The peril of sounding manly:
A look at vocal characteristics of lawyers before the United States Supreme Court

Introduction: Individuals make use of many aspects of the speech signals to construct personas and to project hidden desires to the external world. Of interest here is whether vocal characteristics and the perceptual evaluation of them exert an influence on listener behavior. With the exception of a few pioneering studies (e.g., Purnell et al. 1999), this question has remained largely unexplored. In the present study, we examine the vocal characteristics of lawyers arguing in front of the Supreme Court of the United States and link this data to the lawyers' actual win rates in the Court. We show that perceived attributes of voices predict Supreme Court wins, suggesting potential differential labor market treatment of lawyers with certain mutable characteristics such as sounding more or less masculine or confident.

Part I: Methods: In order to obtain listener evaluation of talker voices, we extracted sixty sound clips of male lawyers' Supreme Court oral argument's introductory sentence, which is identical across cases (i.e. "Mister Chief Justice, may it please the court") from the Oyez Project website (http://www.oyez.org/), a multimedia archive at the Chicago-Kent College of Law devoted to the Supreme Court of the United States. 200 participants recruited on Amazon's Mechanical Turk listened to the sixty sound clips (normalized for intensity) and were asked to rate the voice sample in terms of masculinity, attractiveness, confidence, intelligence, trustworthiness, and educatedness, as well as the probability of win, on a 7-point scale. **Results:** To understand the relative importance of these seven scalar factors in predicting actual court outcomes, and to avoid problems of collinearity, we conducted binary partitioning of the data using a Classification and Regression Tree (CART) analysis (Breiman et al. 1984) with the *rpart* function in *R* with court outcome (win vs. lose) as the dependent variable and the listeners' responses on the seven scales as predictors. Only two factors, Masculinity and Confidence, remained in the final pruned tree. Individuals with higher masculinity rating are more likely to **lose**, while individuals with high confidence rating are more likely to **win**.

Part II: Methods: To explore the acoustic features that index perceived masculinity and confidence, we measure the following phonetic attributes: formant frequencies (F1, F2) for five stressed vowels (/i, ɪ, ej, ɔ, ʌ/, formant dispersion (average vowel distance from a central point per talker per sound clip), spectral tilt (H1-H2, H1-A1, H1-A2, H1-A3), center for gravity and peak frequency of /s/, speaking rate (phonemes per second), and rhythm (Pairwise Variability Index; Low et al. 2000). **Results:** We conducted binary partitioning of the data using a Classification and Regression Tree (CART) analysis with by-subject normalized perceived masculinity and perceived confidence ratings as separate dependent variables and the phonetic factors as the predictor variables. Individuals with lower F2 (i.e. more back) for /i/ and /ɪ/ and lower spectral center of gravity for /s/ are rated as more masculine. In terms of perceived confidence, lower F2 of /i/ and higher PVI (more rhythmic speaking style) are perceived as more confident, but hoarser voices (H1-H2 and H1-A3) are all signs of low perceived confidence.

Conclusion: Our data linking actual outcomes with perceptions, holding constant the words and omitting visual cues, form an uncommon dataset. We show that perceived masculinity and confidence constitute significant predictors of Supreme Court decisions. In particular, more masculine sounding voices are less likely to win a case, while more confidence-sounding voices show the opposite correlation. While the mechanism underlying these connections is still under investigation, it suggests that the perceived vocal characteristics might have significant impact on real world outcomes.