Teaching Faculty’s Perception of Their Vocal Characteristics and the Use of Amplification to Support Vocal Health

Introduction and Purpose
- To investigate the relationship between faculty’s perception of their vocal health and the use of voice amplification

Literature Review

What is a Voice Disorder?
- “A voice disorder is characterized by the abnormal production and/or absences of vocal quality, pitch, loudness, resonance, and/or duration, which is inappropriate for an individual’s age and/or sex” (ASHA, 1993)
- Seven main causes of voice disorders include infections, vocal misuse and abuse syndromes, systematic diseases, vascular conditions, lesions, trauma and neurologic conditions (Ramig & Verdolini, 1998)

Prevalence in the General Population
- Roy, Merrill, Thibeault, Parsa, Gray & Smith (2004) stated that there were varying reports of the prevalence of voice disorders for the general population
- The results of their research, which involved over 1000 subjects (non-teachers) completing questionnaires, indicated a prevalence of 6.2% in general population
- They also noted that prevalence of voice disorders increased with age
**VOICE AND PROFESSIONS**

- “Of the total working population in the United States, 24.49 percent have jobs that currently require voice use” (Raming & Verdolini, 1998, p. 102)
- Those who are considered heavy voice users in their jobs is estimated at 5-10% of US workers (Titze, Lemke, and Montequin, 1997)
  - Teachers represented 20% of their voice clinic caseload

**TEACHERS AND VOICE DISORDERS**

- Roy et al. (2004) stated that teachers are a high risk group for developing voice disorders
- Many other studies have also recognized teachers as having more difficulties with their voice than nonteachers
  - Russell, Oates, and Greenwood (1998); Sapir, Keidar, and Marthers-Schmidt (1993); Titze et al., (1997); Smith, Lemke, Taylor, Kirchner, and Hoffman (1998); Sataloff (1997); Gotaas and Starr (1993)

**USE OF AMPLIFICATION FOR TREATMENT**

- Roy, Weinrich, Gray, Tanner, Toledo, Dove, Corbin-Lewis, & Stemple (2002) conducted a study comparing voice amplification versus vocal hygiene for teachers with voice disorders
  - For six weeks, each participant was assigned to one of the following treatment groups:
    - Vocal hygiene
    - Voice amplification
    - No treatment (control)
  - Among other measures, the Voice Handicap Index (VHI) was completed pre- and post- treatment

**USE OF AMPLIFICATION FOR TREATMENT**

- Results (Roy et. al., 2002)
  - Both treatment groups showed improvement compared to the control group
  - No significant differences between treatment groups
  - Teachers who used the amplification demonstrated significantly lower degrees of voice handicap after the 6 week period (pre vs. post VHI)
  - Results supported the use of amplification for treatment of voice problems in teachers

**USE OF AMPLIFICATION FOR TREATMENT**

- McCormick and Roy (2002) looked at the use of a portable amplification system in reducing the sound pressure level of a voice and thus reducing the risk of vibration overdose
  - 10 subjects
  - Results indicated that the device did reduce the intensity of the speaker’s voice at the microphone and did amplify the voice towards the back of the room
  - Researchers then inferred that this should contribute to lowering the risk of vibration overdose, which can lead to vocal fold tissue injury

**USE OF AMPLIFICATION FOR TREATMENT**

- Roy, Weinrich, Gray, Stemple & Sapienza (2003) conducted a study in which 64 subjects were randomly assigned to one of three treatment groups:
  - Voice amplification (VA) using the ChatterVox
  - Resonance therapy (RT)
  - Respiratory muscle training (RMT)
  - VHI and voice severity scale completed pre- and post-treatment (6 weeks)
USE OF AMPLIFICATION FOR TREATMENT

- Results (Roy et. al., 2003)
  - Both VA and RT groups reported significant improvements in perceived vocal health
  - VA compared to the other two groups showed significantly more overall voice improvement
  - These findings replicated the results from the Roy et al. (2002) study supporting the clinical use of voice amplification as an effective treatment alternative for voice problems in teachers

METHODOLOLOGY

Subjects
- 10 subjects (2 men, 8 women) were randomly selected to participate in this study

Participants
- Of the 10 subjects, 5 were randomly assigned as participants, those who would use vocal amplification
- All participants were current teaching faculty at MSUM with at least one year teaching experience in an academic setting, and all were able to use the infrared amplification device in their classroom for a six week period of time

Controls
- Of the 10 subjects, 5 controls were randomly selected
- All controls were current teaching faculty at MSUM with at least one year teaching experience

PROCEDURES AND DATA COLLECTION

Initial Meeting
- Informed consent was obtained by all subjects
- The VHI and voice questionnaire were administered to all 10 subjects
- The 5 participants were instructed on the care and use of the single-speaker infrared amplification system
- At completion of each initial meeting, the documentation was put in a locked filing cabinet to ensure confidentiality

Second Meeting
- Six weeks after the initial meeting, each of the 10 subjects returned and filled out the VHI again in order for the examiner to see if the perceptions about their vocal health had changed

Third Meeting
- All 10 subjects will be debriefed and the vocal health/vocal hygiene issues will be discussed

MY GRADUATE PROJECT

My Graduate Project

Teaching Faculty’s Perception of Their Vocal Characteristics and the Use of Amplification to Support Vocal Health

METHODOLOLOGY

Materials
- The VHI (Jacobson, Johnson, Grywalski, Silbergleit, Jacobson, Benninger, 1997) was used to assess the subjects’ judgments about the relative impact of daily activities on his or her vocal health
- In addition to the VHI, supplemental questions pertaining to the subject’s voice, vocal problems, and diet were asked to gather more extensive information about their vocal history
- The 5 participants used the SoloSolution multimedia sound system, which is a single speaker wireless infrared amplification unit from Audio Enhancement
- The participants each wore a microphone and transmitter and the single speaker was placed towards the back of the classroom

METHODOLOLOGY

Data Analysis
- Content data analysis consisted of evaluating literature to determine whether overall evidence base support existed for the use of infrared devices to help professors whom have vocal health problems
- The examiner collected data from the pre and post VHI scores. That data was analyzed quantitatively to determine net gain or loss and to conclude if the use of the infrared amplification system in the classroom was effective
RESULTS

Table 1
Pre and post amplification VHI scores for the participants

<table>
<thead>
<tr>
<th></th>
<th>Pre-Amplification</th>
<th>Post-Amplification</th>
<th>Total Net Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>3</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>P2</td>
<td>2</td>
<td>13</td>
<td>+11</td>
</tr>
<tr>
<td>P3</td>
<td>9</td>
<td>XX</td>
<td>XX</td>
</tr>
<tr>
<td>P4</td>
<td>19</td>
<td>14</td>
<td>-5</td>
</tr>
<tr>
<td>P5</td>
<td>15</td>
<td>20</td>
<td>-5</td>
</tr>
</tbody>
</table>

Legend:
- (-) indicates an improvement in the subject's perception of their vocal quality
- (+) indicates a decline in the subject's perception of their vocal quality

Table 2
Pre and post six weeks VHI scores for the controls

<table>
<thead>
<tr>
<th></th>
<th>Pre-6 weeks</th>
<th>Post-6 weeks</th>
<th>Total Net Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>9</td>
<td>4</td>
<td>-5</td>
</tr>
<tr>
<td>C2</td>
<td>9</td>
<td>9</td>
<td>0</td>
</tr>
<tr>
<td>C3</td>
<td>27</td>
<td>16</td>
<td>-11</td>
</tr>
<tr>
<td>C4</td>
<td>24</td>
<td>22</td>
<td>-12</td>
</tr>
<tr>
<td>C5</td>
<td>8</td>
<td>21</td>
<td>+13</td>
</tr>
</tbody>
</table>

Legend:
- (-) indicates an improvement in the subject's perception of their vocal quality
- (+) indicates a decline in the subject's perception of their vocal quality

RESULTS

- Total net gain of participants: +2.75
- Total net gain of controls: -3

DISCUSSION

- Why didn’t all of the participants improve?
  - The one participant who did not show improvement or decline after six weeks of amplification had low (favorable) ratings for the pre-data
  - None of the subjects had a voice disorder or perceptions of vocal problems at the beginning of the study
  - Why did two of the participants decline?
    - Extraneous factors (P2 & P5)
  - Why did three of the controls improve without amplification?
    - The heightened awareness of their vocal health after the initial meeting could have played a role in the improvement on the VHI

DISCUSSION

- The participants reported that they enjoyed using the IR amplification device
  - One of the participants inquired about using the device in the future
  - A faculty member on campus who was not part of the study has already requested using the equipment when the study is done

Discussion

- Wide range of subjects including age, years of teaching, number of courses taught, size of classrooms, etc.
- Did not control for extraneous factors such as water intake, allergies, etc.
- Did not objectively measure vocal quality pre- and post-treatment
  - Relied on subjects’ perceptions
CONCLUSION

- The results were not consistent with previous studies using voice amplification.
- Given the improvement with the controls (no treatment), further research on how increased awareness alone can improve an individual's perception of vocal health may be warranted.
- Further research with this population (teaching faculty) on a larger scale with more controls may also be another avenue.

REFERENCES


I would like to extend a SPECIAL THANKS to

- Richard Adler, Ph.D., CCC-SLP
- Kris A. Vossler, M.S., CCC-SLP

Any questions?

Thank-you