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A Series of Grunts and Whistles: Making Sounds and Saying Words in Political Discourse.

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A Series of Grunts and Whistles:
Making Sounds and Saying Words in Political Discourse.

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by

stonegarden grindlife

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ABSTRACT OF THE DISSERTATION

A Series of Grunts and Whistles:
Making Sounds and Saying Words in Political Discourse.

by

stonegarden grindlife
Doctor of Philosophy in Political Science
University of California, Los Angeles, 2017
Professor Jeffrey B. Lewis, Chair

Is politics becoming more aggressive? Or are we focusing on the outliers? If discourse is becoming less civil, what are the causes and effects of any rise in mutual disdain among political actors? In this dissertation I look at variation in the basic prosodic elements of loudness, pace, pitch, and pitch variance in congressional speeches. To test for any increases in aggression I capture over 60 million seconds of footage from the C-SPAN library for the 109th through 112th Congresses. This covers House and Senate floor proceedings encompassing nearly 700 days of video in the 2005 to 2012 period. Not everyone expresses anger and aggression in the same way. To control for this I develop legislator-specific baselines of emotional expression. Using the vocal and lexical components from a subset of House speeches I also test the possibility that not only actively negative but also actively positive speeches may affect political outcomes.

With this large and novel sonic data set I demonstrate that congress members are becoming more fevered in their speech. Becoming more aggressive is not necessarily becoming aggressively negative. Comparing vocal dimensions with the actual words that legislators speak, I find a positive relationship between talking louder, faster, and with elevated pitch and making more negative statements. Turning to the causes and effects of these changes, I find that House members are more likely to speak aggressively and that more controversial legislation similarly encourages aggression. On the other side of things, speaking style af-

fects productivity. Faster speakers are less capable of drawing cosponsors on their legislation while those with greater pitch variation experienced the opposite. The inverse is true for a legislator's ability to move things through congress to the president's desk. When it comes to electoral outcomes, legislators who raise their pitch are more likely to lose in a primary. I also find that such a raise in pitch can signal a member's political aspirations to higher office, in particular the Senate or a Governorship.

The dissertation of stonegarden grindlife is approved.

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CHAPTER 1

Introduction

Is politics becoming more aggressive? Are candidates becoming more blatantly rude towards each other? Has basic civility broken down in democratic discourse? Those of us who have lived through the 2016 Presidential Election cycle may have reason to believe the answers to these questions is "Yes! Yes it has, dammit!" For some this outburst would arise from earnest aggressive passion, being willing participants in this fracturing of civility. For others it would be that of a gruff weariness at bearing witness to the 2016 race for the White House.

The most recent election may have been an especially peculiar year with a truly novel candidate in eventual Republican nominee Donald Trump. Not being a beltway insider himself, and lacking any of the polish of a person having served in any level of electoral office, he ran on a platform of "draining the swamp" in Washington, D.C. Consistent with his lack of familiarity with the implied rules of decorum, in front of campaign rallies, in interviews, and during debates, Trump would openly mock his opponents and deride his critics in simplistic ways. When 2008 GOP nominee for president and former prisoner of war Senator John McCain (R-AZ) took issue with his views on Mexican immigrants, Trump declared "He's not a war hero ... I like people who weren't captured."[1] During the Republican presidential nominee debates he took issue with Megyn Kelly pressing him on his past assertions that women he did not like were "pigs, dogs, slobs, and disgusting animals." In response to this he dismissed her as having "Blood coming out of her wherever."[2] After easily gaining the

[1]http://www.politico.com/story/2015/07/trump-attacks-mccain-i-like-people-who-werent-captured-120317. Last accessed: 03-20-2017

[2]http://www.cnn.com/2015/08/08/politics/donald-trump-cnn-megyn-kelly-comment. Last accessed: 03-20-2017

nomination he did not temper his speaking style. In debates against Democratic nominee Hillary Clinton he would roll his eyes and shrug. He dismissed her as a "nasty woman" and threatened to jail her when he got into office.[3] Despite these and other incidents of brash disregard for even the mere performance of civility and intermittent respect for opponents and critics, Donald Trump was sworn in as the 45th President of the United States on January 20th, 2017.

In the post-mortem of the Clinton campaign multiple theories were presented to account for her loss to Trump in the Electoral College (though not the popular vote). There was a "silent majority" that was not willing to admit their support for Trump when they were polled.[4] Per the logic of this argument, those who were going to vote for Trump obscured this fact due to a social desirability bias. They did not want to be thought a fool for doing so; effectively an inversion of the Bradley Effect. This effect is most often associated with an overstatement of support for minority candidates for fear of being accused of being racist, whether such prejudices are present in a voter's decision calculus or not (Vogel & Ardoin 2008; Powell 2013; Stout & Kline 2011). Evidence of this phenomenon is also found when potential voters are polled about female and gay candidates as well as ballot initiatives related to issues including gay marriage. Another theory explaining Clinton's loss was the desire for "change". In the eyes of many in the electorate Hillary Clinton did not represent change. Poor, struggling, white voters in the post-industrial rust belt cities and coal country towns were disillusioned with the status quo. They were tired of figuratively crawling while those around them were running. Any candidate who did not represent "more of the same", that might give them a chance to rise up and at least break into a steady stride walking on their own two feet, was preferable to yet another party machine candidate bearing either the Democratic or Republican label.[5]

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[3]https://www.theguardian.com/us-news/2016/oct/10/debate-donald-trump-threatens-to-jail-hillary-clinton. Last accessed: 03-20-2017

[4]https://www.washingtonpost.com/news/the-fix/wp/2016/10/06/the-donald-trump-campaign-takes-its-silent-majority-case-to-the-media. Last accessed: 03-20-2017

[5]https://www.theatlantic.com/magazine/archive/2016/09/the-original-underclass/492731. Last ac-

Coupled with this disillusionment, and possibly exacerbated by a Democratic party that was focused on identity politics—where this "silent majority" may have felt their concerns about waning employment opportunities and a loss of a sense of working hard and achieving an ever-receding "American Dream" were ignored in favor of debates over social issues such as transgender bathroom access rights—a further theory was presented.[6] Trump won ***because*** of his brazenness. His lack of polish and disregard for the minutiae of "political correctness" was not a liability, but rather a strength. He won because this was "refreshing" and drastically different than the behavior of any major party candidate in some time. It touched on a sense of populism not seen in a potential president since Andrew Jackson.[7] His rough words, his rude sentiments, these resounded with voters in a primal, perhaps subconscious manner. Running on the platform that "I am not Trump" or "I am a woman" was not enough to distinguish Hillary Clinton from her opponent, the theory goes. His overwhelming lack of restraint, the sheer novelty of his appeal, these provided voters with enough reason to vote for Trump that no amount of not being Trump could give voters reason to vote against him.

Trump's ascension through the primaries to the presidency is not something that could be attributed merely to his own efforts coinciding with a greater desire (or at least tolerance) for incivility in political discourse. Another major player in this was the media. This manifested in at least three ways: the role of partisan media, the lack of media consumption diversity by voters, and a general desire for ratings regardless of—especially televised—media political orientation. If politics is becoming more aggressive and its coverage more tolerant of incivility, is this a new age in our democratic discourse? Or is it a return to the youth of our country's political media? In Hamilton's *All The News That's Fit To Sell* (2004) he argues that early American news sources were unrepentantly partisan in the past.

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[6]http://www.newyorker.com/news/daily-comment/the-democrats-and-the-seesaw-of-identity-politics. Last accessed: 03-20-2017

[7]http://www.politico.com/magazine/story/2016/03/gop-2016-andrew-jackson-1824-213726. Last accessed: 03-20-2017

Such unrestrained extremity eroded after the Civil War on into the early twentieth century. This could be accounted for largely by basic economic factors. Improvement of printing technology and the need to invest in this new technology created a disconnect between previous party patronage, including outright subsidization of the presses by party leaders, and the publishers. With political party benefits for printing being too low, more—and generally more ideologically diverse—investors were brought in. To further spread the costs around, the presses had larger circulation runs for two basic reasons. It reduced the cost of an issue for the general public and the larger reach made potential advertisers more likely to want to buy ad space in the newspaper. At the same time this broadening reach led to a moderation of policy positions, or at least the tendency to divorce papers from party labels. Thus papers became less likely to explicitly refer to themselves as, for example, the Waterbury Republican American but rather the "Independent".

Moving to the broadcast news era from 1969-1998 there was a rise in soft news at the expense of policy coverage resulting from a few factors. The first among these was the increase in media competition from the expansion of cable. The purchase of networks by organizations that had no historical connection to broadcasting—GE by NBC and CBS by Westinghouse, for example—also contributed to this (Hamilton, p. 162). As we transitioned to the era of social media and further competition for eyeballs from an ever-expanding array of satellite and online media streams, the outrageous and the controversial was an easy means to gain and maintain ratings. A blusterous braggadocious Donald Trump is just what television news needed to consistently draw the attention required to charge advertisers premium rates for air time.[8] CBS president Les Moonves's public sentiments on the matter were undoubtedly reflected by the heads of other media conglomerates.

> "'It may not be good for America, but it's damn good for CBS,' he said of the presidential race. Moonves called the campaign for president a 'circus' full of 'bomb throwing,' and he hopes it continues. ... 'Man, who would have expected

[8]http://www.politico.com/magazine/story/2016/04/2016-donald-trump-blame-tv-cable-news-media-campbell-brown-campaign-cnn-fox-msnbc-213839. Last accessed: 03-20-2017

the ride we're all having right now? ... The money's rolling in and this is fun.'"[9]

The ability to microtarget advertisements in online platforms may have drawn the potential for polarized media and echo chambers of political media consumption back onto itself. Like an ouroboros we appear to have come full circle, at least in our news sources, to the hyper partisanship that existed before the Civil War.

1.1 Looking High and Low

In this dissertation I argue that we are focusing at the top when we should be aiming our sights a bit lower. Relying on the hyper focus of the media in the controversy of a presidential race—especially in a race where the purported Republican candidate has a history of giving to his erstwhile friends the Clintons, and supporting traditionally non-conservative positions regarding many social matters, including gay rights—may not provide the best evidence for increased support for aggression and incivility in politics. If as Tip O'Neill asserted "all politics is local" then we may have a better sense of whether our politics is becoming more rude and discourteous by looking not at the second branch but rather at the first branch. There is some argument that though the politics of getting into government may be local in the Fenno sense of needing to build and maintain a reelection constituency (1978) that the actual act of governing often lies somewhere between local and national realities.[10] In Congress we find this middle, where the local need to bring pork projects back to the district intersects with national concerns over health care and international issues of defense and diplomacy.

The novelty of my project relies on improvements in technology, computing power, and their ability to supplement and extend prior analyses of polarization and incivility that have been conducted via two other means. The most common method of testing for polariza-

[9]http://www.hollywoodreporter.com/news/leslie-moonves-donald-trump-may-871464. Last accessed: 03-20-2017

[10]https://fivethirtyeight.blogs.nytimes.com/2011/01/03/all-politics-is-local-the-debate-and-the-graphs. Last accessed: 03-20-2017

tion is in roll call votes. Poole and Rosenthal (2000; 2009) have used this data to explain most of the voting behavior in congress on two dimensions. One of these is a now-obsolete North-South dimension roughly approximation historical attitudes on slavery. The remaining salient dimension is a traditional liberal-conservative scale that reflects views on the role of government in matters like socio-economic issues. Since at least the late 1980s polarization, that is a divergence between the two major parties central voting ideology scores, has been steadily increasing. The more recent use of textual analysis (Grimmer 2013; Laver, Benoit, and Garry 2003; Slapin & Proksch 2008) has revealed similar divisions in the way members of congress speak. While not as high as the late 19th Century Jensen et al (2012) find that there has been an increase in polarized speech since the 1990s. By their own admissions (Grimmer & Stewart 2013) concede that while text as data has its strengths, those who rely on the "bag of words" as a tool for extracting topic and sentiment from political proceedings and literature do so with some assumed risk and—until computing power and algorithms become as complex as humans in understanding matters of nuance and context—are not replacements for actual living coders. Alternative methods aside from voting scores and text analysis have also become more feasible with advances in computing power. One such method relies on campaign donation patterns. Using a vast data set of political contributions at the state and federal levels as a more recent proxy for ideological positions Bonica (2013; 2014) similarly finds evidence for increased polarization.

In my work I take these means of polarization testing and translate them into measures of incivility. To do this I build a large and novel data set of prosodic cues—the vocal dimensions accompanying floor speeches in the House and Senate. Pulling in over 60 million seconds of video footage from the C-SPAN servers over the 109th through 112th Congresses covering 2005 to 2012, I extract 4 vocal patterns of interest. These are speaker pace, loudness, pitch, and pitch variation. Using these in conjunction with the lexical dimension of the words they speak, I test assorted linguistic and psychological theories of emotional activation and sentiment. Focusing on vocal aggression as a drastically under-examined factor in political science research I find that the what legislators say and how they say it are not merely the "political theater" they have been dismissed as in the literature (Gilmour 2011).

1.2 Plan of the Dissertation

This dissertation begins with an antecedent question. Before asking *what* legislators talk about and the *how* they debate, I must first ask the question of "why" they choose to speak in the first place. In Chapter 2 I review House and Senate floor proceedings in the post World War II period from 1947 to 2006. I look at factors affecting the probability that a member of congress will speak at all. Is there a rationale to choosing to speak in the first place? I find that more ideologically extreme members are more likely to speak. I also find evidence that the introduction of C-SPAN cameras to record proceedings increases speaking probability. This is true regardless of the fact that C-SPAN introduction was staggered for the two chambers. Looking at census and redistricting effects on the House, I find that the period between the census and the first election thereafter decreases speaking probability. This effect is tempered by speaker tenure. In the Senate I find that higher cloture threshold encouraged speaking.

In Chapter 3 I make use of the data available in this post-C-SPAN era. In doing so I provide a deep dive of the methods and technologies I used to develop a distributed scraping method to capture the footage from both chambers from 2005 to 2012. I explain the rationale for my focus on this time frame, both as a matter of practical limitations and systematic concerns that can be encountered if one ventures into not only larger time frames but other contexts outside of floor proceedings. After elaborating on some of the general linguistic and psychological literature on my prosodic cues of interest and their relationship to assorted emotional states, I then make use of a close captioned parallel video set to associate actual text of proceedings with the sounds House members make. Translating these text blocks into positive and negative sentiment scores via a standard text analysis API I then review some of the relations between prosody and lexical tone of speech. As a general trend I find that as my prosodic cues become more elevated the sentiment of the spoken words becomes more negative.

Establishing legislator-specific baselines to control for each speaker's own version of vocal activation I perform a brief review of these trends. I then test for factors that affect

the valence and intensity of the prosodic dimensions. In Chapter 4 I frame this analysis in the context of the legislative controversy. Coding for CQ Key Votes and non-controversial House suspension debate I find that more controversial bills are unsurprisingly accompanied by higher indicators of aggression. Debate in the Senate is more passive. An in-depth review of the ideological and text-as-data metrics reveals the nuances and limitations of testing for aggression and polarization using merely vote scores and *Congressional Record* text. With the understanding of self-censoring due to restrictions of decorum and the role of the media in magnifying the appearance of incivility and polarization in congress, I examine prosodic aggression effects on two measures of productivity. I find that some evidence that more aggressive legislators are able to gain more bill cosponsors relative to their own cosponsorship numbers. Using a complex measure of legislative productivity I find a divergence between pace and pitch variation—the latter being a proxy for a greater range of emotional expressiveness. Faster speakers are less productive while higher pitch variation speakers are more productive. Finally I intersect the lexical sentiment dimension on my prosodic dimensions to test whether legislators who use a strategy of negative attack are more or less productive than those who decide on positive advocacy.

In Chapter 5 I explore gender effects on performance of pitch. Over time I find that male speakers' pitches are moving closer to that of their female counterparts while female pitches remain consistently different from males'. There is some psychological evidence that voters prefer their politicians to speak on the lower end of their sex's standard pitch range. When compared to their own sex's median pitches I find that women legislators have distinctly lower pitches. However male legislators have clearly higher pitch differences relative to the general male population median baseline. Understanding that higher pitch variation is also associated with charismatic speech and higher assessments of speaker benevolence, I find that there is a definite divergence between the sexes. Women are have higher pitch variation than men. Where actual pitch differences between men and women have biological groundings in differences in vocal cord length and thickness, variation of pitch is not similarly tied to anatomical structure. It appears that when it comes to pitch variation men may be succumbing in part to gender norms of vocal control by reducing their variation. Though

the inverse may be true for women who are opening up their range of vocal expression. None of these pitch differences are significantly related to productivity. When I look at debate language that uses the framing of family, I find that female legislators are much more likely to make an appeal on the basis of their experiences "as a mother". I also find that men who speak with a more "feminized" pitch have a greater probability of introducing "women's issue" legislation.

Exploring the possibility that pitch cues can be a response to electoral framings and an indicator of electoral success, in Chapter 6 I revisit the post-census period modeling. The period between the census and the most recent election thereafter is associated with increases in pitch and pitch variation. The actual number of seats gained or lost after a census is insignificant while the mere presence of a post-census period is highly significant. When legislators increase their pitch from the prior Congress they are more likely to lose their primary, though this appears to be countered by an increase in their pitch variation. When I look at the general election, lower pitch variation is correlated with higher predicted probability of loss. Finally I tested for the possibility that pitch changes may serve as an indicator of political aspirations. Legislators that elevate their pitch are are more likely to run for the Senate or their own state's Governorship.

Concluding in Chapter 7 I summarize my findings and explore future research agendas. This includes a discussion of regional variations in speech patterns and expressions of anger. I explore the possibility—though more realistically the difficulties—in testing for lying by legislators. I offer an alternative to a direct coding of lying as such. I discuss the potential of expanding C-SPAN video library analyses to committee proceedings, debates, and other campaign events. I explore the potential of the visual elements of the C-SPAN footage as a tool for political analysis. This includes the simpler possibilities of props and whether they work in complement with aural and lexical effects to strengthen a legislators arguments or whether they serve as a crutch signaling the ineffectual nature of their debate style. In closing I lay out the complex methods yet rewarding possibilities of using the video library for body language and gesture analysis. Finally, returning to the possible benefits of actively negative speech for legislative productivity, I provide a basic analysis of message complexity

and its relations to vocal aggression and message sentiment.

CHAPTER 2

To Speak Or Not To Speak: That Is The Initial Question

Prior to getting into a discussion of the sounds associated with speech, it is perhaps instructive to get at the question of "Who Speaks?" This is more properly initially framed in the context of textual analysis of political actors. However, it is nonetheless antecedent to reviewing words on a page. The field of research on the actual content of speech in legislatures is relatively young but growing. Its primary focus has been on utilizing texts of speeches and legislative proceedings as data to approximate party positions on policy matters (Laver, Benoit, and Garry 2003; Slapin and Proksch 2008). Politicians provide us with mountains of words to review. In the proceedings of the Congressional Record, in transcripts of press conferences, and in the press releases we have access to ample amounts of text as data. Grimmer in particular has made good use of press releases to show the strategy of legislators in targeting their messages (Grimmer 2013) to fit the anticipated desires of their constituents. Members of Congress will take more or less bipartisan positions on matters such as appropriations depending on the ideological composition of their constituency. On especially controversial issues such as the Iraq War, members from ideologically diverse constituencies will be less likely to make any comment. Most of the explicit position taking on highly divisive issues is made by ideologically extreme legislators with high co-partisan populations in their states and district. Any person who has been on the ground for a political campaign is likely to have seen such targeted messaging. In my personal experience working for a House Member in a tight district—one he won by less than 500 votes as an incumbent in the prior electoral cycle—this was the case. Bearing witness to repeated speeches, ones we could have recited from memory to a crowd in an emergency, my fellow grunts and I could determine

the socioeconomic makeup of the audience based on the emphases in the script. If we were in the more working class part of the district, the speech was about making college affordable for the voters' children. If we were in the more affluent part of the district, then affordable college was swapped out for environmental causes. While the candidate most certainly cared about both issues, he was strategic in when to emphasize one issue over another.

While such research provides a sense of strategy to when a legislator might speak on a matter, this is still not the base question I wish to address. The mere act of speaking as such is largely taken for granted in the work on political text as data. In the course of this chapter I hope to move the analysis of speaking in legislatures forward by first stepping back and asking the question of why legislators choose to speak at all. This is the guiding question of the following pages. Other questions that follow include whether there is any strategy to speaking? Similarly, might there even be a strategy to not speaking? Clearly this is a consideration that others have already addressed in some part. I focus more specifically on speech on the House and Senate floors. Lastly, what conditions would encourage a strategic choice of not speaking in a body that requires words to be uttered—even at the most basic parliamentary level of speaking—for anything to get done?

The question of analyzing speaking or not speaking as a fundamental strategic consideration for a legislator may seem a non-starter at the outset. It may be difficult to characterize a speaking choice for a legislator as a decision on par with how to vote on a bill or nomination, or whether or not to add or remove a name as a cosponsor to a piece of legislation. Surely speaking is a fairly consistent activity of every legislator. As seekers of re-election they want it to be known that they are advocates for their constituencies' concerns on the floor of their chamber. As lawmakers they must endeavor to speak, in order to contribute to a meaningful debate that will craft the best legislation possible.

Among the findings of this chapter is that such a presumption of constant speaking appears to be incorrect. Looking at the 60 years of U.S. Congressional proceedings from 1947 through 2006, I constructed a 4,000-plus point data set that captures speaking patterns in both the House and the Senate. This data set touches upon a range of different legislators and the circumstances surrounding their decisions to speak or not speak, while similarly

capturing a wide range of legislative days and how their peculiarities might have contributed to speaking strategies. With the aid of this data I constructed models testing speaking in the Congress as a whole. Using some variables in my models specific to the separate chambers, I also tested speaking probabilities in the House and Senate individually.

In absence of a fully developed existing literature on speaking as such as a strategy, I tested assorted questions that might arise from the more general literature on legislators' decision-making strategies. Among them were whether variations in speaking could be accounted for by general institutional constraints such as the number of members in a chamber or the presence of a Rules Committee? Are these differences better explained by the electoral security or insecurity of the individual members? What about the role of party strength? Does tenure of the member coupled with leadership roles and norms of apprenticeship explain why some Senators and Representatives might be more or less prone to allowing their words to be written down in an historical record?

2.1 Literature Review

A major difficulty in approaching this subject is that there is little apparent direct literature addressing strategies of speaking in legislative bodies as such. This is not to say that there is no literature that involves using the legislative proceedings as data. While there could be said to be a literature addressing questions parallel to my concerns, what parallel literature there is that might be in the same area of study takes for granted the act of speaking. These papers instead focus on using word counts to estimate party policy positions over time (Laver, Benoit, and Garry 2003; Slapin and Proksch 2008). That being said, some variables that might contribute to the probability of a legislator speaking could be gleaned from the standard literature on Congressional action. In attempting to account for possible fluctuations in a legislator's probability of speaking on a given day in a given chamber, much can be learned from the broader literature on the general motivations for legislators to act or not act in various other aspects of the legislative process. Using these guideposts I can construct some models to test for legislator strategies in speaking.

From Mayhew's influential work on the electoral connection some motivation for legislative speech could be accounted for by attempts to claim credit, take positions, and engage in policy-devoid advertising (Mayhew 1974). Decisions to engage in any of these activities in speaking can be motivated by concerns over an impending election. This could be coupled with their understanding of Americans' myopic views of political history (Bartels 2016). With an understanding of any possible value of speaking in Congress and American short-term memory there may be a relationship between speaking and the closeness of an election. Where Mayhew provides some basis for why a legislator might speak Arnold (1992), in laying out evidence for legislative blame-avoidance strategies, gives us some reasons why a legislator might avoid speaking on the floor. Arnold suggests that at some level a legislator is not so much a benefits-maximizer as much as a costs-minimizer when she performs her rational choice math in deciding how to act. One strategy that legislators engage in involves reducing the visibility of their connection with legislative outcomes that will lead to costs for their constituents. This generally takes the form of avoiding roll-call votes (preferring voice votes) on controversial legislation, or the use of legislative bundling to couch potentially costly legislative outcomes in must-pass legislation. An example of this could be found in the original Department of Homeland Security (DHS) authorization bill, when legal protections for producers of vaccines containing mercury-based preservatives—which were claimed to be tied to childhood onset of autism—were inserted into the text. This way legislators could claim that they did not want to vote for the specific legal immunity provisions, yet had to in the course of maintaining national security with the creation of DHS. In a similar line of thought, it could be possible that legislators will speak less on legislation that is costly to their constituents—especially if these legislators have some direct hand in creating the legislation. This could of course work in the opposite direction, where costly legislation could lead to an increase in legislative speech.

In Fenno's analysis of legislators' Home Styles (1978) he suggests that the types of actions that legislators engage in is largely tempered by their tenure in a chamber. Early on in a legislator's career she will spend more time in the state or district in an effort to maintain or build her re-election constituency. As her career goes forward she begins to move away from

more explicit connections to constituents in attempting to develop good policy in committees and on the chamber floor. Eventually she may aspire to party leadership positions and move even further from spending significant time in the state or district with her constituents. Peculiar to the House though is another wrinkle in the re-election constituency motivation to speak or not speak. With the decennial census comes the possibility that redrawing of district lines and the gain or loss of seats in a state's House delegation could trigger a renewed interest in the re-election constituency (Ansolabehere, Snyder, and Stewart 2000).

Sinclair (1989) states that apprenticeship norms (where newly-arrived members—particularly in the Senate—are expected to be silent and learn from their elders) in Congress are essentially dead. Obama's election to the presidency served as a resounding affirmation of Sinclair's contention. Nonetheless, depending on the time frame of analysis, it could be argued that such a norm may have accounted for legislator silence in the past. When exactly this norm began to dissipate is not clear, though Rieselbach (1995) suggests that it began in the 1970s. This coincides with the introduction of the Subcommittee Bill of Rights and the influx of Watergate-baby members of Congress, elected by constituents suspicious of the way things were being run on The Hill.

The strength or weakness of the parties, both within Congress (Aldrich and Rohde 2000) and as electoral parties, may feed into a legislator's desire to cultivate a personal vote (Cain, Ferejohn, and Fiorina 1987). This could discourage speaking in Congress as a personal vote may be built with solid constituency service and pressing of flesh in a state or district. It could also encourage speaking on a chamber floor as the personal vote can be built in running as a maverick or outsider against one's own party; a party which is too weak to either punish a legislator in Congress or depose the legislator in the primary process.

Another possibility is that legislators would be encouraged to speak due to the legislation on the floor at the time. If the bill being discussed is from their committee or a committee tied to some constituency concern (Adler and Lapinski 1997) then they should be more likely to speak on the floor. Another consideration is that the legislator has some (either self-imposed, or at the behest of the party) descriptive representational duty to speak about a piece of legislation (Swers 2002). This is to say that if a legislator is female and the bill

could be classified as a "women's issue" bill then they may either be pushed by their party or self-select to speak about the bill. Similarly, if there is a bill related to any number of demographic groups that the legislator "represents" then comparable party or self-selection speech biasing may increase the probability of speaking on a chamber floor. Even in absence of such a specific bill that could be tied to their demographic, historically under-represented members may feel a need to speak out of a sense of duty to make sure that there is some balance in the discourse and the considerations that can frame the formation of legislation and the consideration of nominations.

2.2 Expectations

With the understanding that the literature on the strategy of speaking needs more development than I will provide in this chapter, my expectations are actually quite numerous. Though none of the literature I delved into during my cursory review directly addressed speaking strategies it nonetheless adds more detail and nuance to potential models. Among my expectations of the patterns of speech is that there will be more speaking in the Senate. This is due to the absence of a Rules Committee and its resolutions, which can constrain the time of consideration on a bill while also limiting the amendments that can be debated. The lack of a germaneness rule—before cloture has been invoked on a bill or a nomination—in the Senate might also contribute to an increased speaking probability. The relative smallness of the chamber compared to the House may also have an effect on speaking. Though when including this size discrepancy as a control in my models it is possible that the differences in speech between the two chambers will be minuscule.

Building off of Fenno, I anticipate that the more tenure that a legislator has in a given chamber the more likely it is that she would speak. This is, at some level, a reflection of the legislator successfully having cultivated her reelection constituency; and thus feeling freer to speak her mind on any number of issues. Longer tenure can also lead to ascension of legislators to Chairman and Ranking Memberships positions—both of committees themselves as well as important subcommittees. At the top of these committees and subcommittees the

legislators must speak, if only to guide traffic during the floor debate. Longer tenure can also lead to movement to the top of party leadership, which can further increase the probability of speaking. As a nuance to this tenure effect I expect that the census will temporarily reset the need for House members to cultivate their reelection constituencies. This is due to the redrawing of district lines and the need for House members to adjust to any changes. As states cannot be gerrymandered I neither anticipate nor test for any such adjustments affecting speaking in the Senate. My suspicion is that this post-census period will encourage House members to speak less, as they will spend more time in their districts pressing the flesh.

When it comes to the issue of electoral insecurity I anticipate that though there will be an effect of some on speaking this can tilt either way. If a member is going into a race with an expectation that the fight will be tough or that she may even possibly lose she could either speak more or speak less. On one end she may feel it to be more electorally wise to spend as much time in her state or district making face-to-face connections with undecided voters. She may also feel that she will get more reward in votes by being seen on the floor of the House or Senate fighting for a pivotal piece of pork to be inserted into an appropriations bill. I have similar expectations for a legislative day that a lawmaker might have the opportunity to speak on being closer to an election day. As Election Day approaches she may find it more beneficial to speak or more beneficial to be with her constituents. At some level this may be tied into the phenomenon that is C-SPAN.

The introduction of C-SPAN cameras is not something that the literature addresses, yet it may be pivotal to any spikes in speaking. When daily House proceedings began to be broadcast on March 19, 1979 (and later in the Senate on June 2, 1986) the visibility of Congressional actions increased drastically. Herein the cameras afford legislators the ability to be seen by their constituents. They also let it be known when legislators are absent from their duties on The Hill. C-SPAN can tie back into whether electoral security and the days before an election might effect speaking. Borrowing from the presidential literature on going public (Kernell 2006), electorally insecure legislators feeling pressed by the approach of an election might flee their districts to speak in front of the C-SPAN cameras. Much in the way

that Kernell suggests that presidents go abroad during periods of low approval to appear more presidential, perhaps a legislator may flee to D.C. to speak on her chamber floor to appear more congressional.

Another factor that I anticipate will affect the probability of a given legislator speaking on a legislative day is the requirement for consideration and passage of a bill or approval of a nomination. To test this I focus on the Senate and the shift of the cloture threshold from 2/3rds to the current 3/5ths. I expect this lowering of the threshold to encourage speaking on the Senate floor. This should be the end result of more filibustering attempts, particularly by more ideologically extreme opponents of a measure or nomination. My further suspicion is that the direction of this ideological extremity is not as important as the extremity itself.

Finally, I expect that Aldrich and Rodhe's (2000) Conditional Party Government activation and deactivation will influence the probability of a legislator speaking. As party discipline increases, particularly in the House, I anticipate speaking to be suppressed. When parties are weaker speaking should increase. While this could be due to less party discipline generally, it may be more about the decreased power of a party label to serve as a cue to constituents on how to vote. If parties have less meaning this could force a legislator to cultivate a personal vote (Cain, Ferejohn, and Fiorina 1987). This could further lead the legislator to speak on the floor of her chamber to set herself apart from her party. Of course this could work against speaking as she may choose to create a personal vote by spending more time in the district.

2.3 Design and Methodology

To test my expectations and apply the theoretical structures suggested by the literature I began by taking inventory of the over 10,000 legislative days listed in the Congressional Record when either the House or Senate was in session from 1947-2006. I then used simple random sampling to extract from this universe a 3% sample, where I sampled 3% of legislative days by Congress. So if the House and Senate were in session more days during one Congress as opposed to another there were a few more days drawn from that Congress. With 305 days

to work with I then cleaned out 14 days that were pro forma. Pro forma days are legislative days when the only real purpose for a chamber to be in at all is to allow for the printing of Conference Committee Reports, more general committee reports, and introduced texts as well as proposed amendments—thus there is no real expectation that anyone is going to speak at all (except for perhaps the president or speaker pro tempore).[1]

I then took the legislators listed in the NOMINATE scoring data and sampled 3% of these members by chamber per Congress. This gave me 13 House Representatives and 3 Senators to work with per Congress. When coding whether a legislator spoke or not on a given legislative day, I also took note of whether they were not yet members of the chamber I drew them from or had prematurely departed a chamber. If a member arrived late to a chamber, via special election to the House or gubernatorial appointment to the Senate, and thus it was not possible for them to speak on a legislative day I did not code her for that day. Similarly, if legislators left early due to retirement, expulsion, or passing on before the end of their term I did not code them as speaking or not speaking either. This left me with 4,043 data points with which to test my models, where each point represents a legislator-legislative day pairing.

My dependent variable was whether the legislator spoke on the legislative day that she was paired with. For the purposes of this chapter I only coded a legislator as speaking if she literally spoke on the chamber floor. I did not code instances where a legislator was associated with non-spoken text as speaking. Thus I ignored all cases where a member made comments in the Extension of Remarks section as well as text inserted into the floor proceedings.[2] I also ignored instances where the legislator was serving as the pro tempore presiding officer of a chamber.

Regarding the independent variables I included in my models for Congress as a whole as well as those for the House and Senate specifically, I will briefly review those that may not be

[1]In more recent congresses, pro forma Senate sessions have also been used to prevent recess appointments by the Obama administration.

[2]Inserted text was fairly clearly demarcated by bullet points, denoting the and ending of an inserted block of text.

as clearly understood by their mere labeling in the following tables. All ideological scoring and calculations are drawn from the Poole and Rosenthal (2000) NOMINATE scorings, where -1 denotes the most liberal possible ideological score for a legislator in a particular chamber and +1 the most conservative. To create the *Ideological Extremity* variable I simply calculated the absolute value of the difference between the legislator's NOMINATE score and the median score of her chamber. Coding *Days Left Until Next Election* I took the House Clerk's historical records of Election Day returns and compared it to the legislative day I was coding for. I then determined the number of days in the future the next general election was for the Representative or Senator in question on that legislative day. *Tenure* was derived from information on Charles Stewart's Congressional Data Page (Cannon, Nelson and Stewart 2017; Stewart and Woon 2017). Taking this information I coded *Tenure* as the number of complete Congresses the legislator has served in a particular chamber. So if a House Representative moves on to the Senate, for example, regardless of her years of service in the House this number was reset to 0 until she served a Congress in the Senate, at which time it would be coded as a 1—and so on.

I used *Prior Vote Share* to approximate potential electoral insecurity of a legislator. For House members this was fairly straightforward. I just determined the percentage of total votes cast for the legislator in the prior election. In the case of Senators this coding became slightly more complicated. If I was fortunate enough to have a Senator that ran in the prior election, I coded the variable like the House. In absence of this data I used the vote share that the Senator's party gained at the state level for the presidential cycle. If it was not a presidential election year that I was working off of I looked back one election cycle prior to the one I was using for the House. If I had access to the Senator's race in this earlier cycle, I used those numbers to calculate vote share.

Seats in Chamber was coded from House Clerk historical data, and fluctuated from 96 to 100 seats for the Senate and between 435 and 437 for the House.[3] *Majority-Minority Ideological Difference* is derived from Aldrich and Rohde's (2000) conditional party govern-

[3]The increase of seats in the House above 435 was an artifact of the inclusion on the new states of Alaska and Hawaii in 1959. This was adjusted for in post-1960 census redistricting.

ment understanding of partisan activation. It is coded as the absolute value of the difference between the majority and minority party NOMINATE medians for a chamber. *Majority Ideological Standard Deviation* reflects the standard deviation of the NOMINATE scores for the majority party in a chamber and *Minority Ideological Standard Deviation* is its minority party counterpart.

To capture the role of C-SPAN I coded the *CSPAN Introduced* as 1 for both the House and the Senate from the time period when C-SPAN started covering the House on March 19, 1979 on to the present and 0 otherwise. For *CSPAN Introduced [Chamber-Specific]* I coded the Senate as 0 until it began to be covered on June 2, 1986. Thereafter I coded it as 1, as with the House. *Apprenticeship Norm* roughly approximates the presence or absence of an apprenticeship norm in Congress. Taking my cues from Sinclair (1989), Rieselbach (1995), and the introduction of the Subcommittee Bill of Rights, I coded any legislative day prior to 1973 as 1 and thereafter as 0.

Drawing from the broader congressional literature and my own sense of chamber-specific dynamics that might influence speaking patterns, I coded two variables that required separate models for the House and Senate. At the intersection of Fenno (1978) and Ansolabehere, Snyder, and Stewart (2000) I tried to capture the potential effect of redistricting in the post-census period on House members' speaking strategies. For every 2-year stretch following a census (e.g. 1951-1952, 1961-1962, 1971-1972, etc.) I coded *Post-Census Period* as 1 and 0 otherwise. For *Cloture Threshold* I coded dates before March 7, 1975 (the date that the Senate agreed to S. Res. 4 in the 94th Congress, and thus altered cloture requirements) as 2/3rds and dates thereafter as 3/5ths.

2.4 Findings

Before moving to my models it will be helpful to point out some specifics of the sample and the universe of legislative days from which it was drawn displayed in Figure 2.1. Any suspicion that speaking in Congress is a fairly uniform act, engaged in by every legislator with regularity is not particularly supported in my sample.

Of the 4,043 legislator-legislative day pairings I examined, only 848 of them (21%) represented days on which a legislator spoke. Whether this is an accident of the sample would not be particularly clear without increasing the sample size, or having some a priori knowledge about the realities of the universe of speaking on all possible legislative days. It is nonetheless possible to compare the distribution of the universe I compiled my sample from and the distribution of the sample itself.

With a brief glance at Figure 2.2 it appears that my sample may have under-represented November and December, though this may be balanced by a similar under-sampling of September and October. Under-sampling of December (and post-Election Day November) legislative days might present problems. Overwhelmingly the Chairs and Ranking Members of committees, which need to take care of lingering appropriations and authorizations bills, have populated the chambers during this time frame. Near the end of the calendar year the rest of the Congress is often back home for the holidays. This may skew my findings towards an increased probability of speaking. As members tend to try to get work done immediately before an election, to keep themselves in the political memories of their constituents, the undersampling of September and October may be skewing the findings towards a decreased probability of speaking.This could correct for the undersampling of November and December days.

In looking at which chambers were in when during my sample, the House was in by itself in 7% of the time. The Senate was in by itself 3% of the time while the House and Senate were in together 89% of the time.[4] Without expanding my sample or again having some prior knowledge about the state of the universe I was drawing from I cannot be certain if this sampling is skewed. But my suspicion is that the percentage of days where the House is in solo compared to the Senate being in solo seems tilted towards the House. With these observations in mind I will move to my binomial logistic speech models of Congress as a whole, and the House and Senate individually.

[4]The missing 1% is lost in the rounding down, but it is actually there split evenly enough amongst the three categories I have enumerated.

2.5 Speaking in Congress

In my first set of models I used both the House and the Senate data. The only difference between the two models in this set was how I coded the introduction of C-SPAN. The first finding that stands out is that there is no apparent relationship between the chamber that a member of Congress is in and the probability that she will speak. Controlling for chamber size Senators do not show any greater propensity for speaking than their House counterparts.

In Table 2.1 we see that neither an approaching election nor possible electoral insecurity had any correlation with speaking. Female members of Congress were not any more or less likely to speak than males. There are many statistically and substantively significant findings in these full Congress models. Among the less surprising findings are that increased tenure is associated with increased speaking. Holding all the other values at their means and moving the value of tenure over the range I have in my sample up to the 21 Congresses served by Senator Ted Kennedy I found that the maximum change in speaking probability was 20%. This was true for both models. When I look at a smaller range I find that an increase in service of one Congress translated to slightly less than a 1% increase in speaking probability.

While not at the desired level of significance (0.06) the ideological distance between the majority and minority parties in a chamber shows substantive promise when my C-SPAN variable is coded broadly. Looking over the range of ideological distance between the majority and minority in my sample I found a 9% decrease in the probability of speaking. This, combined with increase in speaking as the minority party becomes more ideologically diffuse (a 16% increase over the range in my sample), tends to support my assertion that party strength can affect speaking strategies.

Though my loosely coded C-SPAN variable suggests that the presence of cameras in the House increased the probability of speaking in both the House and the Senate by 6%, its descriptive power disappears when I apply my stricter C-SPAN coding. This chamber-specific coding makes the apprenticeship norm statistically significant. The presence of such a norm tended to decrease the probability of speaking in either chamber by 4%. Perhaps the most intriguing finding in these models is that the extremity of a legislator's ideological

position relative to her chamber median has a highly statistically and substantively significant correlation with her probability of speaking. Moving over the range of distance between legislators and the medians in my sample (from 0 to 1.0975) I found an increase of 18% probability of speaking in both models.

2.6 Speaking in the House

Modeling speaking in the House by itself is required for my *Post-Census Period* variable. However since there is no difference between the general introduction of C-SPAN and the chamber-specific introduction of C-SPAN in the House (both occurred on March 19, 1979) I only have one model to examine.

In Table 2.2 we see that while legislator tenure and ideological extremity hold up in this model their substantive significances diverge. Compared to the full Congress models the substantive effect of tenure drops 4% while ideological extremity correlation with speaking increases 7%. Party effects are more pronounced in the House model. An increase in ideological distance between the majority and minority parties over the range in the sample relates to a 16% decrease in speaking. A weakening of the majority party over the range of standard deviation in the House is associated with a 17% increase in speaking. That Republican House majorities correlate with a 24% increase in speaking is intriguing, but perhaps not unexplainable.

The Democrats dominated the House for forty consecutive years. During the last few Congresses of their rule there were complaints by the Republicans that Democrats were using overly restrictive rules in the consideration of legislation (a complaint that the Democrats would echo near the end of the Republicans' control of the House when they were in the minority). When the Republicans took control of the House in the 104th Congress they made a point of opening up debate. This may partially account for the increased speaking when there are Republican majorities.

The presence of C-SPAN cameras falls within a fraction of a percent of the desired 0.05 threshold for statistical significance (at 0.051). The substantive significance of the

introduction of the cameras into the House is comparable to its full Congress counterpart at a 5% increase in speaking probability. The change in the effect of the apprenticeship norm on speaking is negligible. Though a legislative day falling within the post-census period is statistically significant its substantive significance is not particularly pronounced. My intuition was that any changes that the post-census period might bring to speaking probability were not going to be consistent when I looked at a legislator's tenure.

In Figure 2.3 I graphed the probability of speaking and broke it out over three different tenure levels. I chose 1 as my floor for comparison as a tenure period of 0 completed Congresses would be meaningless when thinking of a post-census period triggering any sort of rebuilding of a reelection constituency. A legislator with 0 completed Congresses would merely be building her constituency, lacking any pre-census context for rebuilding. I took 19 as my ceiling of comparison as it was the maximum tenure in my sample (shared by former House Speaker Rayburn and former Florida Representative Charles Bennett). The 10 years line is there merely to split the middle. The more tenured members of the House experience a slightly more pronounced decrease in speaking probability than members with less tenure. The difference in speaking probability decrease between the members with 19 Congresses served compared to those with only 1 Congress served was a little over 3%. To say that more tenured members may be more affected by the post-census period can mean at least one of two things. The more tenure these members have may reflect a sort of disconnect from their districts that comes with spending more time in D.C. in committee hearings and markup sessions or moving in the party leadership. Such a disconnect may encourage them to go back to their districts more than less-tenured members after a census. On the other hand the reason that less-tenured members' speaking patterns may be less influenced by post-census periods is that they do not speak that much in the first place compared to members with greater seniority.

2.7 Speaking in the Senate

When I turn to the Senate speaking models the importance of ideological extremity for the legislator becomes nonexistent. However the correlation of tenure with speaking becomes more pronounced. Where an increase of 1 Congress of service was associated with a less than 1% increase in speaking probability in the full Congress models, such a shift in Senate tenure led to a 1.8% increase. In the chamber-specific C-SPAN version of the Senate models this remains at a fairly robust 1.5% increase in speaking probability per Congress served. Over the range of tenure in the data, the non-specific C-SPAN model led to a 40% increase in speaking probability while the stricter C-SPAN model correlated with a 34% increase.

In Table 2.3 we see that intriguingly the lowering of the cloture threshold in fact seems to decrease the probability of speaking in the Senate, counter to my expectations. Lowering the cloture requirement from 2/3rds to 3/5ths is associated with a 26% reduction in speaking probability.[5] Focusing on the chamber-specific C-SPAN model, Republican majorities were associated with a 20% decrease in speaking while the increase of the Senate chamber from 96 seats to the current 100 over my time frame of analysis is correlated with a 19% increase in speaking. This may be accounted for more by the disappearance of the apprenticeship norm coupling with the lack of a Rules Committee or a germaneness requirement in the Senate.

2.8 Future Models

While the multiple findings in my models are encouraging, there are nonetheless some shortcomings in the design that could be improved upon in the future. Some of my coding could be elaborated upon and expanded to provide more nuance to my results. One matter that comes to mind is expanding how the concept of speaking might be thought about. Speech could be extended to inserted text, including prepared speeches placed in the body of cham-

[5]It has been pointed out to me by Prof. Sarah Treul that such a reduction may be accounted for at least in part by the introduction of the "two track system" on filibusters near the time of the lowering of the cloture threshold. This could interfere with the possible logic of encouraging more ideologically extreme Senators to bring more filibusters. I have yet to disentangle the mechanics of this change in rule making thus far.

ber proceedings and the Extension of Remarks, as well as referenced articles and letters from constituents and interest groups. My suspicion with such an expansion is that it will interact with the C-SPAN coding. Before the daily proceedings of their chamber were broadcast on television Members in Congress may have been more susceptible to inserting instead of speaking their words.

Content analysis on par with Groseclose and Milyo's (2005) analysis of potential media bias may be instructive in thinking about such insertions. When looking at non-spoken texts such as letters, articles, and the think-tank citations that Groseclose and Milyo focus on which can be associated with legislators, we begin to move beyond mere speaking. Including these insertions can expand speaking strategies analyses to how the legislators might be trying to convince each other of the validity of their positions. They can also be examined as possible cues to supporters outside Congress as to legislators' actual views on policies.

It has not escaped me that speaking on a chamber floor is not the only manner in which a legislator can officially make her policy positions known or appear more congressional in times of electoral crisis. Speaking in committees is not something to be ignored. However it will be more difficult to make a full accounting of speaking due any number of practical concerns, not the least of which is the often-closed nature of many committees' proceedings. All is not lost though. With the help of the data on Charles Stewart's Congressional Data site, historical committee rosters can be used and crosschecked against committee proceedings listed in the Congressional Record Daily Digests. This information could be coded for the possibility that a legislator may value speaking in a committee more than on the floor of her chamber. An even more detailed coding of subcommittee membership would likely make such an endeavor more fruitful.

One shortcoming of my *Vote Share* variable to capture potential electoral insecurity is that it can have a high obsolescence factor. A lot can happen over the course of 2 to 4 years that can drastically improve or ruin a legislator's prospects for reelection. In future models it may be helpful to include a timelier metric such as Congressional Quarterly's pre-election ratings of Congressional race competitiveness instead of these simple vote shares. It may also be possible to extrapolate potential competitiveness parallel to such ratings (Caughey

and Sekhon 2011). I could also expand on the demographic coding to include ethnic or religious minorities to further test speaking being motivated by descriptive representation for speaking on "women's" or "minorities'" bills. A control for the number of (for example) women would have helped in reviewing speaking strategic effects. As a further example, if the number of women in a chamber increases over time will that increase or decrease the probability that any one of them will speak on a given legislative day? How much do the psychological concepts of diffusion of responsibility and the bystander effect come into play as the demographics of Congress change.

A major shortcoming of this chapter is that I make no distinction in what is literally spoken. Procedural speech that Chairs and Ranking Members may be engaging in more than the rank and file member could not be properly understood as speech at all. Stating "I order the previous question on the resolution to provide for the consideration of the amendment to the Constitution to prohibit the use of procedural-speak examples such as this one in political science dissertations" is not the same as making proper arguments for or against the actual legislation prohibiting procedural speaking. Non-procedural speaking in the course of the consideration of a matter on the floor may feed back into Mayhew's typology of legislator strategies, particularly when it comes to credit claiming

Another avenue worth exploring involves the conditions under which a bill is considered in the House. This can provide a parallel to my test of cloture thresholds in the Senate. Bills considered under suspension of the Rules require a 2/3rds majority for passage, while those considered with the accompaniment of a Rules Resolution generally only require a simple majority to pass. With these differing requirements for passage coupled with the increased importance of ideological extremity contributing to the probability of speaking in the House, I would expect that more ideologically extreme members will speak at greater rates the lower the threshold is. This could also merely reflect the relative lack of controversy for bills considered under suspension of the Rules and the brief amount of time allotted to them for their consideration—at 40 minutes maximum (Carr 2005). Nonetheless I expect an examination of the manner of consideration for House legislation to add to the richness of any future models of speaking as a strategic act.

It might also be wise to provide an analysis of speaking with a context. In addressing a choice to speak on the House or Senate floor, it would be helpful to frame it against other actions available to the member. This can include triangulating their possibly speaking in committees, but may likely benefit from looking at bill and amendment introduction patterns and well as fluctuations in co-sponsorship patterns analyzed in the existing literature (Fowler 2006; Woon 2008). This can provide a measure of the relative growth or shrinkage of speaking compared to other activities that a given legislator can engage in on a given legislative day.

2.9 Conclusion

Taking the daily proceedings of Congress printed in the Congressional Record from 1947 to 2006 I created an original 4,000-plus point data set capturing whether a legislator spoke in a given chamber on a given legislative day. Speaking in my sample was rare, but I was still able to uncover multiple findings. Using binomial logistic regression models for the whole of Congress as well as for the House and Senate individually my review suggested that the chamber a legislator might speak in had no particular effect on the probability of speaking as such. The importance of tenure for speaking was consistently present across all chambers. When I focused on the individual chambers it was clear the tenure was more substantively important in the Senate. While the ideological extremity of a member contributing to speaking was present in the whole of Congress as well, such a relationship seemed to be driven more by the House. The effect of the introduction of C-SPAN into Congress varied depending on my coding. If C-SPAN's introduction was coded without regard for the fact that Senate proceedings began to be broadcast at a later date than the House, its significance and effect suggested that the cameras encouraged speaking in both chambers. If C-SPAN introduction took this chamber variation into account, then the relationship disappeared.

Across all my models there was evidence consistent with the Conditional Party Government framework that the strength of parties mattered. Stronger parties tended to discourage speaking, particularly in the House, while weaker parties encouraged a legislator to speak. In the House model the post-census period, where legislators had to adjust to redistricting,

discouraged speaking. This dampening of speech was slightly more pronounced for more tenured legislators. In the Senate models the importance of the cloture threshold seemed to depend on how C-SPAN introduction was coded. In my looser coding the decrease in the threshold seems to in fact discourage speaking in the Senate. When I used the chamber-specific C-SPAN coding, this correlation ceased to exist.

Asking the question of who speaks is merely the first step in analyzing legislative speech. Asking who speaks leads to any number of equally intriguing questions. Given that a member may be more or less likely to speak in a given chamber on a given legislative day, then what might they actually talk about? If they are in a tight race close to a general election and choose to speak in Congress—as opposed to being with their constituents—are they more likely to try to speak in the context of debate on a bill that they can claim credit for? Might they be better served by engaging in a political advertising speech lacking any real policy content? When might it be advantageous to engage in position taking?

Given that a legislator decides to speak on a specific topic what is the tone she takes with regards to the subject? What about the tone she takes with her fellow legislators? If the parties are both strong and the seat advantage of the majority party is slim, would a minority party legislator be more likely to take an adversarial tone than when either the majority seat advantage is large or one or both of the parties is weak? Are there certain pieces of legislation, perhaps addressing national defense or providing universal pork to constituents, that cause the rhetoric between the two parties to be toned down if not completely amicable?

An especially intriguing question is whether legislators ever can be understood to truly convince each other of anything at all in their speeches and debate on the House and Senate floors. If some legislators are more successful than others at convincing people within their own party and across the aisle that their legislation is worth Congress's time or that their policy position is correct why might this be the case? Is their rhetoric more restrained? Is there some disconnect between the ideological language that they use and the ideological tilt in their voting that allows them to convince fellow legislators that how they speak is actually how they will vote? How large can this difference between speaking and voting be before it strains plausibility with their fellow legislators?

Ultimately these questions lead to one of whether speaking in a legislature even matters at all? More specifically does speaking matter in legislators' reelection strategies? Does it matter policy-wise for legislation and the success or failure of nominations? In the following chapters I will attempt to get at the tone of speech as well as it is causes and effects. Though here I may mean tone in a different way than its merely lexical connotations.

2.10 Tables and Figures

Table 2.1: Full Congress Speaking Models

	C-SPAN	**C-SPAN by Chamber**
	Speaking Probability	
Majority Party Member	−0.070	−0.064
	(0.101)	(0.102)
Ideology	−0.023	−0.019
	(0.194)	(0.195)
Ideological Extremity	0.958***	0.965***
	(0.217)	(0.217)
Republican	0.014	0.007
	(0.162)	(0.163)
Days Until Next Election	−0.00000	0.00000
	(0.0001)	(0.0001)
Female	0.154	0.130
	(0.186)	(0.187)
Tenure	0.052***	0.052***
	(0.010)	(0.010)
Prior Vote Share	−0.450	−0.407

Continued on next page

Table 2.1 – continued from previous page

	C-SPAN	C-SPAN by Chamber
	Speaking Probability	
	(0.316)	(0.315)
House	−20.202	−18.312
	(15.416)	(15.865)
Republican Majority	0.101	0.081
	(0.126)	(0.133)
Chamber Seats	0.057	0.051
	(0.046)	(0.047)
Majority-Minority Ideological Difference	−1.132*	−0.567
	(0.606)	(0.709)
Majority Ideological Standard Deviation	2.910	1.591
	(1.830)	(1.875)
Minority Ideological Standard Deviation	6.348***	4.575**
	(1.897)	(1.786)
C-SPAN Introduced	0.386**	
	(0.169)	
C-SPAN Introduced [Chamber-Specific]		−0.026
		(0.167)

Continued on next page

Table 2.1 – continued from previous page

	C-SPAN	**C-SPAN by Chamber**
	Speaking Probability	
Apprenticeship Norm	−0.114	−0.292**
	(0.144)	(0.127)
Constant	−7.702*	−6.580
	(4.519)	(4.643)
Observations	4,043	4,043
Log Likelihood	−1,910.178	−1,912.779
Akaike Inf. Crit.	3,854.356	3,859.558
Note:	*p<0.1; **p<0.05; ***p<0.01	

Table 2.2: House Speaking Model

	Speaking Probability
Majority Party Member	0.109
	(0.137)
Ideology	0.154
	(0.261)
Ideological Extremity	1.480***
	(0.293)
Republican	0.178
	(0.222)
Days Until Next Election	−0.0004
	(0.0003)
Female	0.218
	(0.204)
Tenure	0.054***
	(0.012)
Prior Vote Share	−0.320
	(0.386)
Republican Majority	1.489***

Continued on next page

Table 2.2 – continued from previous page

	Speaking Probability
	(0.364)
Chamber Seats	0.002
	(0.118)
Majority-Minority Ideological Difference	-3.492^{***}
	(1.170)
Majority Ideological Standard Deviation	16.330^{***}
	(5.000)
Minority Ideological Standard Deviation	-7.715
	(4.889)
C-SPAN Introduced	0.405^{*}
	(0.208)
Apprenticeship Norm	-0.398^{**}
	(0.190)
Post-Census Period	-0.389^{**}
	(0.156)
Constant	-2.915
	(51.240)

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Table 2.2 – continued from previous page

	Speaking Probability
Observations	3,218
Log Likelihood	−1,341.675
Akaike Inf. Crit.	2,717.351
Note:	*p<0.1; **p<0.05; ***p<0.01

Table 2.3: Senate Speaking Models

	C-SPAN	**C-SPAN by Chamber**
	Speaking Probability	
Majority Party Member	−0.001	0.001
	(0.172)	(0.170)
Ideology	0.056	0.093
	(0.307)	(0.305)
Ideological Extremity	0.295	0.392
	(0.366)	(0.362)
Republican	−0.228	−0.360
	(0.261)	(0.256)
Days Until Next Election	−0.0002	−0.0001
	(0.0001)	(0.0001)
Female	0.619	0.291
	(0.485)	(0.475)
Tenure	0.083***	0.068***
	(0.018)	(0.018)
Prior Vote Share	0.076	−0.233
	(0.631)	(0.628)

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Table 2.3 – continued from previous page

	C-SPAN	C-SPAN by Chamber
	Speaking Probability	
Republican Majority	-0.801^{***}	-0.849^{***}
	(0.274)	(0.282)
Chamber Seats	0.086	0.216^{**}
	(0.088)	(0.084)
Majority-Minority Ideological Difference	-3.356^{***}	-2.739
	(1.173)	(1.881)
Majority Ideological Standard Deviation	9.916^{***}	1.912
	(3.456)	(3.684)
Minority Ideological Standard Deviation	8.644^{*}	-4.731
	(4.811)	(3.499)
C-SPAN Introduced	2.098^{***}	
	(0.559)	
C-SPAN Introduced [Chamber-Specific]		-0.007
		(0.440)
Apprenticeship Norm	-0.881^{*}	-0.671
	(0.452)	(0.465)
Cloture Threshold	16.817^{**}	3.989

Continued on next page

Table 2.3 – continued from previous page

	C-SPAN	C-SPAN by Chamber
	Speaking Probability	
	(7.602)	(6.801)
Constant	-21.886^{**}	-21.573^{**}
	(9.181)	(9.558)
Observations	825	825
Log Likelihood	-523.994	-531.400
Akaike Inf. Crit.	1,081.989	1,096.800
Note:	*p<0.1; **p<0.05; ***p<0.01	

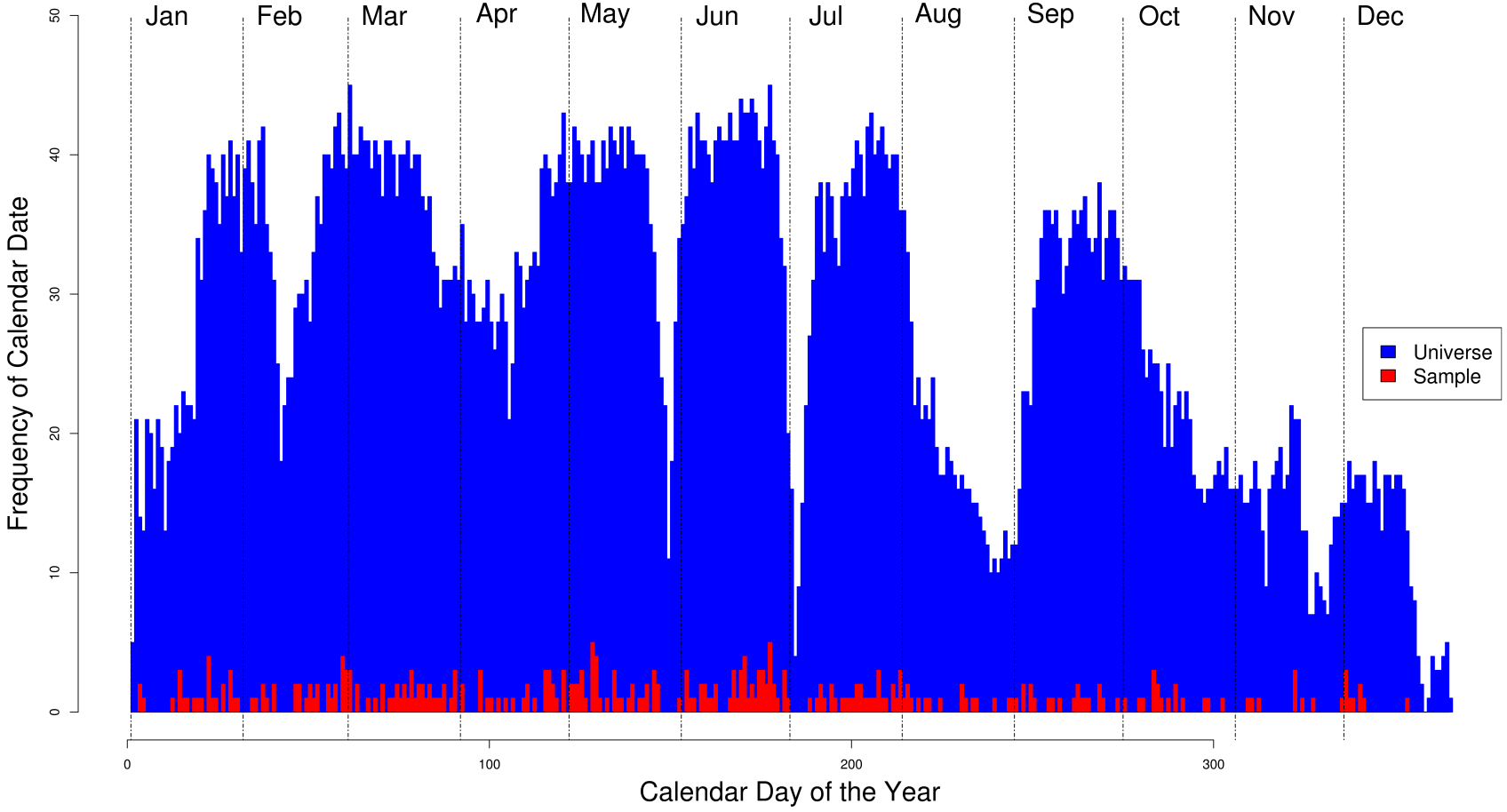

Figure 2.1: Distribution of Sampled Days Compared to Universe of Days

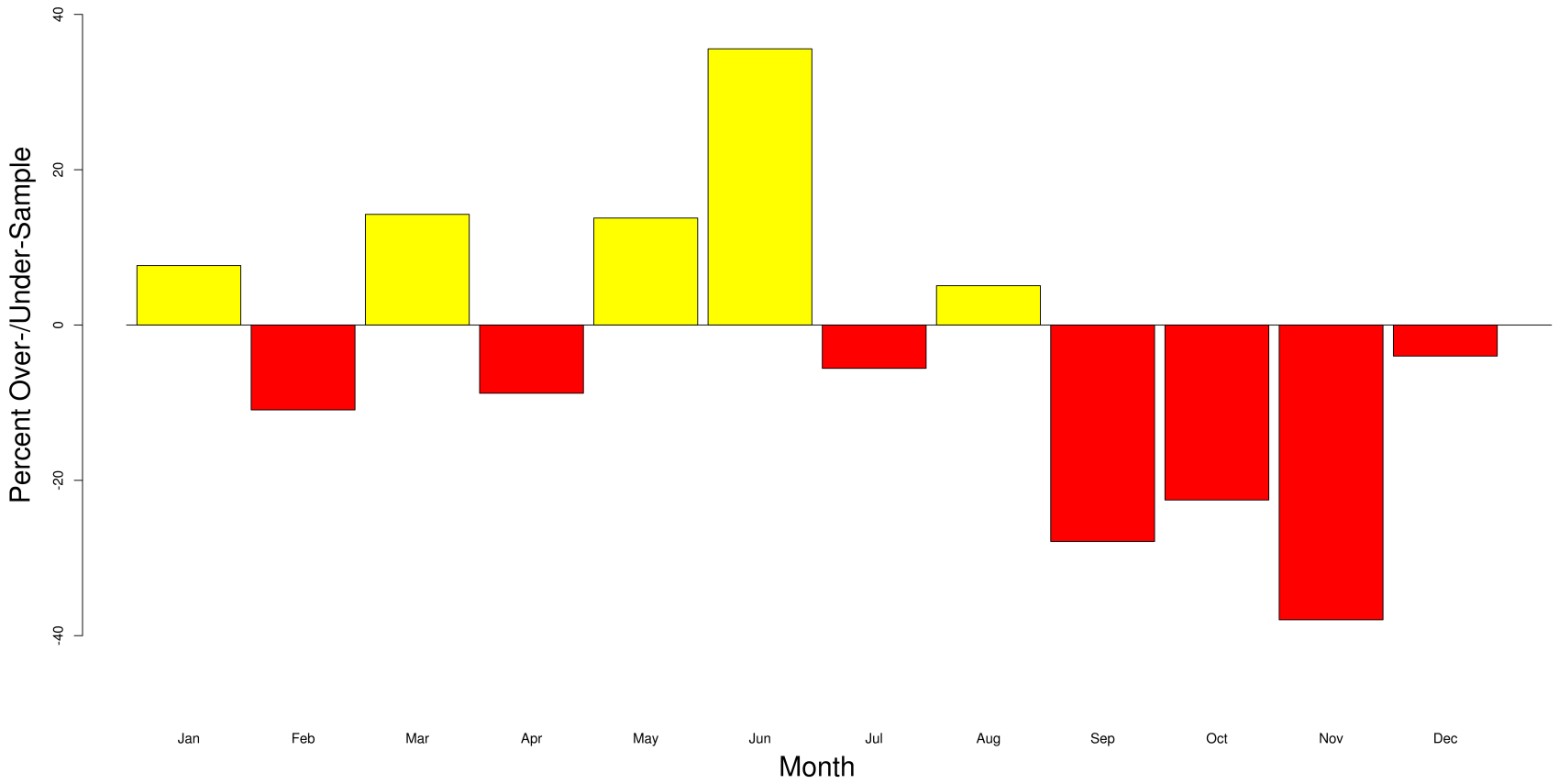

Figure 2.2: Percent Over- or Under-Sampling of Legislative Days By Month

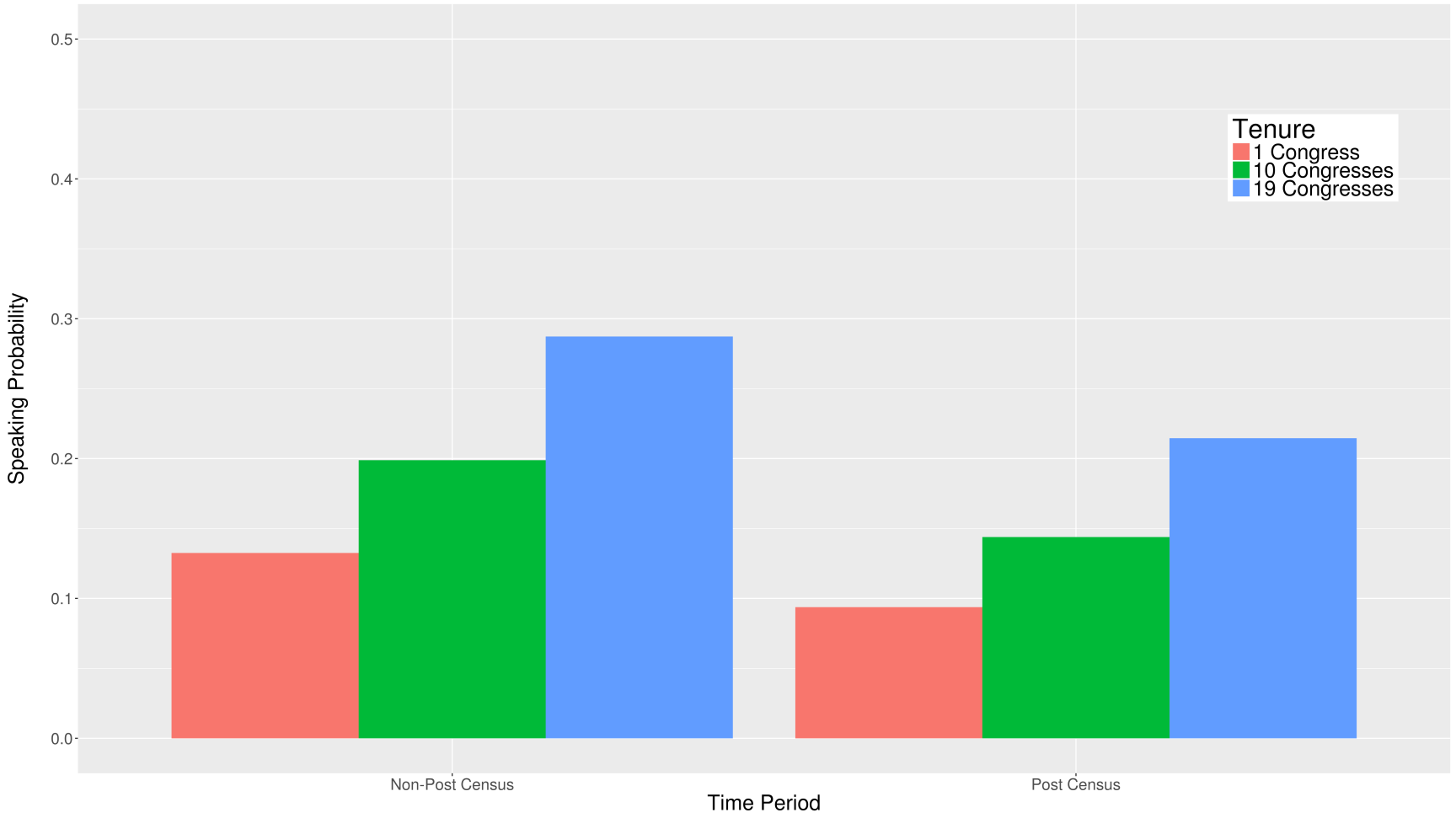

Figure 2.3: Probability of Speaking in the House versus Post-Census Period by Chamber Tenure

CHAPTER 3

Audio as Data and an Initial Review

Now that I have touched upon the questions of which legislators talk and when they might strategically choose to speak or not to speak, I move to one of the other questions driving this dissertation. *How* do they speak?

As with the prior chapter I am less concerned with the prevalent text-as-data method of analysis. Here when I ask how a legislator is speaking I am asking what the tone—the spirit of these words—may be. There is value in examining the lexical. And I will not completely avoid this element in congressional speaking. It is important from both sides of my research project. If my coding finds aural indicators of a legislator becoming excited, I need a sense of the words accompanying that excitement to determine whether this is a positive or negative activation. If a legislator speaks louder or faster or with a higher pitch than is ordinary for him generally, is it because he's spewing vitriol in railing ***against*** some policy or some person? Or is it because he's passionately advocating ***for*** a person or policy? This is where the words on the page serve to complement determining the valence of speech. On the other side of the words and sounds interplay, if the words on the page are especially negative or positive, does that necessarily indicate an impassioned and sincere statement by the legislator? Negative words delivered with indifference and lassitude may lack the rhetorical punch a legislator would need to encourage fellow legislators to support a bill.

A large and relatively untouched resource of audio data on Congress exists in the C-SPAN archive. It serves as an exhaustive review of floor proceedings of the House and Senate as well as an assortment of committee hearings and press conferences. It also contains a selection of campaign events, congressional debates, and party convention coverage. For my purposes I focus only on the House and Senate chamber proceedings. As discussed in the prior chapter,

an obvious place to look for advocacy in congress would be in committees. The overriding issue with this is that hearings are not consistently available to the public. There is also the concern that committee hearings serve primarily as a means of grandstanding for legislators. Other sources of legislator audio and video available through C-SPAN can be contaminated with systematically higher levels of vocal aggression and excitement that would make them suspect candidates for analysis. While press conferences can be relatively tame events, there are clear issues of including congressional race debates, campaign events, and political conventions. The latter two are rife with hyperbole and playing to the crowd with less-than-measured speech—up to and including a Dean Scream. That is not to say that there may not be some benefit in measuring variations in vocal patterns across speakers within a debate or a party convention, where the debate or convention is considered a discrete event. However, intermingling these speeches with that of House and Senate floor debates can complicate matters.

3.1 Data Acquisition and Methods

Focusing on C-SPAN floor proceedings, in this section I will provide a fairly detailed accounting of the methods I used to acquire my data. Resuming where I left off in my historical review of speaking as such in the prior chapter I decided to limit my period of analysis to the 109th through 112th Congresses. Taking place from 2005 to 2012[1] this window provides me with an ideal arrangement of congressional party leaderships, presidential party control, and the divided government configurations to test assorted scenarios of party effects. During this time frame George W. Bush went from working with a Republican-controlled Congress to a Democrat-controlled one. Barack Obama went from a unified party government to a divided one with the House returning to Republican control after the 2010 midterm elections. There were other practical considerations as to why I focused on these eight years of C-SPAN coverage; most of them dealing with my basic finitude as a human being and my limited resources as a grad student compared to the scale of my endeavor. Nonetheless, as

[1]Technically this encompassed a few days in early January 2013 as well.

will be evident shortly, this is a sufficiently large and rich data set of footage to focus on.

3.1.1 A Targeted Crawl

Using the THOMAS website[2] I made note of the days that each chamber of Congress was in session based on the information provided in the Congressional Record section. I then performed a similar search of the C-SPAN video library[3] based on these days to pull in a list of URLs for video segments. I was able to identify 1,441 days where there was C-SPAN coverage. Of these days the House and Senate were both in 1,024 times. The House was in by itself 112 times and the Senate was in solo 305 times. The House time in by itself was virtually identical to my historical analysis (at 7% to 7.7%). The percentage where both chambers were in dropped (from 89% to 71%) and the Senate took up this slack by increasing its time in without the House (from 3% to 21%).

Each day of coverage by C-SPAN for a chamber-date pairing was not necessarily associated with a single video file. Often the days were broken up into sub-segments. While this was associated with length of a congressional day's proceedings it was also tied to C-SPAN shifting from Standard Definition to High Definition format. In all I identified 3,757 video segments. In counting up the time associated with these files, there were over 63 million seconds of footage to scrape. To restate this number, that is a little over 729 days of video—or about two years—of House and Senate floor proceedings I was to acquire. While I know C-SPAN is making efforts to improve the ability for the public to make use of their library, at the onset of my project this was not the case.[4] The files were not directly accessible through download links to MP4 files. Rather they were situated behind a streaming wall.

[2]http://thomas.loc.gov. More recently this has been re-branded as http://www.congress.gov

[3]https://www.c-span.org

[4]This is not to say that there was an explicit effort on C-SPAN's part to make it difficult to pull the footage I needed. My demands for their resources were far and above those of the public at large or pretty much any academic specifically. In talking with him during a 2014 conference at the C-SPAN, the director of the archives Dr. Browning made it clear that access to the underlying files feeding the front end of the C-SPAN site were going to be opened to the public.

To properly acquire my footage I had to record them real time. I did this using the command line utility **rtmpdump**.[5] In an example nightmare scenario, let us suppose that a speech that was vital for a model was at the 15 hour and 30 minutes mark of a 16 hour file. To get to that point, I would be recording the whole file. If the connection were to drop somewhere between my computer and C-SPAN at any point before I got through the recording, then I would have to restart the whole recording process again. To protect against such a scenario I built redundancies. This was also necessary to speed up my acquisition and processing timeline.[6]

At this point I would be remiss if I did not mention those that helped me scrape C-SPAN's servers; being Byrd, Conyers, Inouye, and Dingell. These were the names of the computers in my office that worked tirelessly plugging away day and night. They were named after the oldest and most senior members of the House and Senate from my scraping time frame.[7] Along with a fifth machine that served as the central hub for the database containing the names, locations, and other details of the the C-SPAN files I built a redundant, distributed acquisition workflow. With cron jobs on each machine running periodically, a machine would contact the checkout server to determine what file was next in the queue as well as whether the machine was already pulling a file or whether a pull had failed at some point. Using these details it would ultimately fetch the next relevant file from C-SPAN. To speed up this process further and create more failure fallbacks I made use of the Amazon Web Service (AWS) cloud platform. I launched a few more micro-computers—each of them about the size of a small USB thumb drive—and had them make similar calls to the checkout server.[8]

[5]During my scraping process, I had to adjust my code to accommodate C-SPAN updating their server technologies, this added some more time to the process.

[6]Well after principal scraping had been performed I became aware of a faster scraping utility **yt-download**. While it seemed to reliably get behind the streaming wall, I would sometimes run into inconsistent naming conventions and over-scraping issues which would require me to figure out how to stitch together the correct further sub-segmented files to replicate the output I received via the rtmpdump process.

[7]It is completely accidental that all of these members happened to be Democrats. Much in the same way it was an accident that Byrd happened to be the slowest and oldest machine of the bunch.

[8]These micro-computers are called Elastic Compute Cloud, or EC2, instances. For my purposes a machine around 8GB in size was more than sufficient for scraping in a C-SPAN file of any length.

With the AWS computers there was an added step of sending files from the cloud to my local machines on campus. Once a local import was confirmed, the file was wiped from the remote machine to make space for the next round of scraping. A general sense of this workflow is available in Figure 3.1. At peak capacity I had 20 machines simultaneously scraping C-SPAN footage.[9] Without getting into specifics, there were major cost reductions in building this workflow. Even with my multiple redundancies I estimate that I paid about 5% of the cost I would have had I decided to buy the footage directly from C-SPAN. The trade off to this cost benefit was that it did take some time to acquire the footage. Though nowhere near the 2 years of time the footage covered.

3.1.2 Processing the Footage

When I was done scraping I was able to get 3,677 of the files from the servers—a 97.9% acquisition rate. Taking into account the total seconds to scrape, I was able to capture nearly 61 million seconds of footage; a little over 96% of the total time. In all over 3TB of files were pulled in covering over 700 days of data to for me to explore. Before chopping up the footage and extracting prosodic cues we must consider some of the benefits and limitations of the C-SPAN video library. On one hand, it is clearly huge and expansive. It is a fire hose of data to work with. On the other hand, the accompanying metadata for this library is not on par with the size and scale of the data itself. Its major failing is in the captioning. While it is rather strong at providing in and out points for a speaker, it fails in other aspects. It is very good at providing cut points for important discussion on highly salient bills and nominations. However it is not as exhaustive as one would prefer when attempting to gain a representative random sample of speech for legislators. Even in an ideal world where every legislator's every utterance had proper timecode associated with it, the transcription is very lacking.

[9]To be clear, this was a practical limit based in part on budget, but more so on other considerations. The major consideration was one of not angering either endpoint of my scraping process. I did not want to get throttled by the UCLA IT powers on one end. I also did not want to anger C-SPAN by scraping with abandon and accidentally getting the campus temporarily banned.

There are however means of gaining a sufficiently randomized sample of speech to determine speaker-specific baselines of vocal expression. In capturing images on the screen as well as the audio in recording movie files, I am able to make use of chyrons—the text overlaying roughly the lower third of the screen—to make a more than educated guess at who is actually speaking on screen.

Using the video processing program **ffpmeg** I took high-quality screenshots of all of my video files at 10 second intervals, providing me over 6 million images to work with. I then wrote an optical character recognition (OCR) script in **python** that pre-processed each image by cropping to the lower third of the screen, blowing it up, and forcing it from full color to a high contrast black and white image. In Figure 3.2 we can seen an example of a screen capture of Paul Ryan (R-WI) speaking on the House floor along with the prepared isolation on the lower third.[10] For the OCR-proper I used a default install of **tesseract** to dump the computer's estimation of the text in the screen isolation to an intermediate text file that I further processed via the same python script to a crawlable JSON representation of the text.

A default tesseract install can be fairly noisy in its estimation of what it sees on the screen. However, in this case it was consistent in picking up on certain strings that would indicate that the speaker is a legislator. In particular these were "Rep. ", "Rep ", "Sen. ", "Sen ", "Del. ", and "Del "; title abbreviations consistently on screen in the C-SPAN footage.[11] With this key to indicate a potential speaker of interest, the python **nameparser** library was used to guess at the speaker's first and last name. While not perfect it was sufficiently functional to aid in some human coding after the fact. Speakers with multiple "last" or non-hyphenated last names especially confused this name coding. Legislators such as Debbie Wasserman Schultz and Eddie Bernice Johnson were mismarked by this process as "Schultz, Debbie" and "Johnson, Eddie".

[10] If you are especially observant you will notice that this is not a loose isolation of the lower third of a screen capture. Rather it is a more narrow sub-cropping of this area of the screen. It is tightened to reduce noise in the name estimation process caused by the C-SPAN logo to the right of the expected speaker name location. It also attempt to crop of extraneous image noise to the left of this same name region.

[11] Note the trailing spaces in these key strings.

While the pre-processed 10-second screen shots were generated locally, the lower-third isolation and OCR processing was offloaded to AWS Lambda functions for speed purposes. What would have taken many weeks to process on Byrd et al. was processed over a few days by sending my 6 million images up to AWS Simple Storage Service (S3). Once processed I pulled the JSON interpretations of the OCR results back down. Of these screen captures about 1/5th of them lacked any discernible text in the lower third of the screen. Using the title abbreviation as a cue for a potential legislator speaking on screen, I was left with over 2.3 million frame candidates to code. More than half of these were readily associated with the ICPSR ID number of a legislator by running a fairly basic last name-chamber-date matching script.

For those legislators who did not have a unique ID match roughly 250,000 of them were due to a having a common last name with at least one other legislator in the same chamber. Others were due to tesseract outputting a partial name, the script marking a last name as a first name, or outright butchering the name of the speaker on screen. When not complete gibberish, the names tesseract generated were often quite humorous; ranging from the mildly salacious, to the snarky response[12] one might expect from a petulant teenager, to absurdities of Monty Python levels. Some of the names guessed may also serve to confirm or deny the estimation of a legislator's character—depending on one's personal political leanings.

There were other miscodes which were a failing of my anticipation of other outcomes when looking at the lower third of the screen. These dealt with C-SPAN cutting away to a committee hearing, a legislator name appearing in ticker for Capital News, or in a listing of tweets. There were also issues of a legislator's name appearing during a vote or a quorum call. Finally there were occasional incorrect coding instances that dealt with congress paying tribute to a retiring, recently deceased, or injured member.[13] Keying on phrases surrounding these scenarios it was easy enough to mark the associations as the

[12]As an example of this, when the script was asked to guess the name of one senator, it snapped back that the person was "My Mom".

[13]Byrd and Kennedy dying, as well as Gabrielle Giffords being shot and Tim Johnson suffering a stroke, were picked up as them speaking.

errors they were. Mercifully, other patterns that tesseract was consistent on picking up on included partial state names and digits. With these cues I was able to do a state-by-state sweep to make legislator-frame associations.[14]

After human intervention corrected the OCR shortcomings, I then wrote a script to infer the ICPSR IDs of frames that fell within a 3 frame (or 30 second) gap of two other frames with the same IDs in a given C-SPAN file. The logic here is that if Paul Ryan was on screen at 1 minute into a segment and 30 seconds elapsed without any of the frames between having an ID association—only for him to appear again thereafter—it is unlikely that Ryan fled the scene and someone stepped in to speak in the interim only for him to rush back into frame at the 90 second mark. I took a 5% sample of these identified speakers and in a final identification sweep generated two-frame images for the first and second frame in a 10 second window to check ICPSR ID associations. Over 99% of the frame associations survived. The ones that were removed were overwhelmingly cutaways to press conferences. As we can see in Figure 3.3 there were rare instances were a chyron lingered too long and Sen. Jim Inhofe (R-OK) was picked up as Sen. Daniel Inouye (D-HI). At the end of this process I was left with 102,421 frames to run models against covering nearly 12 total days of audio.

3.2 Prosody and Emotional Expression

Before I explain my process for extracting 5 primary vocal cues from these clips, I must review how they help determine the tone of a legislator's speech. I will also expand on how information on loudness, pace, pitch, and pitchiness (effectively the variation in pitch) can be used in answering the "How Do They Speak?" question.

[14]There were still instances where C-SPAN provided names and states, but no district numbers. This made coding the Carolyns of New York and the Daniels of Hawaii an adventure.

3.2.1 Literature Review

As is the common experience of conversing with our fellow humans in daily life, what we say is not merely a series of words devoid of detail such as pitch, volume, and pace. We are not computers. We do not send and receive information in discourse as a string of ones and zeroes. The speed with which we acquire and disseminate our words matters. The words "I hate you" or "I love you" are still merely these words to a computer, whether it takes 5 milliseconds or 5,000 milliseconds to process them. Dissociation of prosodic cues from these phrases can in fact relate the opposite sentiment from the lexical content of these utterances (Mehrabian, 1968). Similarly, this information is transmitted and received in intensity scalings varying wildly from a 0 to 1 level. Through these cues and the context in which they are spoken—occasionally including a historical knowledge of the speaker and whether that person is prone to express him- or herself at a particular volume, pace, and pitch—we receive not only the words but the spirit with which those words were spoken.

Linguists and psychologists have enumerated some consistent speaking patterns over time. Charismatic speaking is associated with pitch fluctuations that can denote expressiveness (Hirschberg & Rosenberg, 2005). People speaking in monotone are generally not thought of as passionate in their speech. There's a reason that Ben Stein was the one writing speeches for Presidents Nixon and Ford and not the one delivering them. At the other end of pitch variation multiple reports across a wide range cultures and languages have associated high pitch variance with fear, anger, and surprise (Breitenstein et al., 2010; Scherer, 1986). People who are sad tend to speak more slowly and at a lower pitch (Nwe, Foo, & De Silva, 2003; He at al., 2011). Pauses in arguments between two people are associated with shifts in the emotional tone of the interaction (Cowie et al., 2000). Reduced perception of these prosodic cues can increase errors in emotional categorization of speeches. In a very interesting natural experiment, people using cochlear implants to aid in hearing were compared to those not requiring aural aids. By varying maximum perceived amplitude and frequency ranges for both groups, Luo et al. (2007) provide evidence of the "importance of overall amplitude, pitch, and other spectral cues to vocal emotion recognition".

Of interest are the prosodic indicators of aggression. Psychologists and linguists readily admit that it can be hard to distinguish between fear and anger, especially across languages. This is particularly the case when those languages seem especially harsh to non-native speakers, such as German (Polzehl, Schmitt, & Metze, 2010). The difficulties in disentangling fear and anger may be due to the fact that the former can lead to the latter. Both fear and anger are associated with increases in the speed and volume of speaking (Chuenwattanapranithi, Xu, Thipakorn, & Maneewongvatana, 2007; Siegman, Anderson, & Berger, 1990). However, the two can often be distinguished when taking into account vowel stress. Statements of fear involve consistently loud and fast utterances, while anger usually involves the use of vowel stress accompanying this elevated pacing and volume.

There are baseline generalizations when taking into consideration the sex of the speaker. This is predominantly expressed in pitch differences. Spoken human vocal pitch tends to fall between 85Hz and 255Hz (Titze, 2000). Males tend to have a lower pitch range than women. Due to, on average, longer and denser vocal cords men are more likely to have a spoken pitch falling between 85Hz and 180Hz. For inverse reasons women tend to have a range between 165Hz and 255Hz.[15] In developing baseline metrics of speech it is necessary to be aware of these general biologically-based pitch discrepancies.

3.2.2 Methods

To get loudness, pace, and pitch details I used two standard audio processing utilities. Loudness was indirectly calculate by first extracting the *root mean square amplitude* (AMP_{rms}) with **SoX**.[16] I then converted these amplitudes to decibels relative to full scale (dBFs).[17] In

[15]Spoken range is distinguished from non-spoken ranges. When singing humans can dip below and rise far above this range.

[16]http://sox.sourceforge.net/

[17]AMP_{rms} was converted to decibels via a logarithmic conversion.

$$dBFs = (20 * \log_{10}(AMP_{rms})) \tag{3.1}$$

dBFs scale the less negative a decibel rating is the louder it is. For ease of understanding in the following pages, I will often use DB as shorthand for dBFs. For pace and pitch I used a common linguistic analysis program called **praat**.[18] The former was estimated by a script that counted syllables and the amount of time the legislator spoke in the 10 second window.

Syllables were extracted by counting decibel fluctuations above a minimum silence threshold. With the silence and syllable numbers praat then output *Speech Rate* and *Articulation Rate* values. The former is the number of syllables per 10 seconds. The latter is the syllables with the actual speaking time as the denominator. *Median Pitch* and *Pitch Standard Deviation* were also calculated with an off-the-shelf standard praat script. It printed out the vocal frequency of the speaker in 0.05 second intervals. With the 85Hz to 255Hz spoken frequency range I added some padding allowing praat to consider anything from 75Hz to 300Hz as a potential data point. Medians, means, and standard deviations were then calculated for the each 10 second clip.

3.2.3 Adjusting The C-SPAN Decibel Levels

I had to correct for an intervening variable I discovered in the C-SPAN footage related to the estimated loudness of speech. This is more readily demonstrated on the written page by regressing the estimated decibels of a speech on the year it occurred.

As we can see in Table 3.1, the ***Raw DB*** model yields a rather large and troublesome R^2 value of 0.791. Upon a closer inspection involving strapping on the headphones and listening to speaker trends across time it became clear that the innate volume of the footage on the C-SPAN servers had been slowly ratcheted up over time. While some of this could be the microphones themselves it was similarly apparent that it was the general feed volume that had been incremented up for my 2005-2012 time frame. A discount factor for the estimated decibel levels was necessary.

To calibrate down the decibel estimates I needed to rely on what I refer to as ***anchor speakers***. These would be speakers that have no motive to fluctuate the volume of their

[18] http://www.fon.hum.uva.nl/praat/

speech and would deliver their words in as consistent a manner as possible whenever they speak.[19] Even more ideally they would essentially be reciting a text that is so rote to them that its delivery would be on par with an unconscious reflex. At first glance sampling the speaking patterns of the reading clerks in each chamber would have been a fairly ideal situation. However locating and isolating on them in a consistent manner programmatically or otherwise proved too cumbersome. Instead I relied on the hosts of C-SPAN's *Washington Journal* program. More specifically I focused on open call segments and the hosts' recitations of the phone numbers to call into the show. I took a 5% sample of the days on which an open call segment was mentioned in a query of the C-SPAN website. I then used a similar scraping flow to pull in these segments and further isolated on the first 10 minutes of an open calls session. I located the in and out points for the "numbers to call" phrases and was able to identify 12 distinct hosts from the data on each of the open call segments' pages. In the course of coding the in and out points I also made note of whether there was any music playing when the phone numbers were being recited. Running these phrases through the prior decibel estimation process I was able to capture 177 data points.

I had to map volumes down relative to one speaker in a specific year. In my sample I had data points for every year related to Pedro Echevarria and Susan Swain, so my job was simplified somewhat.[20] Prior to deciding on my baseline year-speaker for comparison I first estimated how much of a discount would be necessary to account for the presence of music. This was calculated as the median difference in my sample of speakers compared to themselves in a given year when I had segments with and without music. For example, if I had a clip of Susan Swain in 2005 where she was speaking over music and one where she was not I accounted for this difference and added it to a list with a similar difference for Brian Lamb in 2007. Taking the median of these differences my musical discount factor was 0.193 dBFS. I eventually settled on 2005 Pedro Echevarria as my baseline of comparison and

[19]As a matter of practicality, these anchor speakers should (and generally do) speak their words with a consistent pace and pitch as well.

[20]The presence of a speaker throughout the whole of the time frame was unnecessary. As long as there is some overlap for speakers—a sort of sonic provenance—across this span it is possible to reliably map the volume levels down relative to a specific speaker in a specific year.

performed a similar mapping of relative volumes of speakers to Pedro by year, taking account of each speaker's median difference in volume and applying that discount as necessary. On the completion of these mappings I took the median difference between other speakers and Pedro by year and compared it to the median of Pedro in 2005. While not perfectly linear I was nonetheless able to determine that there was a distinct upward trend in volume and applied these dBFS discounts at the yearly level. Using 2005 as the base of comparison the discount factors were as follows: 2006, -2.3922; 2007, -2.02865; 2008, -1.3834; 2009, -7.60687; 2010, -11.241; 2011, -13.073; 2012, -11.7719

Reviewing the regression of these corrected decibel levels in the ***Adjusted DB*** model in Table 3.1 by year we see that the intervening volume bumps in the C-SPAN footage appear to have been accounted for as the R^2 has been reduced to 0.049.

3.2.4 General Trends

Before I go into deeper models on on the more specific causes and effects of how legislators speak in the next chapter, I perform a more general review prosodic cues in the sample. With the two pace indicators graphed against the Congressional Day of a legislator's speech we see little difference between the two parties. Articulation rate estimates ignore pauses in speech when calculating the number of syllables per second that the legislator is speaking; thus the discrepancy between the two pace measures seen in Figure 3.4 and Figure 3.5. While very subtle there is a slight divergence over time in articulation with Republicans speaking slightly faster. With speech rate there is slight decrease in pace, where the two parties converge as time goes on.

In Figure 3.6 we see a slight upward trend in median speaker pitch, with Republican increases pushing up from the bottom. Democrats had a higher pitch generally than the other party. As we see in Figure 3.7 there is most certainly a sex effect driving this difference. When I look at the underlying ratio of Democrat-to-Republican women in my sample there are nearly 3 times as many of the former as the latter. On top of this we can see that female Democrats have a higher median pitch than Republican females. In Figure 3.8 we see an

uptick in pitch standard deviation, with the two parties converging by 2012. The Republican party appears to contribute more to pitch variation. Finally we see in Figure 3.9 that, even after the adjustments in DB levels, there is a clear increase of the median loudness in speech over the 8 year period.

In Table 3.2 I have constructed fairly rudimentary models to parse out some more details of these trends and give more specific effects estimates. While the *Pitch* model accounts for the greatest amount of variance in the data, Figure 3.10 reveals this is due to the high correlation with speaker sex a well as the slight conflation of being a woman and belonging to the Democratic Caucus. House members have higher potential indicators of aggression and possibly anger than those in the Senate. Ignoring pitch, Women have higher indicators on 3 of the 4 remaining cues. The passage of time is tied to higher levels of emotional excitement. The only somewhat meaningful correlation time has with any of the other explanatory variables is that I seem to have picked up on more Senate speech in my sample during later years.

3.3 House Video Supplement

The wealth of prosodic data I have generated from the C-SPAN video archive can provide valuable insight. Yet it is still in need of a lexical grounding to test whether speaking louder and faster, with greater pitch or pitch variation, is speaking with anger ***against*** or with righteous passion ***for*** an issue. Again, while expansive in scope as far as raw video and audio data, C-SPAN's identification of speakers is not as exhaustive as may be desired. I have demonstrated that this gap can be closed. However the greater shortcoming of the C-SPAN library is the lack of captioning.

All is not lost. There is another congressional video library. The House has its own collection of archived recording of its floor proceedings.[21] Even better, it has close captioning files to relate what a legislator says as well as when he is saying it. This video source has

[21] http://houselive.gov/

been used in a highly enlightening prior pitch-specific analysis of legislative speech (Dietrich, 2014). As with the C-SPAN archive, it has its strengths and its weaknesses. The most obvious limitation is the isolation on only one chamber on The Hill. The other major limitation is that it does not go back as far in time as the C-SPAN archive. Its coverage initiates at the beginning of the 111th Congress; only encompassing the second half of my C-SPAN sample. While its scope is limited to a quarter of my base data set, the text and the ability to tie it to clearly identified speakers and their audio is still quite vital for the purposes of my project.

Using a drastically simpler and more efficient scraping flow, I was able to pull pre-filtered days of Congress for examination in reviewing the closed captioning files. To prevent pro forma sessions from being captured I focused on only those days from 2009-2012 where at least 30 distinct members were identified as speaking. I then took a 10% sample of these days and scraped them in.[22] In all, I sampled from 42 days of proceedings.[23] With the caption files it was similarly quite simple to chop up the footage and make associations with legislators and text of speeches.

On top of running the resultant audio clips through the same prosodic cue extraction flow, there was a need to figure out the lexical tone of the actual words tied to the sounds. When thinking about tone it would be hard to not mention the work of Hart et al. (2013) in their analysis of "how leaders talk and why". Using a typology driving their DICTION program, they categorize speeches based on a dictionary of 30,000 key words. In their approach speech tone can fall into the categories of "Certainty", "Optimism", "Activity", "Realism", and "Commonality". While this is a fine-grained tool worth exploring, by their own admission (p. 16) its methodology relies on a bag of words approach that dissociates words from their proper phrasing context. Modifiers matter. The word "bad" picked up in a sentence may be "not bad" in as much as a "great" coding may in fact be "not so great". In

[22]This was much faster as the video files were publicly exposed to the world.

[23]While the House provided MP4s there were occasional gaps. Fortunately these gaps were filled with MP3 files also available on their site. Only 3 of the 42 files relied on MP3s.

another sense, such an exhaustive array of lexical tone codings is probably a bit more than my immediate project requires. Ideally a sentiment analysis metric would rely on phrases and multi-word sentence chunking to capture attendant adjective and adverbs accompanying textual interjections and outbursts. Even more ideally it could be scaled in a way that is clearly understood and simple in its response to inputs. One such approach that has been developed relies on the language of movie review and the fairly standardized rating systems (Pang and Lee, 2005). Movie review are more than often tied to a scaled metric of some sort that accompanies the actual text. Whether it is a star rating (0-4), or a letter grade (A-F), or a binary of thumbs up or down, the phrases in reviews can be used to approximate a valence metric of positivity or negativity.[24]

I ultimately decided to use the sentiment analysis API based on this movie review training corpus.[25]. Passing the speeches in the captioning into a REST endpoint available via MASHAPE,[26] I received four bits of information back for each block of text. These were the probabilities that the text was neutral, positive, or negative as well as a label for the highest probability. Negative and positive probabilities would sum up to 100%. So for simplicity I calculated the sentiment metric for a speech as the net-positive probability–being the positive minus the negative probability. Thus the the potential range of sentiment values for a speech were between -1.0 and 1.0.

3.3.1 Lexical Sentiment and Prosody

The results in comparing speaker sentiment to my prosodic cues provided me with clearer distinctions than in the C-SPAN data. They also enforced a sense of party differences and even in-party differences in speech to sentiment relationships. In Figures 3.11 and 3.12 we find

[24]There are peculiarities in using movie reviews. Though they are isolated enough that they are unlikely to contaminate evaluations of text sentiment. For example, if a legislator happened to utter the name "Matt Damon" repeatedly in a speech, then the speech will have higher positive probability estimates. http://text-processing.com/docs/faq.html

[25]http://text-processing.com

[26]https://market.mashape.com/japerk/text-processing#sentiment

that both pace indicators negatively correlate with positive speech sentiment. Republicans become especially more negative the faster they talk. In Figure 3.13 we see a slight downward trend for sentiment related to pitch. When we break it out by speaker sex, this is driven by men. Both increased pitch variation and speaker loudness were associated with more negative statements in Figures 3.14 and 3.15. Longer speeches led to more positive speeches, especially for Democrat members. All of these relationships held up as I varied the range of volume response ranges as well as the maximum length of speeches in the data.[27]

In Table 3.3 we see the results of the two pacing models for speaker sentiment. Median speaker pitch becomes statistically insignificant in both models. The clearest drivers of negative speeches were being male and Republican. Though limited to House speakers in the second half of my C-SPAN data set, this captioned video set provides ample evidence that there are relationships between the extracted prosodic cues in the speech audio and the lexical tone of the speech. Republicans were more negative than Democrats on multiple dimensions. Sex effects are present in both data sets, though we see some divergence on the role of pitch within the Republican party. While more emotionally activated speech in the general populace might be associated with a range of expressions from anger to joy, or criticism to support, this does not appear to be the case in congress. These spikes in aggressive speech tilt towards the negative. While statistically significant, their effects are nonetheless slight enough that I must build on my models to provide a context of what legislators talk about. I will further explore the use of positive and negative affect in debate and their relationship to individual legislator productivity in the next chapter.

[27]To reduce the uptake of procedural speeches I excluded any caption segment less than 10 seconds long.

3.4 Tables and Figures

Table 3.1: Speaker Loudness (DB) by Year

	Raw DB	Adjusted DB
Year	2.319***	0.247***
	(0.004)	(0.003)
Constant	−4,688.572***	−533.392***
	(7.498)	(6.853)
Observations	102,241	102,241
R^2	0.791	0.049
Adjusted R^2	0.791	0.049
Residual Std. Error (df = 102239)	2.635	2.408
F Statistic (df = 1; 102239)	386,162.100***	5,257.629***
Note:		*p<0.1; **p<0.05; ***p<0.01

Table 3.2: C-SPAN Prosody General Models

	Articulation	Speech	Pitch	Pitch SD	DB
House	0.122^{***}	0.271^{***}	5.607^{***}	1.245^{***}	0.642^{***}
	(0.003)	(0.004)	(0.173)	(0.054)	(0.015)
Year	0.005^{***}	-0.001	0.539^{***}	0.129^{***}	0.266^{***}
	(0.001)	(0.001)	(0.039)	(0.012)	(0.003)
Republican	-0.013^{***}	0.060^{***}	-4.143^{***}	-0.151^{***}	0.057^{***}
	(0.003)	(0.004)	(0.168)	(0.052)	(0.015)
Male	0.075^{***}	-0.132^{***}	-48.535^{***}	-8.431^{***}	-0.120^{***}
	(0.005)	(0.006)	(0.246)	(0.076)	(0.022)
Constant	-5.475^{***}	5.677^{***}	-889.475^{***}	-223.976^{***}	-571.912^{***}
	(1.474)	(1.774)	(77.740)	(24.052)	(6.867)
Observations	102,241	102,241	102,241	102,241	102,241
R^2	0.015	0.056	0.306	0.121	0.066
Adjusted R^2	0.015	0.056	0.306	0.120	0.066
Residual Std. Error (df = 102236)	0.512	0.616	27.013	8.358	2.386
F Statistic (df = 4; 102236)	386.775^{***}	$1{,}529.810^{***}$	$11{,}277.910^{***}$	$3{,}501.939^{***}$	$1{,}818.399^{***}$

Note: *p<0.1; **p<0.05; ***p<0.01

Table 3.3: Speech Sentiment

	Net Positive Sentiment	
	Speech Rate	**Articulation Rate**
Speech Rate	-0.039^{***}	
	(0.011)	
Articulation Rate		-0.072^{***}
		(0.015)
Pitch	-0.0003	-0.0002
	(0.0002)	(0.0002)
Pitch Std Dev	-0.008^{***}	-0.008^{***}
	(0.001)	(0.001)
Loudness (dBFs)	-0.004^{**}	-0.004^{***}
	(0.002)	(0.001)
Speech Length (seconds)	0.0001^{**}	0.0001^{***}
	(0.00003)	(0.00003)
Republican	-0.045^{***}	-0.045^{***}
	(0.011)	(0.011)
Male	-0.176^{***}	-0.165^{***}
	(0.016)	(0.016)

Continued on next page

Table 3.3 – continued from previous page

	Net Positive Sentiment	
	Speech Rate	**Articulation Rate**
Constant	0.665***	0.783***
	(0.073)	(0.082)
Observations	4,808	4,808
R^2	0.063	0.065
Adjusted R^2	0.062	0.064
Residual Std. Error (df = 4800)	0.362	0.361
F Statistic (df = 7; 4800)	46.372***	47.941***
Note:	*p<0.1; **p<0.05; ***p<0.01	

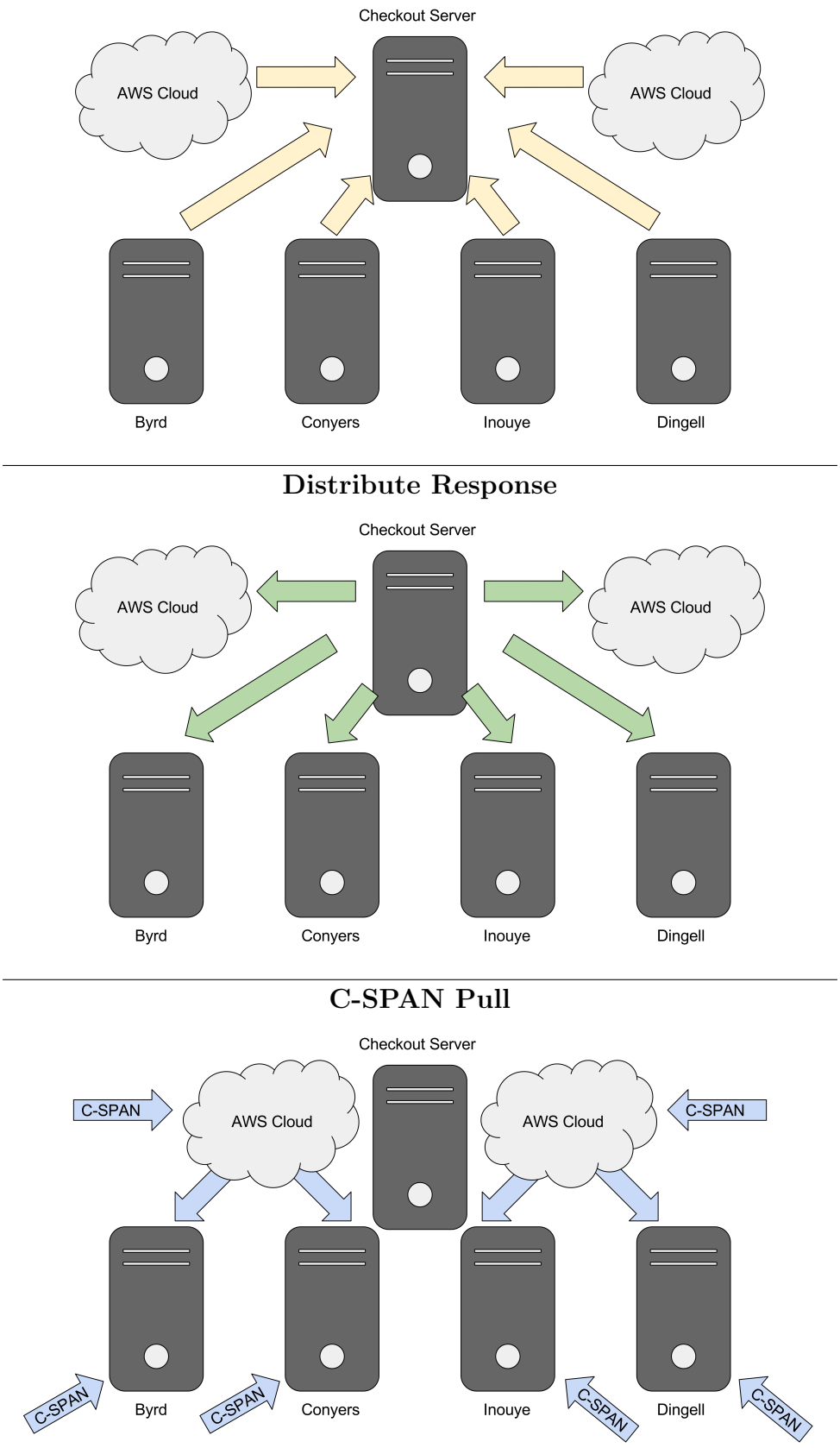

Figure 3.1: C-SPAN Video Scraping Workflow

Figure 3.2: Screen Capture and Lower-Third Isolation Example

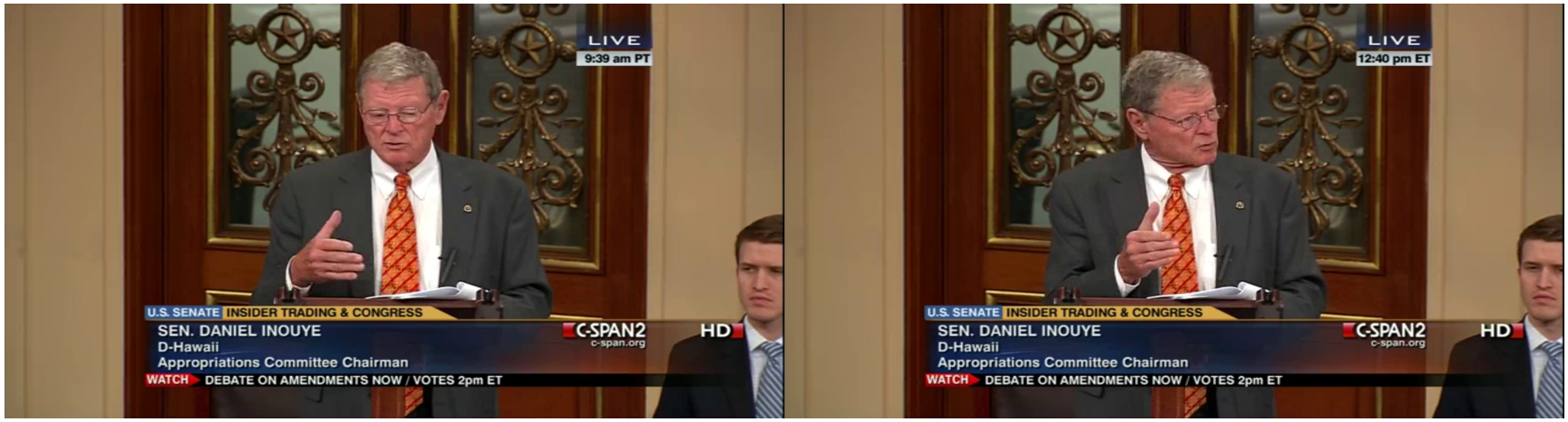

Figure 3.3: Two-Frame Miscode Example

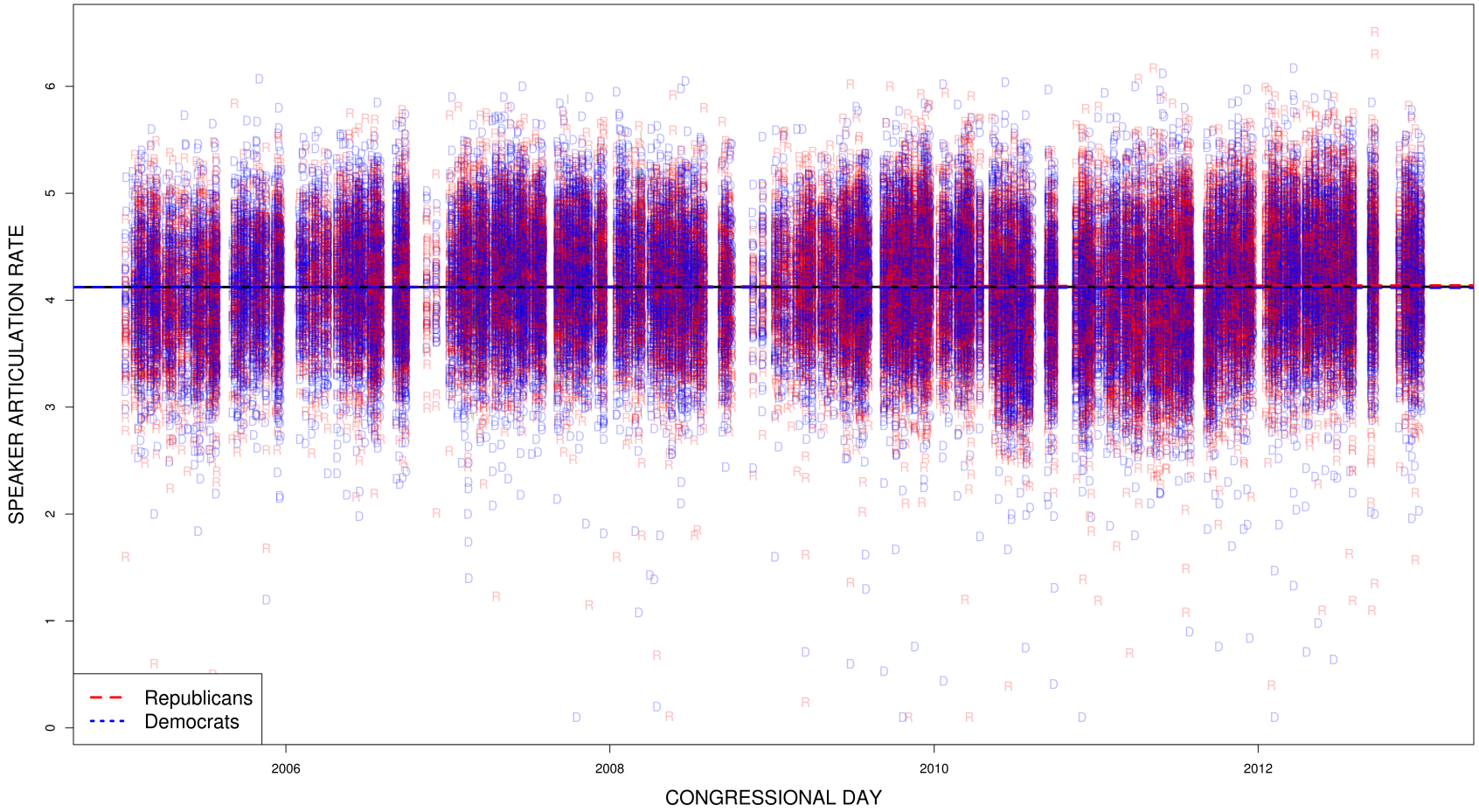

Figure 3.4: Articulation Rate [2005-2012]

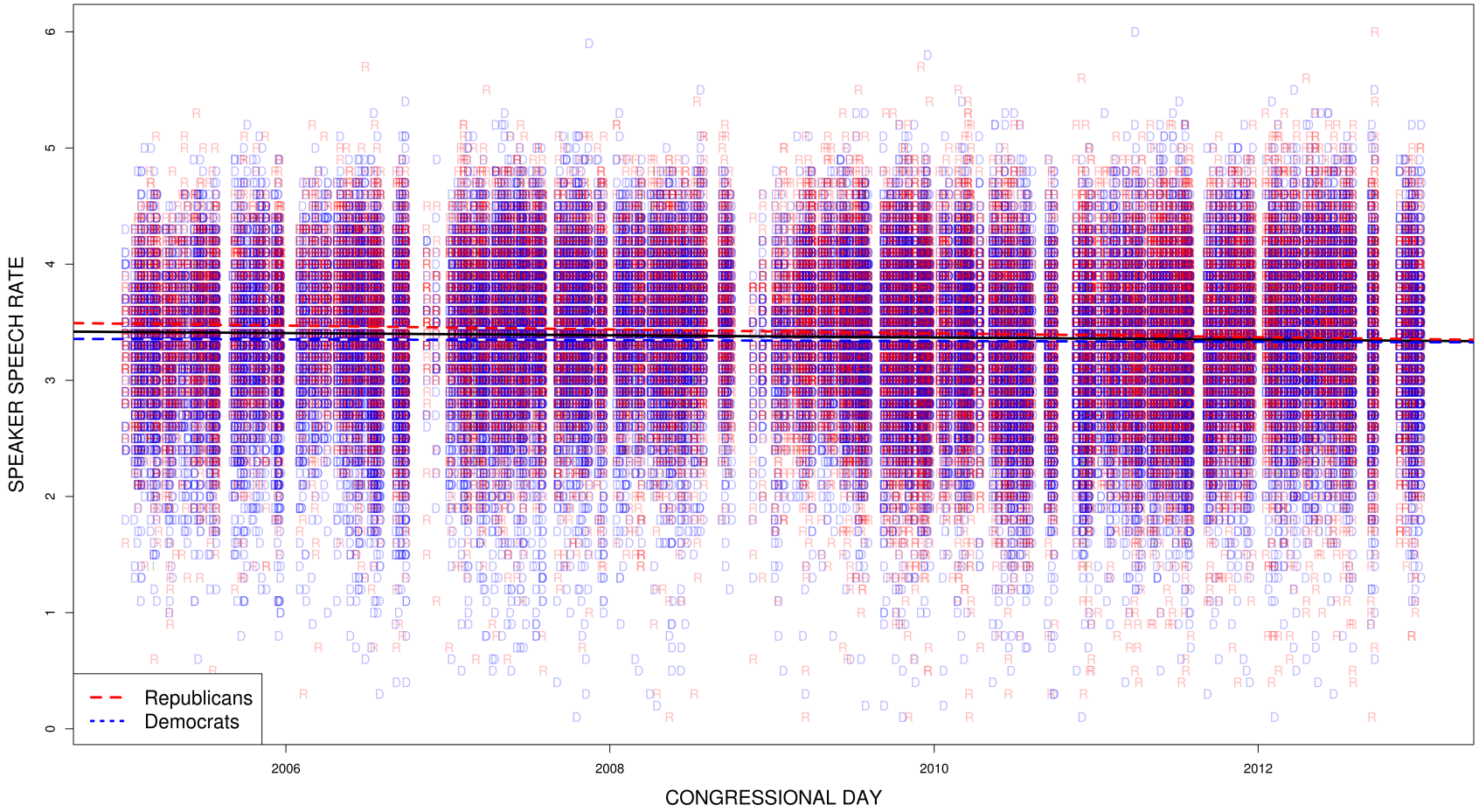

Figure 3.5: Speech Rate [2005-2012]

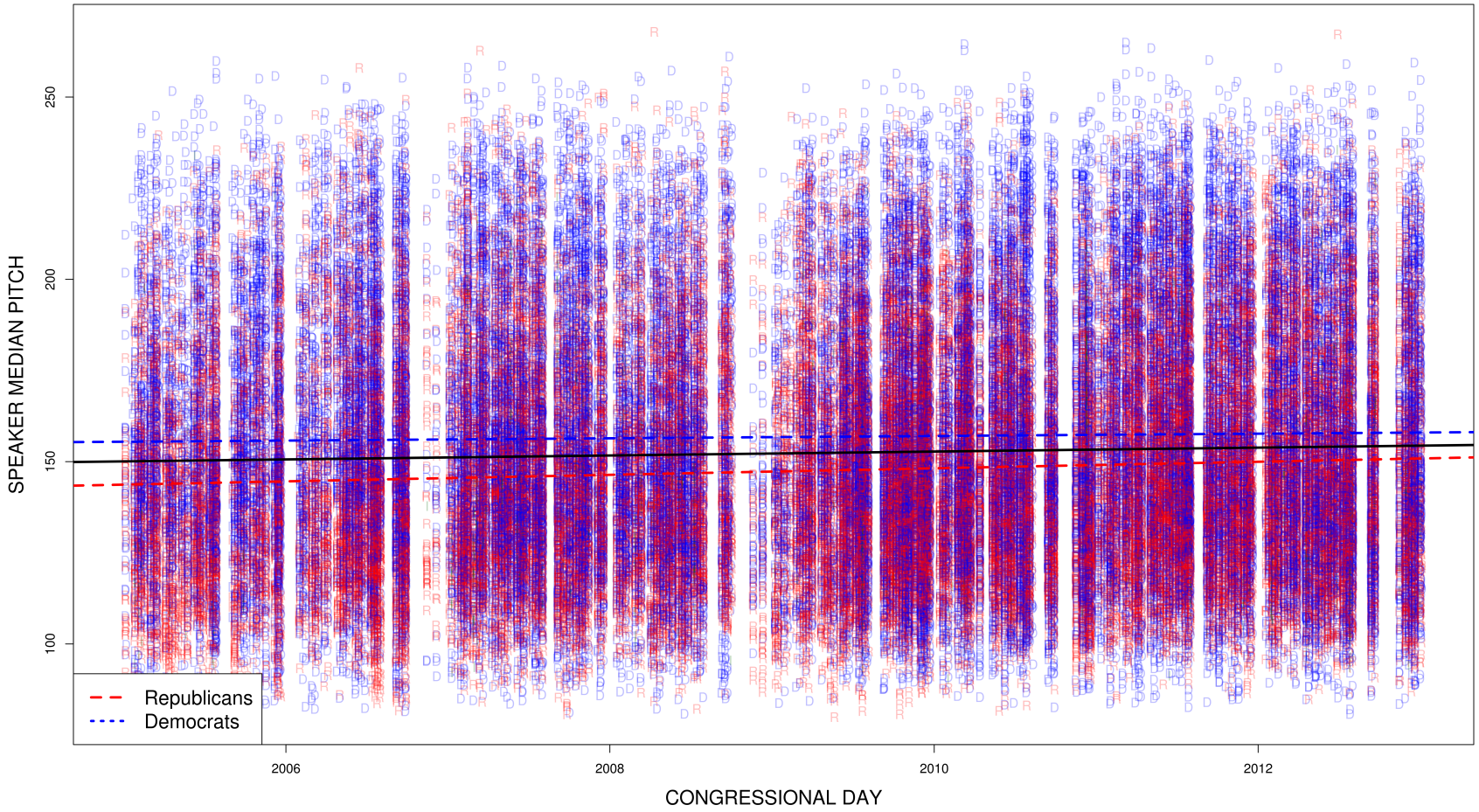

Figure 3.6: Median Pitch [2005-2012]

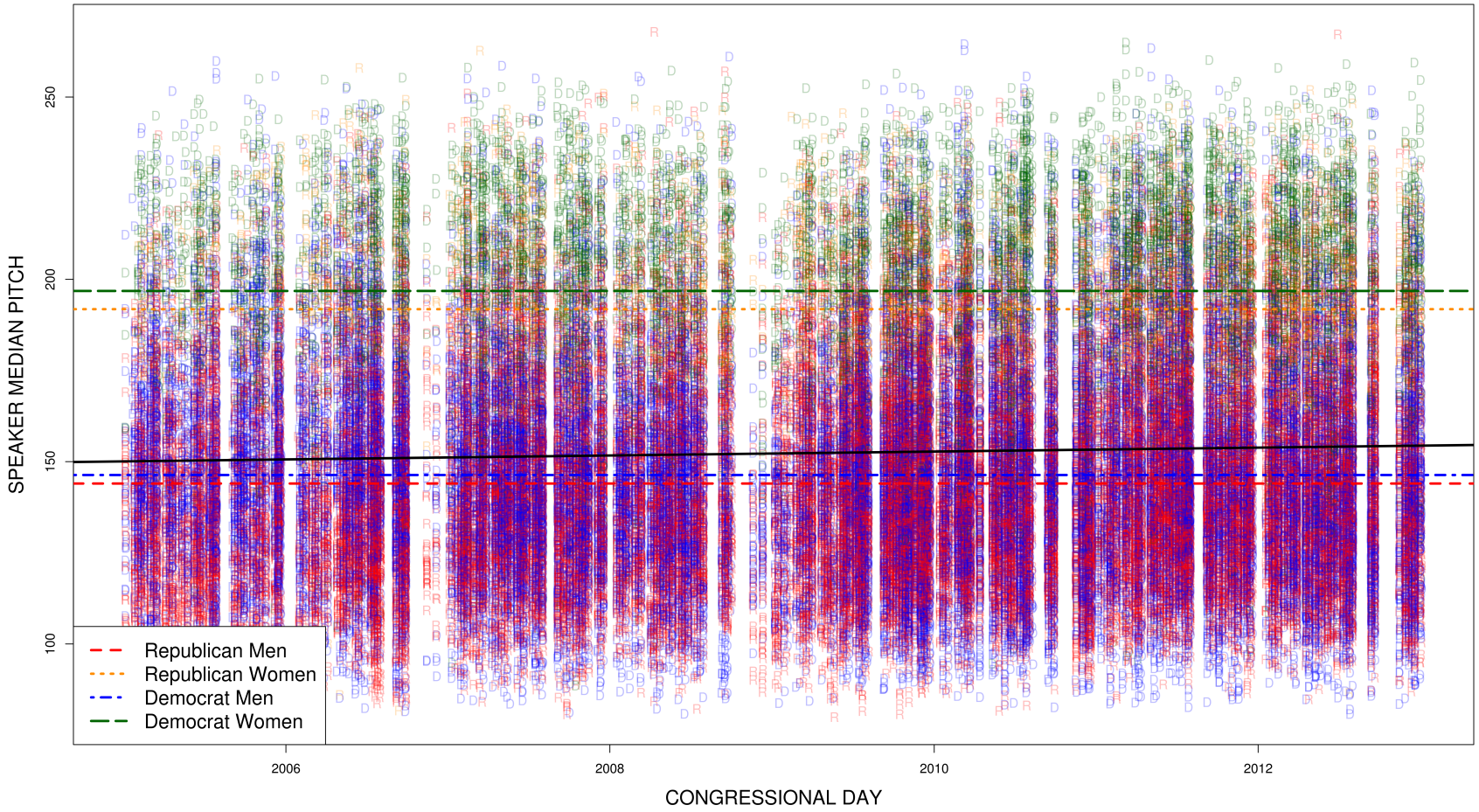

Figure 3.7: Median Pitch by Speaker Sex [2005-2012]

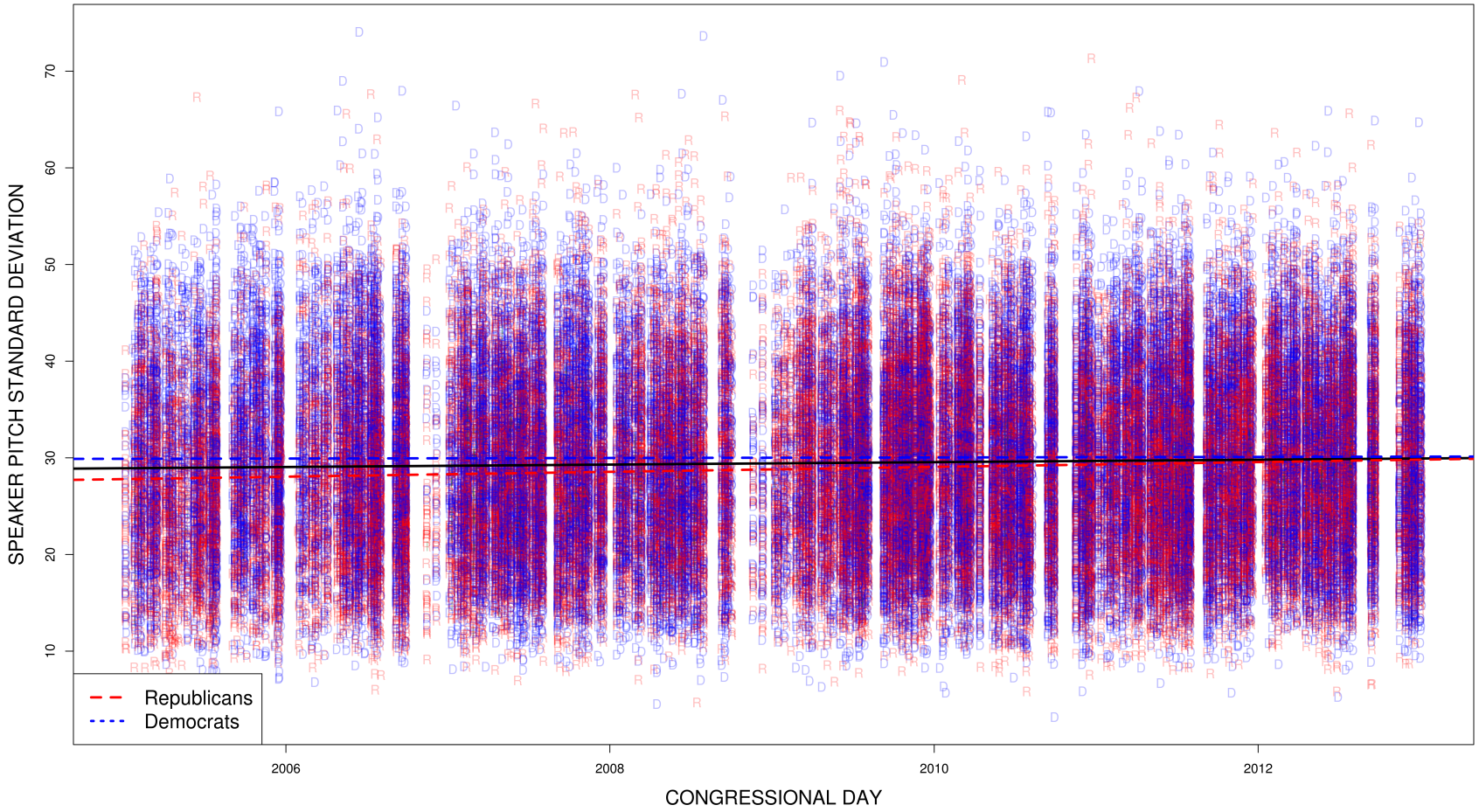

Figure 3.8: Pitch Standard Deviation [2005-2012]

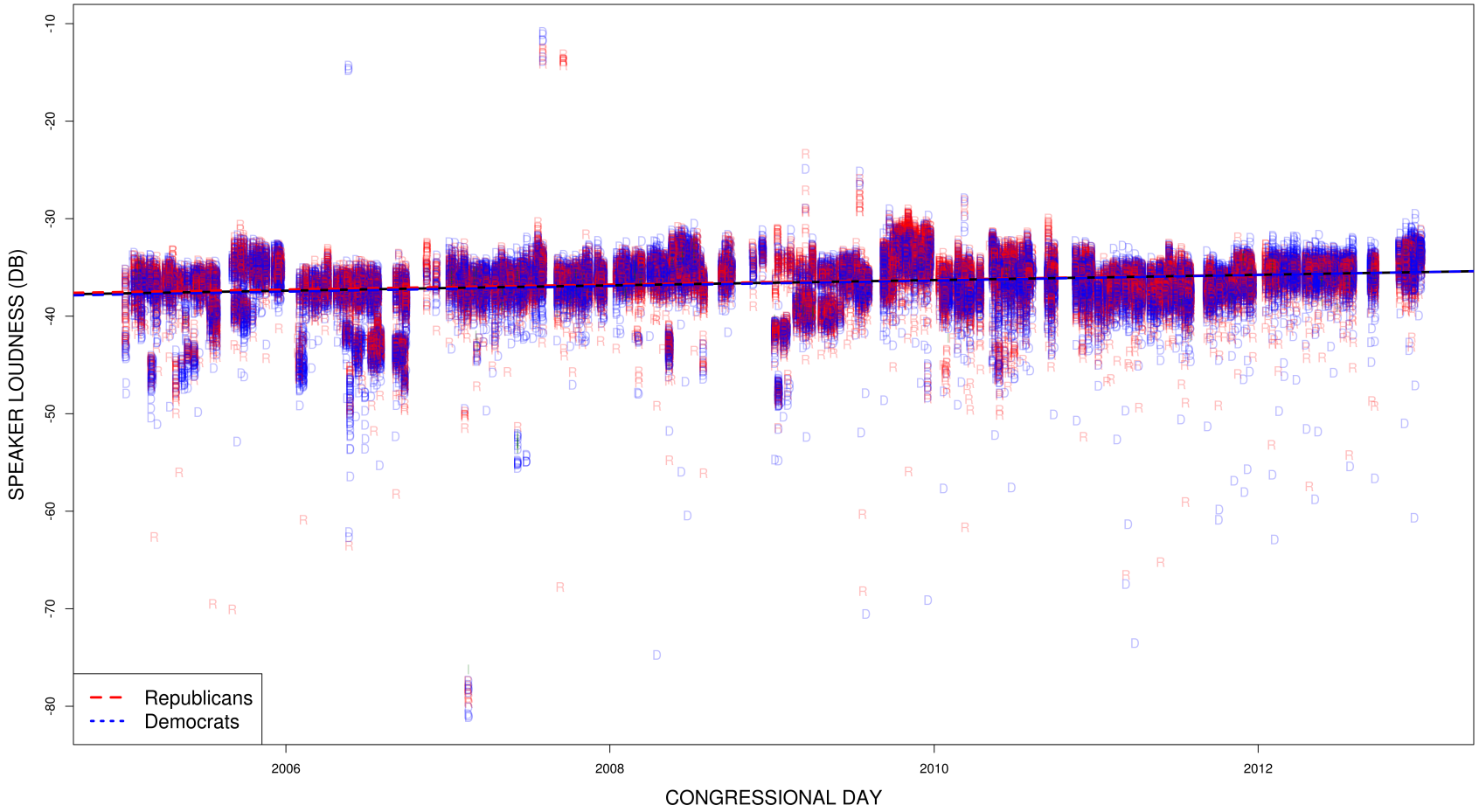

Figure 3.9: Speaker Loudness (DB) [2005-2012]

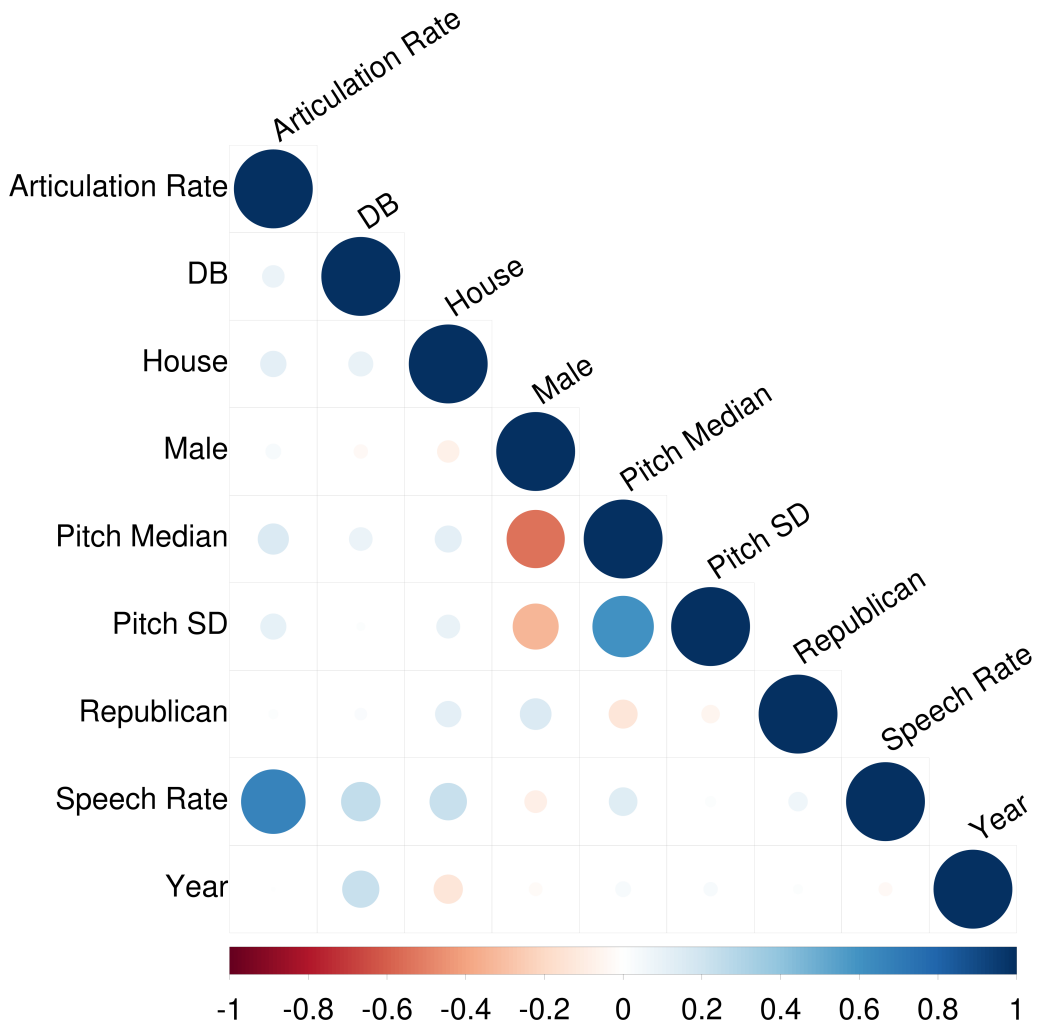

Figure 3.10: Correlation Matrix for C-SPAN Prosody Variables

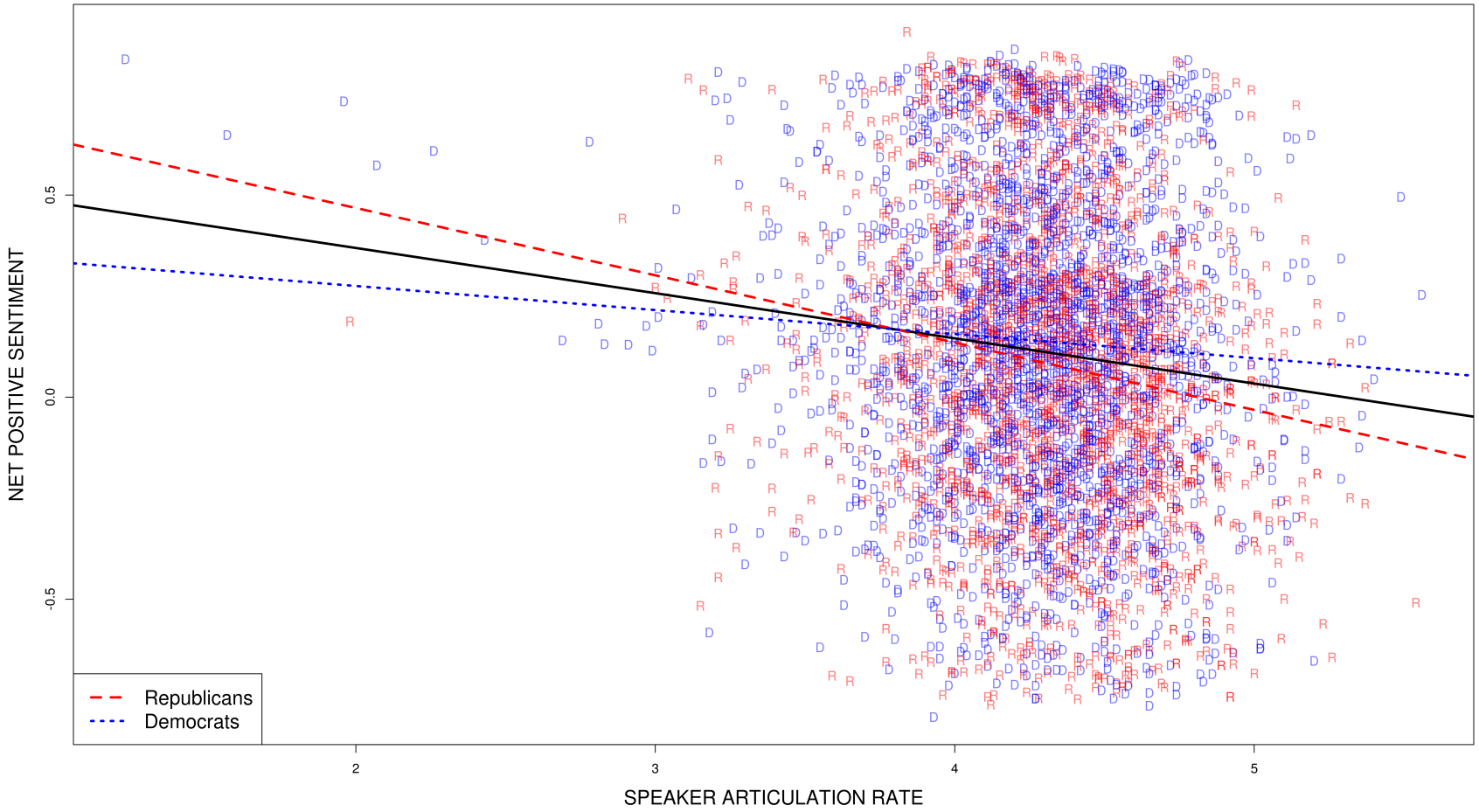

Figure 3.11: Sentiment vs. Articulation Rate

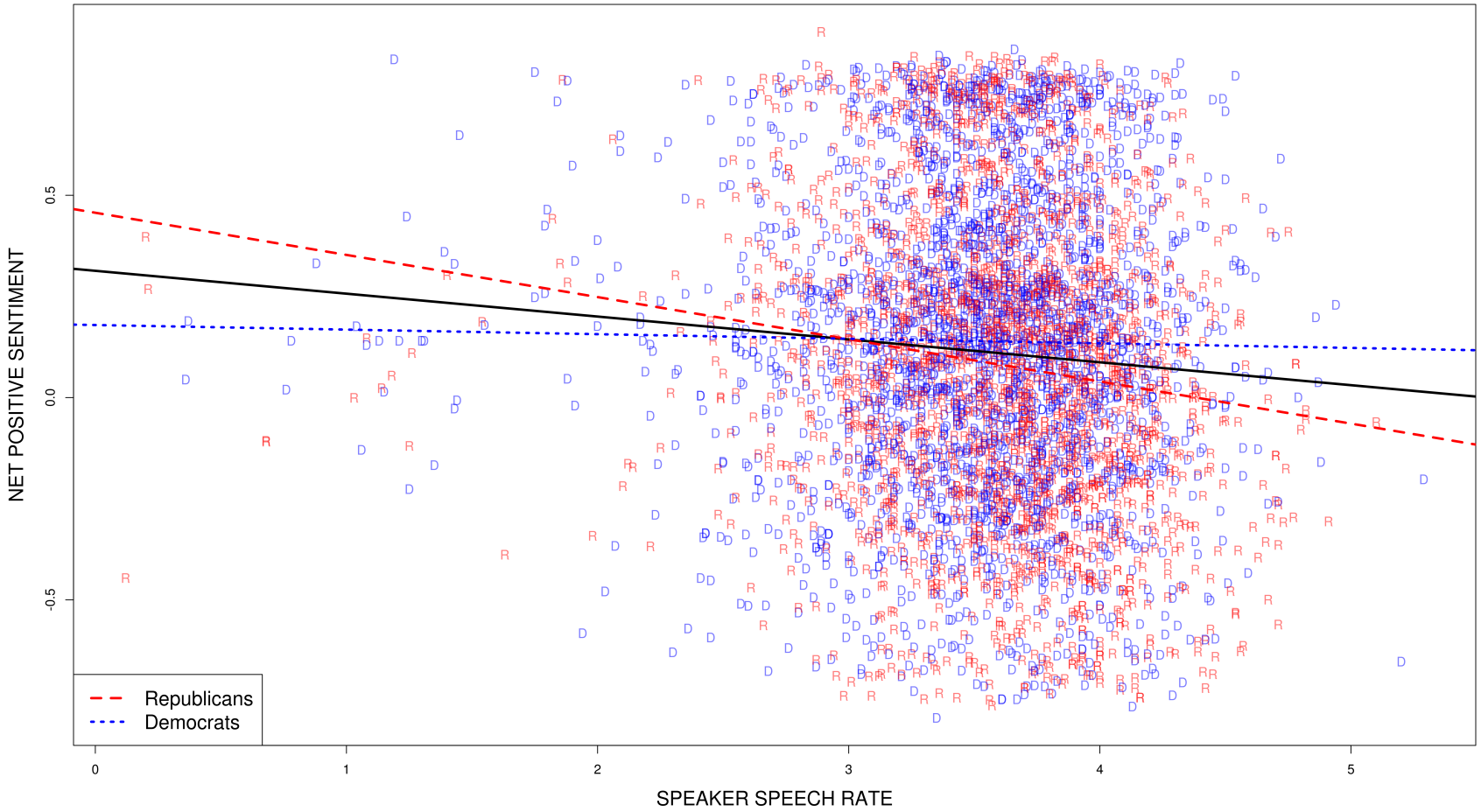

Figure 3.12: Sentiment vs. Speech Rate

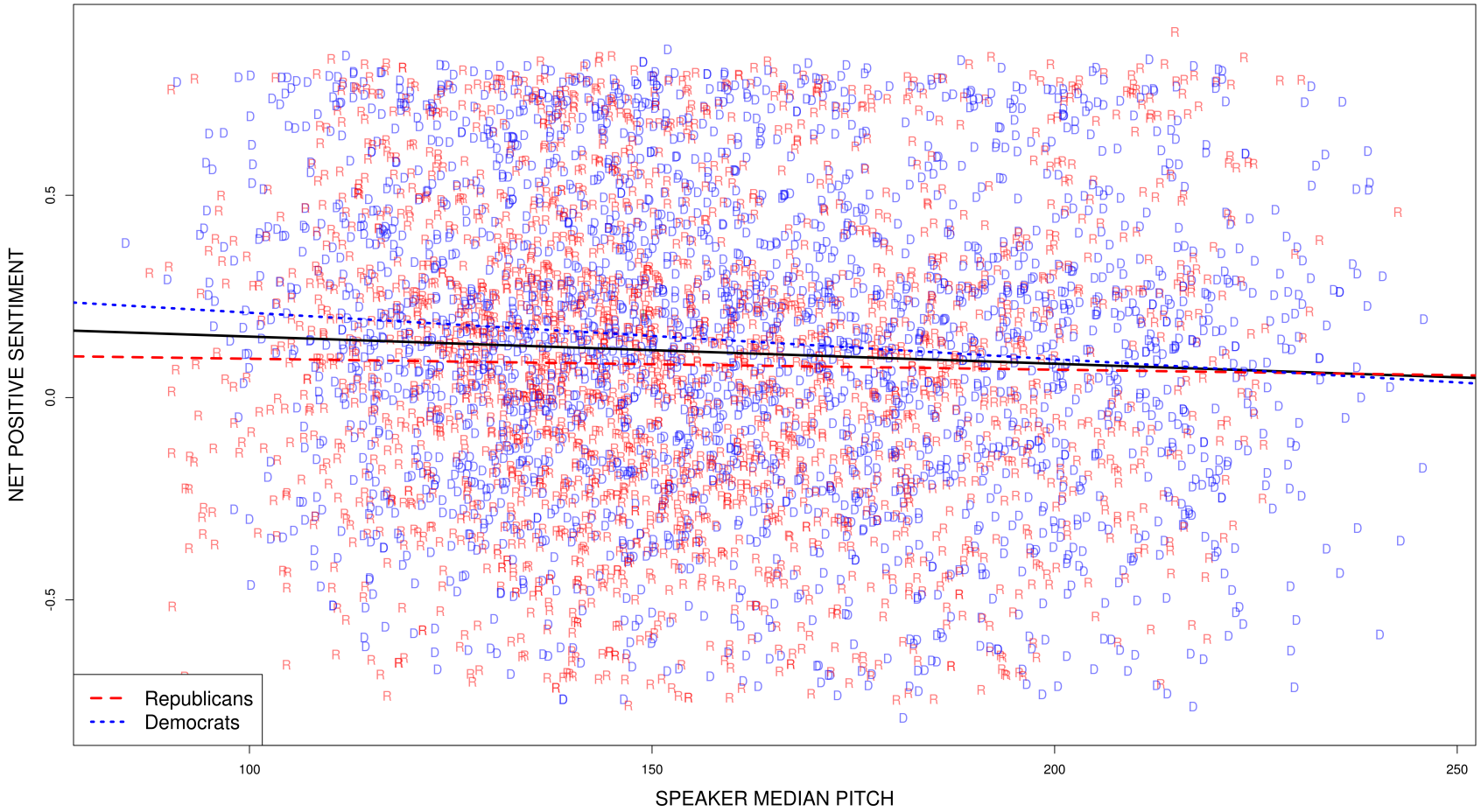

Figure 3.13: Sentiment vs. Median Pitch

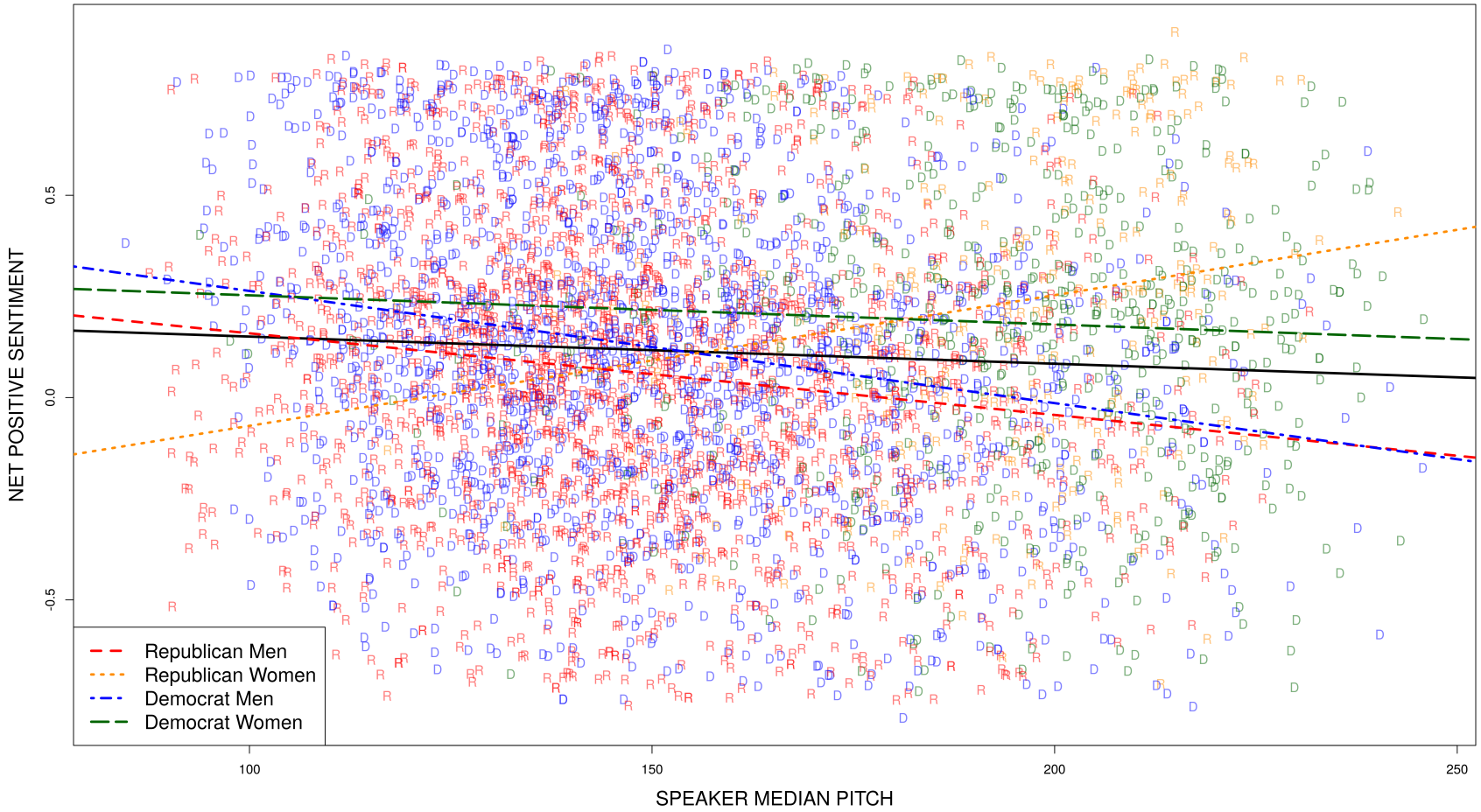

Figure 3.14: Sentiment vs. Median Pitch by Sex

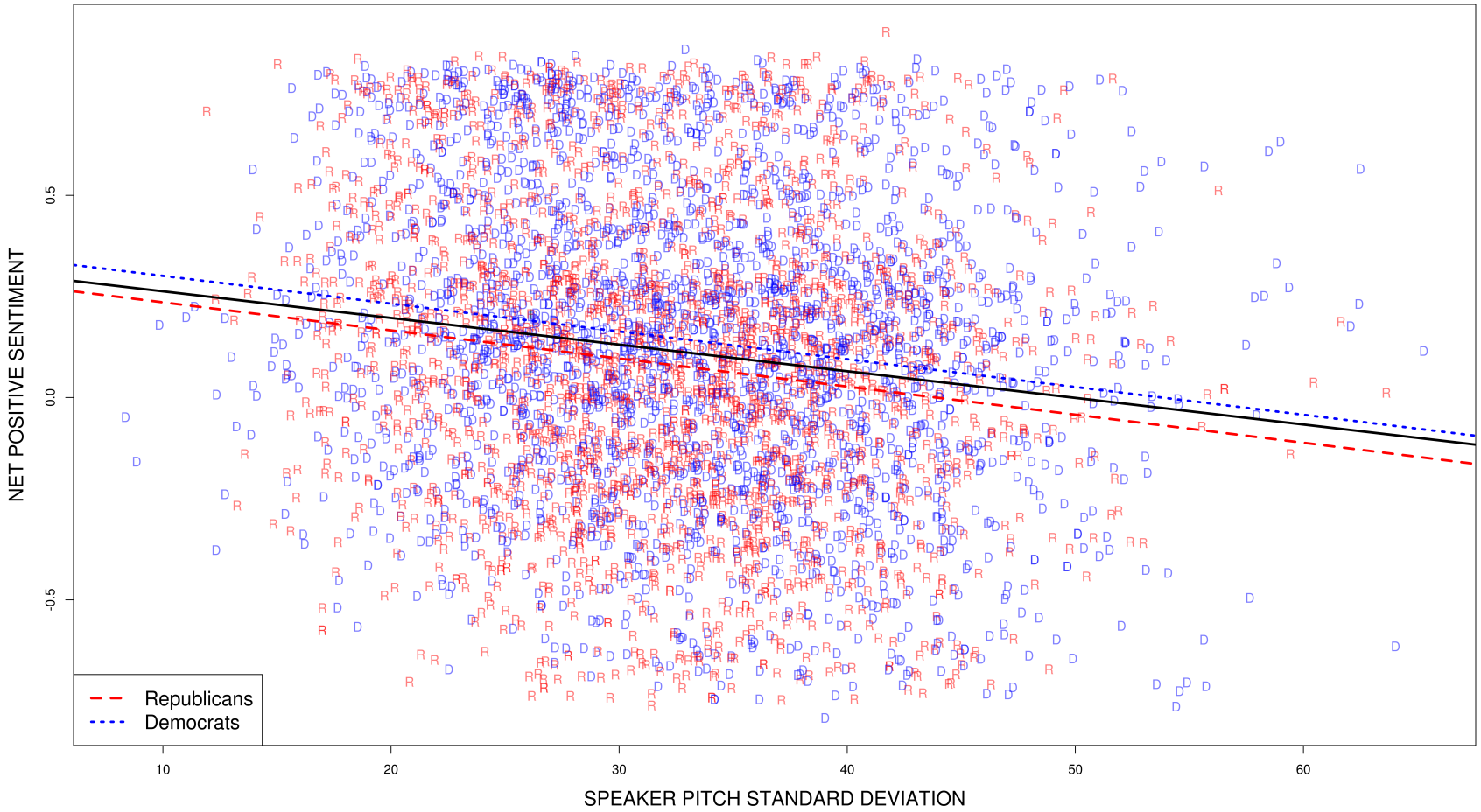

Figure 3.15: Sentiment vs. Pitch Standard Deviation

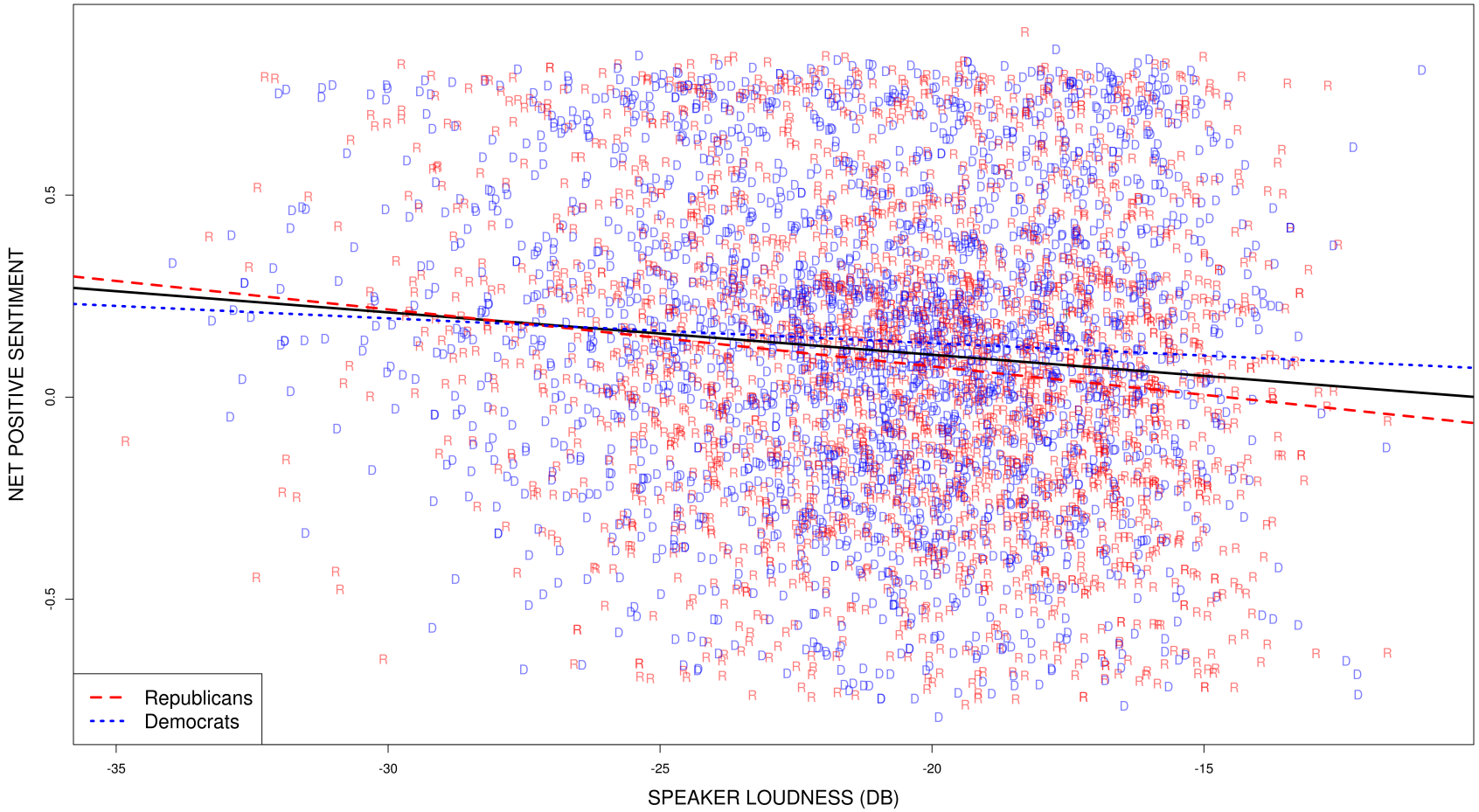

Figure 3.16: Sentiment vs. Loudness

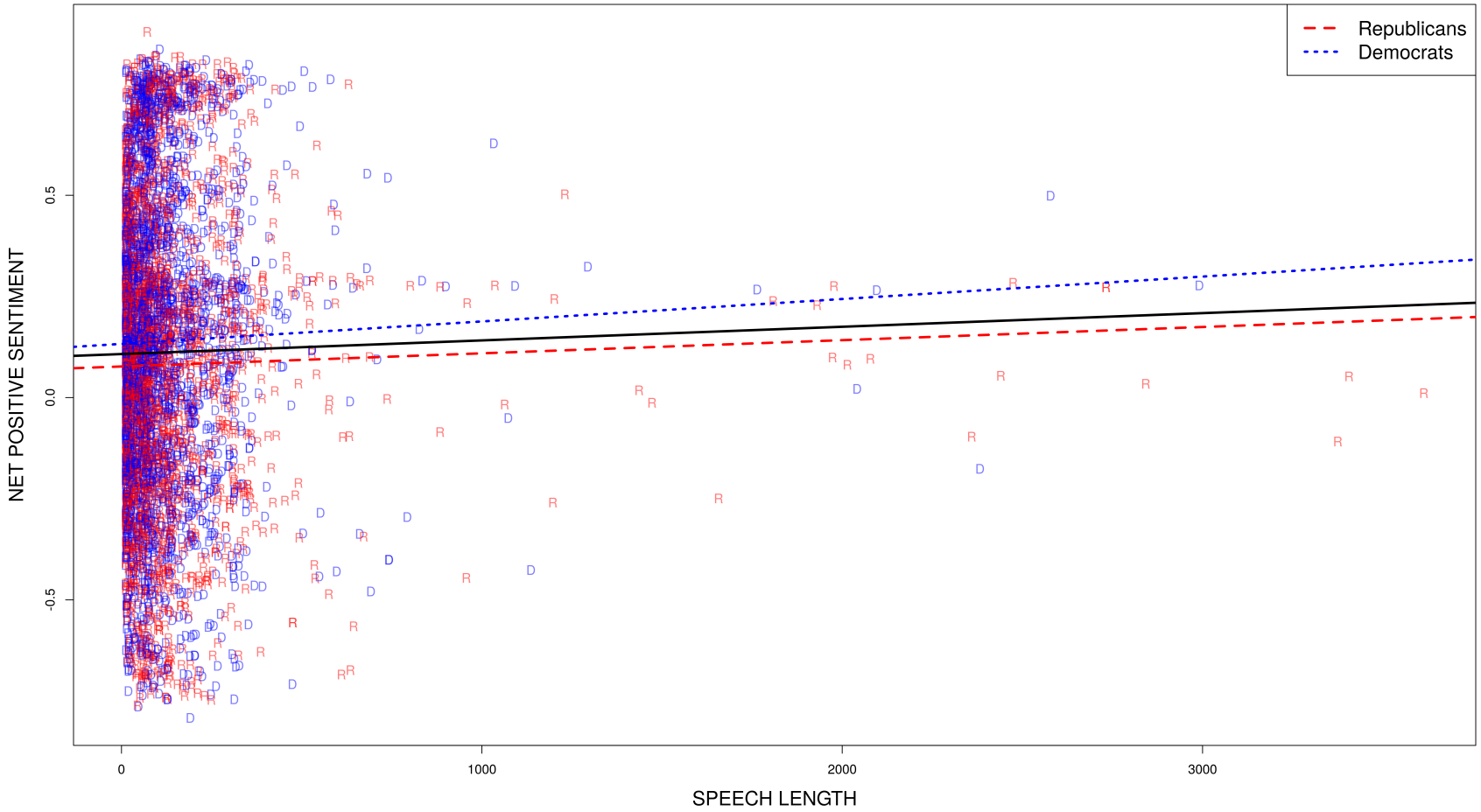

Figure 3.17: Sentiment vs. Speech Length

CHAPTER 4

Legislative Controversy, Congressional Productivity, and Speaking Styles

In this chapter I focus on *what* legislators talk about in the context of the *how*. I am particularly interested in properly framing the individual realities of each legislator's "how". With the large novel data set I constructed in the prior chapter, I can develop individual baselines for legislators. They can improve the intent of the models in controlling for the idiosyncrasies of each person's speech patterns. As individual humans, we are all naturally calibrated by our own experiences, backgrounds, and occasionally physical realities such as illness and health. Such variations can inform and influence the way that we speak; both in our words and in the literal sounds which escape our heads when we form these words. One person's natural speaking pace and loudness can be drastically different from another's. Former Senator Joe Lieberman's expression of a range of emotions is not going to be the same as that of a Paul Ryan (R-WI). To an uninformed observer, Lieberman's version of frothy-mouthed rage may appear indistinguishable from a naturally louder and faster speaking Paul Ryan's version of casually telling a person the time of day. With this in mind it is wise to develop legislator-specific baselines of speaking.

In Dietrich's pitch-specific review of the 2009 to 2011 House proceedings he controlled for each person's baseline pitch using rough biometric approximations. For example, while males tend to have lower pitch in their voiced speaking patterns there are still going to be variations within the male speaker population. One way to control for innate pitch is to look at body size. While there is no apparent correlation between a person's pitch and body mass index (Bright et al., 2014), this is not the case when weight is ignored. Height is highly correlated with vocal cord length (Han et al., 2005). It does not necessarily have

a consistent correlation with the density of vocal cords (Ximenes Filho et al., 2003). Even with these basic guidelines there are occasional outliers that come to mind. While not the voiced pitch range, we can nonetheless hear this in the pitch of popular singers. A 6'4" Barry White would support the argument for height correlating to longer and thicker vocal cords, and thus lower pitch. However, 5'7" Pearl Jam frontman Eddie Vedder has significant lower-range vocal overlap with Mr. White.[1] Here the intervening variable that might explain the discrepancy in height to low-end pitch is Vedder's vocal cord density. Lacking an MRI machine and willing congressional participants to even be measured for their heights—let alone to be shoved in a tube for imaging—Dietrich (2014, p. 152-153) used head size to approximate body size and height. There's a high correlation between head size, body size, and height (Geraedts et al., 2011; Bale et al., 1991).[2] Using portraits of legislators and taking congressional flag pins, neckties, and earrings as his visual anchors he then estimated legislator head size. Roughly there is an expectation that big-headed people should have lower natural pitch floors (again relative to their sex). He found a significant relationship between pitch and head size, as well as a trivial relationship between this metric and his "bad words" lexical component to measure anger.[3]

Though inventive in its methods for determining a pitch baseline control, I do not rely on Dietrich's methodology in deriving my own legislator-personalized controls. My baselines are drawn from the prosodic details revealed in the larger and more expansive sample of speech I have created. While I am on the lookout for current and former legislators willing to be subjected to the whir of industrial-strength medical diagnostic machinery, this is an unlikely scenario in the foreseeable future.[4] In absence of this I am comfortable enough with

[1]An interesting translation of singing vocal ranges that can illuminate this discussion of pitch is found online at http://www.concerthotels.com/worlds-greatest-vocal-ranges. Last accessed: 08-18-2016

[2]There is a slightly higher correlation between body size and head size.

[3]This is drawn from the Linguistic Inquiry and Word Count literature (Dietrich, 2014 p. 58; Pennebaker and Francis, 1996)

[4]Maybe there's a PAC I can start with an ambiguous enough name that gives legislators campaign funds in return for spending time in a paper skirt for a few hours at the George Washington Medical Center. It cannot be that much more awkward or painful than any number of other things the average legislator

taking the medians of samples for each legislator from both the House and Senate for 2005 to 2012 in determining not only the pitch that Dietrich explores, but also pace, pitch variance, and loudness.

4.1 Legislator Baselines Review

My general legislator speaking baselines are calculated as the median of each speaker's sample. There are caveats. The first is that I take the median of a congress member's prosodic cue regardless of whether they transition across chambers in the 2005 to 2012 time frame. I try to control for this with standard chamber and party variables in the following models. There are also concerns about an intervening factor affecting the loudness variable that is hard to extract without a more detailed image analysis workflow. This is the issue of microphone placement. While its orientation relative to a speaker's mouth may be problematically systematic, in some sense it could be seen as a signifier of an intent to display aggression.

To get a quick sense of the overall trends in pace, pitch, and loudness I look at the top 10 legislators in each category. I focus on these top legislators due to the relationship between the high end of these prosodic indicators and increased aggression.[5] For greater clarity in removing outliers, I also limit these top results to speakers that have at least 5 minutes (or 30 of the 10-second samples) of data to draw from. For further clarification, the reported medians are the median of the sampled medians. In Tables 4.1 and 4.2 we can see the the fastest speakers. Each of the medians associated with a legislator is displayed with the standard deviation in parentheses.[6] In the top articulation rate pace speakers we see a male dominance. Only Stephanie Tubbs Jones (D-OH) breaks into the top articulation pace. There is a decent regional and party distribution in this pace measure. However the

endures in fundraising. As a matter of personal experience, it definitely beats cold-calling people to ask them for their vote and their money.

[5]Of course, the bottom end of these ranges are available upon request.

[6]As with the reported medians, the reported deviations are the standard deviations of the medians in the sample.

top speakers are dominated by House members. Only Marco Rubio (R-FL) appears from the Senate delegation. With speech pace we see a minimal change in the female speakers. Party splits remain consistent, though no senators appear in the top speech rate pace legislators. Gary Miller (D-CA) and Steve Scalise (R-LA) are the only legislators that appear on both lists, though their ranked order is swapped.

Top median pitch is broken out by speaker sex in Tables 4.3 and 4.4. Female legislators are dominated by Democrats. Only Tammy Baldwin (D-WI) has spent any time in the Senate, and only after the time frame of my analysis.[7] To get a sense of how high our top women legislators' pitches are I recorded snippets of a high-pitched speaker from a top-rated television show. Actor Melissa Rauch, who naturally speaks in a less drastic manner in her daily life, portrays Dr. Bernadette Rostenkowski-Wolowitz on The Big Bang Theory. Her character's distinguishing feature is her exaggeratedly high speaking pitch. It is used to comedic effect, especially in contrast during moments of anger when her pitch drops precipitously to chide her husband Howard. Using Bernie as an example of a distractingly high pitch speaker, I took a sample of speech from The Big Bang Theory where she was speaking without the interference of music, crosstalk, or audience laughter. I then ran it through the same praat workflow and calculated Dr. Rostenkowski-Wolowitz's median pitch. While Betty Sutton (D-OH) may seem to have a particularly high speaking pitch, it still falls well below that of Bernadette's which was in the high 240Hz range. As a further example I found an interview with the late actor Mae Questel—the voice behind cartoon characters Betty Boop and Olive Oyl. Her natural speaking pitch was not that dissimilar from that in her portrayals of a disproportionately large-headed woman with a peculiarly childlike voice or the damsel in distress flailing to free herself from the Bluto's grasp. A similar vocal analysis revealed Questel's pitch to go well over 250Hz. So while Sutton's pitch is the highest, it is not at a cartoonishly distracting level.

The top pitched male speakers were more evenly distributed among the two parties. Sen. Roland Burris (D-IL) had the highest pitch of these legislators. Intriguingly the pitch drop

[7]Starting in 2013.

off from top to bottom of the top 10 is more dramatic with men. The pitch drop from Sutton to Marsha Blackburn (R-TN) was 13.95Hz compared to the Burris to Major Owens (D-NY) drop of 22.87Hz. In Table 4.5 we see the top legislators by pitch variation. Dominated by Democrat legislators, only Sen. Blanche Lincoln (D-AR) appears on this list from the chamber on the north side of The Hill. There seems to also be a high relationship between being a woman and having higher pitch variation. This may be due in part to general social norms in the public at large that I will explore later. Though Democrat Sutton tops this list as well, the second highest pitch variation legislator is Republican Marsha Blackburn.

In Table 4.6 we see top speakers by loudness. Only Sen. Barbara Mikulski (D-MD) represents women, though this may be a specific fluke of her particular relationship to the technology capturing sound for C-SPAN. Rep. Tom Osborne (R-NE) being the loudest speaker is likely a result of his former profession. As the erstwhile head coach of the three-time NCAA Championship Nebraska Cornhusker football team, it is understandable that he would have a prone to projecting certainty and control in his speech. Returning to the Mikulski matter, there is an intervening variable that is hard to ignore. To give us a sense of this by way of contrast we see a sample of screenshots for Osborne in Figure 4.1. Of note is the placement of the microphone relative to the coach's mouth. While he may have a slight propensity to look down when speaking into the microphone, there is still sufficient variation in the screen captures to believe that the microphone placement is stochastic enough to not be of that much of a concern in possible models.

In clear contrast to this, in Figure 4.2 we see Mikulski's prone for a specific microphone placement. Where Osborne appears largely indifferent to its orientation, Mikulski has a distinct desire to use a lapel microphone. Even more disconcerting is her desire to take it in her right hand and hold it as close to her mouth as possible. This can make her speaking loudness seem more exaggerated than it would be were she to use a microphone on a stand and not appear perilously close to accidentally consuming it. I am not certain if there's another issue with Mikulski related to her hearing, where she needs to make sure that she can hear herself to be certain that others can hear her as well. But there is also the possibility that Mikulski—and other legislators that go out of their way to get as close

to the microphone as possible—are doing so for specific effect. They may want you to know that they want to be heard. Its also quite possible that were legislators allowed to drop the microphone like Eminem after winning a rap battle, that they most certainly would. This intervening variable is nonetheless an issue that makes loudness as a prosodic cue of aggression in my models somewhat problematic. Even after making the decibel adjustments in the previous chapter, speaker volume is the most suspect of my variables. Pace, pitch, and pitch variation are nonetheless independent of microphone placement.[8]

4.2 Legislative Controversy

What legislators speak about can affect the way they speak. One factor that should serve to temper or inflame passions is controversy. More controversial topics should lead to greater levels of aggression. In a congressional context this controversy would surround policy as well as those who would be responsible for implementing and interpreting the constitutionality of these policies.

To select the speeches for my analysis of controversial debate I first crawled the *CQ Press Congress Collection* website for their listing of Key Votes from the 109th to 112th Congresses. These votes are chosen by the CQ staff for their controversy and larger impact on Americans, amongst other factors. This gave me 194 data points to draw from. Because of current gaps in the C-SPAN transcripts—some due to basic malformation of in the transcript file structure, others from outright absence—I had to drop 14 of these cases. This left me with 180 cases covering 159 distinct days of debate. Looking solely at the House cases I then located the first day preceding a Key Vote that the House engaged in debate on legislation under suspension of the rules. This provided me with data for 78 extra days in the House. These served as my ground test for non-controversial debate. By its very nature

[8]I have tested this with pace and pitch by varying the volume of some of my samples with SoX and running them through the praat scripts. The pace calculation is definitionally independent of loudness. Unless the person operating the C-SPAN soundboard was randomly tweaking the the volume levels up and down mid-speech there would not be any loudness effects on pace. Similar potential volume effects on pitch were non-existent.

legislation considered under suspension of the rules is limited to 40 minutes of debate and must be passed by a two-thirds majority. Most of the bills and resolutions were passed or agreed to by voice vote and tended to cover benign topics such as the naming of post office or congratulating sports teams on their championships. In total I ended up isolating 306 streams containing nearly 75 days of raw footage from the larger library of footage already on my machines.

Contemporaneously I scraped in the transcripts from the each of these days' pages off of C-SPAN and crawled them for the names of the speakers as well as the time code for segmenting the streams. I ignored times when a legislator was speaking as the presiding officer. The C-SPAN archives were very good at catching this. Aiding my personal ability to identify large portions of the presiding officers from their speech, C-SPAN would label presiding officers as "Unidentified Speaker[s]." For the Key Vote debate I only looked at debate on the day of the vote between when the consideration began, up to the actual vote. If the Key Vote was on an amendment I attempted to isolate the debate to only the amendment of interest. Finding the cut points for suspension debate was fairly straight forward in scanning the Congressional Record for the phrase "I move to suspend the rules" and locating the corresponding in and out timecode for the identified speakers in my C-SPAN footage.

With key and suspension debate segments isolated, I built a model focused solely on the key votes to contrast House and Senate speaker differences in speech. I then also built a House-specific model to contrast key votes with suspension debates. In both these sets of models the response variables are my pace and pitch prosodic measures. Because of the suspicious intervening variable issues with my loudness measure I am saving us some time in ignoring it in models moving forward.

Many of my explanatory variables are replicated from chapters 2 and 3. For quick review they are primarily a series of binary controls, including the following:

- Speaker was a Republican
- Speaker was in the minority

- Republicans control the chamber
- Midterm election year
- Presidential election year
- Divided government (when the presidency and at least one of the chambers of Congress are controlled by different parties)
- Debate was on a key vote issue—only relevant for the House-specific model.

Other general legislator-specific variables included length of a legislator's speech, the speaker's sex, congresses served, and age. With the key vote models I also include the CQ subject coding to test for more subject specific controversy effects.

In Table 4.7 we see pace models that are agnostic to the peculiar speaking proclivities of individual legislators. Focusing solely on key votes, we find intriguing party effects on speaker pace. Republicans in the minority seem more emotionally activated, particularly in the House. While election years increase speaking pace, oddly enough divided government does not. More liberal legislators seem to speak more quickly, though this is on par with a legislator being more ideologically extreme generally. The CQ key vote subject variables have inconsistent relationships with pace. In Table 4.8 I looked at the pitch and pitch variation effects. Chamber and timing effects drive pitch variation more than median pitch in the agnostic models. Similar Republican minorities in the House are associated with larger pitch spread in key vote debate. The speaker specific variables correlate consistently for both pitch and pace, with the effects being more pronounced for pace. Unsurprisingly there are intervening speaker sex effects for pitch.

We turn to the House exclusively in Table 4.9 to contrast key votes and suspension debate effects on speaking pace. It is no great shock that debate surrounding key votes is more fevered in its pace. The effect of Republican minorities is flipped from the key vote models that cross both chambers.[9] For pitch effects in the context of House suspension debates, we

[9]There were high inter-correlation issues among a few of the suspension explanatory variables that were

turn to Table 4.10. Increases in pitch aggression indicators are once more associated with Republican minorities. They also tended to be tied to more ideologically extreme members.

4.3 Polarization

The idea that America is the most politically polarized since the Civil War has become a popular sentiment amongst politicians and the media alike. From Jimmy Carter[10], to James Q. Wilson[11], to California Governor Jerry Brown[12], down to the repeated sentiments of fictional news reporter Will McAvoy on the HBO series *The Newsroom* it is hard to escape the sense that America has not been this divided since brother fought brother some 150 years ago. A common focal point of this contention is the behavior of Congress Members and their increasing intransigence in developing policy and working across the aisle. In providing more concrete evidence of such Congressional polarization, political scientists rely heavily on voting scores to show a basic divergence in policy positions. Looking at the historical NOMINATE party means in the House on the liberal-conservative economic dimension in Figure 4.3 we see this growing divide.

Another means of testing polarization in Congress is found in the lexical analysis of speeches. Aside from the party-position inference methods I have mentioned, other research has looked at the use of language attacking party rivals on the House and Senate floor; including how such incivility has affected legislative output and particularly judicial confirmations (Schraufnagel 2005). There has also been research into incivility as measured in the striking of words from the Congressional Record (Jamieson 2011).

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used in the key vote models. In particular I had to drop divided government and a few of the NOMINATE party distance measures to prevent outrageous—and highly improbable—coefficients in the suspension models.

[10]http://www.youtube.com/watch?v=ugZxfGsYAkY. Last accessed: 08-18-2016

[11]http://www.commentarymagazine.com/article/how-divided-are-we/. Last accessed: 08-18-2016

[12]http://losangeles.cbslocal.com/2011/04/10/jerry-brown-gop-stalling-budget-reform/. Last accessed: 08-18-2016

While much can be accounted for in an analysis of the Congressional Record it nonetheless highlights two problems with relying solely on such a data source. The first is that definitionally an examination of stricken words reveals that the Congressional Record is not a literal transcription of every utterance of members on the House and Senate floors. In fact the striking of words and the even more undesirable rescinding of the privilege to speak that can result from such offending words can bias the data in two ways. On one hand the stricken words are missing data. The subsequent possible punishment for violating decorum in Congress can itself serve as a bias in what words the legislators choose to speak. As Rep. Barney Frank (D-MA) stated in a section of the Record entitled "Do-Nothing Congress":

> "But I want to come to their [The Republicans'] defense to some extent, Mr. Whip, because there may be some implication that they're not willing to work hard. No, let's be very clear. The reason we have such a dismal record here is not because they are lazy, our Republican colleagues. It's more because of a word that rhymes with 'lazy,' which the House rules will prohibit me from using."
> - Congressional Record [21 Sept. 2012] H6263.

Depending solely on the printed word in the Record to pick up on Congressional polarization, either in the use of aggressive and attacking language or incivility, is not a wholly futile venture. It nonetheless has its innate limitations. As much as Barney Frank wants to call the Republicans "crazy", the best he can muster without his words disappearing or him losing the privilege to speak for the rest of the day is to say that the opposite party is "a word that rhymes with 'lazy'."

To put it more succinctly, one cannot act like Donald Trump on the House or Senate floors. There are basic rules of decorum. You cannot call other legislators stupid. You cannot speak ill of fellow legislators' mothers. There are even peculiar rules specific to each chamber that prevent a full range of legislator expression. Per former House rules, members have been prohibited from mentioning Senators on their chamber floor.

> "Except as provided in subdivision (B), debate may not include characterizations

of Senate action or inaction, references to individual Members of the Senate, or quotations from Senate proceedings."

[107th Congress House Rule XVII; Decorum and Debate][13]

There was a point of order raised in the House during the 2004 election year where members were eventually allowed to reference Sen. John Kerry (D-MA) so long as the member was referring to Kerry as presidential candidate, and not explicitly to Kerry as representative from the Commonwealth of Massachusetts.[14] Other limits of expression found include that a legislator "may not smoke or use a mobile electronic device that impairs decorum" and "may not wear a hat".[15] After the death of Trayvon Martin, Rep. Bobby Rush (D-IL) made headlines by approaching the microphone on the House floor with a sweatshirt underneath his blazer, only to pull its hood over his head to emphasize that "Just because someone wears a hoodie does not make them a hoodlum." After the Speaker Pro Tempore figured out that Rush had violated decorum, he was quickly gaveled out and escorted from the chamber by the Sergeant at Arms—temporarily losing speaking privileges in the process.

The striking of words from the Congressional Record, that can accompany a loss of floor privileges, are not necessarily always a matter of explicit violations of decorum. They can be the result of an awkward utterance that a legislator may want to obscure. An example of this could be found during the 2003 debate surrounding the *Protection of Lawful Commerce in Arms Act*. This bill made bringing civil suits against gun manufacturers and sellers more difficult. While discussing a potential amendment prohibiting gun sales to people in drug treatment Rep. Barbara Cubin (R-WY) stated:

"My sons are 25 and 30, they are blonde haired and blue eyed. One amendment today said we could not sell guns to anybody under drug treatment. So does

[13]https://www.gpo.gov/fdsys/pkg/HMAN-108/pdf/HMAN-108-pg718.pdf. Last accessed: 08-18-2016

[14]https://www.congress.gov/crec/2004/04/22/CREC-2004-04-22-pt1-PgH2300.pdf. Last accessed: 08-18-2016

[15]http://clerk.house.gov/legislative/house-rules.pdf. Last accessed: 08-18-2016

that mean that if you go into a black community, you cannot sell a gun to any black person or does that mean because my ..."

- Congressional Record [9 Apr. 2003] H2989.[16]

She was immediately cut off mid-sentence by Rep. Mel Watt (D-NC) who demanded her words be taken down. Despite repeated suggestions that she withdraw them to prevent her sentiments from being preserved for posterity, Cubin did not relent. Eventually this incomplete statement, repeated multiple times by the presiding officer and Clerk in the next few pages, was printed in the Record after a party-line vote deemed them neither unparliamentary nor in violation of the rules of decorum.

A major difficulty in approaching this subject is that there is little readily apparent direct literature addressing strategies of speaking in legislative bodies as such. I have attempted to get at this basic matter in chapter 2, however there is more detail to account for when thinking about polarization. This is not to say that there is no literature that involves using the legislative proceedings as data. Maltzman and Sigelman (1996) as well as Morris (2001) look at the politics of talk by analyzing 1-minute, 5-minute, and Special Order speeches in the House. People who speak in Congress are generally in leadership positions either in their party or on a committee relevant to legislation on the floor. Otherwise they tend to be First-Dimension NOMINATE score outliers. Furthermore they tend to be minority party outliers. This makes sense especially considering they are examining a House where there can be a party filter of the Rules Committee and a germaneness rule interfering with speaking in the context of debate. This narrow analysis in a post-C-SPAN era suggests that speaking tends not to be motivated by re-election concerns but policy formation. Furthermore these ideological outliers tended to speak in a divisive, partisan, and polarizing manner.

An Annenberg study on civility in Congress from 1935-2011 suggests that such inflammatory speech is not in fact the norm (Jamieson 2011). Operationalizing incivility in the frequency of words taken down or withdrawn from the Congressional Record, the study finds

[16]https://www.congress.gov/crec/2003/04/09/CREC-2003-04-09-pt1-PgH2968-2.pdf. Last accessed: 08-18-2016

that generally there is civility in discourse. What spikes there were in incivility were tied to turnover after an extended period of control by one party, and tended to be isolated to the House. The most common types of incivility across all time frames were found in accusations of lying and abusing basic prejudices to acquire votes. Blatant impugning of a legislator's intelligence has fallen off since the early 1940s.

Measures of incivility and polarization in Congress can sometimes rely on secondhand reports of proceedings in the House and Senate. In Schraufnagel's review of partisanship, incivility, and a general lack of comity in Congress he develops newspaper and CQ Almanac indices to account for changes in conflict from in the 1977-2000 period (2005). While there is a divergence in the CQ and newspaper scores prior to the late 1980s, with CQ reporting lower levels of incivility, he finds a convergent increase in the apparent incivility based on his two indices thereafter. As Schraufnagel mentions, using newspapers as a source can involve its own limitations. Though for him this is a concern about a constant onslaught of actual incivility in Congress leading to burnout by the media and a reduced likelihood of covering it. His own data collection suggests that such a growing insensitivity to incivility is not the case. In fact the media reports more and more on conflicts. While it is not impossible that incivility and expressive polarization in Congress is on the rise, relying on secondhand reports of conflict and aggression in Congress can present us with another bias. Legislators may be less likely to express their most uncivil of sentiments on their chamber floor for fear of having them stricken, having to withdraw them, and possibly being censored for the remainder of the legislative day. A counter-bias may be present in news reporting. Conflict can lead to higher ratings. With the rise of the explicitly partisan new era in the United States this should amplify such a pro-conflict biasing in a feedback loop.

This possible overstatement of conflict may be the observationally equivalent outcome of either high liberal or conservative partisan biasing in the media. This should especially be the case in media outlets like Fox News and a post-2005 MSNBC. These outlets benefit economically from conflict, so in attempting to either foment or sustain outrage they can overstate incivility in Congress. Either parallel to partisan news sources or in response to these outlets' accusations of bias to the left or right in their reporting, less explicitly

partisan news sources can also contribute to the overstatement of conflict. In a less nefarious way the mainstream—center-right/center-left—media can engage in what Sellers refers to as "balancing" in their reporting of politics (2010). Here the media attempts to find counter-arguments within Congress, which may not in fact be representative of the proportion of statements actually emanating from The Hill. So, for example, no matter how few Democrats speak on Partial-Birth Abortion the media will attempt to display something approximating a 1-to-1 ratio of statements for and against the policy. In doing so they may pick up on more ideologically extreme Democratic outliers who are more than willing to speak in an aggressive and angered manner. Sellers argues that this balancing seems to occur the farther along in the legislative process a bill progresses. There is more of this forced balancing once a bill crosses chambers than there is if it is being discussed in an originating House or Senate subcommittee. Regardless of the way the reporting of conflict may be biased in the media it can feed back onto itself. As Forgette and Morris suggests, such emphasis on conflict-laden reporting can reduce trust in the political system and reduce and evaluations of Congress generally (2006). Whether, of course, this translates into a person's estimation of her own legislator is another question (Hibbing and Theiss-Morse 1995).

When the average person thinks of polarization and conflict in Congress it is unlikely multi-dimensional voting spaces and -1 to 1 ideological scoring distances come to mind. They are more likely to bring to their consciousness images of partisans yelling at each other and framing those across the aisle as somehow either fundamentally evil or stupid; sometimes even both. Such expressions in debate on the House and Senate floors may be naturally biased to understate aggressive tones and the media may have a natural bias to overstate conflict.

4.4 Productivity and Speaker Styles

In this section I will attempt to test prosodic effects on policy formation effectiveness. Most research on congressional productivity addresses congress as a whole. An important focus in this literature is the role of divided government. Mayhew (1991) contends that differences

in party control between the president and Congress have little effect on the the amount of "important" legislation that is passed. Howell et al. (2000) have concerns about Mayhew's methods, particular in his aggregation of legislation, and the retrospective as opposed to contemporaneous evaluations of their "importance". Breaking laws passed out into finer-grained subgroups and taking into account the views on laws at the actual time of their passage, they find evidence that differences in party controls do matter. While passage of trivial laws are increased in divided government, landmark legislation production is suppressed by some 30% (p. 302).

A literally perennial concern in productivity surrounds the budgeting process. A tool that Congress can use to get around gridlock and polarization effects halting the functioning of the government is the omnibus appropriations bill. Where legislators can use packaging to hide costly policies from their constituencies, they can also package multiple disparate appropriations bills together in order to build coalitions across the aisle to makes sure their roads, military bases, and other government-funded projects do not run out of money.

As a natural outgrowth of Mayhew (1974), Kiewiet and McCubbins (1985a; 1985b; 1988) produced models on the electoral connection to appropriations funding levels and priorities. They find that election years translated to greater overall appropriations levels and that a higher Democratic proportion of seats in Congress translated to higher appropriations. Kiewiet and McCubbins (1985b) also analyze the role the president can play in shaping the outcome of the appropriations process. Anticipating the president and Congress to be largely mutually accommodating they test whether this accommodation translates to larger budget requests by the president during election years, especially during presidential election years. They find that this is not the case, though Democratic presidents tend to have five-percent higher average budget requests than their Republican counterparts. Moving to the veto-threat game (1988) Kiewiet and McCubbins test for variations in presidential decisions to offer a veto when there is a discrepancy between his budget request and the amount in an appropriations bill moving its way through Congress. They find that there is an asymmetry in the issuance of vetoes depending on the sign of this discrepancy. Presidents are much more likely to issue vetoes on proposed legislative packages that are over their suggested

funding target than those where they actually want Congress to increase funding. Kiewiet and McCubbins argue that this asymmetry is the result of basic constitutional limits on the president's veto power and point out that Republican presidents tended to be in more advantageous settings for using their veto (1988, 729).

Some basic yet potentially powerful variables for analyzing omnibus appropriations at the aggregate and individual level can be gleaned from the legislative omnibus literature. Krutz's (2000) analysis of legislative omnibus bills stems from an apparent discrepancy between Mayhew's (1991) findings that there are roughly as many significant bills passed during divided and non-divided government and other research (Edwards, Barrett, and Peake, 1997) that suggests that there are more significant bill failures during divided government. He finds that this is addressed through omnibus utilization. If there is increased gridlock, measured through the presence or absence of divided government, then omnibus packaging can increase the productivity of legislating to the point that there is little distinction in the amount of important legislation passed between periods of unified and divided government.

But what of the actual bills attached to the legislative omnibus? Krutz (2001) follows through with his analysis, testing partisanship dynamics, Congress-president interactions, as well as general issues of policy complexity, to account for omnibus attachment. He finds that presidential opposition to a bill, divided government, and the issue complexity of a bill encourage omnibus inclusion. Of interest is his measure of complexity. Rather than using word or character counts, or enumerating the number of sections in the bill, Krutz uses an issue fractionation measure. This reflects jurisdictional ambiguities where committees can overlap in addressing a policy area. In the course of Kurtz's analysis I was struck by an inversion of the basic questions that are driving this paper. Rather than asking, "Why are there omnibus appropriations?" and "Are some appropriations bills more likely to be included in an omnibus than others?" at some level the questions could just as easily be "Why are there not always omnibus appropriations bills?" and "Why are not all appropriations bills included in this omnibus package?" While not directly asking or answering this question, Kurtz adds a variable to his model to account for the "prominence" of a bill. Though not necessarily substantively significant, he does find that the prominence of the bill statistically

significantly correlates inversely with the inclusion of the bill in an omnibus. In more recent years, this de facto use of legislative packaging as a means to productivity has been manifest in the reliance on appropriations by continuing resolution.[17]

4.4.1 Individual Legislator Productivity

Getting at individual legislators' productivities has been examined in less detail. A large reason is that many of the metrics that can be more readily derived have some major limitations. There are nonetheless simple measures that can be developed to get at whether a particular member is more "productive" than another one, if in a glancing and indirect way. In Fowler's review of sponsorship and cosponsorship patterns he develops a measure of "connectedness" (2006, p. 461). Using a weighted estimate of centrality he finds that cosponsorship-to-sponsorship levels are a good proxy for estimating legislator influence in getting bills and amendments through. Looking at these co/sponsor patterns from the 93rd to 108th Congresses Fowler finds that there is greater interconnectedness for members of the Senate. There also seems to be a relationship between more connected members of the House eventually becoming members of the upper chamber. Focusing on bills instead of amendments is something of an issue when contrasting the two chambers.

Aside from cosponsorship there is another "Moneyball" method of measuring individual success. Jackman et al. also make use of sponsorship data as a metaphor for number of times "at bat" that a legislator makes. One impulse that a researcher might indulge would be to determine the number of bills sponsored that become law. The problem with swinging for the fences is two-fold. In one sense this is too high of a threshold. An incredibly small number of bills get passed and become law. During the first session of the 113th Congress

[17]Continuing Resolutions have historically been used to maintain status quo funding levels for government agencies if one or more of the Appropriations Subcommittees had not passed their bill before the end of the federal fiscal year—September 30th. Largely claimed to be the result of increased party polarization, Congress has instead used these resolutions to circumvent inefficiencies in the budgeting process as outlined in the Congressional Budget and Impoundment Control Act of 1974. An influx of Tea Party members, notoriously inflexible in their desire to reduce the size of government, have played no small part in budgeting-by-Continuing Resolution since the 2010 midterm election.

less than 1% of bills became public law.[18] There is some need to distinguish between what can become a law and what cannot. Of the 8 types legislative items that can be introduced by a Representative or Senator (H.R., H. Res., H. Con. Res., H. J. Res., S., S. Res., S. Con. Res., S. J. Res.) only 4 of them can be properly be understood as something that can be enacted—or presented to the president to be signed into law (H.R., H. J. Res., S., S. J. Res.).[19] These 4 types of legislation can be "passed" where the other 4 can only really be "agreed to".[20] The other concern in focusing on bill passage is that the farther along in the legislative process a bill proceeds the less plausible it is that an individual can claim credit for its success. As a more tempered means of measuring success—how many "hits" a legislator gets from each "at bat"—Jackson et al. focus on percentage of sponsored bills that get out of committee.

A more nuanced metric of productivity exists in the ***Legislative Effectiveness Scores*** created by Volden and Wiseman (2014). For each Congress they calculated the relative productivity of House members taking into account 15 factors. These include whether members are getting more "commemorative", "substantive", and "substantive and significant" bills through. Using the moneyball metric we can overestimate legislators who are getting more trivial pieces of legislation through. It can put hard-fought regulatory reform on the same level as a non-controversial naming of a post office. They also take into account practical other factors such as chair and sub-chair positions, being a member of one of the power committees—Ways and Means, Appropriations, or Rule—or on the Budget committee. They then calculate each member's productivity relative to a baseline standard score of 1. Thus if one legislator has a Legislative Effectiveness Score (LES) of 10 and another has an LES of

[18]http://www.politico.com/magazine/story/2014/01/effective-senators-congressional-moneyball-102146. Last accessed: 08-18-2016

[19]H. J. Res. and S. J. Res. are used primarily for proposing constitutional amendments and for the continuing resolutions extending appropriations. The overwhelming majority of actual lawmaking flows through H.R. and S. proposals.

[20]That is not to say that the concurrent and simple resolutions have no legal power. They can have indirect legal repercussions in that they can have the power of law *within* Congress. They can be used to set committee rosters, and are meant to be used to outline the budget parameters for the appropriations committees.

2 then the former is 5 times more productive than the latter.[21]

4.4.2 Aggression and Productivity

For my two measures of productivity I rely on two of these methods. Pulling bill sponsorship details from THOMAS, I constructed cosponsor-to-sponsor ratios for the legislators. While it is instructive to get at each lawmaker's version of being aggressive in pace and pitch, individual legislators may not be aware of each other's prones to speak faster or squeak at a higher pitch. Considering the number of voters who could even name their own legislators' names, there may be some value in tempering our expectations. For a sense of trends in bill sponsorship productivity over time in both chambers, I re-use the key votes speech data.[22] In the model I removed the CQ key vote subject controls and add ones for whether the legislator was the chair or ranking member of a committee. This is drawn from the Stewart et al. data set (2017) on historical committee rankings.

In Table 4.11 we see the models where productivity is measured as the number of bill co-sponsorships a person got relative to their own bill sponsorships. House members gain more cosponsors. We also see that ideologically extreme Republicans are more productive, though more liberal legislators are also more successful. Faster speakers are less productive while legislators what spoke with greater pitch variation were more successful at gaining bill co-sponsors. To create a legislative productivity measure that translates Volden and Wiseman's metrics from the 109th through the 112th Congresses, I had to change their LES values into rank orders. Per their own assertion, a baseline value of 1 in the 109th Congress does not directly translate to a 1 value in subsequent Congresses. From their own recommendations it is still possible to compare ordinal ranks across the periods. I ranked each legislator's LES score by each time frame. From highest value of 1 to the lowest value based on redundancy of slots filled due to multiple legislators having the same rank. The lowest rank thus varied

[21] http://www.thelawmakers.org. Last accessed: 03-19-2017

[22] I ignore the suspension debate in my tests.

from Congress to Congress.[23] I used each legislator's rank by these 4 periods for my response variable in Table 4.12. As the ranks were coded in descending order, where the highest LES had a rank of 1, I then flipped the valence on the coefficients before reporting them. We can see that there is no relationship between productivity and median pitch. However legislators who have higher pitch variation have lower legislative productivity. Increased speaker pace across these models was associated with more productivity.

4.4.3 Advocacy and Attack

In this section I create a simple typology to account for legislative speaking styles and their potential effects on a speaker's legislative success. To do this I must return to the more narrow House video library. With the speaker sentiment probabilities discussed in chapter 3, I can create an intersection of the lexical and the aural. Knowing a speaker is emotionally activated—as demonstrated by an uptick in his prosodic indicators—is of limited value in and of itself. At the same time a legislator speaking with an elevated positive or negative sentiment needs to be placed in context.

To help understand this, in Figure 4.4 we see a visual representation of the ***Circumplex Model of Affect***.[24] On the horizontal axis we see the a scaling of sentiment. This represents the lexical component of a person's speech. The vertical axis represents the aural component of a speech. In my project we make a simple substitution of "displeasure" and "pleasure" with "negative" and "positive" in considering this figure. A speech that is negative but lacking passion can be perceived by a listener as anything from bored to depressed. A low energy positive speech can indicate contentment. By the very nature of a legislator's function, there is little benefit in appearing content regardless of party or minority status. There could be some sense that a legislator is sent to Washington, D.C. to maintain the status quo; and thus project a sense that things are fine and should stay as they are. However, in the course of debate such a legislator is unlikely to let things abide amongst the cacophony of a

[23]Lowest ranks by Congress: 109th: 338, 110th: 371, 111th: 337, 112th: 327

[24]This image is taken from the Tseng et al. (2014)

chamber floor. To prevent their position from being ignored, they should be more likely to engage in vocally activated positive speech. As with the requirements of decorum clipping the lower range of potential negative sentiment, the role of a legislator as a representative of constituent concerns should raise the general floor on vocal activation.

Dietrich (2014) made use of a valence and arousal typology in testing the role of a speaker's innate pitch on legislative outcomes. Where he focused on pitch as such, I further look at speaker pace and pitch variation. I also expand on his analysis of negativity to include the effects of positivity on legislative productivity. To this end I took the prosodic indicators from the House speeches from 2009 to 2012 and intersected them with the net positive sentiment of a speech. Using the medians and standard deviations of each House member's pace and pitch baselines drawn from the C-SPAN sample, I then coded each legislator's speech as emotionally activated if it fell more than one standard deviation above the median cue of interest. To clarify, if a member's median pitch in a House speech was greater than the median of that legislator's baseline pitch plus the standard deviation of their medians, then I coded that speech as vocally activated.

This coding method was mimicked with the text sentiments. Here I took the median net positive sentiment in the House over the 111th and 112th Congresses as my baseline. If a speech's net sentiment rose at least one standard deviation above this point then it was marked as positive. If it fell more than one deviation below the median it was marked negative.To get a sense of the overall sentiment of the House, the median net value tilted slightly positive at a value of 0.117. This would translate to a 56% positive versus 44% negative median speech.

With sentiment and activation determined I coded a speech as ***Actively Positive*** if it was activated and positive. Speeches that were activated and negative were coded as ***Actively Negative***. There is some sense in the NOMINATE polarization literature that an asymmetry exists between the two parties. In particular the Republicans seem to be becoming more consistently conservative faster than Democrats are becoming liberal. I performed a cursory analysis of a divergence between the parties in their probability of speaking actively negatively or positively. Regressing party label on each of my pitch and

pace actively negative and actively positive speech counts, the closest thing I found to true divergence was in the articulation dimension. Republicans ($p < 0.023$) gave more actively negative articulation rate speeches, while Democrats ($p < 0.00236$) gave more actively positive articulation speech. So there is some glancing evidence that when Republicans speak quickly they are being more aggressively negative. When Democrats are in a rush for words they use their time to speak in a more aggressively positive manner.

In Tables 4.13 and 4.14 I modeled a legislator's actively negative and positive speech counts for the 111th and 112th Congresses against their productivity rank. In these models the pace effects disappear. Pitch variation likewise loses significance. Nonetheless there are still instructive observations that can be drawn from doing a deeper dive on the types of advocacy and attack speeches that a legislator can engage in. Using simple poisson regressions of some of the other explanatory variables on the negative pitch speech count, there were distinct asymmetries in this debate strategy. Higher counts of attack speeches were driven more by conservatives, the ideologically extreme, Republicans, and males. None of these factors had any discernible connection to speeches where the speaker made a clear effort to positively advocate for a position.

4.5 Discussion

In this chapter looked at the role of legislative controversy and how it may drive my prosodic measures of aggression. Using CQ Key Votes data for the House and Senate, and suspension debate for the House only, I found that—as expected—more controversial key votes encouraged more agression. More aggressive indicators in key votes debate was associated with the House and to some extent Republicans in the minority. Consistent with conditional party government theory, the greater the ideological difference between the majority and minority parties, the greater the vocal activation indicators were. When I looked only at non-controversial suspension debate in the House many of these signs inverted when reviewing speaker pace. Moving to my productivity measures, legislators who spoke faster were less able to draw cosponsors to their legislation, while the opposite was true for those who

had greater pitch variation. Translating the Volden and Wiseman scores into ranks, I tested for legislative productivity. Considering just the prosodic cues absent any lexical dimension, I found that faster speakers were more productive, while those with higher pitch variance were less productive. When I intersected the net positive sentiment scores for the House captioning data on the prosodic dimension I was able to code speeches as actively positive and actively negative. While I did not find any relationship between advocacy and attack speech styles and productivity ranks I am not completely discouraged by this. Considering the low number of cases (608) I had to work with in collapsing my data down on House speeches only occurring in the 111th and 112th Congresses, I suspect that the statistical and substantive significances of these speaking styles for productivity will be able to be drawn out with the aid of more cases.

4.6 Tables and Figures

Table 4.1: Top 10 Median Articulation Rate

Name	***Median***
Jerrold Nadler (D-NY)	4.88 (0.463)
Michael Simpson (R-ID)	4.79 (0.695)
Steve Scalise (R-LA)	4.75 (0.492)
Richard Neal (D-MA)	4.74 (0.502)
Luis Gutierrez (D-IL)	4.71 (0.730)
Gary Miller (R-CA)	4.70 (0.468)
Jesse Jackson (D-IL)	4.70 (0.485)
Marco Rubio (R-FL)	4.67 (0.532)
Stephanie Tubbs Jones (D-OH)	4.67 (0.475)
Andy Harris (R-MD)	4.66 (0.433)

Table 4.2: Top 10 Median Speech Rate

Name	***Median***
Gary Miller (R-CA)	4.30 (0.590)
Steve Scalise (R-LA)	4.30 (0.558)
Brian Baird (D-WA)	4.20 (0.586)
John Tierney (D-MA)	4.20 (0.442)
Mark Souder (R-IN)	4.20 (0.530)
Michael Turner (R-OH)	4.15 (0.399)
Bobby Jindal (R-LA)	4.10 (0.370)
Shelley Berkley (D-NV)	4.10 (0.520)

Continued on next page

Table 4.2 – continued from previous page

Name	*Median*
Timothy Walz (D-MN)	4.10 (0.579)
Candice Miller (R-MI)	4.05 (0.587)

Table 4.3: Top 10 Median Pitch—Women

Name	*Median*
Betty Sutton (D-OH)	231.90 (31.15)
Diana DeGette (D-CO)	228.83 (24.07)
Hilda Solis (D-CA)	227.02 (19.02)
Linda Sanchez (D-CA)	222.90 (30.61)
Laura Richardson (D-CA)	222.86 (25.85)
Tammy Baldwin (D-WI)	220.69 (21.59)
Corrine Brown (D-FL)	220.65 (32.03)
Stephanie Herseth Sandlin (D-SD)	219.28 (13.56)
Kathy Castor (D-FL)	218.92 (20.87)
Marsha Blackburn (R-TN)	217.95 (26.18)

Table 4.4: Top 10 Median Pitch—Men

Name	*Median*
Roland Burris (D-IL)	213.33 (19.75)
Sean Duffy (R-WI)	210.99 (21.41)
Patrick Kennedy (D-RI)	209.56 (37.35)

Continued on next page

Table 4.4 – continued from previous page

Name	***Median***
Jesse Jackson (D-IL)	203.96 (29.33)
Gregory Meeks (D-NY)	200.81 (28.78)
Barney Frank (D-MA)	192.44 (28.36)
Walter Herger (R-CA)	192.05 (24.38)
Larry Craig (R-ID)	191.98 (21.48)
Tom McClintock (R-CA)	190.97 (21.08)
Major Owens (D-NY)	190.46 (17.07)

Table 4.5: Top 10 Median Pitch Variation

Name	***Median***
Betty Sutton (D-OH)	44.82 (6.70)
Marsha Blackburn (R-TN)	44.23 (7.29)
Maxine Waters (D-CA)	43.26 (5.80)
Loretta Sanchez (D-CA)	43.21 (6.45)
Blanche Lincoln (D-AR)	42.68 (5.62)
Charles Rangel (D-NY)	42.41 (8.44)
Susan Davis (D-CA)	42.08 (7.19)
Tammy Baldwin (D-WI)	41.72 (7.53)
Jim McDermott (D-WA)	41.62 (7.40)
Cynthia McKinney (D-GA)	41.46 (6.06)

Table 4.6: Top 10 Median Loudness (DB)

Name	***Median***
Thomas Osborne (R-NE)	-34.51 (2.05)
James McCrery (R-LA)	-34.69 (1.59)
Robert Scott (D-VA)	-34.76 (2.32)
Barbara Mikulski (D-MD)	-34.89 (1.96)
Henry Cuellar (D-TX)	-34.94 (1.85)
Bill Cassidy (R-LA)	-34.95 (2.03)
Sean Duffy (R-WI)	-34.95 (1.71)
Joe Courtney (D-CT)	-35.02 (2.24)
Howard Berman (D-CA)	-35.03 (1.72)
Ben Nelson (D-NE)	-35.04 (1.54)

Table 4.7: Key Vote Pace Models

	Articulation	**Speech**
Chamber Variables		
House	0.084^{***}	0.249^{***}
	(0.018)	(0.021)
Republican Majority	-0.593^{**}	-0.093
	(0.281)	(0.320)
Majority-Minority Ideological Distance	13.001^{***}	2.846
	(1.838)	(2.090)

Continued on next page

Table 4.7 – continued from previous page

	Articulation	Speech
Majority Party Ideological Spread	15.129***	3.554
	(4.447)	(5.056)
Timing Variables		
Divided Government	−0.471***	−0.137*
	(0.073)	(0.083)
Presidential Year	0.273***	0.148***
	(0.040)	(0.046)
Midterm Year	0.272***	−0.023
	(0.043)	(0.049)
Year	−0.238***	−0.065
	(0.040)	(0.045)
Speaker-Specific Variables		
Republican	0.121***	0.223***
	(0.035)	(0.039)
Ideology	−0.168***	−0.186***
	(0.033)	(0.038)
Ideological Extremity	0.177***	0.190***
	(0.031)	(0.036)

Continued on next page

Table 4.7 – continued from previous page

	Articulation	Speech
Minority Party Member	-0.070^{***}	-0.113^{***}
	(0.018)	(0.021)
Male	0.092^{***}	-0.095^{***}
	(0.014)	(0.016)
Age	-0.005^{***}	-0.006^{***}
	(0.001)	(0.001)
Speech Length	-0.001	-0.018^{***}
	(0.001)	(0.001)
Congressional Experience	-0.006^{***}	-0.011^{***}
	(0.001)	(0.001)
CQ Bill Subject		
National Security	0.021	0.001
	(0.027)	(0.031)
Law and Justice	-0.034	-0.104^{***}
	(0.035)	(0.040)
Health	-0.075^{*}	0.001
	(0.039)	(0.045)

Continued on next page

Table 4.7 – continued from previous page

	Articulation	**Speech**
International	−0.011	0.064**
	(0.026)	(0.030)
Business and Banking	0.086	0.173**
	(0.067)	(0.076)
Budget	−0.109**	0.034
	(0.052)	(0.060)
Taxes	−0.057	−0.002
	(0.066)	(0.075)
Military	0.023	0.044
	(0.056)	(0.064)
Constant	467.152***	131.782
	(77.081)	(87.636)
Observations	6,188	6,188
R^2	0.137	0.235
Adjusted R^2	0.134	0.232
Residual Std. Error (df = 6163)	0.375	0.426
F Statistic (df = 24; 6163)	40.917***	79.023***
Note:	*p<0.1; **p<0.05; ***p<0.01	

Table 4.8: Key Vote Pitch Models

	Pitch Median	**Pitch SD**
Chamber Variables		
House	8.940***	3.314***
	(1.165)	(0.364)
Republican Majority	−28.798	−22.103***
	(17.857)	(5.577)
Majority-Minority Ideological Distance	248.691**	93.297**
	(116.675)	(36.443)
Majority Party Ideological Spread	458.215	362.455***
	(282.339)	(88.187)
Timing Variables		
Divided Government	0.077	4.277***
	(4.637)	(1.448)
Presidential Year	5.659**	1.683**
	(2.545)	(0.795)
Midterm Year	6.304**	2.412***
	(2.731)	(0.853)
Year	−5.262**	−2.137***

Continued on next page

Table 4.8 – continued from previous page

	Pitch Median	Pitch SD
	(2.509)	(0.784)
Speaker-Specific Variables		
Republican	1.785	0.017
	(2.201)	(0.687)
Ideology	-9.045^{***}	-1.742^{***}
	(2.116)	(0.661)
Ideological Extremity	23.126^{***}	8.483^{***}
	(1.985)	(0.620)
Minority Party Member	-9.651^{***}	-3.386^{***}
	(1.174)	(0.367)
Male	-47.654^{***}	-9.281^{***}
	(0.909)	(0.284)
Age	-0.291^{***}	-0.044^{***}
	(0.045)	(0.014)
Speech Length	0.405^{***}	0.172^{***}
	(0.078)	(0.024)
Congressional Experience	0.197^{**}	0.081^{***}
	(0.081)	(0.025)

Continued on next page

Table 4.8 – continued from previous page

	Pitch Median	Pitch SD
CQ Bill Subject		
National Security	1.583	0.893*
	(1.734)	(0.541)
Law and Justice	−2.379	−0.892
	(2.220)	(0.693)
Health	1.167	−0.352
	(2.491)	(0.778)
International	−3.497**	−1.059**
	(1.664)	(0.520)
Business and Banking	−12.620***	−1.776
	(4.232)	(1.322)
Budget	−3.443	−2.654**
	(3.328)	(1.039)
Taxes	10.075**	3.088**
	(4.182)	(1.306)
Military	−5.072	−2.253**
	(3.568)	(1.115)

Continued on next page

Table 4.8 – continued from previous page

	Pitch Median	**Pitch SD**
Constant	10,461.920**	4,189.390***
	(4,893.398)	(1,528.432)
Observations	6,188	6,188
R^2	0.408	0.252
Adjusted R^2	0.406	0.249
Residual Std. Error (df = 6163)	23.792	7.431
F Statistic (df = 24; 6163)	177.155***	86.360***
Note:	*p<0.1; **p<0.05; ***p<0.01	

Table 4.9: Suspension Pace Models

	Articulation	**Speech**
Chamber Variables		
Key Vote	0.079***	0.046***
	(0.008)	(0.010)
Republican Majority	0.640***	0.391***
	(0.069)	(0.080)
Majority-Minority Ideological Distance	5.508***	1.471***

Continued on next page

Table 4.9 – continued from previous page

	Articulation	Speech
	(0.373)	(0.432)
Majority Party Ideological Spread	-20.951^{***}	-10.334^{***}
	(2.005)	(2.325)
Timing Variables		
Presidential Year	-0.068^{***}	0.047^{***}
	(0.012)	(0.014)
Midterm Year	0.114^{***}	-0.022^{*}
	(0.011)	(0.013)
Speaker-Specific Variables		
Republican	0.061^{*}	0.007
	(0.033)	(0.038)
Ideology	-0.074^{**}	0.049
	(0.030)	(0.034)
Ideological Extremity	0.090^{***}	0.104^{***}
	(0.029)	(0.034)
Minority Party Member	-0.051^{***}	-0.075^{***}
	(0.019)	(0.022)
Male	−0.009	-0.177^{***}

Continued on next page

Table 4.9 – continued from previous page

	Articulation	**Speech**
	(0.011)	(0.013)
Age	-0.007^{***}	-0.009^{***}
	(0.001)	(0.001)
Speech Length	0.004^{**}	-0.035^{***}
	(0.002)	(0.002)
Congressional Experience	-0.004^{***}	-0.004^{***}
	(0.001)	(0.001)
Constant	2.318^{***}	4.430^{***}
	(0.135)	(0.157)
Observations	7,070	7,070
R^2	0.099	0.139
Adjusted R^2	0.097	0.137
Residual Std. Error (df = 7055)	0.331	0.384
F Statistic (df = 14; 7055)	55.092^{***}	81.236^{***}
Note:	*p<0.1; **p<0.05; ***p<0.01	

Table 4.10: Suspension Pitch Models

	Pitch Median	**Pitch SD**
Chamber Variables		
Key Vote	13.931^{***}	5.088^{***}
	(0.617)	(0.187)
Republican Majority	-20.260^{**}	-10.016^{***}
	(9.113)	(2.761)
Majority Party Ideological Spread	454.351^{**}	243.890^{***}
	(227.392)	(68.897)
Timing Variables		
Presidential Year	-1.146	-1.612^{***}
	(1.304)	(0.395)
Midterm Year	1.023	0.182
	(0.712)	(0.216)
Year	-0.887	-0.017
	(0.686)	(0.208)
Speaker-Specific Variables		
Republican	0.439	1.521^{**}
	(2.452)	(0.743)

Continued on next page

Table 4.10 – continued from previous page

	Pitch Median	**Pitch SD**
Ideology	-3.848^{*}	-2.666^{***}
	(2.203)	(0.667)
Ideological Extremity	18.092^{***}	9.695^{***}
	(2.173)	(0.659)
Minority Party Member	-7.709^{***}	-4.879^{***}
	(1.390)	(0.421)
Male	-49.889^{***}	-9.758^{***}
	(0.804)	(0.244)
Age	-0.480^{***}	-0.075^{***}
	(0.041)	(0.012)
Speech Length	0.933^{***}	0.133^{***}
	(0.149)	(0.045)
Congressional Experience	0.531^{***}	0.101^{***}
	(0.075)	(0.023)
Constant	1,923.363	37.858
	(1,345.420)	(407.644)
Observations	7,073	7,073

Continued on next page

Table 4.10 – continued from previous page

	Pitch Median	**Pitch SD**
R^2	0.418	0.328
Adjusted R^2	0.417	0.327
Residual Std. Error (df = 7058)	24.677	7.477
F Statistic (df = 14; 7058)	362.100^{***}	246.544^{***}
Note:		*p<0.1; **p<0.05; ***p<0.01

Table 4.11: Bill Co-Sponsor Productivity

	Articulation	**Speech**
Chamber Variables		
House	6.520^{***}	6.663^{***}
	(0.369)	(0.372)
Republican Majority	−6.089	−5.814
	(5.066)	(5.063)
Majority-Minority Ideological Distance	−47.889	−55.402
	(34.194)	(34.031)
Majority Party Ideological Spread	72.958	65.726
	(79.544)	(79.447)
Timing Variables		
Divided Government	3.838^{***}	4.133^{***}
	(1.364)	(1.357)

Continued on next page

Table 4.11 – continued from previous page

	Articulation	Speech
Presidential Year	−0.375	−0.455
	(0.734)	(0.731)
Midterm Year	−1.167	−1.384*
	(0.785)	(0.782)
Year	0.367	0.488
	(0.720)	(0.718)
Speaker-Specific Variables		
Republican	1.626**	1.715**
	(0.683)	(0.684)
Ideology	−2.011***	−2.042***
	(0.658)	(0.658)
Ideological Extremity	3.711***	3.760***
	(0.624)	(0.624)
Minority Party Member	−0.004	−0.056
	(0.364)	(0.365)
Male	0.339	0.125
	(0.345)	(0.340)

Continued on next page

Table 4.11 – continued from previous page

	Articulation	**Speech**
Age	0.047***	0.046***
	(0.014)	(0.014)
Speech Length	−0.027	−0.040
	(0.024)	(0.025)
Congressional Experience	−0.118***	−0.121***
	(0.028)	(0.028)
Committee Leader	−0.966***	−1.003***
	(0.239)	(0.239)
Articulation Rate	−0.810***	
	(0.256)	
Speech Rate		−0.836***
		(0.221)
Pitch	−0.002	−0.003
	(0.005)	(0.005)
Pitch SD	0.057***	0.055***
	(0.016)	(0.016)
Constant	−702.645	−937.214
	(1,404.631)	(1,399.805)

Continued on next page

Table 4.11 – continued from previous page

	Articulation	**Speech**
Observations	6,167	6,167
R^2	0.183	0.184
Adjusted R^2	0.180	0.181
Residual Std. Error (df = 6146)	7.356	7.354
F Statistic (df = 20; 6146)	68.854^{***}	69.115^{***}
Note:		*p<0.1; **p<0.05; ***p<0.01

Table 4.12: Pitch Productivity

	Pitch	**Pitch Variation**
Male	−2.037	−8.474
	(7.902)	(6.873)
Majority	58.289^{***}	62.140^{***}
	(10.675)	(10.705)
Republican	41.004^{***}	39.452^{***}
	(13.934)	(13.926)
Ideology	-41.193^{***}	-40.564^{***}
	(13.571)	(13.548)

Continued on next page

Table 4.12 – continued from previous page

	Pitch	**Pitch Variation**
Ideological Extremity	−15.959	−8.663
	(15.570)	(15.696)
Congressional Experience	2.460***	2.475***
	(0.573)	(0.572)
Majority Leader	50.743***	50.525***
	(13.365)	(13.342)
Minority Leader	−27.012*	−26.880*
	(14.343)	(14.319)
Committee Chair	116.318***	115.675***
	(10.857)	(10.837)
Committee Subchair	45.774***	45.260***
	(6.235)	(6.225)
Power Committee Member	−23.706***	−22.806***
	(5.131)	(5.136)
Budget Committee Member	−13.712*	−14.004*
	(7.748)	(7.733)

Continued on next page

Table 4.12 – continued from previous page

	Pitch	**Pitch Variation**
Articulation Rate	13.363*	15.451**
	(7.064)	(6.971)
Median Pitch	−0.039	
	(0.100)	
Median Pitch SD		−0.919**
		(0.379)
Constant	−312.186***	−300.096***
	(35.062)	(33.858)
Observations	1,713	1,713
R^2	0.330	0.333
Adjusted R^2	0.325	0.327
Residual Std. Error (df = 1698)	86.919	86.773
F Statistic (df = 14; 1698)	59.844***	60.453***
Note:	*p<0.1; **p<0.05; ***p<0.01	

Table 4.13: Pitch-Sentiment Productivity

	Articulation	**Speech**
Male	−3.642	−3.907

Continued on next page

Table 4.13 – continued from previous page

	Articulation	**Speech**
	(9.383)	(9.374)
Majority	51.803***	51.225***
	(19.009)	(18.999)
Republican	6.209	6.800
	(25.811)	(25.939)
Ideology	−13.980	−14.438
	(24.062)	(24.147)
Ideological Extremity	−20.107	−20.509
	(26.313)	(26.301)
Congressional Experience	1.206	1.238
	(0.907)	(0.906)
Majority Leader	48.439**	48.537**
	(23.201)	(23.213)
Minority Leader	−35.034*	−35.755*
	(20.294)	(20.251)
Committee Chair	122.979***	123.575***
	(18.510)	(18.523)

Continued on next page

Table 4.13 – continued from previous page

	Articulation	Speech
Committee Subchair	36.146***	36.257***
	(10.406)	(10.418)
Power Committee Member	−6.263	−6.027
	(8.920)	(8.923)
Budget Committee Member	−10.841	−11.352
	(14.213)	(14.197)
Positive Articulation Rate Speech Count	3.143	
	(8.599)	
Negative Articulation Rate Speech Count	−1.473	
	(8.120)	
Positive Speech Rate Speech Count		4.003
		(13.843)
Negative Speech Rate Speech Count		−4.241
		(6.377)
Positive Pitch Speech Count	5.909	6.010
	(7.315)	(7.287)

Continued on next page

Table 4.13 – continued from previous page

	Articulation	**Speech**
Negative Pitch Speech Count	5.804	6.616
	(5.519)	(5.240)
Constant	-232.022^{***}	-231.496^{***}
	(27.553)	(27.468)
Observations	608	608
R^2	0.297	0.298
Adjusted R^2	0.278	0.279
Residual Std. Error (df = 591)	86.728	86.705
F Statistic (df = 16; 591)	15.621^{***}	15.648^{***}
Note:	*p<0.1; **p<0.05; ***p<0.01	

Table 4.14: Pitch Variation-Sentiment Productivity

	Articulation	**Speech**
Male	−2.798	−3.097
	(9.445)	(9.447)
Majority	55.002^{***}	54.569^{***}
	(19.093)	(19.097)
Republican	6.602	6.715

Continued on next page

Table 4.14 – continued from previous page

	Articulation	**Speech**
	(25.805)	(25.934)
Ideology	−14.324	−14.160
	(24.088)	(24.160)
Ideological Extremity	−15.441	−16.011
	(26.591)	(26.599)
Congressional Experience	1.217	1.251
	(0.906)	(0.906)
Majority Leader	46.006**	45.822**
	(23.209)	(23.219)
Minority Leader	−33.915*	−34.265*
	(20.297)	(20.256)
Committee Chair	121.428***	121.713***
	(18.492)	(18.499)
Committee Subchair	35.781***	35.857***
	(10.392)	(10.406)
Power Committee Member	−6.978	−6.901
	(8.895)	(8.896)

Continued on next page

Table 4.14 – continued from previous page

	Articulation	**Speech**
Budget Committee Member	−10.696	−11.077
	(14.205)	(14.194)
Positive Articulation Rate Speech Count	1.837	
	(8.655)	
Negative Articulation Rate Speech Count	0.691	
	(7.883)	
Positive Speech Rate Speech Count		2.161
		(13.862)
Negative Speech Rate Speech Count		−2.919
		(6.378)
Positive Pitch SD Speech Count	6.091	5.936
	(4.566)	(4.526)
Negative Pitch SD Speech Count	1.719	2.595
	(4.298)	(4.201)
Constant	−236.953***	−236.158***
	(27.928)	(27.886)

Continued on next page

Table 4.14 – continued from previous page

	Articulation	**Speech**
Observations	608	608
R^2	0.298	0.298
Adjusted R^2	0.279	0.279
Residual Std. Error (df = 591)	86.668	86.656
F Statistic (df = 16; 591)	15.693***	15.708***
Note:	*p<0.1; **p<0.05; ***p<0.01	

Figure 4.1: Rep. Tom Osborne (R-NE) Microphone Placement

Figure 4.2: Sen. Barbara Mikulski (D-MD) Microphone Placement

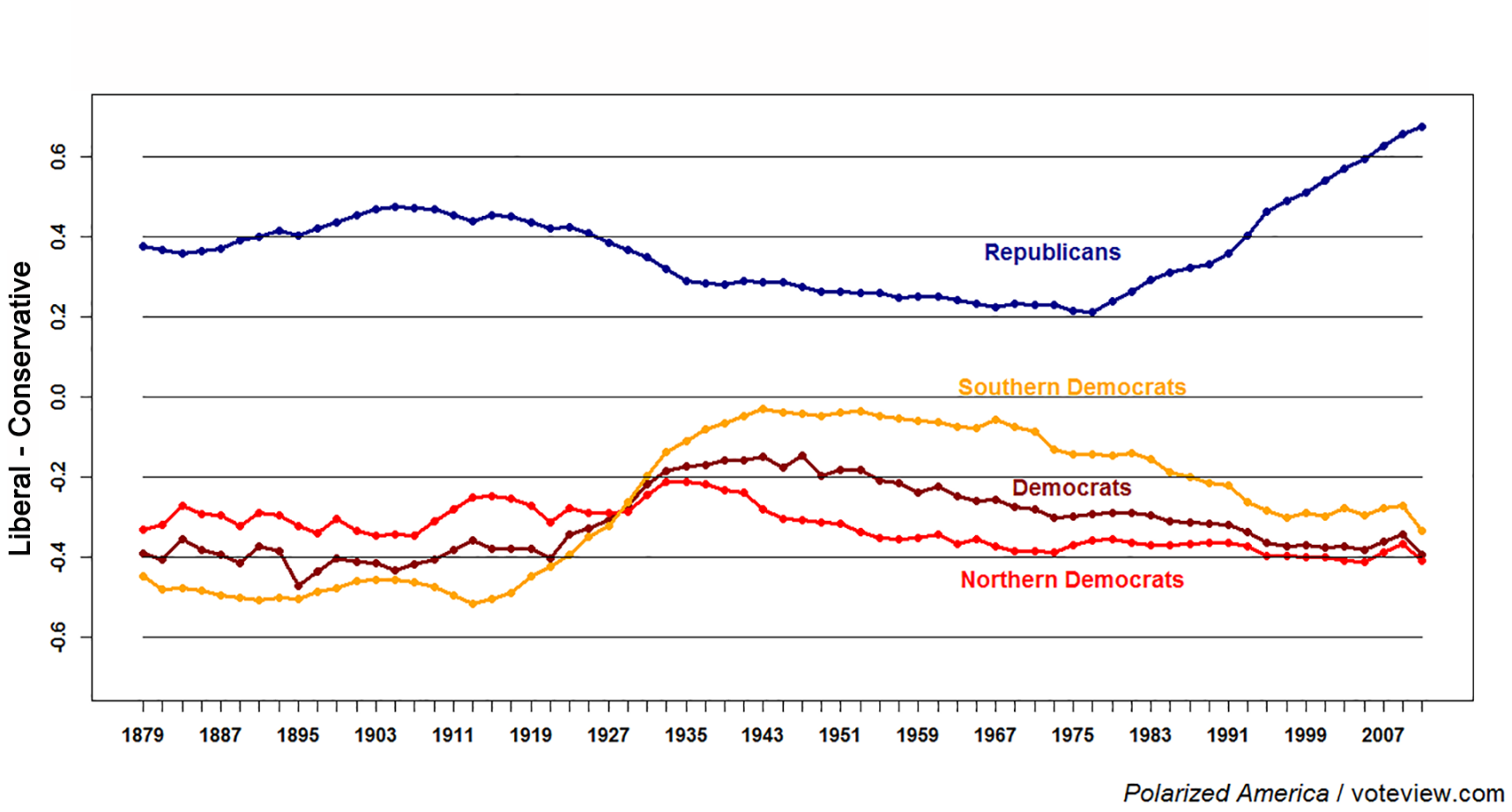

Figure 4.3: Party Means on NOMINATE Liberal-Conservative Dimension in the House (1879-2012)

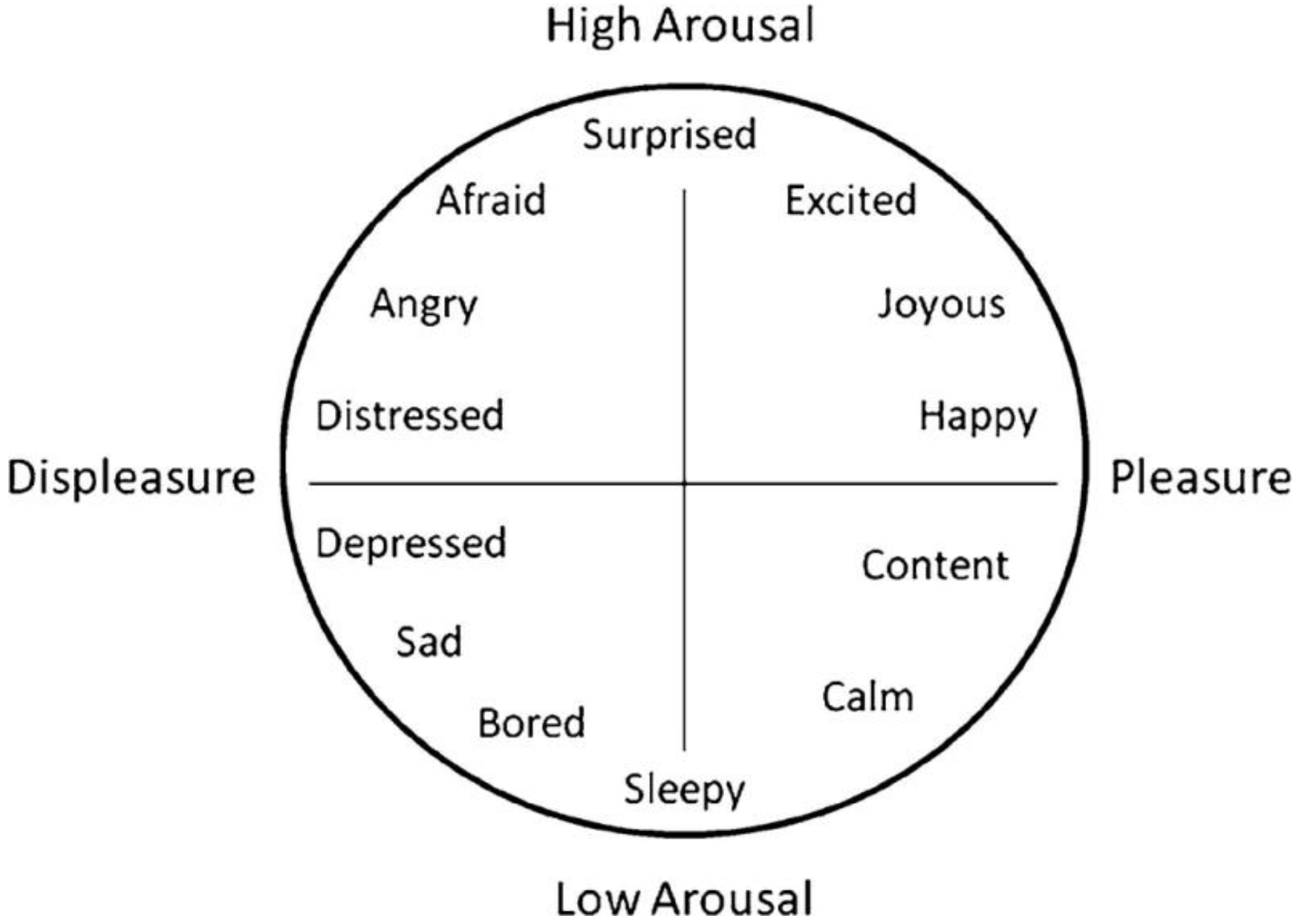

Figure 4.4: Circumplex Model of Affect. Sentiment on Horizontal Axis and Activation on Vertical Axis.

CHAPTER 5

Gender Effects

While there are biological differences between the sexes when it comes to their standard speaking proclivities, especially in pitch, gender norms can also cause people to intentionally alter and moderate their speaking. There can be a performative art to speaking that is not necessarily isolated to actors on a movie screen or strategic actors in a legislative body. In this chapter I will provide a more detailed analysis of the causes and effects of gender- and sex-based speaking patterns in the population at large. I will then translate these factors to the further expectations of legislators operating within the constraints of speaking on the House and Senate floors. Finally I look at how these speaking constraints affect legislative productivity and test for strategic violations of these norms; in both the aural and lexical dimensions of speech.

5.1 Men, Women, and Speech Norms

As with many social behaviours, the pitch, pace, and loudness with which we speak can be explained at least in part by biological imperatives to survive, attract a viable mate, and reproduce.[1] Most of these markers of attractiveness to the prospective partners are fairly static. They commonly include facial beauty, generally measured by symmetry (Grammer & Thornhill 1994) for both sexes, greater shoulder breadth, and a lower waist-to-hip ratio for men and women respectively (Toveé et al. 1999; Singh & Young 1995). Using observations in studies of fish, insects, and fauna in sexual dimorphism Jones et al. (2010) examined the pitch preferences of 800 straight men and women in their 20s to early 30s exposed to vowel

[1]Much of this research is admittedly a fairly hetero-presumptive.

sounds from opposite- and same-sex speakers. They then artificially pitched these samples up and down to "feminine" and "masculinize" the audio. They discovered that while both men and women found lower pitched male voices more attractive, only men had statistically distinguishable preference for higher pitched female voices. Jones et al. make the distinction between attractiveness and dominance. Measures of vocal dominance are associated with perceptions of an increase in competitive edge. Rather than physical dominance, lowering of vocal pitch can serve as an indicator of "skillful leadership and persuasion" (Puts et al. 2006, p. 284). Contrasted with attractiveness, members of both sexes did not demonstrate a divergence in preference. Men and women thought of both sexes as stronger potential leaders if the observed person spoke on the lower end of her or his sex's standard pitch range.

Attractiveness and attraction to vocal cues can vary across time. Women's preferences for lower-pitched men are correlated with their menstrual cycles. More stereotypically visually and sonically masculine men are preferred by women in the days proceeding ovulation (Penton-Voak et al. 1999). This attraction to square-jawed deep-voiced fellows drops off once this time frame ends. There is some evidence that such men are less desirable in the long run. As Puts (2005, p. 394) states it "Males who are putatively of high genetic quality (those with high testosterone levels) appear to invest less in their mates." For long-term relationships and family building women tend to be drawn to higher-pitched, more "feminized", men. At the other end of pitch and perceptions of fidelity, men often anticipate that female partners with higher pitch are going to be more likely to cheat (O'Connor, Re, & Feinberg 2011, p. 69).

This cycle has its own effects on others. Pipitone and Gallup (2008) found that increased risk of conception related to perceptions of vocal attractiveness. Both men and women found a woman who had a statistically higher possibility of getting pregnant to be more appealing speakers. Women who used hormonal contraceptives did not benefit from this increase in appeal.[2] There can be interactions between a woman's own natural pitch and her preference

[2]It is noted that women who use these contraceptives have a higher perceived baseline attractiveness than those not using the pill up until their conception risk calculations diverge near the middle of the reproductive month (Pipitone & Gallup 2008, p. 271).

for male pitch. Higher pitched women are more receptive to men making positive statements with a lower pitch (Vokovic et al. 2010, p. 769). Though there is some evidence that this is itself tied to hormonal fluctuations throughout the month, where women tend to have more elevated pitch when they are most fertile. Whether this is a subconscious or conscious act is a point of discussion as women also tend to raise their pitch when speaking to men they find attractive (Fraccaro et al. 2011).

Everything in the literature on gender roles of speech is not about making and protecting babies. At least not directly. O'Hair and Cody (1987) uncovered relationships between pitch elevation and types of lying. Spontaneous lying is accompanied with lower pitch levels. Planned, essentially scripted, lies are often tied to raised pitch; where increased pitch is a reflection of stress levels. Women were especially more likely to increase their pitch when not extemporaneously lying than men (O'Hair and Cody 1987, p. 9). Men who speak to women with a lower pitch are more likely to have the details associated with the conversations seared into the women's long term visual memories. While women listening to women had no discernible pitch-to-retention effect, higher pitched speech delivery in men was tied to weaker than ordinary long-term memory development (Smith et. al 2012). Pitch variance has effects as well. Aside from the greater perceived charisma mentioned earlier (Hirschberg & Rosenberg, 2005), fluctuations in pitch are associated with other socially desirable personality traits. Pitch variance is not linearly related to most of these phenomena though. It is all about finding the right balance between constraining pitch variance and coming off as cold and socially awkward on one end of the spectrum, or unleashing pitch variation and coming off as flighty and unhinged. Perceptions of autism are intriguingly associated with both ends of this range; where lower variance correlates to low-functioning autism and high-end "sing-song" variance is associated with high-functioning autism (Nadig and Shaw 2011, p. 505). While not really addressing the underlying causal mechanism, Cartei and Reby (2012) touch on the up-pitching and increase in pitch variation as revealed in stereotypical performances of gay characters by actors. The latter may not serve as a relevant cue as increased variance (Gaudio 1994, pp. 49-53) is at best marginally associated with perceived sexuality and even then inconsistently. The middle-road positive social cues tying to pitch fluctuations are

supported in an analysis of pitch and being considered "likeable", "considerate", or "kind". Riding and Lonsdale (2006) find that medium pitch variation leads to higher assessments of a person benevolent nature.

Gender and sex effects in speech are not limited to the prosodic. Lexical constraints are evident. This is particularly true in the discrepancies of the range of expression that men and women are "allowed" to perform. According to Hobbs (2003) "women are more likely to apologize, soften criticism or express thanks than men" in workplace communications. Though there are some variations in the strictness of politeness norms across cultures, there nonetheless appears to be a gender-politeness correlation (Holmes, 1995, p. 27). Ample research on discrepancies between male and female expectations of lexical expression exists in reviews of corporate culture. Wiley and Eskilson (1983) argue that "a man and a woman may be seen as equally competent for the managerial role, but differentiated on warmth despite identical behavioral input (i.e., speech style)". This is generally mediated by the sex of the interviewer. Women who have risen through the ranks to even be a candidate for a leadership position are in some ways trapped by their success.

> "Discouragingly for supporters of equal rights, the expectation held by female respondents that women using powerful speech styles will be socially accepted is not mirrored in the responses of males. Male respondents did not expect the powerful female speaker to be as well liked as the female applicant using the powerless speech style. Male responses indicate a conflict for female managers between the road to success in a corporation and positive personal relationships."(p. 1004)

A woman rising to power can be seen as the end result of strength; a strength that can be displayed through occasional negative expressions. A woman is societally constrained in negativity in a way that a man is often not. To put it more succinctly, a woman can only be so negative—especially aggressively negative—before she would be considered a "bitch."

5.2 Translating Gendered Speech Roles Into Political Context

Are male and female legislators different? The most simple immediate response is in the affirmative. But presuming that this is correct, then in what ways? If there are differences, are they more pronounced between the genders than they are within the genders? The intervening variable that might explain any greater differences in legislator behavior amongst female lawmakers than between males and females on The Hill is the effect of party. The two parties have differing expectations of the roles of men and women and their place in society at large as well as their roles in congress.

Michele Swers has performed in-depth analysis of this intersection of gender and politics in the House (2002) and Senate (2013). She found that women are more active proponents of "women's issue" legislation than men. There are some issues with the way Swers defines what a "women's issue" is, though that is for another day.[3] Nonetheless, such discrepancies are evident in their voting, amendment, sponsoring and co-sponsoring behavior. It is demonstrated in their advocacy style on the chamber floor, where they will often frame their experiences "as a mother of five"(2002, p. 110). It is not clear whether they are more likely to use this language than male legislators who might claim authority or make an appeal based on their experiences as "a father of [insert number of children here]". I will perform a cursory analysis of this phrasing and some of its potential permutations in the next section. There is some evidence that women willingly perform and emphasize femininity in the way that they present themselves on their congressional websites, despite complaints that this framing is solely the fault of a lazy and sexist media (Niven & Zilber 2001a; Niven & Zilber 2001b).

In the Senate there can be a divergence for support of judicial nominees at odds with women's issues. While Democrat women were more ready to attack there was not a mirrored support for such nominees by Republican women.

[3]When I was at Georgetown there was some discussion amongst Michele and those of us who took her course whether gay rights and marriage equality were necessarily issues that could be properly claimed under this label.

> "... in an effort to pressure Democrats to confirm some of President Bush's conservative female and minority nominees to lower federal courts, the Republican leadership wanted Republican women to participate in events to drive home the message that Democrats were discriminating against qualified female and minority Republican nominees. ... 'the Republican women in the Senate were MIA when it came to trying to push judges ... we had to bring women over from the House.'" (2011, p. 72)

Undoubtedly the moderating power of representing a state rather than a gerrymandered district had some role in this gendered party divergence.

In the House there is some indication that Republican women are more likely to propose women's issue amendments when in the majority (2002, p. 102). Swers conjectures that this is at least in part because of their power in a leadership role encouraging them to invest more time and effort. The differences within the genders is on display in amendments as minority-status Democratic women become even more aggressive in their proposals.

Women's issues legislation can have positive or negative valence. So supporting women's legislation is not necessarily supporting "positive"—i.e. supported by standard feminist and progressive organization endorsed—bills. Much in the way that Republican women in the Senate are not actively endorsing potentially "regressive" nominees, there is a question of whether majority Republican female legislators in both chambers might be less likely to push for "regressive" women's legislation than Democrat women in power might support "progressive" women's legislation.

Some of this political divergence in gender roles and expression can be associated with the metaphoric language that the two ideological camps use when talking about what the government is and what it should do. Lakoff (2016) posits that the political language of government functioning is one of a family. He distinguishes between the government as father and (roughly archetypically) as mother. In his typology politicians use a "strict father" or a "nurturant parent" metaphors for the moral functioning and ultimate purpose of the state and its citizens.

A strict father frame of government reflects an erstwhile expectation of the nuclear family where there is an established gender hierarchy of power (pp. 65-67). The father is the leader that makes unquestioned command decisions to prevent children from wandering astray and harming themselves. This family structure builds strong, self-sufficient, children through discipline and implicit—though definitely not explicitly stated—affection. Such love is meted out as a reward for faithful execution of rules and character-building chores. In the language of the sitcom "That '70s Show" patriarch Red Forman there isn't any problem with the kids that can't be fixed with a quick "foot in your ass". In rare moments of affection he will begrudgingly admit to loving and caring for his son Eric, with the requirement that the Eric never talk about it again.[4]

The nurturing parent (again, effectively the mother in this case) metaphor of the government sees the parent as open and communicative. The parents still have ultimate decision making power, but they consult and inform their children when the kids offer input (Lakoff, pp. 108-110). Strength is gained through discourse. Where the strict father sees the world as a Hobbesian nightmare, with the cruel indifference of the state of nature about to strike at any and every moment, the nurturing mother will take a more temperate view. Where the strict father believes power is power over others, the nurturing mother sees power as power with others. Where failures in life are a failure of preparation, of becoming weak and coddled from straying from the tried and true path for the strict father, such tragedies are seen as a failure of the community, of proper deliberative discourse, by the other parent. Returning to "That '70s Show", Forman family matriarch Kitty is literally a nurse. She openly, sometimes excessively so, tells you she loves you. Somewhat in line with the inferences of the mother as a needed counterpart to play "good cop" to the strict father's "bad cop" discussed in Lakoff, she serves as a buffer between the harsh rhetoric of her husband and those in her family and social circles. When one of Eric's friends is effectively abandoned by his own parents, she convinces her husband to take the him into their home and raise him as their own.

These two metaphors of government as a parent in a family map consistently to the

[4]Red's belief in the threat of corporal punishment often extends to the neighborhood kids found congregating in his basement. He first said "I love you." to his son under the influence of painkillers.

language of the liberals and conservatives in our political system. When conservative Republicans talk about government they are talking about their own strict fathers. Self-reliance is key. Government exists to maintain order through the distribution of justice. Disbursement of government monies are prioritized to policies of national defense and to strong law enforcement. A strong society is a self-reliant society. Pull on those bootstraps. When Democrats talk about the government, they are talking about their own nurturing mothers. Positive reinforcement through social welfare programs, prevention of avoidable tragedies through regulation and bureaucracy, these are some of the primary functions of government. Some people are born without bootstraps or boots. Some are even born without feet. Such considerations are reasonable to make deviations from the straight and narrow path of the strict father worldview.

This language can color expectations of women in politics in asymmetrical ways. Republican expectations of who should have power and how that power should be used and enforced vary from Democrat expectations. While potentially affecting the actions of Republican women in congress, they can also interfere with their sense of even seeking office in the first place. Of the four primary candidate sex-political party arrangements

> "... Republican women are the least likely to report having received the suggestion to run for office from a gatekeeper. While Democratic and Republican women are equally unlikely to have received encouragement to run for office from elected and party officials, Republican political activists lag in recruiting women." (Burrell 2015, p. 198).

Such biases for women to occupy certain gender roles as Republican politicians seem to express themselves more than merely in metaphor and recruitment efforts. In their analysis of 111th Congress House members, Carpinella and Johnson (2012) uncovered gendered biases manifest in biology. Again Republican women were different than their Democratic female, Republican male, and Democratic male counterparts. Comparing images of members against a large array of images of men and women, Republican women appear to have more stereotypically feminine faces. Barring strategic and risky plastic surgery, this was

not the result of a performative act on their part. They didn't necessarily have bigger hair. They didn't particularly wear more makeup. They had more stereotypically feminine faces based on their bone structure. They were the only group that had any significantly large enough gendered facial display. Republican males were not more "masculine" than Democratic males, for example. While interesting, it is not a variable that can be strategically manipulated by a politician. It is more of a constant that cannot be readily tested in the context of determining something like legislation productivity. It nonetheless could be a variable in either self-selection or recruitment of women into the Republican party ranks at the state and federal levels.

With prosodic and lexical speech analysis we can test gender performance as a strategy and gendered speaking activation as a response to assorted stimuli. Appeals to the electorate and their preferences for politicians to speak in a specific manner have been highlighted recently. Signorello and Rhee (2016), looking at candidate speeches from the 2016 presidential primary cycle in assorted contexts, focused on Republican candidates Carly Fiorina and Donald Trump and contrasted them with Hillary Clinton and Bernie Sanders. Comparing pitch in speeches relative to their sex there was a preference across all candidates for speeches where they spoke on the lower end of their pitch ranges. This reflects findings from the larger research outside of a political context. While instructive, the findings of their research only directly apply to voters at large and not politicians in the context of actually performing their job amongst their fellow politicians. Pitch variation in response to electoral effects is a topic for the next chapter. In the following section I will test for gendered pitch causes and effects, with a particular emphasis on whether Republican women continue to be a peculiar animal when looking at the sounds they make in the context of the words they speak.

5.3 Partisan Pitch Biasing and Productivity

In this section I examine party differences in pitch profiles for male and female legislators. Focusing specifically on the House captioned sample I also take a look at possible lexical biasing against negativity compounding speaker differences. As suggested in the general

psychology and political analyses literatures of gender, sound, and words this will include sex-typicality of pitch, lower-end preferences for pitch, and the effects of middling pitch variance.

5.3.1 Sex-Specific Pitch Medians and Productivity

While not a performative act, Republican women having more typically feminine facial structures than any other legislator sex and party combination in the 111th Congress House suggests a preference for gender norms in appearance. The first thing I will test extends this expectation to pitch and productivity. The first level looks at sex- and gender-based intersection of typicality. Basically, if Republican women have the most stereotypically feminine faces, doe they necessarily have the most stereotypically feminine voices? One way to operationalize this is to measure feminine vocal typicality by means of masculine voice atypicality. How much does the female speaker's voice not sound like the typical male voice? The opposite is measured as well. What might cause a male speaker to have a more "feminized" speaking voice? Does other-sex atypicality lead to higher legislative productivity?

With my larger C-SPAN set of speaker samples I took the median pitch for each House speaker by congress. I then sanitized this data by disregarding speakers that I did not have at least 5 minutes of speech samples over the whole set. I then further ignored as coding error male and female speakers whose median pitches fell outside of their sex's anticipated bounds.[5] This left me with 1,153 legislator-congress points. To measure atypicality, I then used the median of each sex's pitch range and calculated the absolute value of the distance of each speaker's median pitch from the other sex's median. The farther away the a male speaker's pitch is from 210Hz, the more "masculine" his voice could be thought of. A more "feminine" voice will be farther away from the lower bound of 132.5Hz.[6] In Figure 5.1 we see each legislator's median pitch plotted against its distance from the other-sex median. Each sex's median is denoted by the solid vertical lines. The medians by sex are denoted by

[5] 85-180Hz and 165-255Hz respectively.

[6] I used the congress-specific medians by sex and had negligibly different results in the subsequent models.

the dashed horizontal lines connected to the male (♂) and female (♀) symbols on each end of each graph. It appears that Democratic majorities in the House reduce pitch atypicality differences between men and women. Over the 4 congresses women's median atypicality ticked up slightly from 68Hz to 69Hz. Over this same period of time male legislators have been becoming more "feminized", with their pitch difference decreasing from 73Hz to 65Hz.

In Table 5.1 I modeled these distances against assorted factors. Speaker sex had no effects on potentially performing masculinity or femininity in pitch. Variables with near-statistical significance ($p < 0.1$) included being a Republican, more ideologically liberal, having less congressional experience, and being a committee chair. At the preferred significance cutoff, legislators in the majority speak with a pitch closer to the other sex, as are those on one of the power committees. More ideologically extreme legislators were also more likely to reach across the pitch aisle. There does not appear to be any payoff for legislators who do speak in this way. Table 5.2 indicates nothing remotely approaching statistical significance for this variable.

If men who speak in a more "feminine" pitch are not advantaged in legislative output, and neither are women who speak more "masculinely", then where else might we look? Using the same data points I then compared a person's median pitch and its difference from their own sex's pitch median. As the literatures in communications, psychology, and—more recently—in politics suggest there is a preference for listening to speakers whose pitches are on the lower end of their sex's ranges. Are lower pitched men and women both advantaged in getting their proposals through? In Figure 5.2 I plotted the speaker median pitch difference from their own sex's median general population pitch. From 2005-2012 female legislators spoke at a pitch consistently lower than the population median, while males spoke at a higher pitch. While female legislators oscillated on the lower end by congress, with pitch differences of -8.55, -7.55, -9.5, and -7.94, males consistently increased their pitch. By Congress their median differences were 4.82, 7.17, 8.69, and 12.99. When we look at these pitch differences in Table 5.4 we find no statistical significance of this prosodic indicator in accounting for productivity.

5.4 Pitch Variance Biasing and Productivity

If speakers who hit a certain sweet spot of pitch variation are considered more benevolent and charismatic, then does this lead to them having greater productivity? In Figure 5.3 I plotted the absolute difference of legislators' median pitch variation from the chamber median by congress. Males generally have lower pitch variation than women. This is not particularly surprising as varying one's pitch is associated with emotional expression. McConnell-Ginet (1978) argues that these differences are learned.

> "The extreme of masculine intonation in American English is a complete monotone, whereas there are (theoretically) no limits at the other end of the scale. Masculine speech melodies can thus be heard as metaphors for control, for 'coolness,' and feminine speech melodies as uncontrolled, untamed by culture. The association of feminine and masculine extremes with the full disclosure of emotion and with its suppression, respectively, are concomitants of the general connection of the masculine extreme with constraint."(p. 558)

While there are biological explanations for overall pitch being different between the sexes, the actual range of pitch expression relative to these pitch differences is likely a matter of nurture rather than nature.

5.4.1 Meeting in the Middle

I used the overall chamber median variation as my control after some consideration of alternatives. Among these were the possibility of a preference for upper quartile median standard deviation as well as the lower quartile. The logic behind this is that an upper end variation may be associated with more positive expression of emotion where a lower end variation may be associated with a more somber tone. Models using these baselines were unfruitful. I then used sex-specific baselines to test how great a speaker's distance relative to her or his sex's median. While I found that males had greater variation relative to their controlled median pitch variation, there was no significance of this variable in accounting for productivity. As

we see in Table 5.6, even using the chamber median there is no explanatory power of lower or higher pitch variation for legislative productivity.

5.5 Pitch and Sponsorship Self-Selection of "Women's Issue" Legislation

Do male and female legislators vary in the use of traditionally gendered family role language when they debate on the floor? Historically there is a divergence in the roles of women in society. Men's place has been in the public sphere. Women's place has been in the private sphere. Where men were to go out and be business leaders, women were expected to stay home and raise the children. There is some argument that wider female pitch variation may be in part tied to this historical expectation. McConnell-Ginet (p. 558) posits that "... [women's] frequent contact with young children who are not yet socialized to attend reliably to verbal signals ..." can lead to a prone to wider pitch expression. Such pitch variance (regardless of the sex of the speaker) is actually vital in language acquisition for infants (Kaplan et al. 1999; Reissland, Shepherd & Herrera 2003).

With such an actual difference of experience, or potentially an expectation of this difference, are female legislators more likely to make reference to their maternal experiences than males are to their paternal experiences in the course of debate? Are women more likely to make appeals to paternal experience by proxy than males are to maternal experiences? To test for this I looked at all of the speech segments from the the House captioning in the 111th and 112th Congresses. I then counted the number of speeches where one of the following appeals via parentage were made:

- "being/as a/the great-/grand-/mom"
- "being/as a/the great-/grand-/mother"
- "being/as a/the great-/grand-/dad"
- "being/as a/the great-/grand-/father"

I found 244 speeches where this language appeared. 228 of them could be tied explicitly to a speaker's sex as a matter of title "Mr" vs. "Mrs/Ms". The remaining speeches ambiguously referred to the "The Chair" or "Speaker Pro Tempore". In Figure 5.4 we see the raw counts by speaker type. Not all speeches involved females referencing maternal authority. Not all male speeches use only one type of family appeal. To clarify, a "Female Maternal" speech is one where a woman used the mom/mother language. A "Male Maternal" speech would involve a man using similar language. "Both" appeals would use the dad and mom language in the same speech. In Figure 5.5 I controlled these counts for male and female legislator population size. Over the 111th and 112th Congresses period the average female legislator made about 0.5 speeches using maternal language. This is about 3 times more common than a male referring to fatherhood in any manner. Women referring to dads was over twice as likely as men referring to mothers.

If women are more likely to talk about motherhood than men are fatherhood in their floor debate, and are already more likely to generally sponsor "women's issue" amendments and legislation, what role might prosodic cues play in this? To test for assorted pitch effects I searched govtrack summaries of bills from the 109th through 112th Congresses to find women's legislation. I crudely approximated this by selected legislation with "women", "woman", "female", "feminine", and "girl" in the title or description.[7] In Table 5.7 I ran a poisson model for the number of women's bills a legislator sponsored. Multiple significant factors were found. As expected, males sponsored fewer pieces of such legislation. Republicans in the majority were more likely to sponsor, as were the more ideologically extreme and more liberal. One of my pitch measures yielded a statistically significant effect. Men who spoke with pitches closer to the women's median and women who spoke with pitches closer to the men's median sponsored more women's issue bills.

[7]This also captured the plural of these keywords, where valid.

5.6 Discussion

In this chapter I reviewed general expectations of sex- and gender-based roles in society and applied them to my data set on House prosodic patterns. I found asymmetries in the way male and female legislators conformed to these norms. Women consistently were atypically non-masculine in their median pitch. From the 109th through 112th Congresses male legislators closed the distance in their pitch median from that of female legislators. Male median pitch became more "feminized", in the language of the communications, linguistics, and psychological literatures.

Recent analysis of presidential candidates reflects the non-political science literatures on pitch preference. People assessing politicians and speakers more generally prefer to hear someone talk on the lower end of her or his sex's pitch range. This may not apply to members in congress, at least not consistently between the two sexes. Where women legislators were regularly on the lower end of their pitch spectrum, men were on the high end of theirs. They also had a distinct upward trend. In modeling for these two pitch preferences, there was some indication that more ideologically extreme legislators did not care that much for performing their gender norms. More extreme legislators were more likely to have pitches closer to the other sex's. They were also more likely to have pitches above the median of their own sex. Legislators in the majority were similarly less prone to performing these desirable prosodic acts. When I regressed other-sex pitch atypicality—effectively men being "masculine" by being distinctly "non-feminine" in their pitch, and vice-versa—on legislative productivity there was no significant relationship. The same was true in modeling for same-sex pitch differences. Neither lower-pitched nor higher-pitched men or women had any apparent productivity advantage.

Assorted literatures suggest that having a middling pitch variation is associated with higher ratings of charisma, benevolence, expressiveness, and general likeability. The closer a legislator's median standard deviation of pitch might be to a specified idealized center point the more likely these positive attributes may arise. I found that women had higher pitch variation than men. This is in line with the generally-understood as acquired gender roles of

men and women. Higher variation is associated with greater emotionality. Men, as a matter of societal pressure, can be more often punished for letting their faces grow long. Thus they may self-select to constrain their pitch standard deviation in speaking.

Taking into consideration that the desired median of variation might be in the upper or lower quartile, or might be gender-norm controlled, I settled on the overall chamber median pitch as my control. Aside from the legislator's sex, Republicans were more likely to have higher pitch variance. This is somewhat indicative that female Republicans are different. This would especially be the case if she were slightly more ideologically moderate than her fellow Republicans. There was also an effect where legislators on one of the power committees displayed lower pitch variation.

When I modeled this pitch effect on legislative productivity there was no significant relationship. Unlike with the other pitch cues, ideal pitch variation may be more nuanced and contextualized. Perhaps a lower-end pitch variation is more ideal when discussing explicitly dense economic matters involving the subtleties of tax code. Perhaps a high-end pitch variation is the base ideal when debating a social issue such as abortion or funding for the arts. Perhaps it is less about the topic as such and more about the innate complexity of the topic, or even the expressed complexity that the legislator frames the topic with. If one legislator argues for healthcare reform as a labyrinthian matter of cost controls and long-term budget solvency it may be wiser to restrict the variance of the pitch overall. Though setting the ideal pitch point to the lower quartile and restricting pitch variance relative to that point may be even more preferable. If another legislator frames healthcare reform in a simple matter of life and death—where reforms lead to loss of coverage, avoidable suffering, and untimely passing—then that legislator may want to set his ideal pitch point in the upper quartile and constrain variation around that point.

I performed a cursory analysis of the propensities of female and male legislators to use maternal or paternal language in floor debate. This suggested that female legislators more readily embraced family language framing than males. The overall estimate of delivering family-framed statements in a speech were negligible as a matter of the overall scale of the time frame analyzed however. I then used keywords to isolate "women's issue" legislation

sponsorship patterns. More liberal women legislators sponsoring a greater number of bills was expected. Republicans introducing more of these bills may be a point of confusion. This could be accounted for in part by a lack of nuance in my coding. I did not take into consideration the valence of a bill. Republicans may be more likely to introduce women's legislation. However they may be more likely to introduce legislation that reverts previously-gained rights and freedoms. Regression need not be required. Bills designed to slow the expansion of women's rights may suffice. In this model I found a substantively significant relationship between my other-sex pitch atypicality measure. Male legislators who spoke with a more "feminine" pitch and women who spoke with a more "masculine" pitch sponsored slightly more "women's issues" pieces of legislation.

A lingering question from the outset is "Are Republican women different?" The intersection of being women, dealing with gender norms in society at large, in a distinctly more conservative Republican party invites the question. While Democratic women deal with their own constraints, they are likely compounded for Republicans who more readily embrace the concept of the woman as needing to fulfil a role as a nurturer. Such a woman needs to balance strength with deference. She can be a leader, yet not an aggressive one. There is some indication that Republican women in congress may be different in the way they perform various prosodic cues. However they are in clear contrast to the other groups in congress when I return to the relationship between legislator speaking pitch and speech sentiment. Breaking my data out further by speaker sex and party, in Figure 5.6 we see that Republican women are very much distinct. Where every other subgroup in the House (Republican men, Democratic men, and Democratic women) become more negative in the words they speak as their pitches rais, Republican women become undeniably more positive. There may be compounding constraints on negativity for conservative women in congress, where rules of decorum already create a bias against the use of explicitly and directly negative words. This could also be a matter of the language of politics and aggression not perfectly aligning with the language of the movie reviews training corpus feeding the sentiment analysis endpoint for my data. In an effort to remain strong yet sufficiently "feminine" Republican women may resort to more passive aggressive language when displaying anger and frustration. I

will return to other potential sources of speech sentiment discrepancies in the concluding chapter.

5.7 Tables and Figures

Table 5.1: Speaker Other-Sex Atypicality

	Median Pitch Distance
Male	−0.148
	(1.476)
Majority	−9.359***
	(2.657)
Republican	7.260*
	(3.743)
Ideology	−6.111*
	(3.545)
Ideological Extremity	−16.028***
	(3.852)
Congressional Experience	−0.231*
	(0.136)
Majority Leader	2.420
	(3.051)
Minority Leader	2.807
	(3.261)

Continued on next page

Table 5.1 – continued from previous page

	Median Pitch Distance
Committee Chair	4.474*
	(2.522)
Committee Subchair	2.146
	(1.602)
Power Committee Member	−2.914**
	(1.264)
Budget Committee Member	−0.960
	(1.980)
Constant	79.787***
	(3.990)
Observations	1,153
R^2	0.032
Adjusted R^2	0.021
Residual Std. Error	17.812 (df = 1140)
F Statistic	3.106*** (df = 12; 1140)
Note:	*p<0.1; **p<0.05; ***p<0.01

Table 5.2: Speaker Other-Sex Atypicality Productivity

	Legislative Productivity
Median Pitch Distance	0.001
	(0.002)
Male	−0.050
	(0.108)
Majority	−0.759***
	(0.196)
Republican	−0.535*
	(0.275)
Ideology	0.460*
	(0.261)
Ideological Extremity	−0.149
	(0.285)
Congressional Experience	−0.065***
	(0.010)
Majority Leader	−0.466**
	(0.224)

Continued on next page

Table 5.2 – continued from previous page

	Legislative Productivity
Minority Leader	0.250
	(0.239)
Committee Chair	-3.557^{***}
	(0.185)
Committee Subchair	-0.253^{**}
	(0.118)
Power Committee Member	0.217^{**}
	(0.093)
Budget Committee Member	0.071
	(0.145)
Constant	0.203
	(0.340)
Observations	1,153
R^2	0.443
Adjusted R^2	0.437
Residual Std. Error	1.307 (df = 1139)
F Statistic	69.779^{***} (df = 13; 1139)
Note:	*p<0.1; **p<0.05; ***p<0.01

Table 5.3: Speaker Own-Sex Pitch Difference

	Median Pitch Difference
Male	19.706^{***}
	(1.466)
Majority	13.198^{***}
	(2.639)
Republican	-8.587^{**}
	(3.717)
Ideology	5.766
	(3.521)
Ideological Extremity	21.315^{***}
	(3.826)
Congressional Experience	0.132
	(0.135)
Majority Leader	-0.259
	(3.030)
Minority Leader	1.900
	(3.239)

Continued on next page

Table 5.3 – continued from previous page

	Median Pitch Difference
Committee Chair	-4.638^{*}
	(2.504)
Committee Subchair	-2.986^{*}
	(1.591)
Power Committee Member	1.276
	(1.256)
Budget Committee Member	1.933
	(1.966)
Constant	-24.742^{***}
	(3.963)
Observations	1,153
R^2	0.172
Adjusted R^2	0.163
Residual Std. Error	17.690 (df = 1140)
F Statistic	19.697^{***} (df = 12; 1140)
Note:	*p<0.1; **p<0.05; ***p<0.01

Table 5.4: Speaker Own-Sex Difference Productivity

	Legislative Productivity
Median Pitch Difference	−0.001
	(0.003)
Male	0.065
	(0.154)
Majority	1.369***
	(0.267)
Republican	1.075***
	(0.370)
Ideology	−1.311***
	(0.349)
Ideological Extremity	−0.157
	(0.385)
Congressional Experience	0.066***
	(0.014)
Majority Leader	0.869***
	(0.283)

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Table 5.4 – continued from previous page

	Legislative Productivity
Minority Leader	-0.884^{***}
	(0.298)
Committee Chair	3.150^{***}
	(0.299)
Committee Subchair	0.774^{***}
	(0.161)
Power Committee Member	-0.475^{***}
	(0.126)
Budget Committee Member	-0.169
	(0.195)
Pseudo R^2	0.373
Observations	1,153
Note:	*p<0.1; **p<0.05; ***p<0.01

Table 5.5: Speaker Pitch Variation

	Median Pitch Standard Deviation
Male	-2.758^{***}
	(0.293)

Continued on next page

Table 5.5 – continued from previous page

	Median Pitch Standard Deviation
Majority	−0.233
	(0.527)
Republican	1.872**
	(0.742)
Ideology	−2.301***
	(0.703)
Ideological Extremity	−0.287
	(0.764)
Congressional Experience	0.017
	(0.027)
Majority Leader	−0.448
	(0.605)
Minority Leader	−0.500
	(0.646)
Committee Chair	0.378
	(0.500)
Committee Subchair	0.025

Continued on next page

Table 5.5 – continued from previous page

	Median Pitch Standard Deviation
	(0.317)
Power Committee Member	-0.647^{***}
	(0.251)
Budget Committee Member	0.769^{*}
	(0.392)
Constant	7.373^{***}
	(0.791)
Observations	1,153
R^2	0.114
Adjusted R^2	0.104
Residual Std. Error	3.530 (df = 1140)
F Statistic	12.183^{***} (df = 12; 1140)
Note:	*p<0.1; **p<0.05; ***p<0.01

Table 5.6: Speaker Pitch Variation Productivity

	Legislative Productivity
Median Pitch Standard Deviation	−0.785
	(0.710)

Continued on next page

Table 5.6 – continued from previous page

	Legislative Productivity
Male	1.912
	(7.279)
Majority	59.881***
	(12.619)
Republican	52.272***
	(17.823)
Ideology	−60.592***
	(16.915)
Ideological Extremity	−19.958
	(18.296)
Congressional Experience	2.584***
	(0.646)
Majority Leader	49.725***
	(14.493)
Minority Leader	−43.298***
	(15.490)
Committee Chair	110.481***
	(11.978)

Continued on next page

Table 5.6 – continued from previous page

	Legislative Productivity
Committee Subchair	42.283^{***}
	(7.606)
Power Committee Member	-24.463^{***}
	(6.022)
Budget Committee Member	-4.258
	(9.417)
Constant	-260.291^{***}
	(19.658)
Observations	1,153
R^2	0.379
Adjusted R^2	0.372
Residual Std. Error	84.589 (df = 1139)
F Statistic	53.421^{***} (df = 13; 1139)
Note:	*p<0.1; **p<0.05; ***p<0.01

Table 5.7: Women's Bills Sponsorship

	Number of Bills Sponsored
Other-Sex Pitch Distance	-0.004^{***}

Continued on next page

Table 5.7 – continued from previous page

	Number of Bills Sponsored
	(0.002)
Own-Sex Pitch Difference	−0.002
	(0.001)
Pitch Standard Deviation	0.003
	(0.007)
Male	−0.849***
	(0.062)
Majority	0.792***
	(0.118)
Republican	0.873***
	(0.169)
Ideology	−1.386***
	(0.157)
Ideological Extremity	1.089***
	(0.174)
Congressional Experience	0.035***
	(0.005)

Continued on next page

Table 5.7 – continued from previous page

	Number of Bills Sponsored
Majority Leader	−0.094
	(0.107)
Minority Leader	−0.270*
	(0.140)
Committee Chair	0.354***
	(0.087)
Committee Subchair	0.171***
	(0.062)
Power Committee Member	−0.012
	(0.050)
Budget Committee Member	−0.155*
	(0.091)
Constant	−0.163
	(0.181)
Pseudo R^2	0.211
Observations	1,153
Log Likelihood	−2,277.347
Akaike Inf. Crit.	4,586.695

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Table 5.7 – continued from previous page

	Number of Bills Sponsored
Note:	*p<0.1; **p<0.05; ***p<0.01

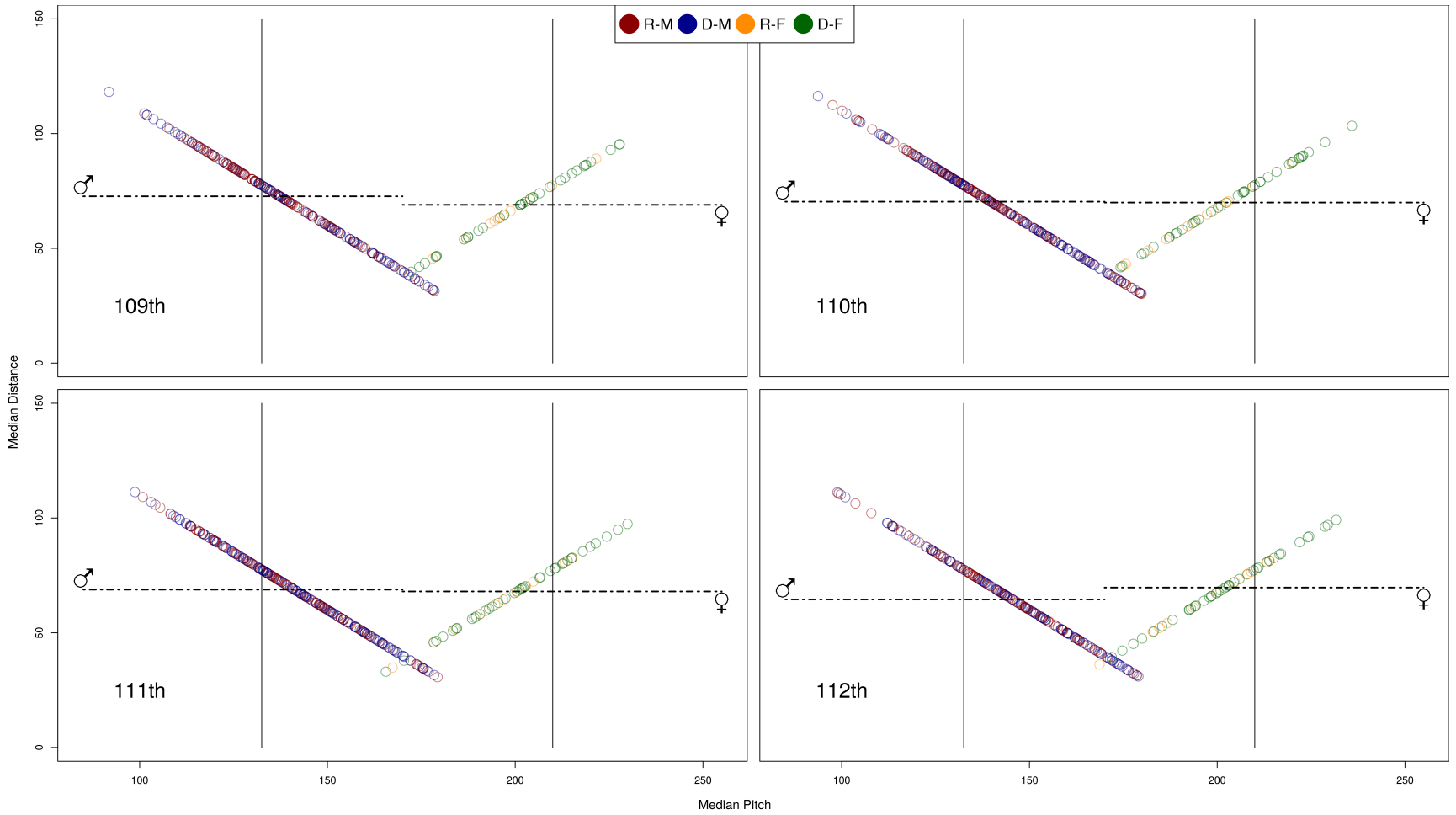

Figure 5.1: House Median Pitch Other-Sex Atypicality by Congress

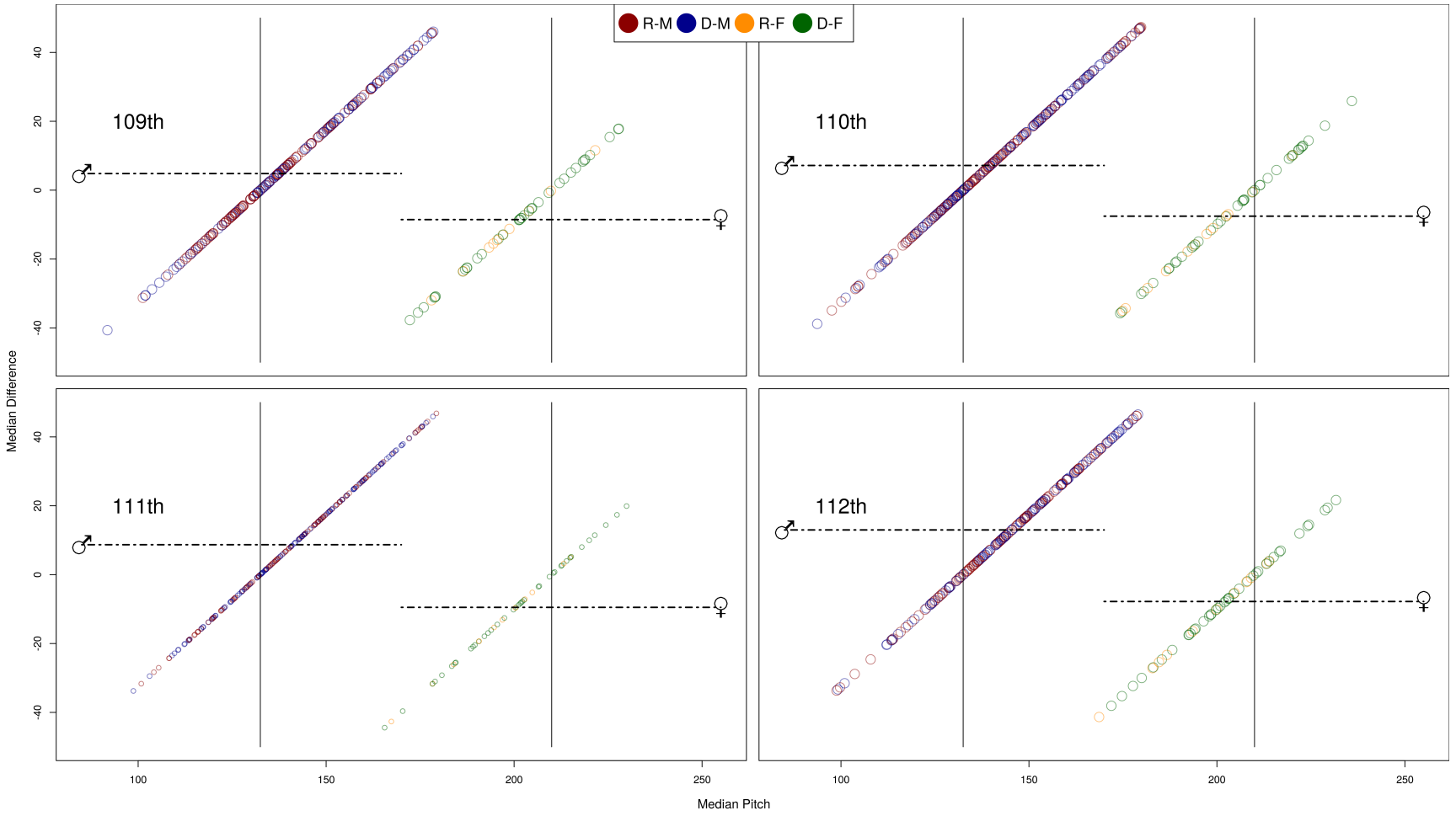

Figure 5.2: House Median Pitch Own-Sex Difference by Congress

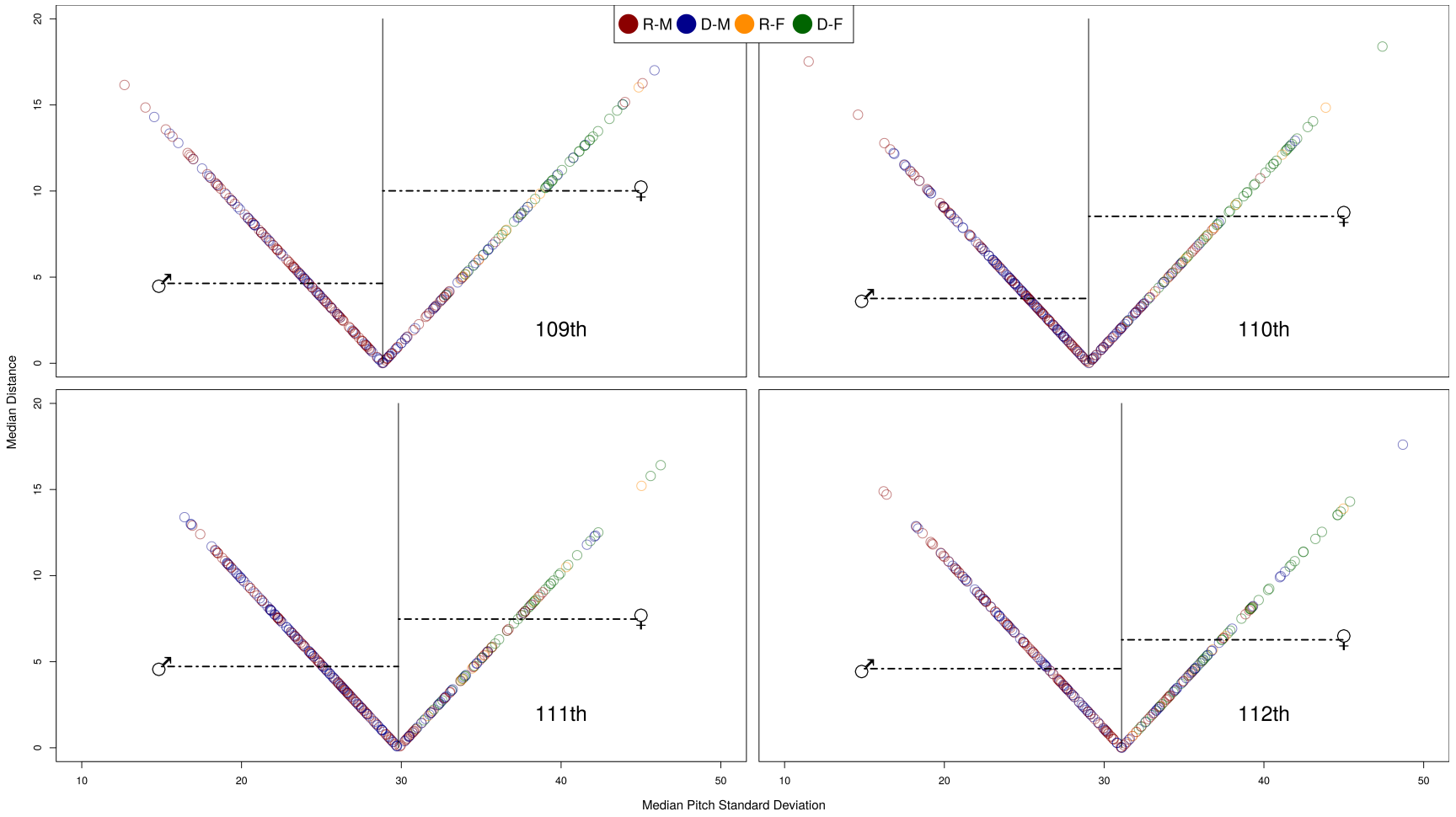

Figure 5.3: House Median Pitch Variation Distance by Congress

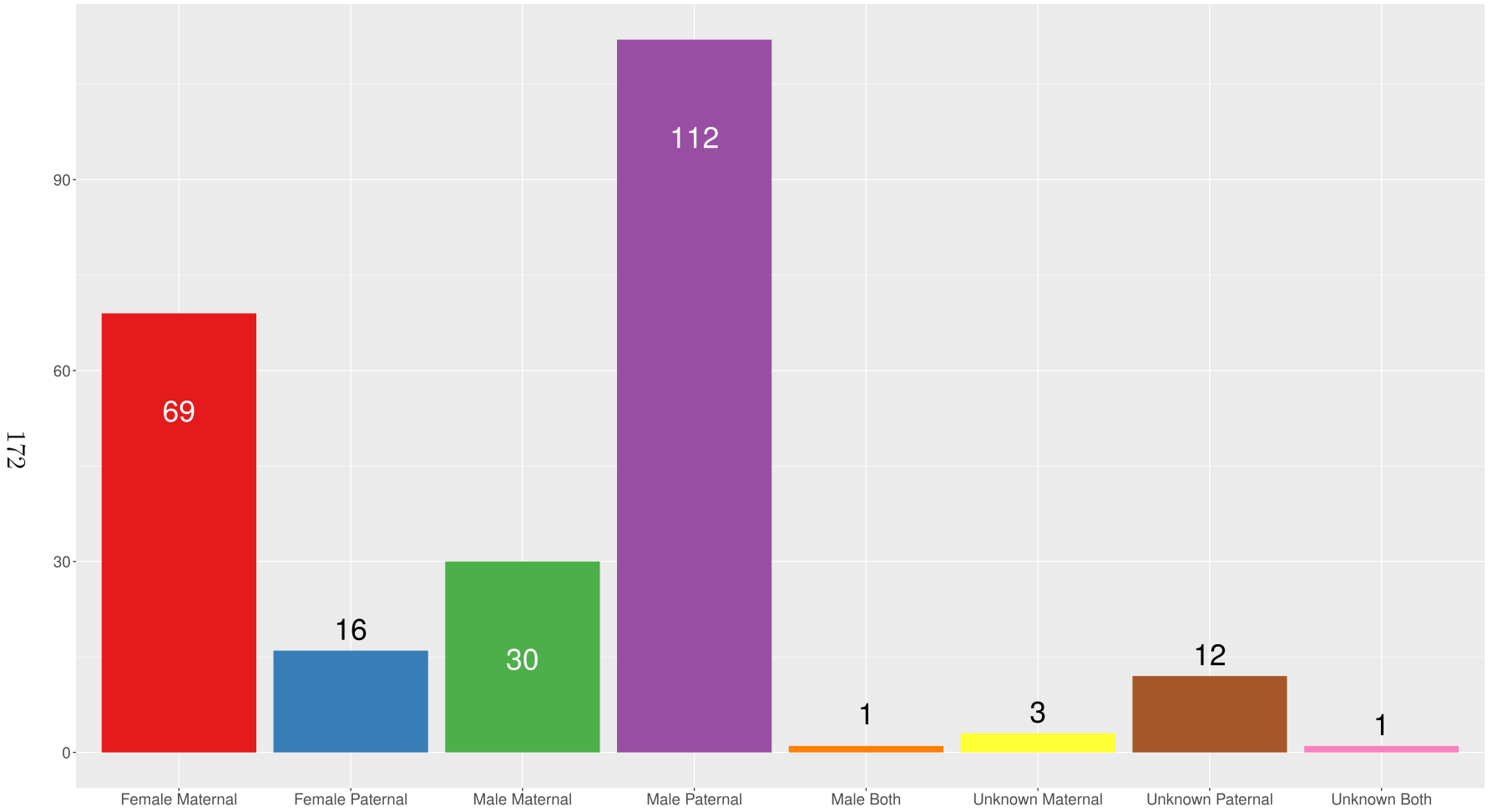

Figure 5.4: Family Appeal Language by Type

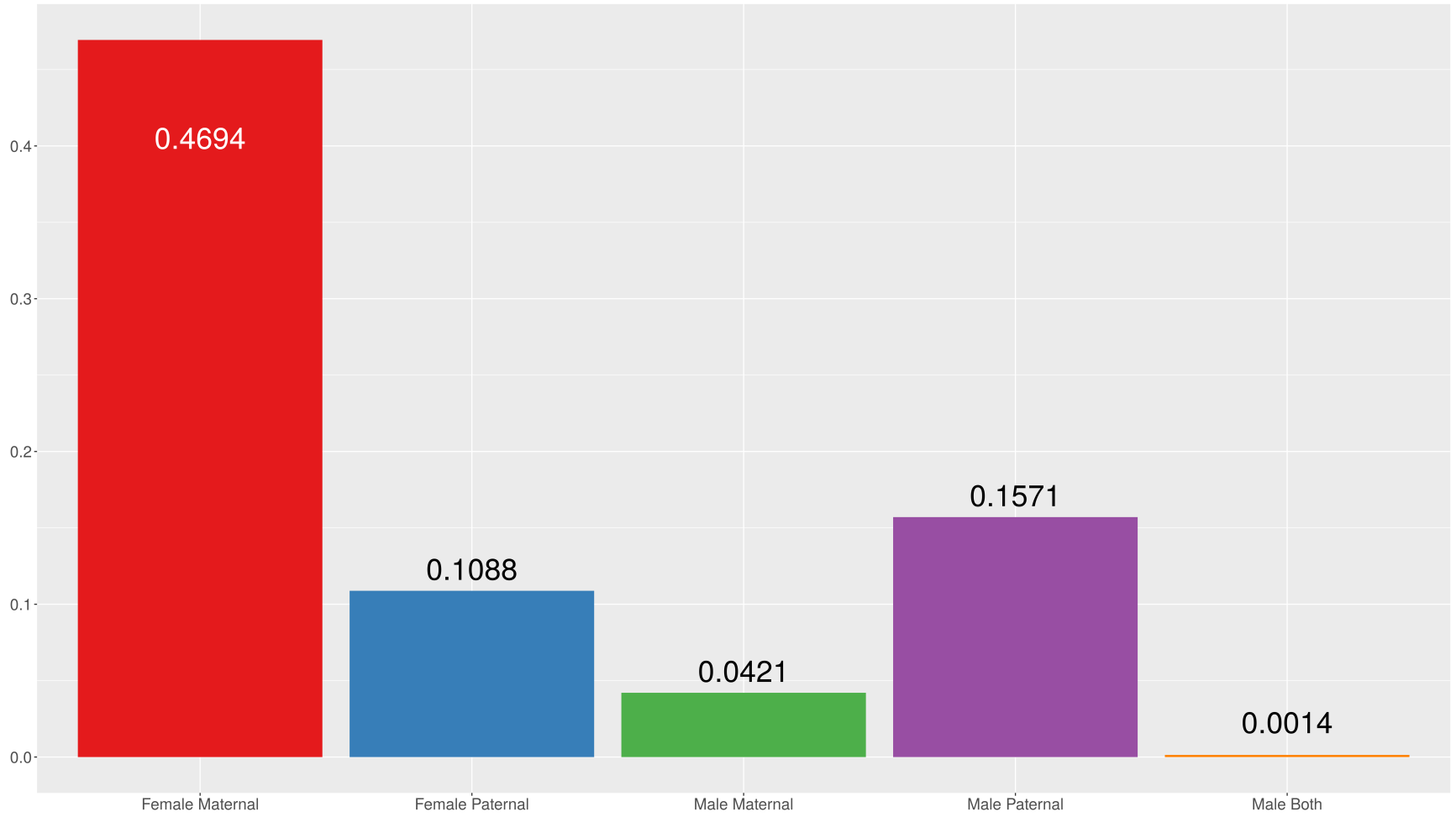

Figure 5.5: Sex Population-Weighted Family Appeal Language by Type

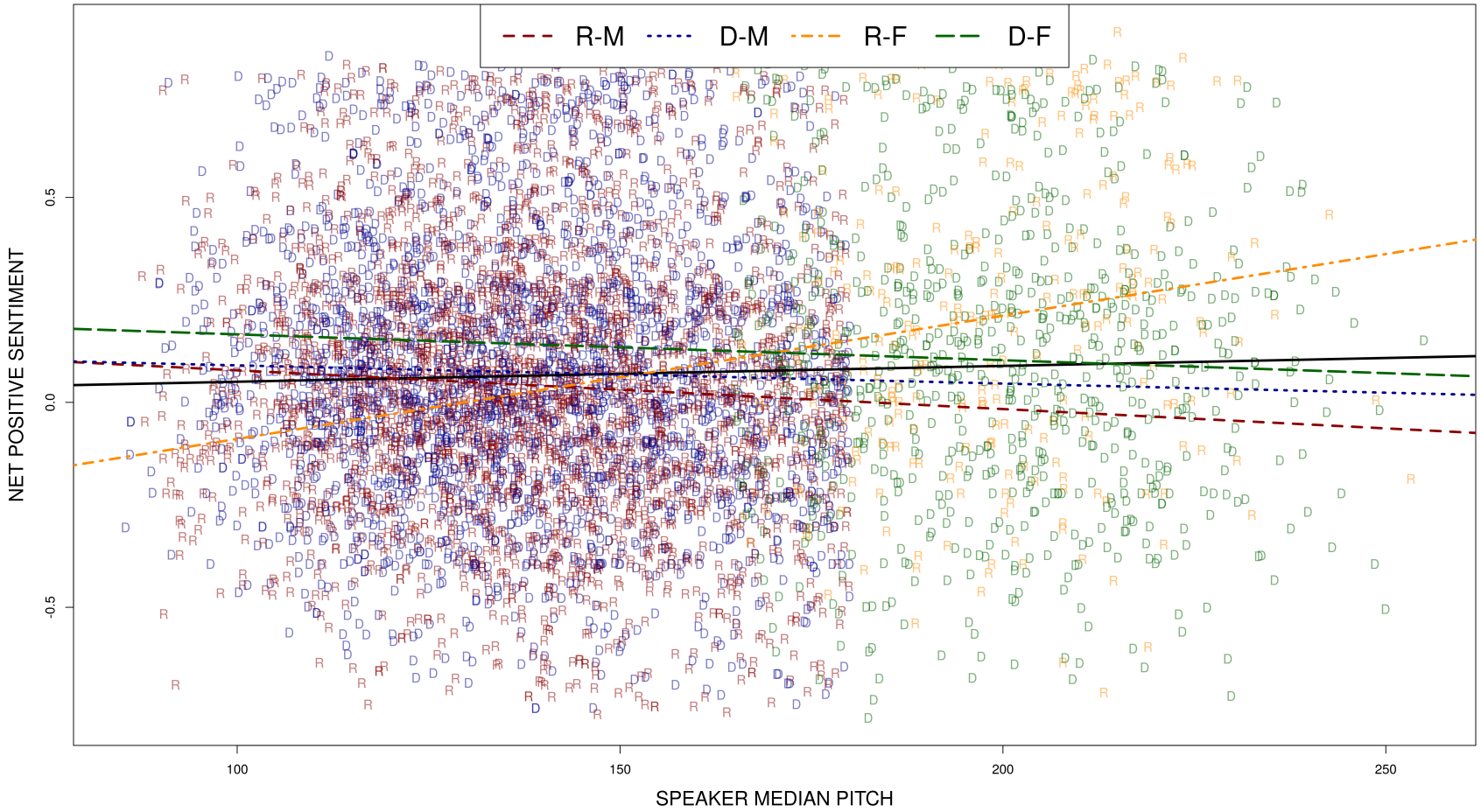

Figure 5.6: Speech Sentiment vs. Median Pitch by Party and Sex

CHAPTER 6

Electoral Effects

Politicians alter their messages to fit the anticipated policy preferences of their audiences (Grimmer 2013). The also adjust their campaign advertisement strategies for different subgroups within their states and districts. This can be tempered by the realities of technology, media, and matters of population density interfering with the ability of such curated messaging to be properly targeted to their desired audiences. Some of this can be adjusted for with the intervening filter of an actual language barrier. Abrajano provides evidence that Spanish-language campaign commercials use more personal-appeal language than English-language ones (2010, p. 58). House members with larger ethnic minority populations are more likely to include more minorities in their television ads.

Even then there can be a limit to the benefits of a more diverse demographic appeal. In absence of an ability for candidates to explicitly target desired demographics—such as Hispanic voters on Spanish-language television channels or mailings to black voters in predominantly African-American neighborhoods—campaigns will refrain from symbolic appeals via Black or Latina/o faces in their advertisements and literature (Nteta & Schaffner 2012, pp. 244-245). This may be a matter of trying to avoid alienating their white voting base, but it may also more practical matter of economic efficiency. Campaign television ads and mailers are not free. Efficiently targeting the right appeal to the right audience can be vital for the best return on investment in the way of voter turnout.

As with floor speeches and maternal language framing, female candidates make use of "Politicized Motherhood" as means to counter perceptions of gender violations. An ambitious woman who seeks office can soften potential criticism of such aspirations by reminding voters of her maternal experiences (Deason et al. 2015). She can be strong. But she has the

capacity to nurture. This can cut both ways. As a matter of comparison men who make appeals not only to their own family experiences, but also in referring to other mothers in their lives—their wives, their own mothers, and so on—seem to benefit more than even women do (p. 141). This motherhood language may benefit men as they remind voters that they are running *for* their families rathern than *in spite of* their expected family commitments. That is not to say that women don't benefit at all from such appeals. Women without children can not use the power of Sarah Palin's call for "mama grizzly bears" to unite in a campaign rally the way that those with children can.

Race is woven into the fabric of our political discourse. While not necessarily present in every aspect of our lives as Americans, like family language it can be wielded to the benefit and harm of a political candidate. Making an argument "as an African American man" or "as a Latina" occurs from time to time in floor debate. In a glancing review of House speeches from 2009 to 2012 such appeals are sprinkled throughout. They are not as prevalent as maternal- and paternal-language statements. This is brought into greater contrast when I take into account how the population size of ethnic minorities as such in the House is larger than that of female legislators in particular. Cross appeals in line with with the male maternal and female paternal speeches discussed in the prior chapter are also present. Where males can refer to the motherhood of their wives and sisters, Asian American legislators can debate the merit of a piece of legislation in the context of the ethnicity of their Hispanic constituents.

Racial- and sex/gender-based contexts can be used by both incumbents and challengers in political campaigns. Unrestrained by the rules of decorum in the House and Senate chambers, a white legislator can make implicit arguments against a fellow candidate based on their race or sex. These can be nuanced and multifarious in their manifestations. They can be crossover attacks on a presidential candidate like Michael Dukakis in the race-baiting "Willie Horton" advertisement by the George H.W. Bush campaign (Mendelberg 2001, p. 10). Jesse Helms relied on subtle racial cues in his 1990 senate campaign ad referred to as "Hands". In this commercial he criticized his African-American Democrat opponent Harvey Gantt's support for racial quotas in hiring. Making sure to mention Ted Kennedy

for optimal effect, the ad featured a pair of white hands slowly crumpling up a rejection letter for a job; emphasizing Jesse Helms's own whiteness in contrast with Gantt's blackness. Such appeals against a candidate by racial proxy do not even need to be in any official campaign communication. A simple push poll will suffice. Push polls are designed to disseminate information to the public, really less in the way of actual facts and often more in the way of rumors and innuendo, rather than acquire vital information for a campaign to react to. The most famous such crossover racialized attack occurred in the 2000 Republican South Carolina presidential primary. The George W. Bush campaign conducted a phone "survey" where

> "Voters were asked, 'Would you be more or less likely to vote for John McCain ... if you knew he had fathered an illegitimate black child?' This was no random slur. McCain was at the time campaigning with his dark-skinned daughter, Bridget, adopted from Bangladesh."[1]

Direct and explicit appeals to not vote for an opponent on the grounds that "he is black" or "she is a woman" are gladly beyond the tolerance of the two major party candidates. Inferred and symbolic appeals nonetheless still persist. Sriram and grindlife (2017) provide evidence that non-white candidates often employ a "deracialization" strategy that is antecedent to any campaign message. Before they decide to run in the first place such candidates will at times choose to go by a more anglicized nickname. This name may be vastly different from their legal name. Former House member, Louisiana Governor, and intermittent candidate for the Republican presidential nomination Piyush "Bobby" Jindal is the most prominent example of this phenomenon. Sriram and grindlife, in a review of decades of South Asian American local, state, and federal candidates for office, find that those who use a nickname are at a distinct advantage for electoral success.

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[1] https://www.thenation.com/article/dirty-tricks-south-carolina-and-john-mccain/. Last accessed: 03-17-2017

6.1 Prosodic Cues and Political Adaptation

The words they speak as well as the way they target and frame them are not the only ways that politicians can adapt to varied constituencies. Recent presidential candidates have altered assorted prosodic dimensions in attempts to adapt to their audiences. They also altered the formality and temporarily acquired an accent depending on what part of the country they were campaigning in. Barack Obama is known to alter his speech patterns depending on whether he is in front of a predominantly African-American audience or not. He will often engage in what Alim and Smitherman refer to as "styleshift" to accommodate his audiences. In front of more caucasian audiences he would use the most explicit expansion of phrases involving the verb *to be*. In front of a whiter audience he might declare "We are all right." While speaking in front of a predominantly black audience this might be contracted down to "We all right." Such distinctions may not be readily apparent if we were to review the official record of a speech.

> "Black Americans, more than any other group, were most sensitive to to Barack's styleshifting and offered more complex and layered descriptions of his linguistic steez (style). Black Americans not only noted the range and ability of Obama's styleshifting, many also distinguished between his language (grammatical structure) and his style (language use). ... 'Barack Obama may not sound "black" in a transcription of his speeches, but he definitely sounds black over audio recordings'." (Alim and Smitherman 2012, p. 6)

Obama's prosodic and lexical adaptations are not isolated. Hillary Clinton's utterances were under intense scrutiny in the 2008 and 2016 presidential election cycles. This was especially pronounced when she became the first female major party nominee for the White House. Throughout the history of her political career Clinton has adopted multiple regional accents. As a child from the Chicago suburbs she has spoken with the "standard American" Midwestern "non-accent". As the first lady of Arkansas she adopted a southern drawl that eventually dissipated until Bill made his own run for the White House. After settling into

D.C. her drawl attenuated once more.[2] She is not the first female politician to adapt to the prospect of ascending to the highest office in the land.

> "Margaret Thatcher, who in 1979 became Britain's first woman prime minister, was obliged shortly thereafter to submit to a linguistic 'makeover', lowering her voice-pitch by almost half the normal range, flattening out her prosodic contours and slowing her delivery to sound more authoritative." (Cameron 2005, p. 496)

In 2016 she was scrutinized for affecting a southern accent at a South Carolina campaign event. While being accused of pandering, a charge not uncommon for incumbents who have "gone native" in their time in D.C. only to have to return to their constituents and try to relate to them, there may be a less nefarious factor in play. Having lived long enough, and having been fortunate enough to have lived in multiple parts of the country, I have experienced people and their prones to speech in multiple contexts. A dear friend of mine happens to be a first-generation Indian American who was raised in the Chicago suburbs. In day-to-day discourse he displays the "non-accent". When I witness him talk around his family, he affects an accent not unlike that of his parents and sister, whose own prones were formed primarily in a Tamil-speaking region of India. I have another friend who is from New Jersey that speaks with a nondescript accent. He will likewise shift to something approximating a more stereotypically "Jersey" accent when he is around some of his extended family or in times of stress. While most likely a strategic performative act, both Obama and Clinton may also nonetheless be demonstrating a subconscious reflex of living in or returning to a linguistic community from their past.

Prosodic cues of pitch, pace, and loudness can be a source of strength or a point of weakness. The intersection of gender roles and their effect on scrutiny of such cues present themselves once again. A female politician fights an uphill battle in this respect. In chapter 5 I presented evidence of a gender-based divergence in performing different aspects of pitch. Female members of the House where more consistently not masculine in their pitch. Their

[2]For a detailed review of Hillary's vocal panoply visit https://www.youtube.com/watch?v=UCyvyyo6dtQ. Last accessed: 03-17-2017

pitch was lower than population the median for their own sex. Males on the other hand were more likely to have pitch medians above the median of the male population and were also more likely to have more "feminized" voices. Only when in looking at pitch variation did we see a stereotypically gender aligned patterns. Females were more expressive in having higher pitch variation while men were more controlled in having lower pitch variation. How does this relate to electoral dynamics? In the case of Hillary Clinton there may have been no way that it would not matter. If her pitch was too high, she was considered "shrill". If her pitch variation was too low she was considered "cold". Her controlled responses to aggressive male candidates were framed as those of a "robot" beep-booping out a script of talking points, deigning to feign humanity in a quest for power for power's sake.

Her male counterparts, particularly Bernie Sanders and Donald Trump, were not held to such high standards. Despite the bluster of the off the cuff and extemporaneous language of these two candidates, Donald Trump in particular interjecting "Wrong!" during the presidential debates comes to mind, they were largely forgiven for their prosodic missteps. Sanders's voice would crack and his syllables were rough and clipped. Trump would stretch his vowels "bigly" and demonstrate an aggressive pace in speech not too dissimilar in ways from Sanders. Some of this was the result of regional dialects from the greater New York City area influencing the vernacular and performance thereof for both of Clinton's main competitors. The asymmetries of payoff for altering her prosody as well as her words was similarly evident. If Hillary were to speak with the gruffness and openness of Trump or Sanders, then whe would be seen as unfit. If she remained controlled, then she was rigid and unfeminine. If she adjusted to play to the audience, then she was pandering. For Sanders and Trump the openness of expression was considered "authentic" and real. This was case even when taking into account the wildly divergent policy positions of Trump and Sanders.[3][4]

I will now translate lessons of the *what* and *how* of speaking learned from the campaign

[3]https://medium.com/@lindsayballant/bernie-hillary-and-the-authenticity-gap-a-case-study-in-campaign-branding-ef46845e11cb. Last accessed: 03-17-2017

[4]https://www.forbes.com/sites/johnzogby/2016/09/24/clinton-trump-and-the-battle-for-authenticity. Last accessed: 03-17-2017

literatures to my data set. In the following sections I will look at pitch and pitch variation cues to test their relationships to assorted electoral outcomes. How do legislators alter these prosodic dimensions in response to an altered electoral landscape? Do shocks to the system such as the census affect how legislators speak? Does the way they speak feed back into their electoral success? Do changes in the way that a legislator speaks serve as a signal of political aspirations?

6.2 Redistricting and Pitch Effects

Historically the post-census Congresses have changed the way that that House members speak. As discussed in chapter 2, the two-year period between when districts are redrawn and members run in those new districts for the first time tends to reduce member speaking probabilities. This is not consistent across all legislators. More established representatives that are often busy in D.C. have a greater reduction is speaking. This is the result of needing to rebuild one's reelection constituency. Newer legislators who were less removed from their constituents had less of a speaking drop off.

In this section I re-test census effects on the pitch and pitch variation dimensions. For all of these models I had to calculate some more variables. I took note of each legislator who spoke in each Congress and kept those who had pitch data between at least two consecutive Congresses. I then coded each House member's median pitch difference between Congresses. Since I did not have 108th Congress data I was only able to code for 109th-110th, 110th-11lth, and 111th-112th deltas. I also calculated the difference of each legislator's median pitch standard deviation in the same manner. The 1,037 data point that remained each represent a legislator-intercongress pitch dimension difference. I returned to the Stewart et al. (2017) historical committee data, this time using their notes field to code for one of a few outcomes aside from simply winning or losing an election. These included running for any non-House office, running for the Senate, or running for Governor of the legislator's home state. I cross-checked these outcomes with govtrack and bioguide data to fill in any gaps

that they may have missed.[5]

In my first models I examined whether post-census periods increased or decreased speaker pitch, a proxy for increased speaker aggression. Aside from the standard controls I have used in prior models and the ones I just mentioned, I included a control or a legislator's state delegation size in the House. I included the productivity measure tested in prior chapters. I used a simple binary for the post-census period in line with the models in chapter 2. I also created an interaction variable between this binary and the number of seats a legislator's state gained or lost due to redistricting.

The expectation here is that there could be a moderating effect where states lose seats. If a legislator's state loses seats then the there is some expectation that the districts should become slightly more ideologically diverse in the course of redrawing lines. I would also anticipate the inverse to be true. The more districts a state gains the less ideologically diverse districts should become. States with no gain or loss should remain relatively ideologically unchanged. In Table 6.1 we can see that there is no effect of the census interaction variable on legislators' pitch differences. The gain or loss of seats has no effect. The mere fact that a legislator was speaking in the post-census period accounts for an increase in pitch. This was not nearly as strong as the act of running for Governor or for the Senate. In Table 6.2 we find that males are have slightly greater pitch variation, though again this uptick in the proxy for emotional expression is accounted for more by the mere post-census period.

6.3 Appealing to Primary and General Election Voters

Can legislators be punished for not being aggressive enough in their advocacy on The Hill? Can they be rewarded for restraining their emotional expression? The findings of chapter 4 indicate that aggressive negativity can yield legislative productivity returns. This becomes more nuanced when we take into account the two-stage process of getting elected to congress. Candidates must survive a primary. This ordeal is generally a fait accompli, with incumbents

[5]http://bioguide.congress.gov

often going unchallenged. Nonetheless it is of some interest to test whether there are prosodic dimensions that can at least marginally account for whether an incumbent wins or loses her primary. In Table 6.3 I ran a binomial logit regression for probability of losing in a primary.[6] We see that legislators who become more aggressive in increasing their median pitch since the previous Congress are less likely to survive their contest. Those who increase their emotional expression by widening their pitch range are more likely to come out the other end unscathed.

A valid question of modeling and direction of correlation naturally arises when thinking about how I am trying to disentangle whether my response variable of winning a primary may account for prosodic differences more properly than the way I am presenting things in this and the following models. To test for this possibility I inverted each of my models so that, for example in this case, pitch change was the response variable and winning the primary was one of the explanatory variables. In model after model I found that the R^2 values for the models I am presenting were easily anywhere from a half to full order of magnitude greater than for those where I would have inverted my response and explanatory variables. To give you a sense of this, where the pseudo R^2 in my *Primary Election Loss* model was 0.146 for the post-census controlled version, when I flipped my variables the R^2 dropped off to 0.019. So there is some sense that my prosodic pitch variables are doing a much better job at accounting for my present response variables than the other way around.[7]

In Table 6.4 I dropped the cases where legislators lost their primaries and ran the same model with general election loss in place of primary loss. Speakers who increased their pitch variation since the prior Congress were less likely to lose. Median pitch change overall did not have any relationship to general election outcome. Neither post-census control was significant, while more ideologically extreme legislators had a greater estimated probability of winning.

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[6]In the subsequent binomial logit models I had to drop some of the dummy variables due to insufficient variation in the data for the 109th through 112th Congresses. These included Majority and Minority Leader as well as Committee Chair and Subcommittee Chair.

[7]Pseudo R^2 values were derived from the **lrm** function in the **rms** R library.

6.4 Vocal Expressiveness and Seeking Higher Office

Members of Congress have multiple channels to signal to potential challengers and fellow legislators their political aspirations. The most common desire is to maintain the status quo of holding their seat and climbing through the ranks to a position to create policies most ideal to their constituents' and their own preferences. They can signal to potential challengers that it is not worth the opponent's time and money to even file the papers for candidacy. By amassing a large enough war chest of campaign funding incumbents can scare away challengers, though the this seems to have differing effects when we take into account challenger quality (Box-Steffensmeier 1996; Goodliffe 2001). A means of signalling to your colleagues that you aspire to a higher office, particularly as a Senator considering a presidential run, is committee assignment requests. A major indicator that Hillary Clinton was going to seek the Democratic nomination occurred when she acquired a seat on the Senate Armed Services Committee. As a New York Times profile from 2005 noted:

> "[Clinton's] public statements and positioning on issues have aroused suspicions that she is setting the stage for a presidential run. Tellingly, some liberals, who make up the core of her political base, have complained that she has been ceding too much to the right, especially in her support for military action in Iraq."[8]

Her move to the right on matters of war, among other policy dimensions, further strengthened this assessment of her aspirations to higher office.

Here I consider the possibility that, much in the same what that increased loudness, pitch, and pace in speech might indicate higher levels of aggression, such vocal dimensions might also reveal aspirations to seek higher office. These may be conscious or subconscious in nature. As with the prior expectations of a larger population having a moderating effect, I suspect that House members who seek an office above their own district should restrain their pitch.

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[8] http://www.nytimes.com/2005/07/13/nyregion/the-evolution-of-hillary-clinton.html. Last accessed: 03-17-2017

In my data set I found a handful of legislators that sought office at the state and sub-state level. Bob Filner (D-CA) left the House to run for mayor in San Diego. Adam Putnam quit to run for Florida Commissioner of Agriculture. From time to time House members seek the highest office in the land. Ron Paul (R-TX), Paul Tancredo (R-CO), and Duncan Hunter (R-CA) had such aspirations.[9] The majority of my cases were for House members running for the Senate or their home state's governorship.

For Table 6.5 I ran a model for legislators who sought any office other than their current House seat.[10] Among my added controls was the variable for their state delegation size. The logic of this variable is that the larger the number of delegates, the less of the state the House member currently directly represents. Those with smaller delegations—ideally like a Wyoming or an Alaska with only one at-large representative—should be advantaged in seeking a state-level move. Those who perceive a natural advantage should be more likely to make a Senate or Governorship run. Out of line with my expectations, legislators appear to ratchet up their pitch relative to the prior Congress when running for another office. State delegation size has the expected sign. More successful legislators had greater predicted probabilities for seeking another office as well.

In Tables 6.6 and 6.7 I isolated on those who ran for the Senate or Governorship, respectively. While prospective senators had greater pitch changes than other office seekers generally, this relationship was stronger for for potential governors. Less experienced members were more likely to run for the Senate than a Governorship and the state delegation size effect becomes stronger. Gubernatorial candidates were more likely to be on one of the power committees, thought they also appeared to be less productive members of the House. For Senate candidates the post-census interaction variable becomes salient. Legislators whose states gained seats during the post-census period had a greater predicted probability of running for senator. It would be hard to test this due to small N problems of post-census periods

[9]Duncan Hunter the elder. Not his son who replaced him in Congress when he quit.

[10]Flipping the response variables in these models similarly suggested that my political aspiration model specifications provide a more ideal fit to the data.

only occurring every decade, but more districts means more curated districts strengthening potential partisan and incumbent gerrymandering. This was not borne out in any way in the 2012 election cycle, but House members whose states gained seats may have a greater incentive to run simultaneous House and Senate campaigns during the same cycle. In Table 6.8 I modeled for members who sought to be either a senator or governor. Minority members were more likely to seek these higher offices. They were more often held seats on one the power committees and tended to be more ideologically moderate. That this last finding was not present in any of the other office aspiration models is somewhat surprising.

6.5 Discussion

In this chapter I looked at electoral effect as both the cause of and response to assorted prosodic cues. Focusing on the House, I created inter-congress metrics to account for a legislator's changing her pitch or altering his pitch variation. Using the latter as an indicator of emotional expression range and the former as a proxy for aggression I uncovered multiple relationships. Many of them were out of line with my expectations of larger constituencies serving as moderating influences on legislator pitch dimensions. House members representing a smaller proportion of their state having lower predicted probabilities of running for higher office seems to balance this out though. Future research could benefit from a more nuanced measure of district differences post-census. Using mere seat counts as a metric for changes over time is admittedly blunt. A proper analysis of partisan as well as demographic and other socioeconomic details would better approximate district changes in post-census periods. It would also be able to capture such flux in the years leading up to the census.

Dietrich (2014) suggests that members who engage in greater incivility on the House floor may drive more constituents to the voting booths. This can work against them though as voters seem to come out to vote against such negativity (p. 173). Being more aggressively angry does not tend to mobilize your base to support you. Rather it activates your opponents to come out to vote against you. This effect could be at play in my findings for primary election loss. Legislators that increase their pitch are more likely to lose primary election

contests. There is some suggestion that as the two major political parties vary in their tolerance for anger and incivility. In line with most of the divergence in NOMINATE scores between the parties being driven by Republicans becoming asymmetrically more conservative than Democrats are becoming liberal, there is preliminary evidence that Republicans have a higher tolerance for incivility than Democrats (Fridkin & Kenney, 2011; Kahn & Kenney, 1999).

Thus a deeper dive into this possible pitch increase and primary election loss relationship could expand on these party interactions. Are Democrats less likely to be uncivil in their speech for fear of drawing out more quality primary party challengers? Are Republicans more likely to be actively negative in their floor debate to similarly dissuade quality challengers from surfacing? My models do not suggest any party effects for increase or decrease in either pitch or pitch variation between Congresses. What role might sex and gender effects play in tolerance for incivility. While males were not any more likely to lose in a primary or general election than females, they tend to have greater pitch changes between Congresses than their counterparts. Female candidates are harmed less by expressly uncivil negative campaign advertisements than men are, though there can be blowback against the attacker (Fridken et al. 2009, pp. 62-64; Banda & Windett 2016). If the proportion of attack ads coming from the candidates is heavily skewed to one over the other, then the estimation of the attacker by voters drops. While probably more relevant to systems like that in California where the top two vote getters in the primary run against each other in the general election regardless of their parties, might an uneven difference in pitch change between two incumbents running for a Senate seat have some effect? If so, might these pitch dynamics be further impacted by the demographics of our general election candidates? If a male legislator faces a female legislator, would he be at a natural disadvantage with regards to prosodic aggression in a way that two men or two women facing off against each other may not?

6.6 Tables and Figures

Table 6.1: Pitch Change: Census

	Census Interaction	**Census**
Ran for Senate	6.565**	6.109**
	(2.841)	(2.810)
Ran for Governor	6.697**	7.610***
	(2.835)	(2.809)
Male	2.450**	2.708**
	(1.243)	(1.230)
Majority	−3.262	−3.417
	(2.386)	(2.358)
Republican	−4.464	−3.270
	(3.172)	(3.145)
Ideology	3.001	1.941
	(2.942)	(2.912)
Ideological Extremity	1.526	0.109
	(3.217)	(3.193)
Congressional Experience	−0.150	−0.165

Continued on next page

Table 6.1 – continued from previous page

	Census Interaction	Census
	(0.115)	(0.114)
Majority Leader	0.010	0.284
	(2.468)	(2.437)
Minority Leader	2.021	1.286
	(2.806)	(2.778)
Committee Chair	0.434	0.337
	(2.204)	(2.179)
Committee Subchair	1.572	1.390
	(1.350)	(1.334)
Power Committee Member	−0.137	−0.136
	(1.031)	(1.019)
Budget Committee Member	0.819	1.239
	(1.657)	(1.640)
State Delegation Size	0.024	0.026
	(0.029)	(0.029)
Productivity	−0.006	−0.007
	(0.005)	(0.005)

Continued on next page

Table 6.1 – continued from previous page

	Census Interaction	Census
Post-Census x Seat Change	0.421	
	(0.741)	
Post-Census Period		4.996***
		(1.022)
Constant	1.085	−0.206
	(3.701)	(3.669)
Observations	1,036	1,036
R^2	0.040	0.061
Adjusted R^2	0.024	0.046
Residual Std. Error (df = 1018)	14.058	13.898
F Statistic (df = 17; 1018)	2.476***	3.920***
Note:	*p<0.1; **p<0.05; ***p<0.01	

Table 6.2: Pitch Variation Change: Census

	Census Interaction	Census
Ran for Senate	0.853	0.742
	(0.977)	(0.973)

Continued on next page

Table 6.2 – continued from previous page

	Census Interaction	Census
Ran for Governor	0.380	0.587
	(0.975)	(0.972)
Male	0.679	0.736*
	(0.428)	(0.426)
Majority	−0.888	−0.929
	(0.821)	(0.816)
Republican	−0.698	−0.417
	(1.091)	(1.089)
Ideology	0.563	0.305
	(1.012)	(1.008)
Ideological Extremity	0.685	0.362
	(1.107)	(1.106)
Congressional Experience	−0.050	−0.053
	(0.040)	(0.039)
Majority Leader	−0.477	−0.426
	(0.849)	(0.844)
Minority Leader	0.033	−0.140

Continued on next page

Table 6.2 – continued from previous page

	Census Interaction	Census
	(0.965)	(0.962)
Committee Chair	0.733	0.711
	(0.758)	(0.754)
Committee Subchair	−0.061	−0.099
	(0.464)	(0.462)
Power Committee Member	0.009	0.011
	(0.355)	(0.353)
Budget Committee Member	−0.539	−0.447
	(0.570)	(0.568)
State Delegation Size	0.008	0.008
	(0.010)	(0.010)
Productivity	−0.002	−0.002
	(0.002)	(0.002)
Post-Census x Seat Change	0.038	
	(0.255)	
Post-Census Period		1.143***
		(0.354)

Continued on next page

Table 6.2 – continued from previous page

	Census Interaction	Census
Constant	0.159	−0.136
	(1.273)	(1.270)
Observations	1,036	1,036
R^2	0.029	0.039
Adjusted R^2	0.013	0.023
Residual Std. Error (df = 1018)	4.836	4.812
F Statistic (df = 17; 1018)	1.809**	2.440***
Note:		*p<0.1; **p<0.05; ***p<0.01

Table 6.3: Lost Primary

	Census Interaction	Census
Pitch Change	0.041**	0.032*
	(0.017)	(0.017)
Pitch SD Change	−0.086*	−0.084*
	(0.051)	(0.050)
Male	−0.340	−0.193
	(0.833)	(0.837)

Continued on next page

Table 6.3 – continued from previous page

	Census Interaction	Census
Majority	1.429	1.147
	(1.413)	(1.459)
Republican	−0.091	0.310
	(2.048)	(2.127)
Ideology	0.413	0.032
	(1.817)	(1.909)
Ideological Extremity	1.999	1.719
	(2.023)	(2.098)
Congressional Experience	0.019	0.013
	(0.067)	(0.065)
Power Committee Member	−0.765	−0.745
	(0.791)	(0.790)
Budget Committee Member	−15.211	−15.067
	(1,143.457)	(1,115.466)
State Delegation Size	−0.036	−0.039
	(0.026)	(0.027)
Productivity	−0.002	−0.003

Continued on next page

Table 6.3 – continued from previous page

	Census Interaction	Census
	(0.003)	(0.003)
Post-Census x Seat Change	−0.380	
	(0.595)	
Post-Census Period		1.505**
		(0.604)
Constant	−5.853**	−6.496**
	(2.541)	(2.633)
Pseudo R^2	0.101	0.146
Observations	1,036	1,036
Log Likelihood	−63.211	−60.222
Akaike Inf. Crit.	154.422	148.443
Note:	*p<0.1; **p<0.05; ***p<0.01	

Table 6.4: Lost General Election

	Census Interaction	Census
Pitch Change	−0.002	−0.0002
	(0.013)	(0.013)

Continued on next page

Table 6.4 – continued from previous page

	Census Interaction	Census
Pitch SD Change	-0.059^{*}	-0.059^{*}
	(0.035)	(0.035)
Male	0.035	0.024
	(0.479)	(0.479)
Majority	-3.632^{***}	-3.626^{***}
	(0.923)	(0.920)
Republican	-2.546^{**}	-2.596^{**}
	(1.131)	(1.135)
Ideology	2.165^{*}	2.181^{*}
	(1.252)	(1.244)
Ideological Extremity	-6.188^{***}	-6.051^{***}
	(1.394)	(1.393)
Congressional Experience	0.014	0.015
	(0.039)	(0.039)
Power Committee Member	-0.268	-0.268
	(0.383)	(0.383)
Budget Committee Member	0.344	0.297

Continued on next page

Table 6.4 – continued from previous page

	Census Interaction	Census
	(0.566)	(0.566)
State Delegation Size	0.004	0.003
	(0.011)	(0.011)
Productivity	−0.0003	−0.0003
	(0.002)	(0.002)
Post-Census x Seat Change	−0.336	
	(0.365)	
Post-Census Period		−0.317
		(0.451)
Constant	2.369*	2.408*
	(1.344)	(1.341)
Pseudo R^2	0.12	0.118
Observations	1,023	1,023
Log Likelihood	−162.852	−163.072
Akaike Inf. Crit.	353.704	354.143
Note:	*p<0.1; **p<0.05; ***p<0.01	

Table 6.5: Ran For Non-House Position

	Census Interaction	**Census**
Pitch Change	0.027**	0.026**
	(0.013)	(0.013)
Pitch SD Change	−0.050	−0.050
	(0.041)	(0.041)
Male	−0.079	−0.073
	(0.514)	(0.514)
Majority	−0.802	−0.875
	(0.898)	(0.905)
Republican	−0.694	−0.671
	(1.241)	(1.244)
Ideology	1.157	1.167
	(1.202)	(1.208)
Ideological Extremity	−0.140	−0.242
	(1.308)	(1.316)
Congressional Experience	−0.074	−0.074
	(0.051)	(0.050)

Continued on next page

Table 6.5 – continued from previous page

	Census Interaction	Census
Power Committee Member	−0.036	−0.046
	(0.417)	(0.417)
Budget Committee Member	0.589	0.624
	(0.522)	(0.523)
State Delegation Size	−0.056***	−0.054***
	(0.018)	(0.018)
Productivity	0.004*	0.003*
	(0.002)	(0.002)
Post-Census x Seat Change	0.223	
	(0.288)	
Post-Census Period		0.336
		(0.384)
Constant	−0.734	−0.788
	(1.511)	(1.516)
Pseudo R^2	0.11	0.111
Observations	1,036	1,036

Continued on next page

Table 6.5 – continued from previous page

	Census Interaction	**Census**
Log Likelihood	−144.299	−144.190
Akaike Inf. Crit.	316.598	316.380
Note:		*p<0.1; **p<0.05; ***p<0.01

Table 6.6: Ran For Senate

	Census Interaction	**Census**
Pitch Change	0.035**	0.035**
	(0.016)	(0.017)
Pitch SD Change	−0.033	−0.033
	(0.056)	(0.055)
Male	−0.221	−0.284
	(0.597)	(0.594)
Majority	−1.123	−1.171
	(1.062)	(1.072)
Republican	−1.067	−1.171
	(1.474)	(1.472)
Ideology	1.079	1.208
	(1.464)	(1.464)

Continued on next page

Table 6.6 – continued from previous page

	Census Interaction	Census
Ideological Extremity	−1.019	−1.117
	(1.578)	(1.592)
Congressional Experience	−0.113*	−0.113*
	(0.066)	(0.065)
Power Committee Member	0.092	0.082
	(0.499)	(0.497)
Budget Committee Member	0.719	0.785
	(0.607)	(0.601)
State Delegation Size	−0.157***	−0.140***
	(0.043)	(0.040)
Productivity	0.005**	0.005**
	(0.002)	(0.002)
Post-Census x Seat Change	0.788*	
	(0.438)	
Post-Census Period		0.391
		(0.457)

Continued on next page

Table 6.6 – continued from previous page

	Census Interaction	**Census**
Constant	1.019	0.976
	(1.680)	(1.686)
Pseudo R^2	0.223	0.215
Observations	1,036	1,036
Log Likelihood	−96.748	−97.645
Akaike Inf. Crit.	221.496	223.290
Note:		*p<0.1; **p<0.05; ***p<0.01

Table 6.7: Ran For Governor

	Census Interaction	**Census**
Pitch Change	0.037**	0.041***
	(0.015)	(0.016)
Pitch SD Change	−0.027	−0.031
	(0.045)	(0.046)
Male	−0.518	−0.541
	(0.688)	(0.690)
Majority	−1.905	−1.263
	(1.877)	(1.901)

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Table 6.7 – continued from previous page

	Census Interaction	Census
Republican	4.058	3.921
	(2.801)	(2.754)
Ideology	−1.804	−1.782
	(2.559)	(2.482)
Ideological Extremity	−1.643	−1.454
	(2.792)	(2.729)
Congressional Experience	0.053	0.054
	(0.054)	(0.055)
Power Committee Member	0.984**	0.991**
	(0.444)	(0.449)
Budget Committee Member	−0.670	−0.755
	(1.078)	(1.078)
State Delegation Size	−0.025	−0.026
	(0.018)	(0.018)
Productivity	−0.005*	−0.005*
	(0.003)	(0.003)

Continued on next page

Table 6.7 – continued from previous page

	Census Interaction	**Census**
Post-Census x Seat Change	0.045	
	(0.532)	
Post-Census Period		−1.602
		(1.125)
Constant	−5.828*	−5.703
	(3.537)	(3.478)
Pseudo R^2	0.29	0.301
Observations	1,036	1,036
Log Likelihood	−91.873	−90.503
Akaike Inf. Crit.	211.746	209.006
Note:	*p<0.1; **p<0.05; ***p<0.01	

Table 6.8: Ran For Senate or Governor

	Census Interaction	**Census**
Pitch Change	0.035***	0.037***
	(0.011)	(0.011)
Pitch SD Change	−0.030	−0.029
	(0.035)	(0.035)

Continued on next page

Table 6.8 – continued from previous page

	Census Interaction	Census
Male	−0.283	−0.308
	(0.447)	(0.446)
Majority	−2.251***	−2.179**
	(0.867)	(0.876)
Republican	0.529	0.431
	(1.171)	(1.166)
Ideology	0.298	0.380
	(1.196)	(1.186)
Ideological Extremity	−2.555**	−2.474*
	(1.267)	(1.269)
Congressional Experience	−0.020	−0.020
	(0.041)	(0.040)
Power Committee Member	0.663**	0.655**
	(0.318)	(0.318)
Budget Committee Member	0.159	0.155
	(0.522)	(0.523)

Continued on next page

Table 6.8 – continued from previous page

	Census Interaction	**Census**
State Delegation Size	-0.063^{***}	-0.060^{***}
	(0.017)	(0.017)
Productivity	0.0002	0.0004
	(0.002)	(0.002)
Post-Census x Seat Change	0.281	
	(0.274)	
Post-Census Period		−0.262
		(0.392)
Constant	−0.003	0.066
	(1.455)	(1.455)
Pseudo R^2	0.177	0.176
Observations	1,036	1,036
Log Likelihood	−177.755	−177.978
Akaike Inf. Crit.	383.510	383.957
Note:	*p<0.1; **p<0.05; ***p<0.01	

CHAPTER 7

The Future of Politics and Sound

7.1 Review

Has politics become more uncivil or are we focusing on the outliers? In this dissertation I have argued that though there may be polarization in voting scores and—to a lesser extent—the language of our representatives, that this is not necessarily the case when we look at *how* they speak. Even the words that they speak may be skewed depending on our source. Either through intentionally focusing on conflict, or indirectly giving voice to extremists by attempting to portray an even balance of support on policies, the media can overstate controversy, anger, and aggression. If we look solely at the words in the Congressional Records to determine levels of conflict, incivility, and nastiness then we run into the opposite skewing.

Rules of decorum prevent legislators from displaying the full range of rudeness that they may want to express. Barney Frank indirectly called Tea Party members in the House "crazy" to avoid a violation of speaking rules. More recently Sen. Elizabeth Warren (D-MA) temporarily lost the privilege to speak because she "impugned the motives and conduct of" Senator-cum-Nominee Jeff Sessions (R-AL). Reading a letter from Coretta Scott King critical of Session's 1986 nomination to a federal judgeship Warren was told to take a seat. As Senate Majority Leader Mitch McConnell (R-KY) put it "She was warned. She was given an explanation. Nevertheless, she persisted."[1] Such incivility—real or perceived—does not remotely begin to touch the vitriol in the Republican primaries and the general election. This is not to say that legislators would not display such lack of decorum were speech rules

[1]Congressional Record [6 Feb. 2017] S855.

not in place to punish them for stepping out of line. Rather, the very presence of such norms of discourse make using political debate as such in congress incomplete.

Where vote scores and textual analysis may come up short, the spirit of the words does not. Words are not merely words, especially in the throes of political discussion. How the words are said can relate as much if not more of the meaning that the speaker is trying to get across to the audience. This audience can vary, as can their response to the series of grunts and whistles that candidates and legislators produce. Making sounds and saying words in political discourse are intertwined. In this dissertation I have presented evidence that not only do these sounds attendant to the actual meaning of the words matter, they matter to multiple audiences. This is true even when we look solely at debate within the constraints of the House and Senate floors.

To test the effects of the prosodic elements of speech, the details of these sounds, on various political outcomes I had to create a large, novel, and expansive data set. In an effort to capture a consistently framed, yet sufficiently topic-diverse, catalog of speeches I turned to the C-SPAN archives. The C-SPAN video library is an unspeakably underutilized source of political information. While I concerned myself exclusively with floor proceedings, this data source has yet to be used to even a fraction of its full potential. It is an invaluable repository of campaign proceedings, congressional hearings, interviews of elite political actors, and international relations history. As a matter of practicality and political symmetry I scraped in the House and Senate floor proceedings from the 109th through 112th Congresses. This covered the period from 2005 to 2012. It also provided me with a balancing of data to test assorted theories of party control, government divisions, and redistricting. These 8 years encompassed 4 years each of Republican and Democrat presidencies as well as 4 years each of divided and unified government.

After building a distributed, redundant, fault-tolerant scraping workflow I pulled in over 60 million seconds of footage from the C-SPAN servers, amounting to nearly 700 days of data. Your angry is not my angry. Your relaxed is not necessarily my relaxed. Translating this reality to members of congress, I took 6 million screenshots of my video to isolate on 10-second frames where the speaker was clearly speaking on camera. I then drew a sample

of over 1 million seconds of footage and derived my assorted prosodic dimensions. These included speaker pace, loudness, pitch, and pitch variation. Higher levels of these factors are associated with emotional activation and increased speaker aggression.

Looking solely at the sounds that legislators make, can we argue that legislators have become more uncivil and rude? Not directly. However, we can see that people in congress are becoming more fevered in their speech. Over my 8 year period each of these vocal dimensions increased. Becoming more aggressive is not necessarily becoming more aggressively negative. To test whether legislators yelling and raising their pitch are not merely becoming especially vigorous cheerleaders of comity and bipartisanship, I added a lexical component. One major shortcoming of the C-SPAN library is its spotty and inconsistent captioning of the actual words that members speak. To address this shortcoming I supplemented the C-SPAN library with the House's own recordings of their proceedings. This video is accompanied by closed captioning. While helpful, the House collection was drastically hampered in that it only began in the 111th Congress—merely half of my C-SPAN timeframe. Nonetheless it helped answer the question of aggression and sentiment. Using a sentiment API to code text as positive or negative, I found that higher-aggression speeches were also more negative in the actual words that were spoken. Understanding that congress is designed to constrain the negativity that legislators express in the name of decorum, we can still see that over time people on The Hill are becoming more aggressively negative in the way they speak.

Turning to the causes and effects of these prosodic changes, I find that House members are more likely to speak aggressively and that more controversial legislation—denoted by CQ Key Votes debate—similarly encourages aggression. There is some preliminary evidence that when Republicans are in the minority they are generally more aggressive speakers than Democrats in the minority, though this is not consistent across all of the vocal dimensions I look at. This may have less to do with party per se though. Across all of my models more ideologically extreme legislators had more elevated pace, pitch, and pitch variation levels. Post-census time periods also increased pitch and pitch variation. On the other side of things, speaking style affected productivity. Faster speakers were less capable of drawing cosponsors on their legislation while those with greater pitch variation experienced the opposite. The

inverse was true for legislators' abilities to move things through congress to the president's desk. When it came to electoral outcomes, those who raised their pitch were more likely to lose in a primary. I also found that such a raise in pitch can signal political aspirations to higher office, in particular the Senate or a Governorship.

7.2 Regional Speaking Patterns

There are nuances of speech that I did not get to in this dissertation. This is partially because they may be more complex than a computer can handle. One of these is the reality of regional variations of emotional expression. Subsequent to this is the issue of passive aggressiveness that may result from these variations. The way people express anger seems to have distinct regional differences. To put it in rude terms, if someone gets so angered that they want to tell someone to "Fuck off!" they will express this differently depending on which part of the country they are from. The argument goes that in Manhattan if someone wants to tell you to "fuck off", then they will just tell you to "fuck off". In Los Angeles this is not so direct. The L.A. "fuck off" is "Let's do lunch." It is not as expressly aggressive, but if read correctly it relates the same sentiment. The speaker has grown weary of the person he is addressing and wishes for that person to depart from his presence. The Midwestern version of this is to say nothing and slowly die of an ulcer from not feeling the emotional release of getting the anger off of their chest. In more genteel southern parts of America this can be expressed in a manner that would be especially confusing to a non-human text analyzer. In a place like Texas you may hear an exasperated person state tell someone "aren't you sweet?" This may be interspersed with an occasional "bless your heart" or "isn't that special?".

Presuming such prones are at least somewhat true what might account for such differences? Classic political contract theory might have something to say about this. Montesquieu would argue that this is a matter of the climate that temperature influences attitude.

> "People are therefore more vigorous in cold climates. Here the action of the heart and the reaction of the extremities of the fibres are better performed, the temperature of the humours is greater, the blood moves more freely towards the

> heart, and reciprocally the heart has more power. ... If we travel towards the north, we meet with people who have few vices, many virtues, and a great share of frankness and sincerity. If we draw near the south, we fancy ourselves entirely removed from the verge of morality; here the strongest passions are productive of all manner of crimes, each man endeavouring, let the means be what they will, to indulge his inordinate desires. In temperate climates we find the inhabitants inconstant in their manners, as well as in their vices and virtues: the climate has not a quality determinate enough to fix them." (*The Spirit of Laws*, pp. 246-49)[2]

Rousseau likewise argues that personality, and thus governability, of people is influenced by climate. Those from colder climates tend to be more densely packed as a matter of survival and are thus simultaneously more unruly, yet more predisposed to a democratic system. Those from warmer climates are more spread out and thus more governable with a propensity towards monarchy (*The Social Contract, Book III, Chapter VIII*).[3] More recent psychological research supports Montesquieu's assertions. Pennebaker et al (1996) have found that northerners are identified, and self-identify, as more emotionally constrained than southerners in the same country.

If regional weather variations affect the expressive range of aggression that politicians display, it is almost certainly more nuanced than this. Being in a cold place does not make one express rage more freely. While a person from the Tri-State Area may be frank and gruff enough to readily tell you to she feels this is probably not the case for an Upper Midwestern American in a place like Minnesota. Perhaps it is the cold compounded with a perceived increase in resource competition in a higher density population center that may make one more ready to express aggression. But what of the genteel passive aggression? As a former fellow graduate student from Texas that I knew from my time at Georgetown once said to me: "An armed society is a polite society." While Montesquieu would argue that living

[2]http://socserv2.socsci.mcmaster.ca/econ/ugcm/3ll3/montesquieu/spiritoflaws.pdf. Last accessed 03-20-2017

[3]https://ebooks.adelaide.edu.au/r/rousseau/jean_jacques/r864s/. Last accessed 03-20-2017

in a warmer climate leads to moral looseness, this may be counterbalanced by the ready availability of guns. Regardless of the source of such variations in expressions of anger, how does it contribute to political outcomes? At the policymaking level, controlling for other matters such as higher constituency demand for policies from particular committees, are passive aggressive legislators more productive committee leaders? Or does a committee benefit from a more direct approach? At the electoral stage of the game, might regional speaking proclivities work for or against candidates as they seek higher and higher office? While a more strident tone may work well for a northeastern legislator in a fairly homogenous district, does it translate effectively once he seeks the Executive Office at the State level? How well would his penchant for vociferous speaking play out in front of a presidential caucus audience in Iowa or a South Carolina primary?

7.3 Committees

Turning to committees, future research on speaking patterns can explore the interaction of its members, the way they talk to each other, and the output levels of committees. The incivility *within* a committees may be even higher than that in the parent chamber. How might such infighting and aggression fluctuate given proximity to a primary or general election? How might it vary given the spread—or lack thereof—of pork tied to a policy? In a 70-year review of Supreme Court nominee hearings in the Senate Judiciary Committee from 1939 to 2009, Ringhand and Collins present evidence that the tone of these hearings has become more aggressive and highly partisan. This has especially been the case since the Robert Bork hearings in 1987 (Ringhand & Collins 2010, p. 592). Potential grandstanding in committees, and the potential for grandstanding to be systematically presented by congress members in selecting which hearings to hold publicly, presents many issues in any prosodic analysis.

There's even some debate as to what the actual function of a committee hearing is. Congress member do not seem to be persuaded by hearings, at least not those actually engaged in the hearing. They appear to be highly orchestrated events following scripts, sometimes quite literally. Oleszek notes a committee staffer commenting that legislators are

often provided a series of questions with an accompanying list of answers from witnesses well in advance of the hearing itself (Oleszek 2013, p. 126). Hearings can occasionally be more properly thought of as "listenings" when viewed from the standpoint of the witnesses who theoretically are meant to contribute to a back-and-forth in a meeting of minds on important policy matters. Legislators can often use their allotted 5 minutes to question the witness as an opportunity to deliver a 4 minute and 50 second speech where the witness is merely asked if they agreed or not in the remaining time.

Grandstanding (and the potential vocal aggression cues that may accompany them) can become so egregious that even the committee chair will want nothing to do with it. One of the most visible recent examples of a chair not taking kindly to perceived legislative bloviation was during a House Judiciary Committee hearing in June 2005. While discussing USA PATRIOT Act reauthorization, Rep. Sensenbrenner (R-WI) took exception to repeated conflation of the bill with Guantanamo Bay. Ultimately the chair decided he had had enough of this, gaveled the hearing to a close, and had the microphones turned off; leaving the C-SPAN cameras on to cover the witnesses and minority party in the room as the Republican committee members abruptly exited.[4] While an intriguing source of potential prosodic analysis, any review of committee behavior is problematic for many reasons.

7.4 Lying

When I discuss my research with people the most common question I get is whether I can capture politicians doing what stereotypically comes most naturally for them. I am asked whether I can tell if they are lying. Part of this is a result of the people asking me confusing campaign statements with blatant mistruths. There is a distinction between politician as candidate and politician as executive or, for the purposes of this dissertation, legislator. There is also a nuance in understanding what exactly "lying" entails. Running for office generally involves making promises. When a person makes a promise, presuming that she

[4]http://www.washingtonpost.com/wp-dyn/content/article/2005/06/10/AR2005061002110.html Last accessed 03-20-2017

does not know for a fact with absolute certitude her ultimate ability to fulfill the promise without qualification, she likely make an antecedent decision. This is the decision to over- or under-promise. Strategically it is probably wisest to avoid promises altogether. Yet it can be difficult to dodge such commitments. If forced to make a promise it is much more preferable to under-promise. This places those making the guarantee at a distinct advantage. They are setting themselves up to pleasantly surprise their audience. If one under-promises one can over-deliver on that promise. The risk-to-reward ratio is skewed to the benefit of the person making the promise. The lower the expectations the greater the potential to meet or exceed these expectations.

A politician whose campaign slogan is something on par with "I will do my best, but seriously do not expect much" is highly unlikely to get elected. Similar assertions that things probably will not change much in the day-to-day lives of voters, while probably much closer to any absolute objective truth than any promise his opponent might make, is a similarly unwise tactic for a candidate. Politicians are naturally biased to over-promise. This sets them up to under-deliver. If voters hold them at the plain-word meaning of such promises, any deviation in outcome from the one declared on the campaign trail can be thought of as "lying". Party effects can magnify or minimize the perceptions on untruth. Though the valence and intensity of this may be inconsistent. A constituent who identifies with the party of the under-delivering politician may feel more "lied" to than an other-party constituent. Though when it comes to any subsequent election the challengers for a Senate seat or the White House will be the ones most likely to seize upon these "lies" in campaign commercials, presenting them as blatant betrayals of the trust of those who had voted for the incumbent. A sophisticated enough voter will understand this bias to over-promise when running for office. They would be better served in understanding that a campaign promise is a declaration of what ***could*** be, not a contractual statement of what ***will*** be. In some ways it is the voter's own fault if he does not become suspicious of any candidate whose promises become so grandiose that they are ultimately a promise of failure.

There is something at the core of this question of lying, nonetheless. If they are not lying in making campaign promises, candidates could be lying in at least two subsequent ways.

One is more directly important to the voter than the other. A politician could be lying about themselves, perhaps by omission or in an embellishment of their biography or qualifications to hold office. Barring any blatantly fraudulent statements, the desire to present the best version of yourself to prospective voters is forgivable in the pursuit of office. If candidates are hesitant to expose their every wort and scar in getting to office, so long as they serve their constituents to the best of their abilities when office, this should be a minor concern to voters. It is a translation of the over-promising of policy outcomes to the person responsible for fighting for those outcomes. The untruth that voters should be concerned about is that of being lied to about the policies that their elected officials pursue. If a politician knows for certain that a piece of legislation will harm his constituents, yet argues for and presents it as if it were a clear benefit, then this is an instance of lying that perhaps fits the definition those curious about my research have in mind. Even then there are caveats. One is problem of philosophical disagreement which can arise between voter and politician. A libertarian congressperson who believes that minimizing the government is a benefit to society may slash at regulations out of a sense of duty to her constituents. However, in her sincere desire to free her friends and neighbors of the perceived shackles of government overreach, she may accidentally allow for the dumping of pollutants into the groundwater in her district. This may lead to an unfortunate increase in disease and death. She is unlikely to have run on the "I may cause great suffering and loss of life" platform. In this way she could not be thought of as committing a political lie. Lying at its core involves a knowing. Knowing the truth and further knowingly presenting the opposite of this truth is the sin of lying, especially in the political context. At the risk of reiterating the sentiments of a former Secretary of Defense, there is a such a thing as knowing what you do not know. Presenting a ***possible*** harm or benefit as the opposite of what it may be falls below this threshold of untruth. This certainty of uncertainty is likely the cause of equivocation by politicians. In the context of this dissertation and an audio-specific analysis of political speech this uncertainty is probably the best I could capture. As mentioned in chapter 5 there may be pitch differences indicative of extemporaneous or scripted utterances of untruth. But these may also be associated with the general uncertainty. Considering the virtual impossibility of any given lawmaker both

reading and understanding every word of every piece of legislation they advocate for, vocal indicators of uncertainty should be commonplace. Any attempts to capture lying of any kind is limited by the paradox of lying itself. The truth about liars is that if they are good at it, they project certitude. They project a righteous sense of knowing that may be accompanied by lower indicators of uncertainty than would be found in the vocal patterns of the well-meaning if under-informed politician or even the person who knows and speaks absolute truth.

7.5 Body Language, Gesture Analysis, and Visual Communication

Among the unexplored dimensions of the data I have collected for this project are the visual elements. I have captured both the sights and sounds of political discourse. Using the footage and the non-verbal cues that permeate them may allow for an intriguing intersection of analysis with speech. Much has been made in popular psychology of certain purported physical manifestations of lying. When talking to someone you can determine if they are telling the truth depending on their eye movements (Steinbach 1984). If they blink too much then they may be lying as well (Leal & Vrij 2008). Other scholars have argued that its not your lying eyes, but rather your lying hands that betray you (Wiseman et al. 2012; Pérez-Rosas et al. 2015). The intrigue of developing an objective measure to capture politicians in the act of lying may be sexy. But other dimensions can be extracted. As much as we can uncover aggression, fear, passion, charisma, or indifference from listening to prosodic cues, the visual elements may be more powerful.

I do not need to hear a legislator speak to know that he is going through the motions. If he is looking down at his prepared speech and does not look up to address the cameras, he is disinterested in the matter he is technically "advocating" for. If he intently stares at the camera and looks about to recognize the multiple cameras in the House then he is engaged with the audience. If he shakes his hands, clenches them into fists, and synchronizes them with the syllables of his words, then he is especially invested. All of these inferences could

be drawn from the video I have captured with the speakers muted. Occasionally legislators will actively engage in a visual language of communicating to their constituents and fellow legislators. This involves the use of props; more specifically charts and graphs. One question of interest is whether a picture is really worth a thousand words. Are legislators who use these graphical representations of policy effects relying on them to substitute for or complement a passion in their speech? Do they need to yell if the numbers speak for themselves? Are they more or less likely to use visual aids when discussing a social issue bill compared to a more technical budgetary bill? How does this feed back into prosodic indicators of passion, charisma, or anger?

7.6 Conclusion

In this dissertation I have looked at, among other emotions, expressions of anger. In doing so I have not captured every means of expressing displeasure. When some people get angry, they raise their voices. Others quiver with rage while raising their pitch. Some slow their speech and hit their syllables harder. Anger can be expressed by other means. It may be the passive aggression that could be at play in regional variations of speech intersecting with gender expectation. But it may also be demonstrated in withdrawal. Some people, when they get especially angry, become very quiet. In a political context this is not likely to be captured. An angry legislator is not going to take the time allotted to him for debate to stand at the rostrum silently. He will not use this time to cross his arms and actively avert his gaze from the cameras. He will not respond with "you know what you did" should the speaker pro tempore ask the distinguished gentleman ask why he is giving the chamber the silent treatment. With anger, fear, joy, uncertainty, and any other emotion at our disposal we can never fully capture their every manifestation and permutation. In dealing with political actors this can be an especially difficult task. While limited in the scope of this dissertation, there is nonetheless still some hope that such endeavors will become more feasible as computing technologies begin to rise to meet the aspirations of political psychology and linguistics.

In closing I return to the question of negativity. Is there something primal and subconscious about aggression, anger, and uncivil words that makes them register with us in a way that measured speech does not? In his defense of negativity Geer (2006) argues that negative advertisements tend to both directly address issues that are at their core more important to voters and the electorate with data to make more informed decisions. A commercial about how a candidate is the kind of guy you would want to have a beer with is not as valuable in deciding how to vote as one attacking him. The latter is more likely to include hard numbers about the candidate's position on tax policy, the number of votes he has missed during his time in office, and the amount of money he has received from lobbyists whose interests may conflict with those of his constituents.

Does this attention to detail and sophistication of information translate to the speeches members on The Hill deliver? Are more negative speeches packed with greater information providing voters and fellow legislators the data they need to make more enlightened decisions? Using the reading level complexity of speeches as a proxy for increased information, the indication is that this is not the case. In Figure 7.1 I graphed the net positive sentiment score of a speech against the speech's grade level.[5] We can see a slight positive relationship between positivity and complexity. While the relationship is slight, as we can see in Table 7.1 it is highly statistically significant. This seems to suggest that floor speeches are not like campaign commercials. Negative speeches are at their heart simpler. Perhaps this is the power behind such messages. If positive speeches are more wonky, more packed with information leading to uncertainty amongst both constituents back home and legislators in D.C., then they may be regarded with distrust. When speaking with anger and negativity, politicians may not only be making a basic emotional connection they may also be making an appeal less cluttered by details. Their anger may lack nuance, but its simplicity can be its strength.

[5]Speech grade levels are derived from the **readability** package in R.

7.7 Tables and Figures

Table 7.1: Speech Reading Level Complexity

	Grade Level
Net Positive Sentiment	3.021***
	(0.141)
Constant	8.110***
	(0.046)
Observations	10,298
R^2	0.043
Adjusted R^2	0.043
Residual Std. Error	4.580 (df = 10296)
F Statistic	461.189*** (df = 1; 10296)
Note:	*p<0.1; **p<0.05; ***p<0.01

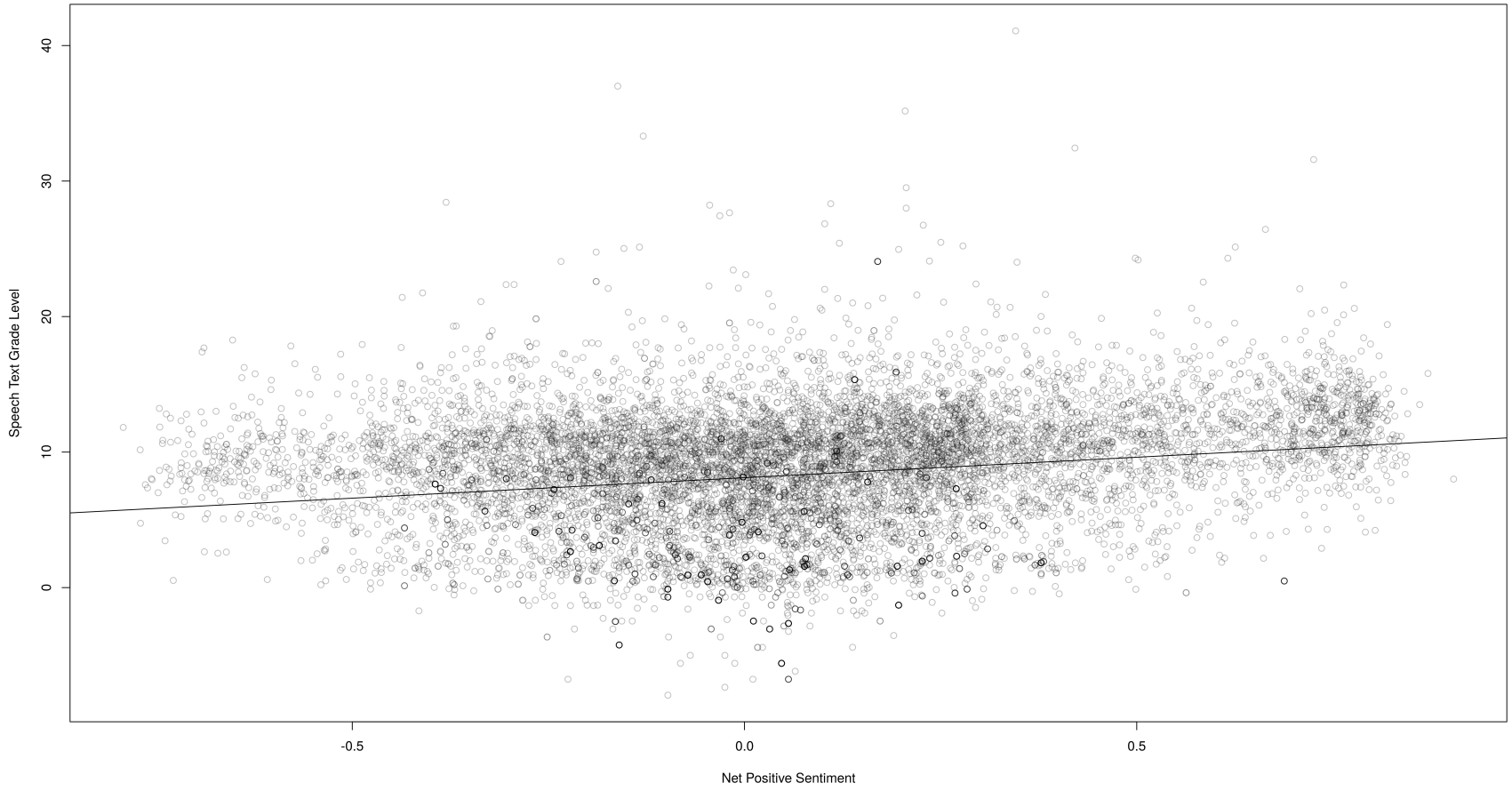

Figure 7.1: Speech Grade Level Readability vs. Speech Sentiment

References

149 Cong. Rec. H2968 (daily ed. Apr. 9, 2003) (statement of Rep. Cubin).

158 Cong. Rec. H6263 (daily ed. Sep. 21, 2012) (statement of Rep. Frank).

163 Cong. Rec. S855 (daily ed. Feb. 6, 2017) (statement of Sen. McConnell).

Abrajano, M. (2010). *Campaigning to the New American Electorate: Advertising to Latino Voters.* Stanford University Press.

Adler, E. and Lapinski, J. (1997). "Demand-side theory and congressional committee composition: A constituency characteristics approach." *American Journal of Political Science*, 895-918.

Aldrich, J. and Rohde, D. (2000). "The Republican Revolution and the House Appropriations Committee." *Journal of Politics*, 62(1), 1-33.

Alim, H. and Smitherman, G. (2012). *Articulate while Black: Barack Obama, language, and race.* Oxford University Press.

Ansolabehere, S., Snyder Jr, J., & Stewart, C. (2000). "Old voters, new voters, and the personal vote: Using redistricting to measure the incumbency advantage." *American Journal of Political Science*, 17-34.

Ardoin, P. and Vogel, R. (2008) "Ask Me No Question, I'll Tell You No Lies: Does the Bradley Effect Still Exist?" *Race, Gender and Class: An Interdisciplinary and Multicultural Journal*, 15(3-4), 65-84.

Arnold, R. (1992). *The logic of congressional action.* Yale University Press.

Bale, S., Amos, C., Parry, D., & Bale, A. (1991). "Relationship between head circumference and height in normal adults and in the nevoid basal cell carcinoma syndrome and neurofibromatosis type I." *American journal of medical genetics*, 40(2), 206-210.

Banda, K. and Windett, J. (2016). "Negative Advertising and the Dynamics of Candidate Support." *Political Behavior*, 38, 747-766.

Bartels, L. (2016). "Unequal democracy." Princeton University Press.

Bonica, A. (2013). "Ideology and interests in the political marketplace." *American Journal of Political Science*, 57(2), 294-311.

—. (2014). "Mapping the ideological marketplace." *American Journal of Political Science*, 58(2), 367-386.

Box-Steffensmeier, J. (1996). "A Dynamic Analysis of the Role of War Chests in Campaign Strategy." *American Journal of Political Science*, 40(2), 352-71.

Breitenstein, C., Lancker, D., & Daum, I. (2001). "The contribution of speech rate and pitch variation to the perception of vocal emotions in a German and an American sample." *Cognition & Emotion*, 15(1), 57-79.

Bright, L. et al. (2014). "Is there a correlation of sonographic measurements of true vocal cords with gender or body mass indices in normal healthy volunteers?" *Journal of emergencies, trauma, and shock*, 7(2), 112.

Burrell, B. (2015). "Women's Political Leadership Roles" in *Polarized Politics: The Impact of Divisiveness in the US Political System*, Edited by William Crotty. Boulder, CO: Lynne Rienner.

Cain, B., Ferejohn, J., & Fiorina, M. (1987). *The Personal Vote: Constituency Service and Electoral Independence.* Harvard University Press.

Cameron, D. (2005) "Language, Gender, and Sexuality: Current Issues and New Directions." *Applied Linguistics* 26(4), 482-502.

Canon, D., Nelson, G., & Stewart, C. (2017). *Historical Congressional Standing Committees, 1st to 79th Congresses, 1789-1947.*

Carpinella, C. and Johnson, K. (2012). "Appearance-Based Politics: Sex-Typed Facial Cues Communicate Political Party Affiliation." *Journal of Experimental Social Psychology*, 49(1), 156-160.

Carr, T. (2005). *Suspension of the Rules in the House of Representatives.* Congressional Research Service.

Cartei, V. and Reby, D. (2012). "Acting gay: Male actors shift the frequency components of their voices towards female values when playing homosexual characters." *Journal of Nonverbal Behavior*, 36(1), 79-93.

Chuenwattanapranithi, S., Xu, Y., Thipakorn, B., & Maneewongvatana, S. (2007). "The Roles of Pitch Contour in Differentiating Anger and Joy in Speech." *International Journal of Signal Processing*, 3, 129-134.

Cowie, R., Douglas-Cowie, E., Savvidou, S., McMahon, E., Sawey, M., & Schröder, M. (2000). "Feeltrace: An Instrument for Recording Perceived Emotion in Real Time." In Proceedings of the ISCA Workshop on Speech and Emotion: A conceptual framework for research, 9-24.

Deason, G., Greenlee, J., & Langner, C. (2015). "Mothers on the campaign trail: Implications of politicized motherhood for women in politics." *Politics, Groups, and Identities*, 3(1), 133-148.

De Montesquieu, C. (1989). *Montesquieu: The Spirit of the Laws.* Cambridge University Press.

DeSilver, D. (2014). "In Late Spurt of Activity, Congress Avoids 'Least Productive' Title." Pew Research Center.

Dietrich, B. (2014). "Its Not What You Say, But How You Say It: Anger, Audio, and the U.S. House of Representatives." Ph.D. diss. University of Illinois at Urbana-Champaign.

Edwards III, G., Barrett, A., & Peake, J. (1997). "The legislative impact of divided government." *American journal of political science*, 545-563.

Fenno, R. (1978). *Home style: House members in their districts.* Pearson College Division.

Forgette, R. and Morris, J. (2006). "High-Conflict Television News and Public Opinion." *Political Research Quarterly*, 59(3), 447-456.

Fowler, J.H. (2006). "Legislative Cosponsorship Networks in the US House and Senate." *Social Networks*, 28, 454-465.

Fraccaro, P. et al. (2011). "Experimental Evidence that Women Speak in a Higher Voice Pitch to Men They Find Attractive." *Journal of Evolutionary Psychology*, 9(1), 57-67.

Fridkin, K. and Kenney, P. (2011). "Variability in Citizens' Reactions to Different Types of Negative Campaigns." *American Journal of Political Science*, 55(2), 307-325

Fridkin, K., Kenney, P., & Woodall, G. (2009). "Bad for Men, Better for Women: The Impact of Stereotypes During Negative Campaigns." *Political Behavior*, 31, 53-77.

Gaudio, R. (1994). "Sounding gay: Pitch properties in the speech of gay and straight men." *American speech*, 69(1), 30-57.

Geer, J. (2006). *In Defense of Negativity: Attack Ads in Presidential Elections.* University of Chicago Press.

Geraedts, E. et al. (2011). "Association between head circumference and body size." *Hormone research in paediatrics*, 75(3), 213-219.

Gilmour, J. (2011). "Political theater or bargaining failure: why presidents veto." *Presidential Studies Quarterly*, 41(3), 471-487.

Goodliffe, J. (2001). "The effect of war chests on challenger entry in U.S. House elections." *American Journal of Political Science*, 45, 830-844.

Grammer, K. and Thornhill, R. (1994). "Human (Homo sapiens) facial attractiveness and sexual selection: the role of symmetry and averageness." *Journal of comparative psychology*, 108(3), 233.

Grimmer J. (2013). *Representational Style in Congress: What Legislators Say and Why It Matters.* Cambridge University Press.

Grimmer, J. and Stewart, B. (2013). "Text as data: The promise and pitfalls of automatic content analysis methods for political texts." *Political analysis*, 267-297.

Groeling, T. (2010). *When Politicians Attack: Party Cohesion in the Media.* Cambridge University Press.

Hamilton, J. (2004). *All the News That's Fit to Sell: How the Market Transforms Information into News.* Princeton University Press.

Han, D. et al. (2005). "Estimation of the length of the nares-vocal cord." *Anesthesia & Analgesia*, 100(5), 1533-1535.

Hart, R., Childers, J., & Lind, C. J. (2013). *Political tone: How leaders talk and why.* University of Chicago Press.

He, L., Lech, M., Maddage, N., & Allen, N. (2011). "Study of empirical mode decomposition and spectral analysis for stress and emotion classification in natural speech." *Biomedical Signal Processing and Control*, 6(2), 139-146.

Hibbing, J. and Theiss-Morse, E. (1995). *Congress as Public Enemy: Public Attitudes Toward American Political Institutions.* Cambridge University Press.

Hirschberg, J. and Rosenberg, A. (2005). "Acoustic/Prosodic and Lexical Correlates of Charismatic Speech." In Proceedings of InterspeechEurospeech, 9th European Conference on Speech Communication and Technology, 513-516.

Hobbs, P. (2003). "The Medium is the Message: Politeness Strategies in Men's and Women's Voice Mail Messages." *Journal of Pragmatics*, 35(2), 243-262.

Holmes, J. (1995). *Women, Men and Politeness.*, Routledge.

Howell, W., Adler, S., Cameron, C., & Riemann, C. (2000). "Divided government and the legislative productivity of Congress, 1945-94." *Legislative Studies Quarterly*, 285-312.

Jamieson, K. (2011). "Civility in Congress (1935-2011) as Reflected in the Taking Down Process." *Annenberg Public Policy Center Report No. 2011-1*

Jamieson, K. and Falk, E. (1999). "Civility in the House of Representatives: The 105th Congress." *Annenberg Public Policy Center Report Series, No. 26*

Jensen, J. et al. (2012). "Political Polarization and the Dynamics of Political Language: Evidence from 130 Years of Partisan Speech." *Brookings Papers on Economic Activity*, 1-81.

Jones, B. et al. (2010). "A domain-specific opposite-sex bias in human preferences for manipulated voice pitch." *Animal Behaviour*, 79(1), 57-62.

Kahn, K. and Kenney, P. (1999). "Do negative campaigns mobilize or suppress turnout? Clarifying the relationship between negativity and participation." *American Political Science Review*, 93(4), 877-889.

Kaplan, P., Bachorowski, J., & Zarlengo-Strouse, P. (1999). "Child-directed speech produced by mothers with symptoms of depression fails to promote associative learning in 4-month-old infants." *Child development*, 70(3), 560-570.

Kernell, S. (2006). *Going public: New strategies of presidential leadership.* CQ Press.

Kiewiet, D. and McCubbins. M. (1985a). "Congressional Appropriations and the Electoral Connection." *The Journal of Politics*, 47(1), 59-82.

—. (1985b). "Appropriations Decisions as a Bilateral Bargaining Game between President and Congress." *Legislative Studies Quarterly*, 10(2), 181-201.

—. (1988). "Presidential Influence on Congressional Appropriations Decisions." *American Journal of Political Science*, 32(3), 713-736.

Klofstad et al. (2012). "Sounds Like a Winner: Voice Pitch Influences Perception of Leadership Capacity in Both Men and Women." In Proceedings of the Proceedings of the Royal Society B.

Krutz, G. (2000). "Getting around Gridlock: The Effect of Omnibus Utilization on Legislative Productivity." *Legislative Studies Quarterly*, 25(4), 533-549.

—. (2001). "Tactical Maneuvering on Omnibus Bills in Congress." *American Journal of Political Science*, 45(1), 210-223.

Lakoff, G. (2016). *Moral politics: How liberals and conservatives think.* University of Chicago Press.

Laver, M., Benoit, K., & Garry, J. (2003). "Extracting Policy Positions from Political Texts Using Words as Data." *American Political Science Review*, 97(2), 311-331.

Luo, X., Fu, Q., & Galvin III, J. (2007). "Cochlear Implants Special Issue Article: Vocal Emotion Recognition by Normal-Hearing Listeners and Cochlear Implant Users." *Trends in Amplification*, 11(4), 301-315.

Maltzman, F. and Sigelman, L. (1996). "The Politics of Talk: Unconstrained Floor Time in the U.S. House of Representatives." *Journal of Politics*, 58(3), 819-830.

Mayhew, David R. (1974). *Congress: The Electoral Connection.* Yale University Press.

—. (1991). *Divided We Govern.* Yale University Press.

McCarty, N., Poole, K. & Rosenthal, H. (2009). "Does Gerrymandering Cause Polarization?" *American Journal of Political Science*, 53(3), 666-680.

McConnell-Ginet, S. (1978). "Intonation in a man's world." *Signs: Journal of Women in Culture and Society*, 3(3), 541-559.

Mehrabian, A. (1968). "Communication Without Words." *Psychology Today*, 2(9), 52-55.

Mendelberg, T. (2001). *The race card: Campaign strategy, implicit messages, and the norm of equality.* Princeton University Press.

Morris, J. (2001). "Reexamining the Politics of Talk: Partisan Rhetoric in the 104th House." *Legislative Studies Quarterly*, 26, 101-121.

Nadig, A. and Shaw, H. (2012). "Acoustic and perceptual measurement of expressive prosody in high-functioning autism: Increased pitch range and what it means to listeners." *Journal of autism and developmental disorders*, 42(4), 499-511.

Niven, D. and Zilber, J. (2001a). "Do women and men in congress cultivate different images? Evidence from congressional web sites." *Political Communication*, 18(4), 395-405.

—. (2001b). "'How Does She Have Time for Kids and Congress?' Views on Gender and Media Coverage from House Offices." *Women & Politics*, 23(1-2), 147-165.

Nteta, T. and Schaffner B. (2013). "Substance and Symbolism: Race, Ethnicity, and Campaign Appeals in the United States." *Political Communication,* 30(2), 232-253.

Nwe, T., Foo, S., & De Silva, L. (2003). "Speech Emotion Recognition Using Hidden Markov Models." *Speech Communication*, 41(4), 603-623.

O'Connor, J., Re, D., & Feinberg, D. (2011). "Voice pitch influences perceptions of sexual infidelity." *Evolutionary Psychology*, 9(1), 147470491100900109.

O'Hair, D. and Cody, M. (1987). "Gender and vocal stress differences during truthful and deceptive information sequences." *Human Relations*, 40(1), 1-13.

Oleszek, W. (2014). *Congressional procedures and the policy process.* Sage.

Pang, B. and Lee, L. (2005). "Seeing stars: Exploiting class relationships for sentiment categorization with respect to rating scales." *Proceedings of the 43rd annual meeting on association for computational linguistics*, 115-124.

Pennebaker, J. and Francis, M. (1996). "Cognitive, emotional, and language processes in disclosure." *Cognition & Emotion*, 10(6), 601-626.

Pennebaker, J., Rimé, B., & Blankenship, V. (1996). "Stereotypes of emotional expressiveness of northerners and southerners: a cross-cultural test of Montesquieu's hypotheses." *Journal of personality and social psychology*, 70(2), 372.

Penton-Voak, I. et al. (1999). "Menstrual cycle alters face preference." *Nature*, 399(6738), 741-742.

Pérez-Rosas, V., Abouelenien, M., Mihalcea, R., & Burzo, M. (2015). "Deception detection using real-life trial data." *Proceedings of the 2015 ACM on International Conference on Multimodal Interaction*, 59-66.

Pipitone, R. and Gallup, G. (2008). "Women's voice attractiveness varies across the menstrual cycle." *Evolution and Human Behavior*, 29(4), 268-274.

Polzehl, T., Schmitt, A., & Metze, F. (2010). "Approaching Multilingual Emotion Recognition from Speech—On Language Dependency of Acoustic/Prosodic Features for Anger Detection." Retrieved from http://speechprosody2010.illinois.edu/papers/100442.pdf

Poole, K. and Rosenthal, H. (2000). *Congress: A Political Economic History of Roll Call Voting.* Oxford University Press.

Powell, R. (2013). "Social Desirability Bias in Polling on Same-Sex Marriage Ballot Measures.", *American Politics Research*, 41(6), 1052-1070.

Puts, D. (2005). "Mating Context and Menstrual Phase Affect Women's Preferences for Male Voice Pitch." *Evolution and Human Behavior*, 26(5), p. 388-397.

Puts, D., Gaulin, S., & Verdolini, K. (2006). "Dominance and the evolution of sexual dimorphism in human voice pitch." *Evolution and Human Behavior*, 27(4), 283-296.

Reissland, N., Shepherd, J., & Herrera, E. (2003). "The pitch of maternal voice: a comparison of mothers suffering from depressed mood and non-depressed mothers reading books to their infants." *Journal of Child Psychology and Psychiatry*, 44(2), 255-261.

Riding, D., Lonsdale, D., & Brown, B. (2006). "The effects of average fundamental frequency and variance of fundamental frequency on male vocal attractiveness to women." *Journal of Nonverbal Behavior*, 30(2), 55-61.

Rieselbach, L. (1995). *Congressional Politics: The Evolving Legislative System.* Westview Press.

Ringhand, L. and Collins Jr, P. (2010). "May it please the senate: An empirical analysis of the senate judiciary committee hearings of Supreme Court nominees, 1939-2009". *American University Law Review*, 60, 589.

Rousseau, J. (1968). *The Social Contract.*, trans. G. Cole. EP Dutton & Co.

Scherer, K. (1986). "Vocal affect expression: a review and a model for future research." *Psychological bulletin*, 99(2), 143.

Schneider, J. (2015). *One-Minute Speeches: Current House Practices.* Congressional Research Service.

Schraufnagel, S. (2005). "Testing the Implications of Incivility in the United States Congress, 1977-2000: The Case of Judicial Confirmation Delay." *Journal of Legislative Studies*, 11, 216-234.

Sellers, P. (2010). *Cycles of Spin: Strategic communication in the U.S. Congress.* Cambridge University Press.

Siegman, A., Anderson, R., & Berger, T. (1990). "The Angry Voice: Its Effects on the Experience of Anger and Cardiovascular Reactivity." *Psychosomatic Medicine*, 52, 631-643.

Signorello, R. and Rhee, N. (2016). "The voice acoustics of the 2016 United States presidential election candidates: A cross-gender study." *The Journal of the Acoustical Society of America*, 139(4), 2123.

Sinclair, B. (1989). *The transformation of the US Senate.* Johns Hopkins University Press.

Singh, D. and Young, R. (1995). "Body weight, waist-to-hip ratio, breasts, and hips: Role in judgments of female attractiveness and desirability for relationships." *Ethology and Sociobiology*, 16(6), 483-507.

Slapin, J. and Proksch, S. (2008). "A Scaling Model for Estimating Time-Series Party Positions from Texts." *American Journal of Political Science*, 52(3), 705-722.

Smith, D. et al. (2012). "A modulatory effect of male voice pitch on long-term memory in women: evidence of adaptation for mate choice?" *Memory & cognition*, 40(1), 135-144.

Sriram, S. and grindlife, s. (2017). "The politics of deracialisation: South Asian American candidates, nicknames, and campaign strategies." *South Asian Diaspora*, 9(1), 17-31.

Steinbach, A. (1984). "Neurolinguistic programming: a systematic approach to change." *Canadian Family Physician*, 30, 147.

Stewart, C. and Woon, J. (2017). *Congressional Committee Assignments, 103rd to 114th Congresses, 1993-2017.*

Stout, C. and Kline, R. (2011) "I'm Not Voting for Her: Polling Discrepancies and Female Candidates.", *Political Behavior*, 33, 479-503.

Swers, M. (2002). *The difference women make: The policy impact of women in Congress.* University of Chicago Press.

—. (2013). *Women in the club: Gender and policy making in the Senate.* University of Chicago Press.

Titze, I. (2000). *Principles of voice production.* National Center for Voice and Speech.

Toveé, M., Maisey, D., Emery, J., & Cornelissen, P. (1999). "Visual cues to female physical attractiveness." *Proceedings of the Royal Society of London B: Biological Sciences*, 266(1415), 211-218.

Tseng et al, (2014). "Using the Circumplex Model of Affect to Study Valence and Arousal Ratings of Emotional Faces by Children and Adults with Autism Spectrum Disorders." *Journal of Autism and Developmental Disorders*, 44(6), 1332-1346.

Volden, C. and Wiseman, A. (2014). *Legislative Effectiveness in the United States Congress.* Cambridge University Press.

Vukovic, J. et al. (2010). "Women's own voice pitch predicts their preferences for masculinity in men's voices." *Behavioral Ecology*, 21(4), 767-772.

Wennerstrom, A. (2001). *The Music of Everyday Speech: Prosody and Discourse Analysis.* Oxford University Press.

Wiley, M. and Eskilson, A. (1983). "Scaling the corporate ladder: Sex differences in expectations for performance, power and mobility." *Social Psychology Quarterly*, 351-359.

Wiseman, R. et al. (2012). "The eyes dont have it: lie detection and neuro-linguistic programming." *PloS one*, 7(7), e40259.

Woon, J. (2008). "Bill sponsorship in Congress: the moderating effect of agenda positions on legislative proposals." *The Journal of Politics*, 70(1), 201-216.

Ximenes F. et al. (2003). "Correlation between height and vocal folds dimensions." *Revista Brasileira de Otorrinolaringologia*, 69(3), 371-374.

Xin et al. (2007) "Vocal Emotion Recognition by Normal-Hearing Listeners and cochlear Implant Users." *Trends in Amplification*, 11(4), 301-315.