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## Perceptions of the Aging Voice

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Perceptions of the Aging Voice

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Communication Disorders

College of Education and Health Professions

Honors Thesis

Spring 2012

### Abstract

The purpose of this study was to gauge whether the age and status of an individual could be discerned or perceived by voice alone. The participants of the study were 7 female and 1 male undergraduate students between the ages of 18-25. The materials for this study consisted of audio segments from different individuals at various ages that were assembled by the researcher into a randomized recording. The audio segments were played to the participants of the study and then were followed by a voice discrimination questionnaire developed from the literature. Procedures for data collection required participants to listen to the audio segments and after each audio segment, complete the paper and pencil questionnaire. A qualitative analysis was then written on the results of the survey.

### Perceptions of the Aging Voice

Can the age of an individual be perceived by the variations in their voice? This question may be extremely important to the emotional well-being of an individual. The treatment of an individual may vary by the way they are vocally perceived. As individuals, we will go through many stages of our life; could these stages be influenced by our perceived vocal attractiveness? Could our treatment by others be determined by how healthy or young we sound?

A number of researchers have studied the aging voice. In a study conducted by Mulac and Giles (1996), listeners were exposed to older voices and asked to identify the age of each voice. The study was based on “the premise that the speakers’ perceived age was more a function of their self-reported subjective and/or contextual age (p. 199).” The researchers were surprised to find that subjective or contextual age was no better at predicting the perceived age of the speaker than chronological age. They found that actually how old a person sounded, not how old the person was or how old they felt, best predicted negative psychological judgments. They hypothesized that it was “reasonable to assume that caregivers’ perceptions of patients’ communicative behaviors influenced their actual treatment of those individuals (p. 200).” These perceptions may have included the age of the patient’s voice as well as their health.

Another study, by Hummert, Mazloff, and Henry (1999), researched the stereotypes pertaining to age and the voice. Forty young listeners assessed the age of 30 older speakers between the ages of 60-80. The study was designed to gather the results of three positive stereotypes and three negative stereotypes perceived in young-old and old-old voices of men and women. The results showed that there were fewer positives in old-old voices of women in comparison to young-old, and there were fewer positives in the young-old voices of men than in the young-old voices of women. This study helped researchers to see the correlation between the

negatives associated with an aging voice as well as the negatives associated with an aging appearance.

Finally, an article by Deliyski and Xue (2001) showed the parameters of the acoustics of the aging voice. Their study reported that, acoustically, older speakers compared poorly with younger and middle-age speakers. It also stressed “the necessity of using discretion in making diagnostic measurements of elderly speakers’ acoustic parameters of voice” without having an established norm and threshold for elderly men and women (p.159).

Based on these findings, this study sought to explore the relationship between the way the aging voice was perceived and the implications it may have had on how an individual was viewed by their peers or other age-groups.

#### Review of the Literature

The most important question of this research was that of age determination by voice alone. Studies showed that when comparing the speech recordings of young and older participants, the listeners were able to frequently distinguish the tracks of the older participants. Mulac and Giles (1996) noted that when judging chronological age, the listeners fared well; however, such findings did not tell the entire story. Rather, there was also the age that the person perceived themselves regardless of their tone of voice. Just as physical appearance and traits can be used in how we perceive each other; the voice can be a strong determinant of age and physical characteristics and attributes (Hummert, Mazloff & Henry, 1999, p. 112).

#### *Vocal Parameters of the Aged Voice*

In Deliyski and Xue’s (2001) study of the acoustic voice parameters, speech samples of young and old voices were gathered using 15 selected acoustic parameters. Older men and women had a lower fundamental frequency than their younger counterparts, but had higher

frequency variations (jitter, shimmer, variance, etc.). Ultimately their research revealed a significant difference in the measurements of old and young voices, with the conclusion that “aging has a significant impact on the acoustic measurements of speakers’ vocal output” (Deliyski & Xue 2001, p. 163). The study also recognized the need for normative testing for parameters of older speakers, and also the need for clinicians to use their discretion when making diagnoses of elderly patients’ voices.

#### *Common Perceptions of the Aging Voice*

Perceptions of age by listeners were where the voice as well as physical attributes of a person came together in stereotypical judgments. Hummer, Mazloff, and Henry’s (1999) study of the impression of the voice on the listener referenced a study done by Ptacek and Sander (1966) that had participants categorizing voices as younger than 35 or older than 65 years of age. Participants categorized voice by age with 78% accuracy. Although this study showed that the listeners were using pitch, volume and rate to determine age, there was no conclusive evidence that there was a consistent variance between all older and younger speakers. Building on this study that used differences between young, middle age, and older voices, Hummert, Mazloff, and Henry (1999) decided to base their study on the older voice alone in order to determine if there was a discernible difference between 60 year olds to 90 year olds. They chose to prove their hypothesis that judging sub-groups within an age group was much more difficult due to the fact that they had similar variance patterns. As mentioned earlier, the fundamental frequency was lower in older speakers, and there was a higher increase in variances.

#### *Common Stereotypes of the Aging Voice*

Returning to Mulac and Giles’s(1996) study of the social meanings behind vocal perception, previous studies showed that older female speakers were deemed more reserved, as passive, and

inflexible than younger female speakers. Older male speakers were thought to be more hesitant than their younger counterparts, but older males were considered more trustworthy and reliable. The issues of age and voice were more complicated than this, however, in that it could also take on a negative connotation in Western societies. An older speaker may be perceived as having “deficient language and communicative competencies” (Mulac & Giles 1996, p. 201).

#### *The Effect of Vocal Perceptions on the Life Stages*

Contextual rather than chronological age playing a large factor in vocal perception was a possible hypothesis approached by Mulac and Giles (1996). Older speakers that felt and acted younger may tend to enact a younger vocal persona. During their experiment they found that vocal attractiveness was just as important as physical attractiveness, and that vocal attractiveness could be important in impression formation of speech styles. Although, this study was inconclusive on whether or not the listener’s perceptions of the speaker’s age “more positively correlated with speaker’s subjective and contextual ages than with the speaker’s chronological age” (p.202); it was noted that there did seem to be a positive correlate between contextual age and perception of age. It was possible however that other factors, such as gender and socioeconomic status affected these perceptions further.

#### *Summary and Questions of the Study*

As can be seen from the literature, there were physiology changes in the voice, and research indicated that social changes occurred as well that were closely linked to identity. The purpose of this study was to see what differences could be perceived in the aging voice at different ages and stages in life.

The questions of the study were:

1. Do men versus women have more difficulty in identifying the chronological age of an individual?
2. Do men versus women use the same vocal quality to judge the voice and associated traits of individuals as they age?
3. Can the health and professional status of an individual be determined by their voice alone?

## Methodology

### *Participants:*

Twenty-five male and 25 female undergraduate college students between the ages of 18-25 were sought as participants in the study. There was no control for ethnicity, but English (or a variant of this) had to be the first language of the participants.

### *Materials*

Audio segments of six individuals, two male and four female, talking at different life stages (ages) were abstracted from open-source archives. In all this consisted of two to three samples of speech for each individual. These were randomized into audio sequences that varied across age and gender among the speakers for the data collection. An opened ended questionnaire was developed for participant responses as they listened to the audio material (Appendix B)

### *Procedures*

Participants were sought through campus organization, undergraduate classes across majors, and by nomination. Participants were contacted and scheduled into specific time slots for data collection. Twenty-one sessions over a four week period were scheduled in three separate



college building to facilitate data collection. When participants arrived, the study was explained to them, and instructions for completing the task were reviewed. The audio samples were played using a Dell laptop hooked into the speaker systems in the smart classrooms. Each participant filled out a paper-pencil questionnaire that asked about voice, age, and professionalism for each vocal sample.

### *Analysis*

The information provided on the study questionnaire was analyzed for content and themes. This descriptive analysis compared the participant responses for each of the recorded voice segments for the male and female stimulus material.

## Results

### *Participants*

Of the 28 participants that signed up for this study over a period of 21 days of data collecting only eight came to the sessions and completed the questionnaire. Out of the eight participants only one was male and seven were female.

### *Question One*

The first question of this study asked if males could perceive chronological age more accurately than females. With only eight participants, only one of whom was male, this question could not be answered as a male-female response comparison. Therefore, the responses of all participants regardless of gender were used to determine how well age could be determined from voice quality alone. Results indicate that participants were fairly accurate in judging the ages of speakers under the age of 20 years, but were less successful for middle aged and older speakers. Participants were more successful in estimating age for female speakers than male speakers across all ages. These data are summarized in Table 1, which follows.

**Table 1. Listeners Estimate of Perceived Age**

Audio Clip	Age, gender	Correct	Incorrect
<i>Young 5-20 years of age</i>			
AC1	9yrs., male	63%	37%
AC6	12yrs., female	75%	25%
AC8	20yrs., female	63%	37%
<i>Older (Middle age) 21-50 years of age</i>			
AC2	33yrs., female	37%	63%
AC4	33yrs., male	14%	86%
AC9	34 yrs., female	50%	50%
AC11	39 yrs., male	37%	63%
AC3	44yrs., female	75%	25%
<i>Old 51-71+ years of age</i>			
AC5	51yrs., male	50%	50%
AC7	68yrs., male	25%	75%
AC10	69yrs., male	37%	63%
AC12	80 yrs., female	25%	75%

*Question Two*

The second question of the study asked if men versus women use the same vocal quality to judge the voice and associated traits of individuals as they age. Due to the lack of male participants, this question could not be addressed.

*Question Three*

The third question of the study asked if the health and professional status of an individual would be determined by voice alone. This question was the broadest of the three study questions and depended most on the narrative responses of the participants. Younger voices, both male and female were judged to be healthier than those of middle and older age. Professions assigned to the voice segments were clearly influenced by the gender of the speaker. Participants indicated that adult males had careers in the military, in politics, and the outdoors; while adult female speakers predominately journalists.

Discussion

This study sought to explore the relationship between the way aging voices were perceived and the implications it may have had on how individuals were viewed by other age-groups. Listeners had a tendency to perceive younger voices' ages correctly more often than older voices. Many of the participants rated the voices of the younger age groups (5-20 years) as higher pitched, both male and female genders, and described them as clear and healthy. As the speaker moved into their middle aged years (31-50 years), the ability to correlate the proper age was significantly reduced, especially in male voices. This difficulty may have been attributed to the listeners' inability to determine whether a deeper, rougher voice was a sign of a normal, healthy male voice. Many of the students used roughness and deepness as a measure of a mature male voice, but were varied and used these terms across all ages of the post-pubescent male speakers. As the age of the speaker moved up in age to old (51-71 + years) the percentages of accuracy continued to decrease.

The question of health and professional status was broached in the third question of the study. Most of the undergraduates used similar terms when describing the healthy voice of male and

female, and young to old voices. The most common for young voices were: high and clear, healthy and understandable. The perceptions of male voices were: deep, rough, gravelly, and lower pitched in all age groups regardless of the health of the speaker. For women the prevailing opinion was that a softer, breathier voice indicated older age in females and a high clear voice was indicative of girls and young women. Thus, as perceived by the participants, the younger the voices sounded, the healthier they were believed to be.

Majority of the listeners concluded that the audio clips were of actors and journalists or news-anchors, which was correct. Some listened only to the context of the audio sample and determined the employment from the things they heard. Interestingly they chose, for the men, careers in the military, in politics, and the outdoors. For the women, fashion designer, professional writer, and even audiologist were chosen when actress or journalist wasn't determined.

As was expected from the literature, the study did reveal that as the speaker aged the difficulty of rating the chronological age was higher. This may have been an indication that contextual rather than chronological age was playing a role here as hypothesized by Mulac and Giles (1996). The results of this study may have been such that the participant's answers were subjective to how young or old the speaker thought he or she was. Furthermore, the difficulty for the majority of the undergraduates to discern from the audio clips the differences in older voices went along with the study by Hummert, Mazloff, and Henry (1999) that showed that subgroups within older age groups had similar variance patterns and were therefore harder to discern.

Although the full question of vocal quality could not be ascertained in regards to this study, it was possible to view the use of common stereotypes associated with young and old voices. That older female's voices were breathier, soft and weak that older males had rougher, stronger

voices. Also too, the fact that the participants found the younger sounding voices to be healthy may go back to Mulac and Giles's (1996) study which argued that how healthy a person sounds, or was perceived to sound, had a bearing on how they were treated or judged.

Predicting employment based on perceptions of the voice alone was introduced in order to determine any positive or negative stereotypes associated with change over the lifespan of the speaker. These results of the question may have been influenced by the student's preconceived ideas of gender dominated occupations.

### *Limitations of the Study*

In order to obtain a more complete understanding of the abilities of males versus females in regard to the first and second questions of the study, a larger number of undergraduate participants of both genders would have been ideal and may have yielded better results.

Finding open-source audio clips was at times difficult and may have contributed to lack of precise information gathering. Many of the audio clips revealed too much contextual information that may have been leading. A smaller number of audio clips spanning the various age-groups of non-celebrities would have been more appropriate and unbiased.

### *Future Directions*

That being said, this study, with corrections in the limitations could gather a lot of information involving how individuals are perceived as they age. As individuals age, their social and financial statuses change. The quality and healthiness perceived in their voice could determine their treatment in employment, healthcare, and other social aspects. This may affect their emotional well-being and possibly play a part in their life-expectancy. There have been many studies on visible facial cues toward age, but more often today we come into contact with people that we may never associate with face-to-face. With the introduction of the

communication age we may associate some of our contacts with only a voice. It is necessary to study all aspects of aging that may have an effect on the health and happiness of an individual.

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<http://www.imdb.com/>

<http://www.youtube.com/>

## **Appendix A**

### **Audio Clips used in the Study**

Audio Clip 1:

Male, 9 years old

<http://youtu.be/zGWMMXTqIno>

Audio Clip 2:

Female, 33 years old

<http://youtu.be/WliwtGBcKrw>

Audio Clip 3:

Female, 44 years old

<http://youtu.be/R2gaSI07vdI>

Audio Clip 4:

Male 33 years old

<http://youtu.be/QtYITsPXD4E>

Audio Clip 5:

Male, 51 years old

<http://youtu.be/jnCPdLIUgvo>

Audio Clip 6:

Female, 12 years old

<http://youtu.be/P3PHVqn2Gvg>

Audio Clip 7:

Male, 68 years old

<http://youtu.be/3wJMO7cmhHo>

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Audio Clip 8:

Female, 20 years old

[http://youtu.be/jFKeFlSP\\_W8](http://youtu.be/jFKeFlSP_W8)

Audio Clip 9:

Female, 34 years old

<http://youtu.be/QxZwIcRiQU4>

Audio Clip 10:

Male, 69 years old

<http://youtu.be/0vRfdgU2Q4E>

Audio Clip 11:

Male, 39 years old

<http://youtu.be/MUxQg5toCfc>

Audio Clip 12:

Female, 80 years old

<http://youtu.be/BfdXLlwI9C8>



## **Appendix B**

### *Sample Questionnaire*

Age: \_\_\_\_\_

Major: \_\_\_\_\_

First Language: \_\_\_\_\_

**Circle One:** Male/ Female

Directions:

Twelve audio clips will be played each numbered from 1-12. After each clip is played, please answer the following questions to the best of your ability.

Audio Clip #

**What age is the person in the clip? Circle One:**

5-10 yrs. 11-20 yrs. 21-30 yrs. 31-40 yrs. 41-50 yrs. 51-60 yrs. 61-70 yrs. 71+ years

**Why did you choose that age?**

**Describe the quality of the voice: (ex. weak, harsh, deep, soft, etc.)**

**Are there any characteristics of the voice that helped you determine age?**

**If the voice is that of an adult, do you think that they are employed? If so, what is their career?**

**Is the speaker in good health? What characteristics of the voice helped you determine this?**