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Judicial Conflicts and Voting Agreement: Evidence from Interruptions at Oral Argument

Tonja Jacobi & Kyle Rozema*

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Abstract

This Article asks whether observable conflicts between judges in a case—interruptions between Supreme Court justices during oral arguments—are associated with future breakdowns in voting agreement among the judges in the case. To do so, we built a dataset containing justice-to-justice interruptions in cases between 1960 to 2015, and employ a framework for measuring case outcomes that treats the outcomes as a set of agreements and disagreements between pairs of justices. We find that on average a judicial pair is 7 percent less likely to vote together in a case for each interruption that occurs in the case between the judicial pair in the oral argument. While a conflict between judges that leads to both interruptions and a breakdown in voting of the coalition is one possible explanation of the finding, it is not the only; an interruption could instead just reflect something about cases that are more prone to disagreement or something about the way the interrupting justice views the case. We set out an empirical strategy that isolates the conflict explanation from these and other possible explanations and find that the conflict inherent in interruptions explains over half of the relationship between interruptions and disagreement.

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INTRODUCTION

Judicial decision-making has been modeled not only as a product of how and why individual justices reach their decisions in cases (e.g., Schubert, 1962; Boucher and Segal, 1995; Black, Johnson, and Wedeking, 2012), but also through the lens of the overall Court, where outcomes depend on judicial peers. In addition to rich evidence of peer effects in the U.S. Circuit Courts of Appeals,¹ strong evidence of peer effects have recently been shown at the U.S. Supreme Court (Holden, Keane, and Lilley, 2017). Rather than modeling case outcomes as a result of one judges' influence on another judge, one might imagine a case outcome to be the result of a set of pairwise agreements and disagreements between judicial colleagues.² One reason to think so is that a case outcome is not simply a product of adding up votes for and against a given ruling: doctrine is a product of opinion writing, and opinion writing is a product of persuasion. Given that the only time that the Supreme Court formally meets as a group to discuss cases other than during oral argument is at its conference session in which each justice casts his or her vote, the canonical persuasive process that Epstein and Knight (1998) describe occurs between pairs of justices, where individual justices send notes to the majority opinion author and the author responds to each justice individually. Under this persuasive process, case outcomes that break with expected outcomes might look more like a result of breakdowns in relationships between justices than solely the result of individual justice behavior.

In this article, we ask whether observable conflicts between judges in a case—interruptions between Supreme Court justices during oral arguments—are associated with future breakdowns in voting agreement among the judges in the case. To do so, we employ a framework for measuring case outcomes that treats a case outcome as a set of agreements and disagreements between pairs of justices, which allows us to control for idiosyncratic differences in agreement between every judicial pair.

We find that on average a justice-pair is 7 percent less likely to vote together in a case for each interruption that occurs between the justice-pair in the case at oral argument. There are several explanations for why justices who interrupt each other in a case are less likely to vote together. Our hypothesis is a 'conflict' theory: interruptions constitute a type of observable conflict that is

¹ Revesz, 1997; Peresie, 2005; Miles and Sunstein, 2006; Epstein and Jacobi, 2008; Posner, 2008; Boyd, Epstein, and Martin, 2010.

² Assessing outcomes of individuals as a set of pairwise outcomes between individuals (referred to as paired or dyadic data) is a prevalent way of thinking about social behavior in the networks (e.g., Battaglini & Patacchini, 2017) and international trade literatures (e.g., Chilton and Posner, 2017).

systematically associated with disagreement. While a conflict between judges that leads to both interruptions and a breakdown in voting is one possible explanation of the finding, it is not the only. We set forth an empirical strategy to isolate the conflict explanation from competing explanations. A second ‘exposure’ theory is that justices who speak more in a case might be more exposed to interrupting or being interrupted simply by virtue of taking up more airtime. A third ‘dissatisfaction’ theory is that an interrupting justice is interrupting because he or she is at odds with the rest of the Court about the direction of the oral argument and the anticipated outcome of the case. For example, this may occur if the case is very salient to the individual justice but not necessarily salient to the rest of the Court. A fourth ‘difficult-case’ theory is that interruptions are simply reflections of something about the case generally that is common to all justices, where cases with more disagreement are more prone to interruptions. The difference between the dissatisfaction and difficult-case theories is that, in the difficult-case theory, the interruption is not specific to *either* of the justices involved in the interruption but is simply a response to the nature of the case itself.

We find that the conflict inherent in interruptions explains over half of the relationship between interruptions and disagreement: even after accounting for the exposure, dissatisfaction, and difficult-case theories of interruptions, we find that the probability that a justice-pair votes together in a case decreases by 4 percent for each interruption in the case. This evidence strongly supports the conflict theory of interruptions. We find no evidence for the dissatisfaction theory, but find evidence for both the exposure and difficult-case theories.

We then consider that there may be heterogeneity in the relationship between interruptions and voting agreement. One potentially important factor is the strength of the relationship between justices. Interruptions between two justices in the first Term they serve together could indicate something different than an interruption in their twentieth Term. We find some evidence to suggest that interruptions between justices who have served together longer are less indicative of a conflict between them than are interruptions that occur earlier in the time they serve together. We also consider heterogeneity in the effect by other justice attributes (same political party, swing justice, difference in experience, and gender) as well as by case attributes (the political salience and legal importance of the case). We find that while some of these characteristics are significant in their own right in predicting disagreement, there is no evidence that any of them significantly change the relationship between interruptions and voting.

Finally, we conduct two placebo tests to give us some confidence that we have identified the conflict inherent in interruptions. In particular, we test whether two types of interruptions that are not

likely to contain conflict in a case are related to disagreement. In a first placebo test, we test the possibility that the relationship between interruptions and disagreement is driven by an unobserved factor that is specific to the oral argument, such as the way an advocate is acting. As discussed below, the rich oral arguments data allow us to distinguish a meaningful interruption from short conversational overlaps. Unlike meaningful interruptions that we expect to reflect conflict, conversational overlaps are not likely indicative of conflict. If conversational overlaps are predictive of disagreement, such a relationship may call into question the credibility of the conflict explanation for the interruptions and voting relationship because there could be an omitted variable driving the relationship. In a second placebo test, we test the possibility that the relationship between interruptions and disagreement is driven by a more general conflict between justices, rather than conflict directed at the case in question in the spirit we have in mind. For this placebo test, we assess whether interruptions between justices in other oral arguments that day or that week predict voting disagreement. We find no evidence of a relationship between conversational overlaps and voting agreement, and no evidence of a relationship between other interruptions between justices in that day or week and voting agreement. These results provides some evidence that it is the conflict inherent in interruptions that is driving the relationship with disagreement and that the conflict between justices is limited to the case in question.

Our study shows that there has been evidence available about likely future votes of Supreme Court justices in plain sight even before the justices have voted at conference. The results add to recent evidence from Dietrich, Enos and Sen (2017) suggesting that emotional arousal in justice's voices during oral arguments, as measured by their vocal pitch, predicts many of their eventual votes. Our study also shows that oral arguments can offer evidence of justice interactions beyond that found in judicial opinions and the tone of their voice, and directs attention to interruptions at oral arguments as evidence of inter-justice dynamics. However, it is worth noting that we do not have a robust way to isolate the direction of causality. It is possible that interruptions cause disagreement among the justices—for example, if there is antipathy produced by a rude interruption. But it is also possible that disagreement causes interruptions—for example, if a justice attempts to shut down expression of a view with which he or she disagrees. Below, we explore the meaning of our findings under alternative assumptions about the direction of causality and argue that the findings suggest that oral arguments are not, at least to the justices, just a form of theatre.

Part 1 provides the background. It first briefly outlines the literature that is relevant to our inquiry, including prior scholarship on judicial voting, interruptions, and judicial coalitions. It then

presents in more detail the four possible explanations we test for how our first major finding—that interruptions are significantly correlated with judicial voting disagreement—could arise. Part 2 describes the data we utilize, including how we define interruptions and how we differentiate meaningful interruptions from conversational overlaps. Part 3 presents our descriptive statistics of interruptions and justice-pair voting patterns. Part 4 sets out the empirical strategy and presents the results. Part 5 investigates whether substantial interruptions and mere crossovers are meaningfully different in terms of predicting voting agreement among the justices. In Part 6, we present the implications of our analysis, propose potential future inquiries, and conclude.

1. BACKGROUND

A. Literature Review

This article draws on and contributes to several literatures in law and political science. First, it relates to research that seeks to determine at what point in cases justices determine their votes (e.g., before or after oral argument) and whether oral arguments influence voting or opinion writing. Here, some research investigates justices switching votes during the opinion drafting process (known as voting fluidity) (e.g., Ringsmuth, 2015), and other research investigates how oral arguments affect justices' votes (Rohde and Spaeth, 1976; Segal and Spaeth, 1993) and the case opinions (Benoit, 1989; Cohen, 1978). For example, Johnson, Wahlbeck, and Spriggs (2006) and Black et al. (2011) use justice voting in previous cases to predict the justice's position going into oral argument, and then use this predicted measure to estimate whether oral arguments change voting. The limitation of this approach is that the counterfactual is based on an out-of-sample prediction. To overcome this concern, Ringsmuth, Bryan, and Johnson (2013) use the positions taken by Justices Blackmun and Powell prior to oral arguments to ask whether oral arguments change their votes and find that they switch votes only in a minority of cases.

Second, it relates to a research that investigates how the justices use oral arguments. For example, Johnson (2001) asks whether justices use oral arguments to seek information about cases. Using oral arguments and the Court's majority opinions in a sample of cases from the Burger Court era, he finds some evidence that oral arguments are used to gather information. Third, it relates to a small literature that attempts to predict the outcome of cases based on elements of oral arguments. For example, Dietrich, Enos, and Sen (2017) use audio recordings of Supreme Court arguments from 1982–2014 to forecast votes based on the emotional arousal of justices at oral argument, and find strong evidence that arousal of justices is highly predictive of how justices vote. Their study is focused

on the arousal of justices based on audio recordings and does not study interruptions.

Fourth, it relates to research that investigates interruptions at oral arguments specifically. Sullivan and Cauty (2015) examine interruptions at oral arguments from 1958–60 and 2010–12 and find that the justices interrupt each other more in the 2010–12 terms than in the 1958–60 terms. Wrightsman (2008) assesses justices interrupting advocates in the 2005 and 2006 terms. Jacobi and Schweers (2017) assess oral arguments in the 1990, 2002, and 2004–2015 terms and find that a significant gender difference in interruptions at the Roberts Court (see also Feldman and Gill, 2017), and also show the gender difference also occurred when the gender division on the Court was less correlated with ideology. They provide a detailed analysis of the patterns of interruptions at oral argument, but do not test whether interruptions are associated with voting agreement between justices.

Black, Johnson, and Wedeking (2012) assess oral arguments between 1998 through 2007, but examine a much broader form of justice-to-justice interruptions than we do in this article. They treat an interruption as having occurred any time two justices speak back-to-back without an interjection or answer from an advocate. The goal of their research was to understand the formation of coalitions generally, so their approach was suited to their purpose. Because we are interested in isolating the conflict inherent in interruptions from other reasons why justices may be interrupting each other, the approach of treating justices speaking back-to-back is unsuitable for our purposes because it would inaptly include many of the other theories for interruptions that we control for when isolating the conflict theory. For instance, it is not uncommon for justices to make statements rather than ask a question, and a second justice speaking after such a statement should not be taken as a conflict between the justices. Black et al. find that 6 percent of all utterances by the justices are interruptions of other justices under their broader definition—as we will see, this is magnitudes higher than the way we code interruptions. Using the speaking back-to-back definition of interruptions, they identify a number of empirical trends associated with judicial interruptions, including the variation among justices’ tendency to interrupt and the tendency of justices who interrupt more to also be interrupted more. They explore a number of hypotheses empirically, and find that justices are more likely to be interrupted by ideologically distant colleagues; that justices who frequently interrupt another speaker (including advocates) during oral arguments are more likely to be subsequently interrupted by their colleagues later in the proceedings; that justices with greater expertise in an area are interrupted significantly less than other justices; and that justices seek “revenge” against a colleague who interrupted them earlier in the proceedings. They find no evidence that speaking is associated with more interruptions—as we will see, this is not the case under our definition of interruptions.

B. The Meaning of Interruptions between Supreme Court Justices at Oral Argument

Below, we seek to isolate the conflict inherent in interruptions between justices: we hypothesize that interruptions constitute a type of observable conflict that is systematically associated with disagreement. A psychological literature on interruptions outside of the judicial context has found that interruptions can represent manifestations of conflict and often constitute expressions of power (Farina, 1960; Leighton, Stollak and Ferguson, 1971; Jacob, 1974; Zimmerman and West, 1975; Ferguson, 1977; Goldberg, 1990). One reading of extant findings on interruptions in the context of Supreme Court suggests that conflict is at work; in particular, scholars have shown that ideology contributes to the frequency of justice-to-justice interruptions, with justices more likely to interrupt their ideological opponents (Johnson et al., 2006: 350; Jacobi and Schweers, 2017).

We seek to isolate conflictual interruptions from other possible causes of interruptions. A possible second exposure explanation for justice-to-justice interruptions is that a justice who considers a case special might not only be more prone to disagree with other justices but also be more prone to control the oral argument by speaking more or longer in the case. Justices who speak more in a case might be more exposed to interrupting or getting interrupted simply by virtue of taking up more time in the oral argument, so the relationship between interruptions and disagreement might be driven exclusively through this exposure.

A third dissatisfaction theory is that an interrupting justice is interrupting because he or she is at odds with the rest of the Court about the direction of the oral arguments and the anticipated outcome of the vote, but who that interruption is directed against is not important. Justice X interrupting Justice Y in a case is not indicative of Justice X and Y's unique disagreement in the case but of Justice X's disagreement with the Court in general; the point of Justice X's interruption is that it is occurring in the case by Justice X, and Justice Y's identity is unimportant. This may occur, for example, if the case is very salient to the individual justice, but is not particularly salient to the rest of the Court.

A fourth difficult-case theory for interruptions and voting disagreement is that a given justice is interrupting not because of something else related to the justice they interrupt or because they are at odds with the rest of the Court but because of some reflection of the case that is common to all justices. For example, Justice X interrupting Justice Y in a case is not indicative of Justices X and Y's disagreement in the case, or of Justice X being at odds with the rest of the Court in general, but rather of the case itself; Justice X's interruption could have been done by Justice Z and the interruption could have been of a justice other than Y; the point of the interruption is that it is occurring in the case by

some justice. The difference between the dissatisfaction and difficult-case explanations is that in the difficult-cases, the interruption is not specific to *either* of the justices involved in the interruption, but is simply a response to the nature of the case itself. There are innumerable possible aspects of cases that can make a case difficult in this way and cannot be individually controlled for, such as unusual fact patterns, disagreement among the justices as to whether certiorari should have been granted, peculiar circuit splits, etc.

2. DATA

Our empirical analysis uses data from the words spoken at oral arguments of Supreme Court cases and justices' votes in the cases. The data for justice case votes comes from the Spaeth Supreme Court Database, which contains information on how individual Supreme Court justices voted on cases and case information (e.g., issue of the case) for those decided between 1960 and 2015 (Spaeth et al., 2015). The unit of analysis in the Supreme Court Database is the justice-vote. We create a dataset where the unit of analysis is the justice-pair-case and define the main outcome of interest as whether the justice-pair voted together in the case (taking a value of 1 if the justices voted in the same direction and a value of 0 if the justices did not vote in the same direction). For most cases in which 9 justices vote, there are 36 justice-pair observations. For cases with 8 and 7 justices, there are 28 and 21 justice-pairs, respectively.

We match these case-justice-pair outcomes to interruptions between the justice-pair in the case from a dataset we built based on information from the Oyez project. Oyez is a multimedia archive of Supreme Court cases, containing the words spoken during Supreme Court oral arguments. A considerable advantage of Oyez is that it contains the words spoken for cases going back to 1960 (whereas the official transcripts only go back to 2004). Oyez has a webpage for each case. For each case, Oyez archives the full transcript of the oral argument presented in the order in which words are spoken. Each time a new speaker begins to speak, the webpage identifies the speaker and then follows with the words spoken until the next speaker begins.

We scraped the Oyez website for the text of words spoken in each Supreme Court case since 1960.³ From these files, we created a dataset and formatted the data such that each observation is a unique "speech episode" of a speaker at oral argument. That is, a speech episode consists of all words spoken between the time a justice or an advocate begins to speak and the time the next speaker begins

³ See appendix for details.

to speak. For each speech episode, the Oyez interface offers “transcript-synchronized and searchable audio.” The synchronized interface operates by highlighting the text of the words of a speech episode that is being played through the audio output. Figure 1 depicts an example of the graphical user interface of the Oyez transcript-synchronized audio recording system.

Figure 1: Graphical User Interface (GUI) of Oyez Transcript-Synchronized Audio Recordings

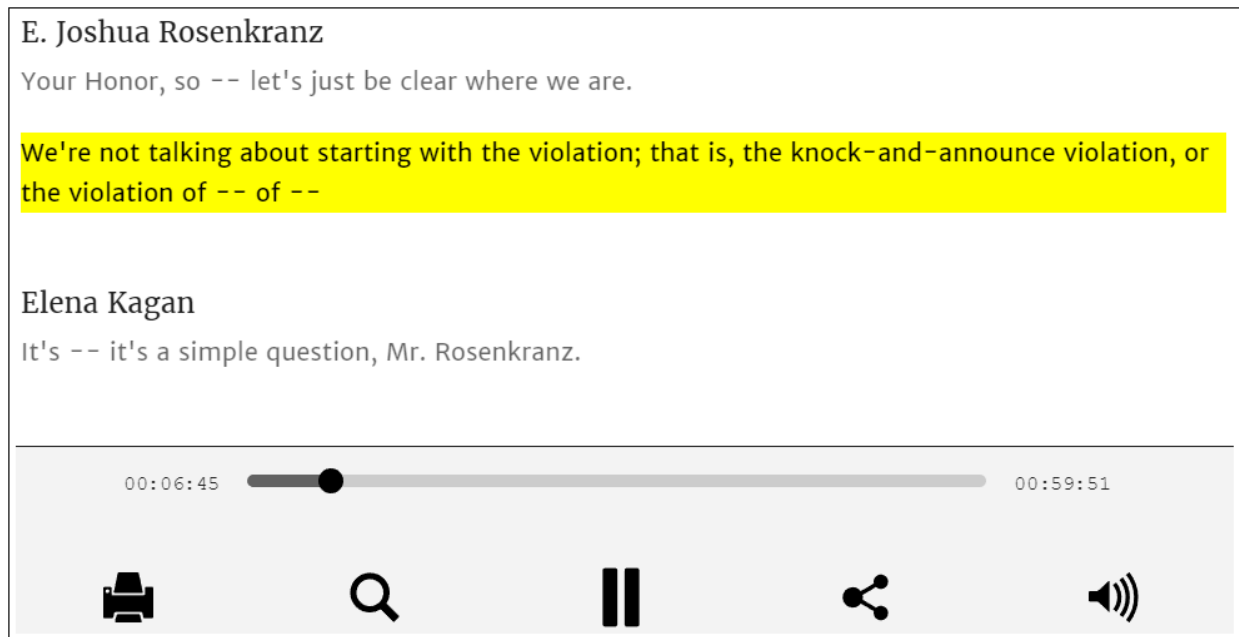


Figure 1 shows the highlighted text as the interface plays the audio file. When the speaker begins a new sentence, the highlighted text moves onto the next sentence. Our definition of a speech episode is not defined by sentences, but rather by the speaking time between one person starting to speak and another person subsequently starting to speak. As such, a speech episode contains multiple intervals of the interface. For example, the speech episode for E. Joshua Rosenkranz in Figure 1 would begin with the words “Your Honor” and end with the words “the violation of--of--”.

For the interface to highlight the relevant words that are being played through the audio, the webpage feeds the timing of the words spoken in the audiofile into javascript. The underlying file that creates the webpage that we scraped contains the time stamps of each highlighted text (to the 0.001 of a second) in which the words spoken begin and end. We utilize these time stamps to create the time stamp of each speech episode. As discussed below, these time stamps are critical to our empirical analysis because they will be used to distinguish between interruptions that are meaningful and mere conversational overlaps.

The underlying files from Oyez identify an interruption with the use of either two dashes at the end of a speech episode of the speaker being interrupted or two dashes at the beginning of a speech episode of the interrupting speaker, or both. This coding is also used in the official transcripts of Supreme Court oral arguments. Figure 1 also provides an example of an interruption. There, the two dashes at the end of Rosenkranz’s speech episode were immediately followed by a speech episode of Justice Kagan; this indicates that Justice Kagan interrupted Rosenkranz, at least as coded in the transcripts.

The two dash coding of interruptions is a useful starting point to identifying interruptions. We now discuss a refinement of the definition of an interruption to address the situation when two people start talking at about the same time and one stops to yield to the other. This type of speech disruption is not a meaningful breach in the course of conversation that one should identify as an “interruption.” We expect the two dash coding of interruptions to fail to distinguish between meaningful interruptions where the interrupter continues to speak after the interruption and non-meaningful “crossover” interruptions when two people begin speaking at around the same time. Using the time stamp of speech episodes, we define meaningful interruptions in two ways. First, we use the time stamps of the interruptions to refine the definition of an interruption where the interrupter continues to speak for more than 1 second. As an example, consider Justice Kagan’s interruption in Figure 1. Justice Kagan interrupted Rosenkranz and then spoke for more than 1 second. We believe this is a meaningful interruption because Justice Kagan appears to have completed her thought. Note that we experimented with different thresholds for the amount of time (e.g., 0.5 second, 1.5 seconds) and find similar results.

As a second refinement, we use the timing of the previous speech episode. In Figure 1, Rosenkranz had been speaking for more than 1 second before Justice Kagan interrupted. We believe that the Rosenkranz’s speech episode in Figure 1 is clearly substantial, and so Justice Kagan’s interruption was a substantive interruption. For our definition of a substantive interruption, we require that the person who was interrupted to have been speaking for at least 1 second before the time stamp of the beginning of the next person’s speech episode. We define overlaps in speech that last for less than these times “crossovers” and separate them from meaningful interruptions. Once again, we experimented with different thresholds for the amount of time and find similar results.⁴ In Part 5, we

⁴ We also experimented with defining a meaningful interruption uses the number of words spoken in speech episodes (requiring the interrupted speech to be at least 2 words and requiring the interruption speech to be at least 2 words). We also experimented with the number of words used for the refinement (3 words, 4 words). The crossovers we

investigate differences between substantial interruptions and crossovers.

Crossovers are common; a typical example arises in *Birchfield v. North Dakota* as shown in Figure 2.⁵ In this example, Justices Sotomayor and Breyer began speaking almost simultaneously; although Justice Sotomayor spoke first, Justice Breyer had probably begun speaking before realizing that Justice Sotomayor had already spoken two words. Justice Breyer's words appear not to be a substantive interruption, but rather a simple crossover in speech.

From these Oyez data on speech episodes, we identify interruptions according to the above definitions, along with the identities of the interrupter and interruptee. For each case, we then calculate the number of interruptions between each justice-pair.

Figure 2: Example of Non-Meaningful Interruptions

Sonia Sotomayor
If you --
Stephen G. Breyer
If --
Sonia Sotomayor
If you obstruct justice by refusing to comply with the warrant, you can punish someone for the obstructing justice, and you can get the same outcome as putting them in jail for being drunk and driving.

00:41:05 01:11:20

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found using the word count largely overlapped with the crossovers we found using the time stamps.

⁵ 136 S. Ct. 2160 (2016). Oral Argument at 41:05:00, 136 S. Ct. 2160 (No. 15-068), available at <https://www.oyez.org/cases/2015/14-1468>.

3. DESCRIPTIVE STATISTICS

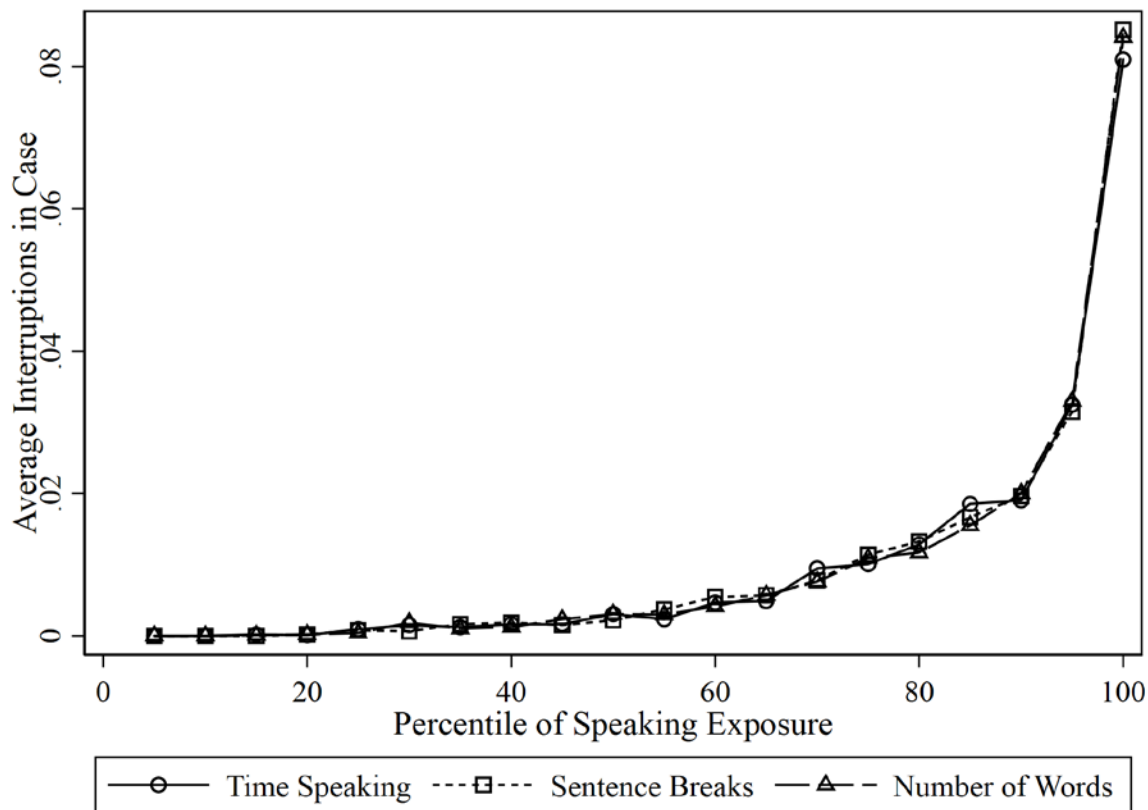
This part presents descriptive statistics of interruptions and justice-pair voting patterns. In 3.A, we assess the extent that interruptions are related to exposure to being interrupted. In 3.B, we present descriptive statistics to highlight our novel framework for measuring case outcomes as a set of agreements and disagreements between justice-pairs. In 3.C, we assess idiosyncratic differences in interruptions and voting by justices and by justice-pairs.

A. Interruptions and Exposure

A justice who speaks frequently or lengthily might have a higher likelihood of interrupting or being interrupted, even without increased levels of conflict. Additionally, speaking more in a case may signal a justice’s greater tendency to disagree with the other justices in the case more generally. If interruptions are related to justices’ airtime, it would be possible to observe a relationship between interruptions and disagreement driven exclusively by variation in this exposure.

We use three different ways of controlling for exposure: (1) the time spent speaking, which is calculated from the time stamps of each speech episode, (2) the number of sentence breaks, and (3) the number of words spoken, which is calculated from the transcripts. Here, we assess the relationship between these exposure measures and interruptions. Figure 3 plots a standard binned scatter plot of the relationship between each of the exposure measures and interruptions. To create the figure, we create 20 equal sized groups of case-justice-pairs for each of the exposure measures based on the percentiles of the exposure measures, and calculate the average number of interruptions for each bin. Figure 3 shows a strong relationship between the exposure measures and interruptions. Given that another measure of justice interruptions—any time two justices speak back-to-back without an interjection or answer from an advocate—was found to be unrelated to exposure (Black, Johnson, and Wedeking, 2012: 44), Figure 3 provides some evidence that our definition of interruption is sufficiently different than previously used definitions. Figure 3 also shows that each of the exposure measures appears to be equally related to interruptions. Below, we use the words spoken as our measure of exposure, but find consistent results using the other measures.

Figure 3: Relationship between Exposure Measures and Interruptions



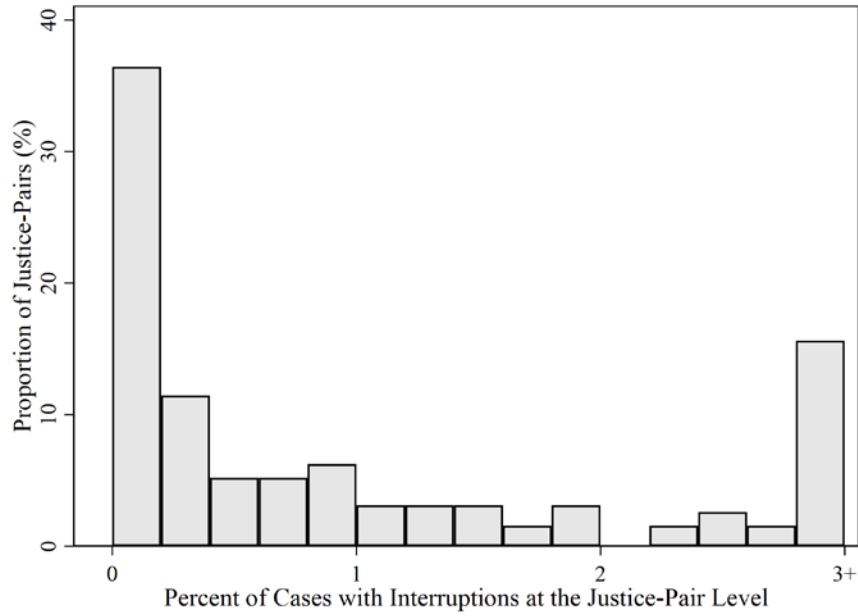
B. *Voting and Interruptions by Justice-Pair*

The main question this Article seeks to answer is whether interruptions between justices in a case are related to voting in that case. A different and more general question is whether justices who disagree more generally are generally more likely to interrupt each other. To assess this more general relationship, for each justice-pair we calculate the percent of cases with interruptions and the percent of cases in voting agreement. Panels A and B of Figure 4 plot the distribution for interruptions and voting, respectively.

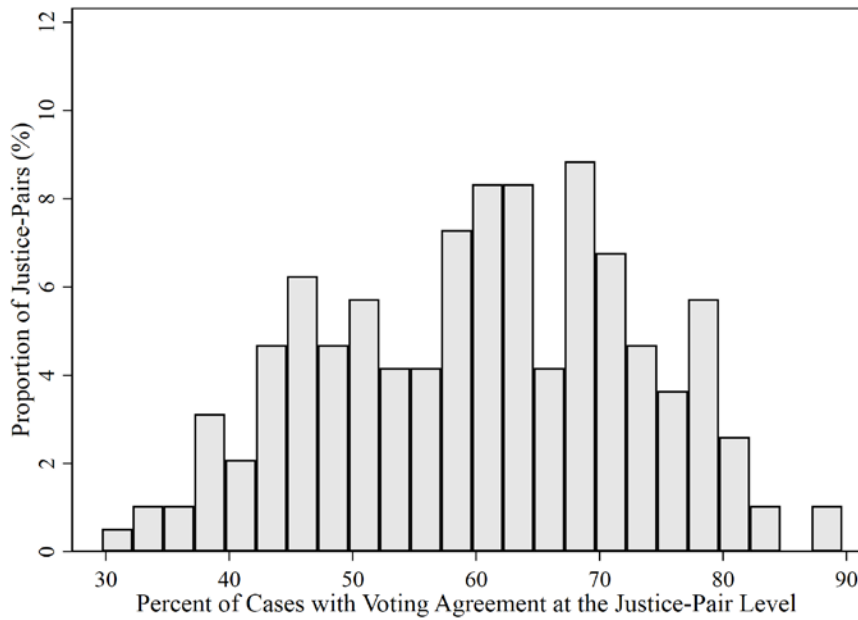
In terms of interruptions, Panel 4A shows that the average justice-pair interrupts each other in 1 percent of cases but the distribution is skewed to the right. Whereas 26 percent of justice-pairs have never interrupted each other and another 10 percent of justice-pairs interrupt each other less than 1 time per 500 cases, 15 percent of justice-pairs interrupt each other in at least 3 percent of cases. Now referring to Panel 4B, the average justice-pair votes in agreement in 60 percent of cases. The agreement distribution appears fairly normal around the average voting agreement of 60 percent of cases.

Figure 4: Distribution of Interruptions and Voting Agreement at the Justice-Pair Level

A. Interruptions

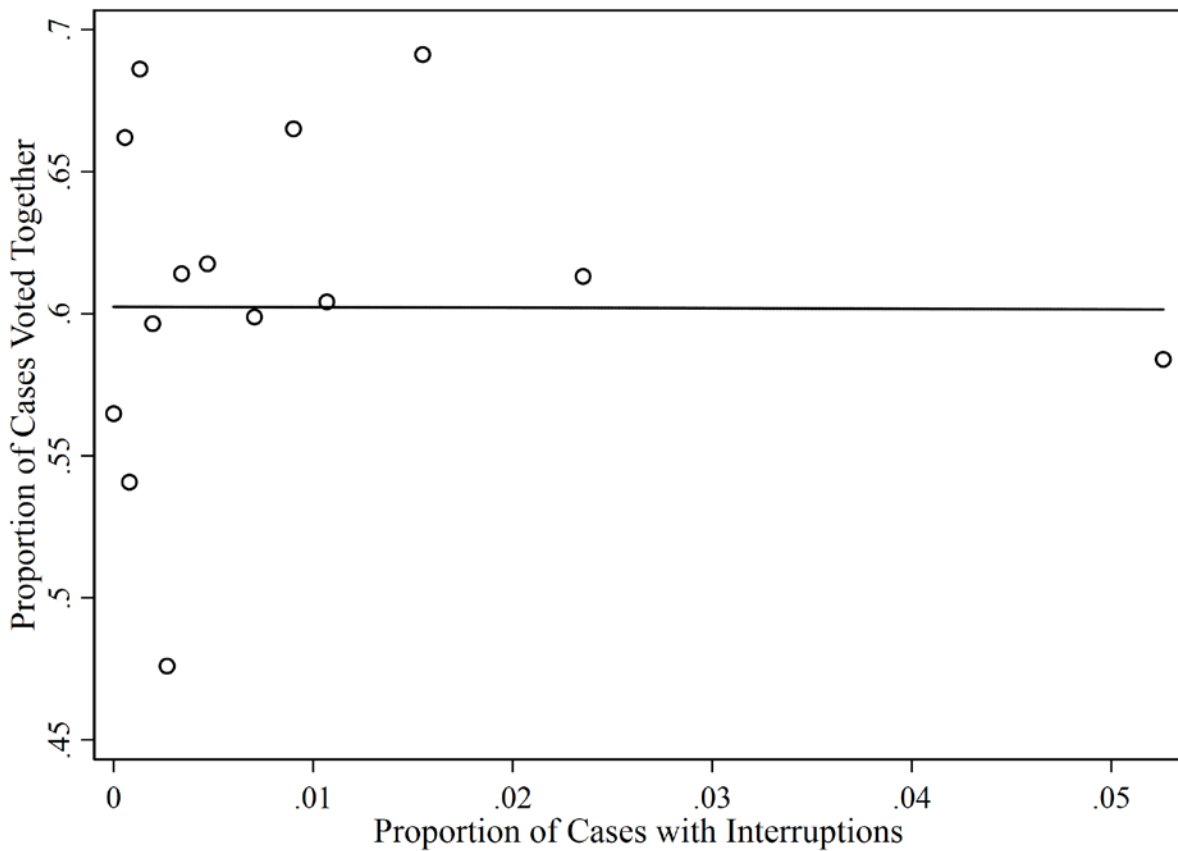


B. Voting Agreement



To assess the relationship between general voting agreement and interruptions at the justice-pair level, Figure 5 provides a binned scatterplot and a line of best fit, where the proportion of cases with interruptions is on the x-axis and the proportion of cases with voting agreement is on the y-axis. Figure 5 provides no evidence of an overall relationship between justices who vote together and interruptions between the justices in all cases. This suggests that any relationship we find between justice-pair agreement and interruptions is not driven by a general tendency to disagree or a general tendency to interrupt.

Figure 5: General Voting Agreement and Interruptions at the Justice-Pair Level

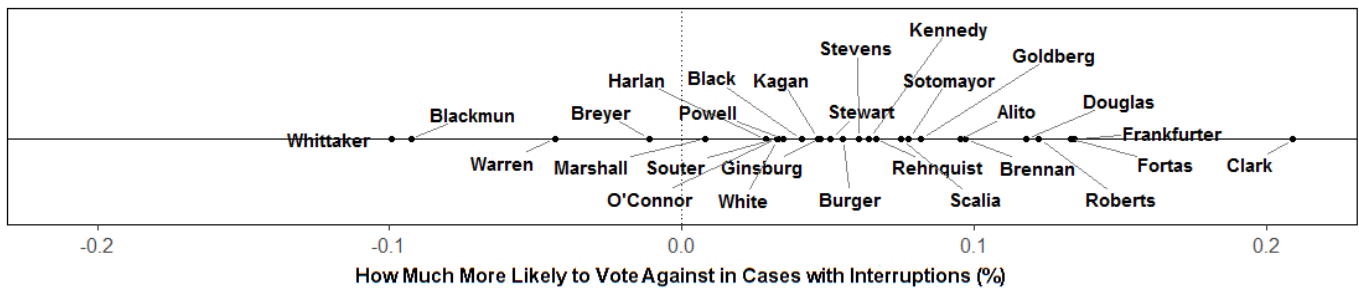


C. *Interruptions and Voting by Justice and Justice-Pairs*

The relationship between interruptions and voting agreement in a case could be idiosyncratic to the justices. For example, Justice Scalia might interrupt someone often, but that might be less reflective of whether he is going to vote against that justice than the same behavior by another justice because Justice Scalia has been thought by some to be a disruptive justice (e.g., Totenberg, 2016). To assess the relationship between interruptions and voting at the justice level, we first calculate the difference in voting agreement between cases with and without an interruption. For example, Justice Scalia and Justice Stevens voted together in 34 percent of cases where one interrupted the other and 41 percent of cases where one did not interrupt the other. The difference in voting agreement between cases with and without an interruption for these Justices is 7 percentage points.

In Figure 6, we plot that the average difference in voting agreement in cases with and without an interruption for each justice on a line. Only four justices disagree more in cases with fewer interruptions—Justices Blackmun, Whitaker, Warren, and Breyer. All other justices to have served on the Court since 1960 are more likely to disagree in cases with more interruptions. This provides strong preliminary evidence of a negative relationship between interruptions and agreement.

Figure 6: Differences in Disagreement for Cases with and without Interruptions



4. RESEARCH DESIGN AND RESULTS

Equation (1) sets out our main econometric specification.

$$v_{ict} = \alpha + \beta I_{ict} + \gamma E_{ict} + \psi A_{jct} + \theta D_{ct} + \sigma_t + \lambda_{ct} + \phi_i + \varepsilon_{ict} \quad (1)$$

where v_{ict} is an indicator for whether justice-pair i voted together on case c in Term t , where justice-pair i is made of up justice j and j' . As described in more detail below, E_{ict} is the exposure of justices to being interrupted measured by the proportion of justice words spoken by the justice-pair, A_{jct} is the total number of the justice j interruptions in the case, D_{ct} is the total number of justice interruptions in the case, σ_t are term fixed effects, λ_{ct} are issue area fixed effects, and ϕ_i are justice-pair fixed effects.⁶ Justice-pair fixed effects are important to our approach because they net out idiosyncratic differences in the propensity for two judges to vote with each other. The main coefficient of interest, β , is on the variable I , which indicates the number of interruptions between the justice-pair in the case. Following the clustering approach with paired data in the international trade literature (Rose, 2004; Chilton & Posner, 2017) and the networks literature (Battaglini & Patacchini, 2017), we cluster at the justice-pair level. This research design is a condition-on-observables approach.

We estimate Equation (1) using a linear probability model. Table 1 provides the results. We begin by estimating the simple correlation in Column 1 in a regression that only includes Term fixed effects. Relative to the baseline agreement of 60 percent, the point estimate of -0.048 in Column 1 suggests that justices who interrupt each other in cases are 8 percent less likely to agree in those cases. Column 1 can be thought of as the average relationship between interruptions and voting across all justice-pairs after accounting for differences in agreement between Terms. To estimate the average *change* in the likelihood that a justice-pair votes in agreement for cases with interruptions between the justice-pair, Column 2 adds controls for differences in overall agreement between each justice-pair through justice-pair fixed effects. The resulting point estimate is slightly reduced to -0.042, and the precision of the estimate is increased.

⁶ In the most sophisticated models that we do not report, we enrich the model by replacing justice-pair fixed effects with justice-pair-Term fixed effects, thus comparing the likelihood of a justice-pair to vote together in cases in which they do not interrupt one another in a given Term to likelihood of the justice-pair to vote together in cases in which they do interrupt one another in the same Term.

Table 1: Relationship between Interruptions and Voting

	Voted in Agreement				
	(1)	(2)	(3)	(4)	(5)
Justice-Pair Interruptions	-0.048*** (0.014)	-0.042*** (0.008)	-0.026*** (0.008)	-0.008 (0.009)	-0.026** (0.010)
Proportion of Words Spoken by Justice-Pair (x10)			-0.053*** (0.006)	-0.025*** (0.006)	-0.025*** (0.006)
Total Interruptions of Justice-Pair in Case				0.000 (0.005)	-0.001 (0.005)
Total Justice Interruptions in Case				-0.008*** (0.001)	-0.009*** (0.001)
Proportion of Words Spoken in Case by Justices (x10)				-0.007*** (0.002)	-0.007*** (0.002)
Justice-Pair Interruptions × Total Justice Interruptions in Case					0.005** (0.002)
Covariates					
Term FE	Yes	Yes	Yes	Yes	Yes
Justice-Pair FE	No	Yes	Yes	Yes	Yes
Issue Area FE	No	No	No	Yes	Yes
Observations	196,626	196,626	196,626	196,626	196,626
Voted in Agreement	0.600	0.600	0.600	0.600	0.600

Note: Standard errors in parentheses clustered at the justice-pair level. * p<0.1, ** p<0.05, *** p<0.01. Proportion of words spoken is multiplied by 10.

Above, we discussed several explanations for why justices who interrupt each other in a case might be less likely to vote together. Our theory is that interruptions are a type of observable conflict, and conflict is systematically associated with disagreement. To isolate the conflict channel from other explanations, we now examine three other possibilities. We also control for issue area fixed effects, but the results are consistent without these controls.

First we explore the exposure theory—that disagreement is higher because justices involved with an interruption speak more in the case. Because we have already seen that interruptions are more likely to occur between justices in cases where they speak more (Figure 1), the effect of interruptions on disagreement could simply reflect the relationship between time spent speaking and disagreement. We account for this possibility in Column 3 by controlling for the relative speaking time of the justices

in the case. In Column 3, we find a strong relationship between justice-pair speaking time and disagreement: a 10 percentage point increase in the time a pair of justices spend speaking decreases the likelihood of their agreement by 5.3 percentage points. The point estimate on interruptions between justice-pairs is decreased to -0.026, but remains statistically significant. The results suggest that although almost half of the effect of interruptions on disagreement is explained by time spent speaking, the effect of interruptions on disagreement remains substantively meaningful and statistically significant.

Column 4 explores the “dissatisfaction” theory of interruptions—that an interrupting justice is interrupting because he or she is at odds with the rest of the Court. To do so, we add a variable for the total number of interruptions of the justice-pair in the case, labeled “Total Interruptions of Justice-Pair in Case.” We find no evidence that interruptions of a justice in the case are reflective of the interrupting justices’ disagreement with other justices in the case.

Column 4 also explores the “difficult-case” theory of interruptions—that interruptions are simply a reflection of the case generally that is common to all justices. To do so, we add a variable for the number of total interruptions in the case by any justice on the agreement of all justice-pairs in the case, labeled “Total Justice Interruptions in Case.” Similar to the exposure story about specific justices interrupting each other, more justice interruptions in a case generally could simply reflect that the justices are collectively speaking more in a case relative to the time the advocates spend speaking in the case. As such, we also control for the proportion of words spoken in the case by the justices (i.e., words spoken by justices divided by words spoken by both justices and advocates), labeled “Proportion of Words Spoken in Case by Justices.”

We find strong evidence that interruptions in a case by any justice and the relative balance of justices and advocates speaking are significantly related to disagreement in the case. The point estimate of -0.008 on total justice interruptions in a case indicates that each justice interruption is related to a decrease in the agreement of the pair-wise Court overall by 1.3 percent (-0.008/0.600). Note that this is in addition to the effect of interruptions between the justice-pair, the effect of a specific justice interrupting in a case generally, and the issue in the case. Also note that the results are not highly sensitive to the inclusion of the proportion of the words spoken in the case by the justices, the issue area fixed effects, or other controls. The point estimate of -0.007 on proportion of words spoken in a case by justices suggests that a 10 percentage point increase in the proportion of the words spoken by the justices collectively in the case decreases the agreement of the pair-wise Court overall by 1.2 percent (-0.007/0.600).

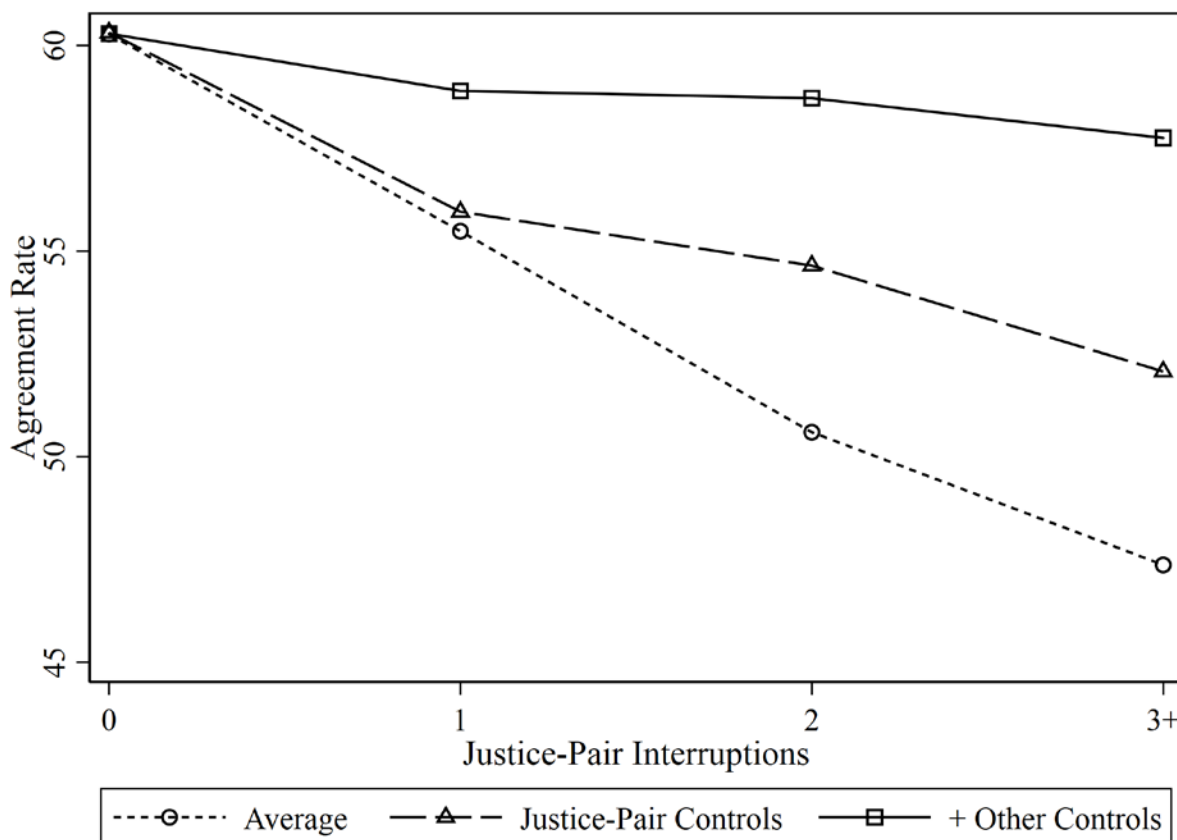
The effect of interruptions between a justice-pair on disagreement of the pair in Column 4 is decreased by one third compared to Column 3 and is no longer statistically significant. This is perhaps not surprising because Column 4 is very demanding on the data: the variation that identifies the effect of total interruptions of the justice-pair in the case and the effect of total justice interruptions in the case also identifies the effect of justice-pair interruptions. Perhaps more importantly, the specification assumes that the effect of interruptions between a justice-pair is independent from the effect of interruptions in the case overall. As discussed above, one might expect the effect of an interruption in a case in which other justices are also interrupting to be different than an interruption in a case in which it is the only interruption. We relax this assumption in Column 5 by including an interaction term between justice-pair interruptions and total justice interruptions in the case.

The results in Column 5 help explain why we lose significance in Column 4 of Table 1. The positive interaction term suggests that interruptions between justices in a case where there are more interruptions between other justices have a smaller effect on disagreement. The main effect on interruptions in Column 5 is remarkably consistent with that in Column 3 and is again statistically significant. This suggests that interruptions between justices are predictive of their disagreement in cases, but less so in cases with other justice interruptions than in cases without other justice interruptions. In both Columns 3 and 5, the main result suggests that the probability that a justice-pair votes together decreases by 2.6 percentage points for each interruption. This implies that, from a baseline of voting together in 60 percent of cases, an interruption decreases the probability of voting together by $(0.026/0.60=)$ 4.3 percent.

Overall, Table 1 provides strong evidence that a justice-pair is less likely to vote together because of the conflict inherent in interruptions, but that the conflict inherent in interruptions is lower in cases where there are more interruptions between other justices. Table 1 also provides evidence for the exposure and difficult-case theories of interruptions, but no evidence for the dissatisfaction theory. While it might be unsurprising that cases with justice interruptions have more disagreement, we find it remarkable that this effect holds even after accounting for differences in agreement for the justice-pair of the interruption and for the justice who interrupts due to disagreeing with other justices. For instance, suppose Justice Scalia interrupts Justice Kennedy and Justice Kennedy interrupts back. Even after accounting for (1) the effect of the interruption on disagreement between Justice Scalia and Justice Kennedy and (2) the signal of Justice Scalia's and Justice Kennedy's interruption of their disagreement with all other justices, the results suggest that (3) the interruptions between Justices Scalia and Kennedy imply that other justices are less likely to agree with one another.

Figure 7 provides a graphical illustration of the regression results. The figure plots the average agreement between justices in cases by the number of interruptions in the cases. The first short-dashed line with circle markers provides the raw average agreement rate. In cases with no interruptions between two justices, the justices vote together 60 percent of the time. This rate of agreement decreases by 5 percentage points in cases where there is 1 interruption between the justice-pair, by 9 percentage points in cases where there are 2 interruptions between the justice-pair, and by 13 percentage points in cases where there are 3 or more interruptions between the justice-pair. The figure also allows us to check whether the relationship between interruptions and disagreement is linear (as assumed in the regressions in Table 1)—the relationship appears quite linear.

Figure 7: Graphical Relationship between Interruptions and Agreement



The numbers in the first line are just the averages across all justice-pairs and cases, and not how interruptions change the relative likelihood that a justice-pair votes together. The second line—the long dash line with triangle markers—shows the average *change* in the likelihood that a justice-pair

votes in agreement for cases with different interruptions between the justice-pair.⁷ After controlling for differences in agreement between justice-pairs, the relationship between interruptions and disagreement is dampened compared to the overall average, but the relationship is still very strong. Compared to cases where a justice-pair has no interruptions, the justices are on average 4 percentage points less likely to vote with each other if there is 1 interruption, 6 percentage points if there are 2 interruptions, and 8 percentage points if there are 3 or more interruptions.

These average changes in the second line are for the overall relationship between interruptions and agreement. Employing a similar strategy to isolate the conflict theory from Table 1 from other causes of interruptions, we plot the size of the conflict explanation in the third line—the solid line with square markers. Compared to cases where a justice-pair had no interruptions, and after controlling for other theories to explain interruptions, the conflict inherent in interruptions suggests that justice are on average 1 percentage point less likely to vote with each other if there is 1 interruption, 2 percentage points if there are 2 interruptions, and 3 percentage points if there are 3 or more interruptions.⁸

A. Heterogeneous Effects

This section investigates whether the relationship between interruptions and voting differs across different judges and different types of cases. To study these heterogeneous effects, we re-estimate the regression in Column 3 of Table 1 above, now including interaction terms between interruptions and various justice and case attributes.

Justice Attributes. We first investigate whether the relationship between interruptions and voting differs across the justices. We explore whether the relationship varies across seven judge attributes: same political party (Column 1); the length of time served together (Column 2); former colleagues, as measured by whether the justices served together on a circuit court of appeals at the same time (Column 3); whether one of the justices is the swing justice in the Term (Column 4); whether one of the justices is one of the middle three swing justices in the Term (Column 5); difference in experience (Column 6); and same gender (Column 7).

⁷ To construct the figure, we regress agreement on justice-pair fixed effects, obtain residuals, and calculate the average residual for justice-pair-cases with 1, 2, and 3 or more interruptions. We then add the average agreement with no interruptions back to these numbers so that they can be compared to the averages. This is a common way to visualize a relationship between two variables after controlling for other variables.

⁸ This series is estimated in the same fashion as the second plotted line but with the addition of other control variables from Column 3 of Table 1.

For political party of the justice, we use a simple, common measure of justice ideology, the party of the appointing president. For the swing justice in the Term and the three middlemost justices, we use the relative scores of each justice in the relevant Term, according to the Martin-Quinn measure of judicial ideology. For difference in experience, we utilize the first year that each justice sat on the bench, and use the absolute value of the difference in years' experience between each justice-pair. Table 2 presents the results. Note that the main effect of time-invariant justice attributes is absorbed by the justice-pair effects.

Table 2: Differential Relationships between Interruptions and Voting by Justice Attributes

	Voted in Agreement						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Interruptions	-0.025**	-0.072**	-0.027***	-0.029***	-0.031**	-0.024*	-0.023**
	(0.010)	(0.033)	(0.008)	(0.009)	(0.014)	(0.012)	(0.009)
Interruptions × Same Political Party	-0.005						
	(0.016)						
ln(Years Served Together)		-0.003					
		(0.011)					
Interruptions × ln(Years Served Together)		0.021					
		(0.014)					
Interruptions × Served Together on Circuit			0.004				
			(0.005)				
Swing Justice				-0.014**			
				(0.006)			
Interruptions × Swing Justice				0.016			
				(0.021)			
Middle Three Justices					-0.009		
					(0.007)		
Interruptions × Middle Three Justices					0.007		
					(0.018)		
Interruptions × Difference in Experience						-0.004	
						(0.014)	
Interruptions × Different Gender							-0.014
							(0.019)

Note: Standard errors in parentheses clustered at the justice-pair level. * p<0.1, ** p<0.05, *** p<0.01.

We find no evidence that the same political party, the swing justice, the three middlemost justices, difference in experience, and different gender significantly alter the nature of the relationship between interruptions and disagreement. The main effect on swing justice is the only variable that is significant other than interruptions. There is some evidence of a differential effect over the course of serving on the bench together. The point estimate of 0.021 for the interaction between length of service together and interruptions in Column 2 does not quite reach statistical significance at conventional levels, but it is very close. Moreover, the main effect of interruptions almost doubles when we allow the effect to change over the course of the time justices serve together. Combined, this suggests that interruptions between justices who serve longer are less indicative of a conflict between them than are interruptions that occur earlier in the time they serve together.

Salient and Important Cases. We next explore whether the relationship between interruptions and voting differs by the salience or the importance of the case. Interruptions might mean something different when the legal or political stakes are very high in a case than they would for more mundane fact patterns or less controversial topics, where the Court might expect less public scrutiny. To explore this, we use a proxy for salience developed in Epstein and Segal (2000) of whether a case is mentioned on the front page of the *New York Times*. This captures the salience of the case in terms of the level of public interest. It is possible, however, that a case might be salient to justices and the legal community but not to the public. To capture this second notion of salience, we also use a measure of whether a case is published in the *Congressional Quarterly*. This measure “is based on experts’ retroactive assessment of whether a case was a landmark decision,” and captures the legal significance of the case. Scholars have used both measures as proxies for important Supreme Court cases (e.g., Bonica et al., 2017).

Before turning to the results, note that justices interrupt each other in 1.9 percent of cases that are not covered in the *New York Times* but interrupt in 2.5 percent of cases covered in the *New York Times*, and that justices interrupt each other in 1.9 percent of cases that are not in the list of *Congressional Quarterly*’s legally important cases but interrupt in 3.2 percent of cases that are in the list of legally important cases. In Table 3, we estimate whether the relationship varies for a publicly salient case (Column 1) and a legally important case (Column 2).

Table 3: Differential Relationships between Interruptions and Voting by Case Salience and Legal Importance

	Voted in Agreement	
	(1)	(2)
Interruptions	-0.016 (0.012)	-0.023** (0.011)
New York Times	-0.159*** (0.007)	
Interruptions × New York Times	-0.016 (0.027)	
Congressional Quarterly		-0.225*** (0.012)
Interruptions × Congressional Quarterly		0.016 (0.029)

Note: Standard errors in parentheses clustered at the justice-pair level. * p<0.1, ** p<0.05, *** p<0.01.

We find that justice-pair agreement is 15.9 and 22.5 percentage points lower in politically salient and legally important cases, but find no strong evidence that the relationship between interruptions and voting differs for politically salient and legally important cases. However, note that the size of the point estimate on interruptions in Column (1) decreases to -0.016 and that we lose statistical significance at conventional levels. This appears to be driven by the interaction term between interruptions and *New York Times*, which is of the same size as the main effect. Taking the point estimates at face value, this would suggest that the relationship between interruptions and agreement is -0.032 for cases cited in the *New York Times* and -0.016 for cases note cited in the *New York Times*.

5. PLACEBO TESTS

A. Substantial and Crossover Interruptions

Above, we described a refinement of the definition of an interruption. The purpose was to distinguish between a substantial interruption, which we expect to express conflict and be associated with disagreement in voting, and a mere overlap in two justices speaking (“crossover”), which we do not expect to express conflict and be associated with disagreement in voting. The time stamps for each speech episode from the Oyez data allow us to make this distinction. Although our main interest

is on substantial interruptions, assessing the relationship between crossovers and agreement can help give context to the relationship between substantial interruptions and voting. Assessing whether crossovers are related to disagreement serves as a type of placebo test: if crossovers are predictive of disagreement, such a relationship may call into question the credibility of the conflict explanation for the substantial interruptions and voting relationship because we do not expect that crossovers to be reflective of conflict.

In this section, we assess the relative predictive power of substantial interruptions and crossovers. To do so, we re-estimate the same set of substantial interruption variables in Table 1 for crossovers. We also include the same set of substantial interruptions, which allows us to assess whether there is a relationship between crossovers and voting *in addition to* the relationship between substantial interruptions and voting. Table 4 reports the results.

There are three main results in Table 4. First, comparing Tables 1 and 4, the relationship between substantial interruptions and voting is not affected by the inclusion of crossovers. The point estimates on substantial interruptions in each of the columns in Table 4 are largely unchanged from those in Table 1. That means that accounting for crossovers does not change our overall finding of a significant negative relationship between substantial interruptions and agreement.

Second, there is no evidence of a relationship between crossovers and voting. In each column, the point estimate on crossovers is small relative to the point estimate on substantial interruptions, and only in Column 2 is the point estimate on crossovers significant. This gives support to our conflict theory: if substantial interruptions are associated with disagreement but crossovers are not, this supports the view that conflict is driving the disagreement.

Third, total crossover interruptions in a case—i.e., all crossovers among all justices, not just the relevant justice-pair—are associated with decreases in voting agreement between justices in the case. In other words, justices are more likely to be in disagreement when other justices in the case are more likely to begin speaking at the same time. Combined, the results suggest that although crossovers do not reflect conflict between the interrupting and interrupted justices, they do reflect something about cases in which justices are more likely to disagree. So, we could imagine a case that prompts a lot of spirited talking, resulting in a lot of crossovers, but does not reflect conflict between the interrupter and the interruptee.

Table 4: Relationship between Substantial and Crossover Interruptions and Voting Agreement

	Voted in Agreement				
	(1)	(2)	(3)	(4)	(5)
<u>Justice-Pair Interruptions</u>					
Substantial Interruption	-0.048*** (0.013)	-0.042*** (0.008)	-0.026*** (0.008)	-0.009 (0.009)	-0.027** (0.010)
Crossover Interruption	-0.010 (0.009)	-0.014** (0.007)	-0.007 (0.007)	0.003 (0.008)	-0.003 (0.011)
<u>Total Interruptions of Justice-Pair in Case</u>					
Substantial Interruption				0.001 (0.005)	0.000 (0.005)
Crossover Interruption				-0.001 (0.004)	-0.001 (0.004)
<u>Total Justice Interruptions in Case</u>					
Substantial Interruption				-0.009*** (0.001)	-0.009*** (0.001)
Crossover Interruption				-0.003*** (0.001)	-0.004*** (0.001)
<u>Justice-Pair Interruptions × Total Interruptions of Justice-Pair in Case</u>					
Substantial Interruption					0.005*** (0.002)
Crossover Interruption					0.001 (0.001)
Proportion of All Words in Case by this Justice-Pair (x10)			-0.053*** (0.006)	-0.025*** (0.006)	-0.025*** (0.006)
Proportion of Words Spoken in Case by Justices (x10)				-0.007*** (0.002)	-0.007*** (0.002)
<u>Covariates</u>					
Term FE	Yes	Yes	Yes	Yes	Yes
Justice-Pair FE	No	Yes	Yes	Yes	Yes
Issue Area FE	No	No	No	Yes	Yes
Observations	196,626	196,626	196,626	196,626	196,626
Voted in Agreement	0.600	0.600	0.600	0.600	0.600

Note: Standard errors in parentheses clustered at the justice-pair level. * p<0.1, ** p<0.05, *** p<0.01. Proportion of words spoken is multiplied by 10.

B. Interruptions at Other Oral Arguments

Next, we explore the possibility that the relationship between interruptions and disagreement is driven by a more general conflict between justices rather than conflict directed at the case in question in the spirit we have in mind. It might even be possible that short term inter-justice animosity in a day, week, or month could affect how the justices subsequently vote. For example, most weeks' arguments are heard on Mondays, Tuesdays, and Wednesdays, and the justices vote at conference on those cases on the Friday following oral argument. It is possible that one case in the week could create an animosity between two justices and that animosity could carry over to other cases heard that week. Any carry-over animosity could influence both how justices treat each other at oral arguments (whether they interrupt) and whether the justices vote together. For example, if a justice strategically votes in case A to influence how other justices vote in case B, there could be conflict between justices in one case resulting from another case. In that scenario, the fact that we see two justices interrupting each other and voting against each other in a case could simply reflect a conflict between them on the day of the oral argument that is unrelated to conflict between the justices in that case.

The Supreme Court Database includes the date of each oral argument.⁹ For this placebo test, we assess whether interruptions between justices in other oral arguments that day or that week predict voting disagreement. Using the date of the oral arguments, we calculate the number of other interruptions between each justice-pair that occurred on the day and in the calendar week. We estimate the effect of these other interruptions on disagreement in the other cases that day or week. Table 5 provides the results. Column 1 includes other interruptions the same day as the oral argument, Column 2 includes other interruptions in the same week as the oral argument, and Column 3 includes both the other interruptions in the same day and same week. Table 5 provides no evidence of a relationship between other interruptions between justices in that day or week and voting agreement, which provides some evidence that the conflict between justices is limited to the case in question. Moreover, controlling for other interruptions does not affect the relationship between interruptions in the case and disagreement in the case.

⁹ The Supreme Court Database also includes the date of any rehearing. We use the date of the first oral argument.

Table 5: Relationship between Interruptions at Other Oral Arguments and Voting Agreement

	Voted in Agreement		
	(1)	(2)	(3)
Justice-Pair Interruptions	-0.038*** (0.008)	-0.039*** (0.008)	-0.038*** (0.008)
Interruptions in Other Arguments that Day	0.010 (0.006)		0.010 (0.008)
Interruptions in Other Arguments that Week		0.003 (0.004)	-0.000 (0.005)
Covariates			
Judge Dyad FE	Yes	Yes	Yes
Term FE	Yes	Yes	Yes
Issue Area FE	Yes	Yes	Yes
Observations	195596	195596	195596
Voted in Agreement	0.600	0.600	0.600
Note: Standard errors in parentheses clustered at the justice-pair level. * p<0.1, ** p<0.05, *** p<0.01.			

6. DISCUSSION AND CONCLUSION

This article asked whether the observable conflicts in judicial relationships in a case in the form of interruptions at oral arguments are related to eventual judicial disagreement in the case. Using unique data on the interruptions between justices in cases from 1960 to 2015, we found that on average a judicial pair is 7 percent less likely to vote together in a case for each interruption that occurs between the judicial pair in the case at oral argument. Our main contribution was to develop competing theories driving the relationship and empirically isolate the different theories, that is, to understand why justices who interrupt each other in a case are more likely to vote against each other relative to their baseline rate of agreement. The particular theory that we expected would shed most light on judicial

relationships was the conflict theory: that interruptions constitute a type of observable conflict that is systematically associated with disagreement. Through a conditioning-on-observables research design, we isolated the conflict theory from an exposure theory (justices who speak more in a case might be more exposed to interrupting or being interrupted), a dissatisfaction theory (an interrupting justice is interrupting because he or she is at odds with the rest of the Court about the direction of the oral arguments and the anticipated outcome of the vote), and a difficult-case theory (that interruptions are simply a reflection of the case generally that is common to all justices, where cases with more disagreement are more prone to have more interruptions).

We found strong evidence that the conflict inherent in interruptions explains over half of the relationship between interruptions and disagreement: even after accounting for the exposure, dissatisfaction, and difficult-case theories, the probability that a justice-pair votes together decreases by 4 percent for each interruption. We also found some evidence for both the exposure and the difficult-case theories, but not for the dissatisfaction theory.

A. Implications

Our finding that interruptions and disagreement are associated might shed light on the significance of oral arguments. Even without knowing the direction of causation between interruptions and voting agreement, we can perhaps reach the conclusion that oral arguments matter, at least to the justices, by considering both possible directions of causality. If interruptions cause disagreement, then oral arguments clearly matter: a conflict between two justices at oral arguments perpetuates further conflict in the form of two justices failing to agree in the ultimate decision of the case. Accordingly, inter-judicial behavior at oral arguments itself can shape the law.

If disagreement causes interruptions, the situation is more complicated. If disagreement exists prior to the oral argument taking place, then arguably cases have already been effectively determined prior to oral argument and oral arguments are just a form of theater. However, even if causation runs in this direction, it does not necessarily follow that oral arguments are unimportant. To see why, consider four possibilities of how disagreement could cause interruptions.

Suppose Justice A interrupts Justice B at oral argument. If disagreement leads to interruptions, then not only must Justice A have already made up his or her mind, but Justice A expects to disagree with Justice B. One explanation is that Justice A expects to disagree with Justice B due to Justice B's general ideological or methodological tendency, but still believes that Justice B's vote is still malleable. Justice A interrupts Justice B to influence Justice B's vote, which would imply that we are only partly

in the reverse direction of causality scenario: at least some justices perceive the votes of other justices to not be predetermined, and oral arguments still matter in terms of shaping case votes.

A second explanation is that every justice has already decided how he or she is going to vote and expects every other justice to have similarly already made their decision. However, Justice A nonetheless interrupts Justice B because Justice A is attempting to shape the way that Justice B approaches the question and the formation of his or her reasoning in the eventual opinion. This second explanation would imply that oral arguments still matter: they do not matter in terms of changing votes, but they matter in terms of shaping doctrine.

The third and fourth explanations both involve scenarios where every justice has already decided on their vote and every justice has already decided on the reasoning. Why, then, are justices interrupting their expected adversaries in the case? A third explanation is that the justices are grandstanding. Then, oral arguments may indeed be a dog and pony show; nevertheless, the conclusion that oral arguments do not matter still does not follow. If the justices grandstand during oral argument, performing for the attendant public and the broader public through the Court reporters, then that tells us that oral arguments matter, just in a different way. The justices must at least care about how oral arguments are *perceived*. Even if oral arguments do not influence case votes or how the opinion is written, the grandstanding explanation would imply that oral arguments nonetheless shape judicial behavior. It also might suggest that the justices believe that perceptions of oral arguments contribute towards the legitimacy of the Court, which an extensive literature has in turn shown to be central to judicial power (e.g., Breyer, 1998; Shane 1998; Lubet, 1998) in part because the judiciary has neither the power of the sword nor the purse (Hamilton, 1788).

The fourth and final possibility is that justices are not grandstanding but simply cannot stop themselves from interrupting. This final theory is a behavioral explanation: that interrupting justices have self-control problems that overcome their self-restraint to wait for a place in the conversation. However, we have shown that interrupting justices are not randomly interrupting but rather are interrupting other justices in cases in which they are more likely than usual to disagree. Accordingly, the lack of self-control means either (1) that interrupting justices care about oral arguments enough to systematically interrupt colleagues with whom they expect to disagree, or (2) that justices are particularly unable to control themselves from interrupting when they are prone to disagree with a colleague. The justices regularly profess that the latter is not the case: that their disagreements over issues of law create no personal animus whatsoever (Grove, 2011; Tremmel, 2015; Guzman, 2016; Ginsburg, 2016; Greenwood, 2017). As such, the only explanation under which oral arguments do not

matter is if the justices have been consistently misrepresenting their own personal responses to disagreement. Otherwise, under all other explanations, oral arguments have significance, at least to the justices.

So, ambiguity may still exist as to the extent of the importance of oral arguments as well as of the mechanism of their impact, but given the results it is harder to argue that oral arguments are meaningless. The final section discusses how future research could attempt to break down that remaining ambiguity.

B. Potential future research

We feel there are at least two important avenues for future research. The first potential avenue for future research would be to attempt to isolate the direction of causality. We have established a relationship between conflict (interruptions) and agreement (voting together), but not which causes which. Although it might be very difficult or impossible to identify a credible research design to isolate the direction of causality, we feel that further efforts to understand the justices' goals of oral arguments—e.g., the extent to which justices use oral arguments to gather information, to signal to their colleagues the strength of their beliefs, or as attempts to influence their colleagues—can help shed light on whether interruptions cause or simply reflect the eventual disagreement.

The second potential avenue for future research relates to differences in the meaning of interruptions. Although we began the process of understanding differences in the meaning of interruptions by distinguishing between meaningful interruptions and mere conversational overlaps, there exists more room for further exploring the dynamics at work. We consider it quite possible that the relationship between interruptions and agreement could be reversed for some types of interruptions: particularly, there could be a positive relationship between interruptions and agreement in cases where the interruption occurs when the justice is trying to help one side or another justice. In some oral arguments, some of the justices come to the argument favoring one side and seemingly wanting to see that side do well. This was explicitly acknowledged in a case in the 2016 Term, *Dean v. United States*.¹⁰ After Justice Sotomayor had repeatedly asked petitioner's advocate, Alan G. Stoler, questions that appeared directed at helping him make a persuasive argument, Stoler confused the positions of Justice Sotomayor and Justice Kagan. Justice Kagan responded by saying "She's Justice

¹⁰ 137 S. Ct. 1170 (2017).

Sotomayor She was the one helping you.”¹¹ This is an unusually frank recognition by a justice of a perhaps not uncommon phenomena, and it is one that is not limited to the justices helping the advocates. Although establishing a way to quantify “helpful” interruptions was beyond the scope of this article, we believe that this is a meaningful distinction that is worthy of further investigation.

¹¹ Oral Argument at 6:39, *Dean v. United States*, 137 S. Ct. 1170 (2017), (No. 15-9260), *available at* <https://www.oyez.org/cases/2016/15-9260>.

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APPENDIX

One limitation of the Oyez site is that the written record of the words spoken at oral arguments are based on the Court's audio recordings. Even though Oyez has made significant progress in identifying each speaker, there are some remaining gaps (discussed below). Some elements are missing in the data. In particular, in some speech episodes, speakers are not identified. This is apparent because speech episodes are defined but the place where the name of the speaker is usually provided is simply empty. This is in the underlying HTML code that we used to generate the data, not simply in our version of the data. The large majority of missing elements was fixed by Oyez between January 2017 and July 2017. The first round of our web scraping ran from Jan 3, 2017 to Jan 8, 2017. To be conservative, we reran the analyses after excluding all cases in which (1) there was a speech episode of a justice that was interrupted and no speaker was identified, and (2) a justice interrupted a speech episode but no speaker of the interrupted speech episode was identified. The results and general patterns do not materially change if we keep the cases with interruptions but simply ignore the missing speakers.

We also scraped data in January 2017, but it was less complete than the July 2017 data, as Oyez had not yet fixed a missing data problem. As pointed out in Dietrich et al. (2017), Oyez dramatically changed its website sometime between September 6, 2015 and October 12, 2015. They report that the old version of the website contained much less aggressive web scraping barriers. Dietrich et al. (2017) scraped an older version of the website on July 1, 2015. Contact authors for more information about overcoming the web scraping barriers.