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Vocal Pitch in the Courtroom

BY JESSICA A. BOYLE AND STANLEY L. BRODSKY

Jessica Boyle, MA is a doctoral student studying Clinical Psychology with a concentration in Psychology and Law at the University of Alabama in Tuscaloosa, AL. Jessica conducts research within the University of Alabama's Witness Research Lab under the supervision of Dr. Stanley Brodsky. Her current areas of interest are nonverbal communication of expert witnesses and media ethics. She has professional experience in trial consultation. You can read more about the UA Witness Research Lab at http://witnesslab.ua.edu/

Stanley L. Brodsky, Ph.D. is a Professor in the Department of Psychology, The University of Alabama, Tuscaloosa, Alabama. His professional interests are in jury selection, witness preparation, and court testimony. He is the author of 14 books in psychology applied to the law, including Principles and Practice of Trial Consultation and the forthcoming 2nd edition of Testifying In Court. You can review the activities of his witness research lab at http://witnesslab.ua.edu/

Think of the best and worst voices you hear and of the impact they make on you. At their very best, some voices soothe and comfort, giving a sense of warmth, confidence, and mastery by the speaker. At their worst, some voices serve to irritate and leave the listener with a sense of distance, derision and disdain of the speaker. In a 2001 poll conducted by the Center for Voice Disorders at Wake Forest University, the best United States voices were identified as James Earl Jones, Sean Connery, Julia Roberts and Katie Couric. The worst voices at the time were those of Fran Drescher, Roseanne Barr, Gilbert Gottfried, Joan Rivers, and Howard Stern (Marcucci, 2002). Fran Drescher's voice merits special attention, in part because she succeeded professionally with a raspy and nasal voice and a laugh that has been described as like, "the sound of a Buick with an empty gas tank cold-cranking on a winter morning" (Marx, 2012, p. 19).

What is it about these and other voices that lead listeners to feel bad or good about the speaker? Although there are many ways of approaching the subject, the attention here is addressed to one component of voice quality: vocal pitch.

Voice as Cue

Many aspects of the human voice are nonverbal communication cues. Strain, jitter, shimmer, pitch, loudness, and nasality are some of the variables that impact a listener's perception of a speaker's voice. As a nonverbal communication cue, voice has been shown to make a difference in people's perceptions of speakers (Tigue, Borak, O'Connor, Schandl & Feinberg, in press). In an investigation of voice quality, DeGroot and Motowidlo (1999) videotaped and audiotaped male and female job applicants and measured viewers' responses to the applicants' visual and vocal cues. For ratings of interview and job performance, participants relied more strongly on vocal rather than visual cues. That is, not only are qualities of the voice important in our judgments of others, in some situations they may prove to be more influential than visual information. Guerrero and Hecht (2008) argue that a vocal attractiveness stereotype exists among listeners. People tend to believe that, "what sounds beautiful is good" (p.155). Other empirical explorations of the attractive voice stereotype have found that attractive voices make a person seem more powerful, strong, assertive and dominant (Guerrero & Hecht, 2008).

The Lower Vocal Pitch Preference

Pitch is one aspect of vocal tone. It is described as the vocally produced musical note, or how high or low a voice sounds (Behrman, 2007; Leathers, 1997; Guerrero & Hecht, 2008). Pitch is measured in Hertz (Hz), which specifies the fundamental frequency, or the rate at which vocal folds vibrate (Breedlove, Watson and Rosenzweig, 2010). Breedlove et al. (2010) noted that frequency and pitch are not the same thing. Frequency describes a biomechanical process whereas pitch is an individual's sensory experience of this process. Most humans can detect small changes in frequency over the audible range of 20 Hz to 20,000 Hz. A person's ability to detect changes in frequency is measured as the minimal discriminable frequency difference between two stimuli. The detectable difference is approximately 2 Hz for tones as high as 2000 Hz (Breedlove, Watson & Rosenzweig, 2010). Published norms for fundamental frequencies in speech indicate that men's habitual mean speaking frequency while reading aloud is 115 Hz. Women's habitual mean speaking frequency while reading is significantly higher at 215 Hz (Behrman, 2007).

Empirical investigations of vocal qualities show that manipulations of vocal pitch level can have a significant impact on how listeners perceive and judge a speaker (Tigue et al., in press; Ko, Judd & Stapel, 2009). In two experiments, Ko et al. (2009) examined how vocal cues influence listener judgments of speaker traits. In the first experiment, participants assigned to an audio condition listened to voices belonging to mock job applicants read resumés. Participants were asked to form opinions about the applicants' warmth and competence. Vocal femininity of job applicant was negatively associated with competence ratings. Vocal femininity was positively associated with warmth ratings, but the strength of the vocal femininity effect was far more pronounced for competence ratings than for warmth ratings. In the second experiment, the bias against applicants with feminine voices was replicated in the competency ratings, even when scenarios regarding applicants' past behavior w introduced to the participants as competing information. The negative effect of vocal femininity on ratings of job applicant competence may have been due to an overall preference for lower-pitched voices among the participants. Overall, studies indicate that lower pitch voices, as compared to higher pitch voices, are more likely to be associated with attractiveness, dominance, maturity, honesty and other positive judgments from listeners (Imhof, 2010; O'Hair & Cody, 1987; Tigue et al., in press).

Deceptive Versus Honest Vocal Pitch

One reason that listeners tend to prefer lower voices is because higher pitch voices are more commonly associated with deception (Ekman & Friesen, 1976; O'Hair & Cody, 1987). Experiments that analyze vocal pitch during instances of deception versus instances of truth support this notion. The idea is that as speakers deceive, they become psychologically aroused in certain ways that tend to put stress on vocal features, leading to an increase in pitch (Ekman & Friesen, 1976). Ekman and Friesen (1976) conducted an experiment utilizing 16 different nursing students as participants. All participants watched pleasant video stimuli, as well as a video depicting victims of amputations and burns. The second video stimulus was designed to arouse negative feelings in the participant. In the honest interview condition, participants described their frank feelings about the film. In the deceptive interview condition, participants were instructed to hide their negative emotions and convince the interviewer that they had seen another pleasant film. These interviews were recorded and researchers measured the nursing students' pitch by exposing the audio to a speech analysis computer program. In the deceptive interview condition, the speech analysis data indicated significant increases in voice pitch.

O'Hair and Cody (1987) studied variations in vocal pitch measurements as they relate to prepared and spontaneous lying behavior in both men and women. The researchers included sex differences as a predictive factor of vocal stress during lying. Their participants were exposed to a simulated pre-employment interview and told to either lie or be truthful when certain questions were asked. Unknown to the participants, a follow-up question was asked that allowed researchers to study the spontaneous vocal behavior of both liars and truth-tellers as they reacted to unexpected questions. No significant difference in vocal stress scores were uncovered in participants' spontaneous lies as compared to their truthful responses. Women, however, did demonstrate higher vocal stress scores in their prepared lies as compared to truthful answers (O'Hair & Cody, 1987). This research shows that prepared lies may cause more vocal stress than spontaneous lies. Further, this effect may be more pronounces in females. People associate higher pitch voices with dishonesty; empirical investigations of this stereotype have shown that there is some truth to this view, particularly when it comes to feminine voices (O'Hair & Cody, 1987).

Lower Pitch Voices and the Attribution of Positive Speaker Characteristics

Lower pitch voices are associated with different speaker personality characteristics than higher pitch voices (Imhof, 2010; Ko et al., 2009, Tigue, et al., in press). Imhof (2010) isolated vocal pitch in order to test how this variable impacts listeners' judgments of the people speaking. Participant listeners were presented with technologically manipulated voices of low and high frequency and instructed to assess personality as well as physical attributes of the people behind the voices. In general, higher voices were associated with youthfulness. Participants indicated that they were more desirous to meet people with higher pitch voices, as compared to lower pitch voices. Higher pitch voices were more likely to be associated with agreeableness. Decreased conscientiousness and lower emotional stability were also ascribed more often to higher pitch voices. People speaking with a lower pitch voice were said to be more sociable and relaxed. Pitch was judged differently between male and female voices. Women with low voices were seen as more agreeable than women with high voices; however, men with lower voices were perceived as less agreeable than men with higher voices. In other words, there is not necessarily a one-to-one relation between pitch and socially desirable traits.

In an examination of vocal pitch and voting-related perceptions, Tigue et al. (in press) obtained vocal recordings of nine different United States presidents and technically manipulated each recording to produce a low and high pitch condition for each president. Participants listened to audio recordings, ascribed personality traits to the voices, and indicated for which candidates they were more likely to vote. The men with lower pitch voices were more likely to have positive personality traits ascribed to them. These traits included attractiveness, dominance, intelligence, trustworthiness and other qualities typical of a good leader. Further, vocal pitch exerted an important influence on voting behavior with the participants significantly more likely to vote for candidates with lower voices (Tigue et al., in press).

Implications for the Courtroom

1. Attorneys and trial consultants would be well served to attend with care to the voice quality and vocal pitch of key witnesses. There is a possibility that triers of fact will be influenced negatively by higher pitch voices. Given available time for training and trials of substantial importance, efforts by attorneys, trial consultants, or communication experts to retrain such witnesses may be a worthwhile investment.

2. When trial consultants or attorneys do prepare witnesses to modify voice pitch, a caution is on order not to overdo it. Witnesses should seek to use the lower range of their normal and comfortable voices in testimony, with a special emphasis on dropping towards the slightly lower range when responding to demanding and aggressive cross examination questions.

3. Similar advice may be extended to attorneys in their opening and closing arguments. For attorneys with decidedly abrasive or high pitch voices, systematic consultation by professionals may help modify voice pitch. By itself, feedback on voice pitch and quality may start the process. Given the regular need for positive appraisal by triers of facts and clients in the courtroom, this kind of pointed effort to gain insight into voice qualities and associated modifications may yield worthwhile payoffs.

4. As both witnesses and attorneys seek to modify their voice pitch, some caveats are in order. First, stay natural. Straining to produce an effect has the potential for backfiring. Next, make dropping to lower ranges an automatic and background process. If it is automatic, it will not distract focus from the substantive and probative issues at hand. Next, small differences in pitch can make a big difference in credibility. It would be seen as phony if comedian Gilbert Gottfried were to try to speak like actor Sam Elliott. A final caution is to promote pitch change to occur in inverse proportion to importance of the statements. That is, speakers should intentionally produce lower pitched statements with important issues.

Conclusion

The application of voice quality and pitch training to the courtroom is new. Although the research data and our own personal observations may seem promising, we advise that users move in small steps. Nevertheless, for persons who have elevated vocal pitch, this area of attention is worth the process of self-examination and possible pitch modifications.

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