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## OVERTONES OF JUSTICE: CONCEALABLE CHARACTERISTICS AND PERCEPTIONS OF VOICE IN THE U.S. SUPREME COURT

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**Abstract** Studies documenting the policy relevance of oral performance are rare. We link linguistic analysis of Supreme Court of the United States (SCOTUS) oral arguments with judicial decisions. Over 1400 participants rated lawyers voices along several measures and predicted whether the lawyer won the case. Voice samples were restricted to lawyers saying the identical introductory sentence, “May it please the Court?” Voices perceived as more masculine were rated more likely to win, but masculine voices were less likely to win in the Supreme Court. To reduce the likelihood that subjects’ mental model of what a winning lawyer should sound like confounds the analysis, a second study asked subjects to only provide one rating. Ratings were strongly correlated across the two studies and replicate. We next explore the reason for these findings. Is there taste-based discrimination against lawyers with concealable characteristics? The negative correlation disappears for lawyers in private firms, consistent with market competition eroding taste-based discrimination.

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## 1 Introduction

Verbal and nonverbal cues have long interested social scientists because of their potential role in explaining long-term outcomes, but little work has examined the process of convergence and identity formation in real-time interactions.

Understanding linguistic difference and change has been central to the field of linguistics. An important catalyst for linguistic fluctuation is communicative accommodation and imitation. While the ability to imitate is said to be innate and automatic (Dijksterhuis and Bargh, 2001), the process is not unrestricted. Accommodation research, particularly work within the framework of Communication Accommodation Theory, which sees speech convergence phenomena as motivated by an individual's desire for social acceptance and identification with a particular social group (Giles and Coupland, 1991), has repeatedly demonstrated the centrality of subjective attitude and ideology for predicting the likelihood of linguistic convergence and divergence between speakers at multiple linguistic levels (Giles, 1973; Giles, Taylor, and Bourhis, 1973; Bourhis and Giles, 1977). Simulation theory of speech perception (Pickering and Garrod, 2013) posits that listeners simulate speakers' utterances by computing forward-model predictions at many different levels, which are then compared to the incoming phonetic input. From this perspective phonetic imitation can be achieved via the same mechanism that is responsible for sensorimotor adaptation, namely, the correction of prediction errors. The degree of motor adjustments that is derived from prediction errors are crucially context-dependent, that is, it is dependent on the speaker's and listener's social identities, conversational roles, and the listener's intention to imitate. Yu, Abrego-Collier, and Sonderegger (2013), for example, found that listeners are more likely to imitate if they like the model talker. Those listeners who have certain personality traits, such as greater degree of openness and more autistic-like traits are also more susceptible to phonetic accommodation. Vocal characteristics of the model also play an important role in phonetic convergence and accommodation. Talker voice typicality and attractiveness have been found to influence the likelihood of imitation, but these effects are most robust in female imitators (McGuire, Russell, and Babel, 2013; Babel, McGuire, Walters, and Nichols, 2013). Females also appears to imitate more when their voices are dissimilar to the model voices (Walters, Babel, and McGuire, 2013). Despite these pioneering studies, there remains a great need to uncover factors that govern the nature of communication accommodation, as such discoveries will be central to understanding the "links between language, context and identity" (Gallois, Ogay, and Giles, 2005).

The present project examines whether language accommodation (i.e. linguistic convergence and divergence) extends to a communicative setting as highly stylized and formal as the Supreme Court of the United States and to what extent the communication accommodation observed is modulated by non-linguistic factors, such as the gender, social background, and sociopolitical ideology of the Justices and the lawyers. Examining the subset of the SCOTUS corpus at the word choice level, Danescu-Niculescu-Mizil, Lee, Pang, and Kleinberg (2012), for example, found that lawyers coordinate/imitate more toward unfavorable Justices (who voted against the lawyer's party in the end) than toward favorable justices, while the favorable justices imitate more toward the lawyers. They

define A as coordinating in his response to B when A uses words that B used. Words, however, can contain irrelevant information. The way a word or a phrase is uttered conveys a lot of pragmatically relevant information and many nuances. What is not clear is whether the oral performance displayed coordination, and whether the correlation between coordination and vote outcomes is robust to socio-demographic controls of the lawyers and Justices. For example, lawyers who speak in a similar fashion as the judge may come from the same region of the country and the judge may be better able to detect deception because she has greater information. What is also not clear is to what extent the lawyers and Justices converge. That is, how much of the imitation is mutual, that is, both side moving closer toward each other, or is coordination purely a one-sided event? Also of interest is whether the factors identified as mediating communication accommodation in a courtroom setting have significant ramifications for judicial behaviors. For example, do speech patterns move in tandem with voting patterns on cases and over time? Do lawyers move towards the manner in which judges speak? Does language accommodation have a causal effect on real outcomes? Answers to these questions may shed light on broader questions in economic and legal theory. An important first question is whether individuals' perceptions of voice matter, as an antecedent to precipitating conscious or unconscious decision-making.

**1.1 Overtones of Justice** Recent studies have shown differential labor market treatment of individuals with different perceived attributes. A seminal study manipulates employers' perceptions of race by sending out resumes with randomized distinctively ethnic names, holding constant resume characteristics (Bertrand and Mullainathan, 2004). This study does not conclusively document taste-based discrimination since employers may attribute differing levels of productivity to distinctively ethnic names. Papers since this notable study have attempted other methods to measure taste-based discrimination. Charles and Guryan (2008) show that black-white wage gaps are higher in states with greater self-reported prejudice against blacks. However, states where there are more prejudice could vary for other reasons that could be correlated with wage gaps.

Taste-based discrimination, when people are treated differently because of animus (Becker, 1957), can be conceptually distinguished from statistical discrimination, when people are treated differently because they are believed to be more productive (Phelps, 1972). They are empirically difficult to distinguish due to lack of data on an individual's actual productivity. An advantage of our study over prior studies is that attorney productivity is observable and measured by their arguing successfully in court. We link oral arguments from the U.S. Supreme Court, lay perceptions of the advocates' voices, and actual case outcomes.

Purnell, Idsardi, and Baugh (1999) found evidence of linguistic profiling in the housing market, suggesting that housing administrators might redline prospective clientele by auditory cues (from telephone conversations) alone. In that study, they conducted a series of telephone surveys where housing was requested from the same landlord during a short time period using standard and non-standard dialects. The results demonstrate that landlords discriminate against prospective tenants on the basis of the sound of their voice during telephone conversations. This study does not conclusively document taste-based discrimination, however.

Two other studies attempt to detect the presence of taste-based discrimination by measuring actual productivity in experimental settings. One experiment correlates an employee's physical attractiveness with the employer's perception of and the true level of the employee's productivity. This study hires subjects to solve mazes (Mobius and Rosenblat, 2006). A second experiment tests and rejects taste-based discrimination by randomizing the actual 'productivity' through assignment of reservation prices in a negotiation context. This study concludes that discrimination in the sports card market is statistical rather than taste-based. When dealers are told that the reservation values of participants buying defaced baseball cards are set randomly, minority and majority buyers are treated the same (List, 2004). We employ a novel research design to measure taste-based discrimination in an actual employment context.

A large number of studies examine the impact of verbal cues on decision-makers' perception of deception by the speaker (Zuckerman, Amidon, Bishop, and Pomerantz, 1982) and shown that even seconds-long observations of non-verbal cues, such as professors' teaching, can be very predictive of professors' final teaching evaluations (Ambady and Rosenthal, 1992). Moreover, different vocal parameters predict perceptions of dominance by men and attractiveness of women (Hodges-Simeon, Gaulin, and Puts, 2010) and attractiveness is predictive of perceived expertise (Patzner, 1983) and of actual success of marketers in a study that randomized attractiveness and accent (DeShields, Kara, and Kaynak, 1996). Individuals have an attraction towards certain kinds of voices manifesting different personalities even when personality is clearly not relevant (Nass and Lee, 2001).

Legal scholarship examining extrajudicial factors has focused on nonverbal cues (LeVan, 1984; Diamond, Casper, Heiert, and Marshall, 1996). In one study of verbal cues, Schubert, Peterson, Schubert, and Wasby (2002) find that in Supreme Court oral arguments dialect dissimilarity is a cue for ethnolinguistic differences and inspires mistrust and anxiety. Justices tend to challenge Southern dialect counsel more than others. However, dialect is not correlated with win rates. Our research design can isolate the effect of verbal cues by controlling for verbal content and test whether verbal cues have relevance in predicting decision-making in the highest courts of the US.

## **2 Conceptual Framework**

Applying recent methodological advances to test for the presence of racial bias in motor vehicle stops and capital sentences (Knowles, Persico, and Todd, 2001; Alesina and Ferrara, 2011), we look for differential treatment based on observed characteristics, in our case, perceived attributes of voices. We look at the success rate across these attributes. A key advantage of the test is that it is feasible even when the data include only a subset of the variables used by the decision-maker. This model assumes that the decision-maker maximizes the number of successes, net of the cost of some action. In the case of motor vehicle stops, characteristics of individuals may be informative about a subject's propensity to carry contraband. In equilibrium, the returns from searching will be equal across subgroups. In our application, some of the characteristics of the lawyer may be informative about the lawyer's success rate. Prejudice is introduced in the model as a difference in the cost to the firm of hiring individuals of different social identities. Prejudice in our case is a

difference in the cost to law firms of hiring SCOTUS advocates with different perceived social or linguistic attributes. If perceived attributes of voices predict Supreme Court wins, then we could similarly infer differential labor market treatment of lawyers with these mutable characteristics.

### 3 Data

Oral arguments at SCOTUS have been recorded since the installation of a recording system in October 1955. The recordings and the associated transcripts were made available to the public in electronically downloadable format by the Oyez Project (<http://www.oyez.org/>), which is a multimedia archive at the Chicago-Kent College of Law devoted to the Supreme Court of the United States and its work. The audio archive contains more than 110 million words in more than 9000 hours of audio synchronized, based on the court transcripts, to the sentence level. Oral arguments are, with rare exceptions, the first occasion in the processing of a case in which the Court meets face-to-face in consideration of the issues. Usually, counsel representing the competing parties of a case each have thirty minutes in which to present their side to the Justices. The Justices may interrupt these presentations with comments and questions, leading to interactions between the Justices, the lawyers and, in some cases, the *amici curiae*, who are not a party to a case but nonetheless offer information that bears on the case not solicited by any of the parties to assist a court.

By way of illustrating the richness this database promises to provide, for the 2001 term, there are 15,110 turns from eight Justices (Yuan and Liberman 2008; one Justice is famous for being silent in the court) and 21,706 tokens of /l/ (Yuan and Liberman, 2009) can be extracted from the “clean” turns (i.e., the turns that have no noise, laughter, etc. based on the transcripts) out of seventy-eight arguments. We investigate the linguistic behaviors of the Justices and the lawyers at the level of phonetic realization, including, but not restricted to, speaking rate, pitch, and individual vowels and consonants.

We have linguistically annotated 120 oral arguments made in 60 cases recorded in the Supreme Court of the United States. These 60 cases form our two studies. While oral arguments have been recorded since the installation of a recording system in October 1955, the transcripts do not identify the speaking turns of individual Justices, referring to them all as “The Court”. We focus on audio recordings where all speakers have been identified so far, that is, recordings from 1999 to the 2013 (i.e. fifteen years of oral arguments; approximately 975 hours of audio). The boundaries between words and between individual speech sounds are automatically determined using the Penn Phonetics Lab Forced Aligner (Yuan and Liberman, 2008), whose acoustic models were trained on the same data set using the HTK toolkit Young and Young (1994) and the CMU American English Pronouncing Dictionary (Weide, 1995).

### 4 Preliminary Results

In two studies, roughly 1400 participants rated the voices of 60 lawyers along several measures and predict whether the lawyer won the case. This study used voice samples of lawyers saying the same sentence; the recordings are available electronically from the Oyez Project (<http://www.oyez.org/>). The studies were conducted on Amazon’s Mechanical Turk, an online labor market. Participants

were asked to use headphones to listen to the audio samples. Besides rating the voices, participants also answered several questions on demographics, personality, hearing abilities, and musical training.

In pilot study 1, each participant rated all 60 lawyers and was asked to rate each voice along 7 dimensions: masculinity, confidence, attractiveness, educatedness, intelligence, trustworthiness and likelihood of winning the court case. 201 participants took part in pilot study 1, of which 13 were excluded from analysis because of failing the hearing test or not completing the whole study. In pilot study 2, each participant rated each lawyer only on one dimension in order to prevent any carry-over effects. Also, participants were asked to estimate the age of the speaker in order to test for a potential confounding relation between perceived age and perceived masculinity/attractiveness. Sequences containing beeps that participants had to report were also included in order to check their alertness. Pilot study 2 had an additional 1192 participants, of which 49 were excluded from analysis because of failing the hearing or alertness tests.

First, the study checked the reliability of perceptions of voice by correlating the ratings for the voices across pilots. Figure 1 shows a scatter plot of the ratings by pilot study. The almost linear distribution of the data points indicates that the ratings are quite reliable. Data from both studies were then pooled and regression analyses performed. They show that when analyzing at the level of lawyers (mean ratings, i.e. 60 data points) lawyers that are rated more masculine are less likely to win the case (cf. Tab. I). At the individual subject level, voices perceived as more masculine or attractive were less likely to win cases (cf. Tab. II).

## 5 Discussion and Conclusion

Nonverbal and verbal mimicry, which have long been studied by social psychologists, have been found to have behavioral effects and effects on the perception of the mimicker. For example, mimicry has been shown to influence consumer behaviors in a real selling context (Jacob, Guéguen, Martin, and Boulbry, 2011).

Studies find that higher linguistic style matching is associated with better negotiations (Taylor and Thomas, 2008) and consumer product preferences (Tanner, Ferraro, Chartrand, Bettman, and Baaren, 2008) and that mimicry is unconscious (Niederhoffer and Pennebaker, 2002) and facilitates interactions and liking (Chartrand and Bargh, 1999). In an economic study, participants whose speech rates converged in conversation were more likely to cooperate in a subsequent prisoner's dilemma game (Manson, Bryant, Gervais, and Kline, 2013).

Anderson and Klofstad (2012) examine the influence of voice pitch on selection of leaders, and find that male and female leaders with lower-pitched (i.e., masculine) voices are generally preferred by both men and women. The authors do not rule out the possibility that masculine voices may indicate older and more experienced candidates.

In the spirit of (Becker, 1957), private firms, with profit-maximizing incentives, would be more likely to assign the lawyers who will win their case (whether because they have more resources to buy these lawyers, more resources with which to find out which lawyers win, more experience litigating and have learned over time which lawyers win, or simply because they care about the bot-

tom line more). Indeed, we find that our results are primarily driven by public rather than private advocates. This heterogeneity alleviates some of the concerns of omitted variables. For example, if firms with bad cases assign tough, masculine sounding lawyers who bluster their way through an oral argument, we might expect both public and private firms to use this strategy, but they do not.

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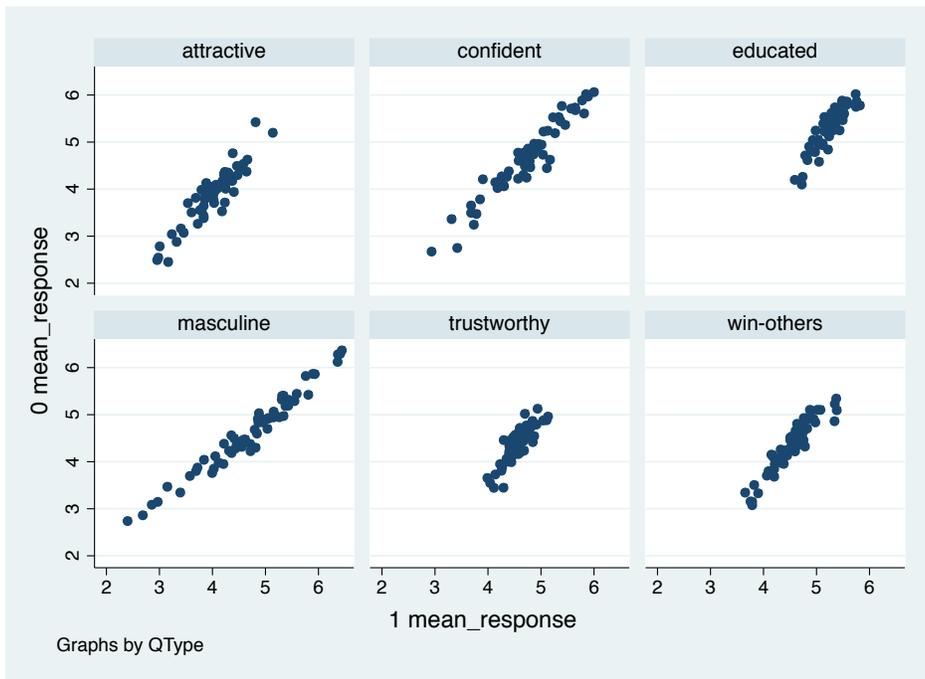


FIGURE 1.— Scatter plots of the different mean ratings for each lawyer. The vertical axis is for pilot study 1, the horizontal for pilot study 2. “win-others” indicates whether participants thought the lawyer would win the case.

Dependent var.	(1) Outcome	(2) Outcome	(3) Outcome	(4) Outcome	(5) Outcome	(6) Outcome
Masculine	-0.227** (0.112)	-0.227** (0.0977)	-0.391* (0.207)	-0.342* (0.175)	-0.342** (0.154)	-0.641 (0.501)
Attractive				-0.0603 (0.292)	-0.0603 (0.265)	-0.331 (1.014)
Confident				0.441 (0.310)	0.441 (0.305)	0.821 (0.715)
Trustworthy				-0.484 (0.584)	-0.484 (0.641)	-0.460 (1.430)
Observations	60	60	60	60	60	60
R-squared	0.066	0.066	0.114	0.101	0.101	0.183

Marginal effects; Standard errors in parentheses

\*:  $p < 0.10$ , \*\*:  $p < 0.05$ , \*\*\*:  $p < 0.01$

TABLE I

DIFFERENT LINEAR REGRESSION MODELS FOR MEAN RATINGS OF LAWYERS' VOICES. 60 LAWYERS WERE RATED BY ABOUT 1400 PARTICIPANTS. COLUMNS 1-3 ONLY CONSIDER MASCULINITY, COLUMNS 4-6 ALSO TAKE INTO ACCOUNT RATINGS OF ATTRACTIVENESS, CONFIDENCE AND TRUSTWORTHINESS. COLUMNS 2,3,5 AND 6 CLUSTER AT THE CASE LEVEL; WITHIN CASE COLUMNS 3 AND 6 COMPARE LAWYERS OF ONE TEAM WITH THOSE OF THE OTHER.

Dependent var.	Outcome
Rating sequence	-0.021 (0.021)
Age	-0.001 (0.003)
Musical training	-0.006 (0.019)
Gender	0.011 (0.039)
Masculine	-0.382*** (0.025)
Confident	0.110*** (0.027)
Attractive	-0.052** (0.023)
Educated	0.087*** (0.024)
Constant	0.025 (0.093)

Observations	11,160
Log Likelihood	-7,588.873
Akaike Inf. Crit.	15,237.750
Bayesian Inf. Crit.	15,457.350

\*:  $p < 0.10$ , \*\*:  $p < 0.05$ , \*\*\*:  $p < 0.01$

TABLE II

LOGIT REGRESSION OF RATINGS OF LAWYERS VOICES. THE DEPENDENT VARIABLE IS THE ACTUAL OUTCOME OF THE CASE, WHICH IS ONE IF THE LAWYER WON THE CASE. "RATING SEQUENCE" LABELS IN WHICH SEQUENCE PARTICIPANTS RATED THE LAWYERS AND THE INDIVIDUAL DIMENSIONS (MASCULINE, CONFIDENT, ETC.). "MUSICAL TRAINING" INDICATES WHETHER PARTICIPANTS HAD MUSICAL TRAINING, IN THAT CASE THIS VARIABLE IS SET TO 1. THE ANALYSIS SHOWS THAT RATINGS OF VOICES AS MASCULINE, CONFIDENT, ATTRACTIVE AND EDUCATED PREDICT OUTCOMES OF THE CASE.

Dependent var.	(1) Outcome	(2) Outcome	(3) Outcome	(4) Outcome	(5) Outcome	(6) Outcome
Masculine	-0.291** (0.139)	-0.291** (0.111)	-0.534 (0.408)	-0.433 (0.268)	-0.433 (0.269)	-1.174** (0.485)
Attractive				-0.0346 (0.417)	-0.0346 (0.294)	-2.146 (1.014)
Confident				0.290 (0.470)	0.290 (0.466)	1.789** (0.780)
Trustworthy				-0.0478 (0.818)	-0.0478 (0.992)	1.653 (1.931)
Observations	34	34	34	34	34	34
R-squared	0.120	0.120	0.439	0.138	0.138	0.737

Marginal effects; Standard errors in parentheses

\*:  $p < 0.10$ , \*\*:  $p < 0.05$ , \*\*\*:  $p < 0.01$

FIGURE 2.— Public lawyers only. Different linear regression models for mean ratings of lawyers' voices. Columns 1-3 only consider masculinity, columns 4-6 also take into account ratings of attractiveness, confidence and trustworthiness. Columns 2,3,5 and 6 cluster at the case level; within case columns 3 and 6 compare lawyers of one team with those of the other.

Dependent var.	(1) Outcome	(2) Outcome	(3) Outcome	(4) Outcome	(5) Outcome	(6) Outcome
Masculine	-0.0908 (0.185)	-0.0908 (0.169)	0.0785 (1.194)	-0.154 (0.274)	-0.154 (0.234)	1.211* (0.574)
Attractive				-0.233 (0.497)	-0.233 (0.537)	-3.474* (1.647)
Confident				0.394 (0.457)	0.394 (0.445)	0.327 (0.377)
Trustworthy				-0.574 (0.916)	-0.574 (0.901)	-1.141 (0.919)
Observations	26	26	26	26	26	26
R-squared	0.010	0.010	0.351	0.077	0.077	0.880

Marginal effects; Standard errors in parentheses

\*:  $p < 0.10$ , \*\*:  $p < 0.05$ , \*\*\*:  $p < 0.01$

FIGURE 3.— Public lawyers only. Different linear regression models for mean ratings of lawyers' voices. Columns 1-3 only consider masculinity, columns 4-6 also take into account ratings of attractiveness, confidence and trustworthiness. Columns 2,3,5 and 6 cluster at the case level; within case columns 3 and 6 compare lawyers of one team with those of the other.