

- Agreement within +/- 20Hz: 40% (16 subjects)
- Disagreement greater than +/- 20Hz: 60% (24 subjects)

$p < .001$
Results

Difference between habitual $F_o$ measures and derived optimum $F_o$ measures.

![Bar graph showing the number of subjects for different frequency ranges.](#)
Results

- 20-30%
- Less than 20%
- Greater than 30%

% of Semitones from Bottom of Range to Habitual Range for Subjects.
Discussion

- This present study supports the findings of Britto and Doyle (1990) in stating that the 25% Method is not an accurate predictor of habitual pitch.

- **Clinical Implications**
  - Consider abandoning the 25% Method
  - Consider using a perceptual judgment for determining the best habitual pitch as proposed by Boone and McFarlane (2000).

- **Future Research**
  - Replication could be necessary with a larger group that is more representative of diverse populations.
References


