Journal of Law and Courts (2025), 1–26
doi:10.1017/jlc.2025.10008

CAMBRIDGE UNIVERSITY PRESS

ARTICLE

Justices on Autopilot: Thinking-Fast Evidence from State Supreme Court Oral Arguments

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(Received 14 December 2024; Revised 22 July 2025; Accepted 28 July 2025)

Abstract

Do oral arguments influence state supreme courts, and if so, how? Focusing on a "thinking-fast" framework, this study analyzes 2014–2021 New York Court of Appeals oral arguments to test whether non-traditional factors such as expressed emotion can shape decisions. Empirical analysis drawn from textual data shows that oral arguments can explain decision-making, and that justices' emotion during arguments likely plays a role. The findings challenge normatively rational models of judicial behavior by underscoring affective, real-time influences and highlight oral arguments as a consequential stage in subnational adjudication. This is the first evidence of their meaningful role in state supreme courts.

Keywords: state supreme court; oral arguments; natural language processing; judicial decision-making

Introduction

Four decades of exploratory research have affirmed the characterization of state supreme courts as indispensable cogs in the American judiciary (Boyea and Brace 2021).[1] Scholarship on state court decision-making is expanding, a trend that Hall (2017) believes is "one of the most exciting and dynamic areas of study within the discipline of political science" (315). Yet a vital stage in a state supreme court's decision-making process has long eluded empirical scrutiny – oral arguments.

A growing literature now analyzes US Supreme Court oral arguments. Seminal work by Johnson (2001; 2004) led to the conclusion that "oral arguments can and do change justices' minds" (Ringsmuth, Bryan, and Johnson 2012, 436). Oral arguments allow justices to collect information for coalition building (Black, Sorenson, and Johnson 2012), enhance public legitimacy (Black et al. 2024; Cann and Goelzhauser 2023), and allow litigants to build their case after briefing (Johnson 2004; Johnson,

[1]State supreme courts can also be referred to as "state courts of last resort." I opt for the former term.

Wahlbeck, and Spriggs 2006). However, this body of research has not yet expanded to the role of oral arguments beyond the highest court in America.

As scholars were debating the influence of oral arguments, a spirited field of research burgeoned, examining how justices reach their decisions. Theories such as attitudinal, legalistic, and strategic emerged explaining the US Supreme Court's decisions (Epstein, Sadl, and Weinshall 2022), and even theories specified for state supreme courts (Hall 2017). Recent scholarship extends these conventional theories. Scholars are probing the intersection of emotion during oral arguments and briefing, sometimes due to personality, and decision-making by the US Supreme Court (Black et al. 2011; Black et al. 2016; Dickinson 2019; Black et al. 2020; Epstein, Sadl, and Weinshall 2022; Hall et al. 2022). Specifically, Epstein and Weinshall (2021) believe that "there is no getting around the fact that [emotions] can distort purely strategic decision-making" (31). The result of this research has been a novel decision-making theory coined thinking-fast (Epstein, Sadl, and Weinshall 2022).

I exploit novel data on state supreme court oral arguments to measure the emotional content of judicial speech and its impact on decision-making. Studying this relationship at the state level is especially fruitful because of state supreme courts' unique institutional arrangements relative to those at the US Supreme Court and the rich trove of unexplored data (Weinshall and Epstein 2020). Previously unanswered questions on decision-making at state supreme courts could be answered from a promising yet developing theory of decision-making (Hall 2017).

Thus, I consider whether oral arguments influence judicial decision-making at state supreme courts. If so, do biases such as the emotion in justices' statements and questions play a role in this influence?

By employing emerging natural language processing (NLP) methods (Dickinson 2019; Hall et al. 2022), I assemble a dataset of appellate cases spanning 2014 to 2021 before the New York Court of Appeals (NYCOA).[2] Harnessing those methods – such as deep learning and transformers – enables me to place justice's emotional speech alongside other theoretically motivated predictors of case outcomes. The implications simultaneously make contributions to state supreme court research while also testing and supplementing theories of judicial decision-making. First, justices' emotions expressed during oral arguments can explain their decision-making, and more broadly that oral arguments matter at state supreme courts. Indeed, the evidence suggests that justices negotiate their expressed emotions during questioning alongside the strategic goals or the legal factors of a case, such as prior briefing. This conclusion provides support to a thinking-fast theory (Epstein and Weinshall 2021; Epstein, Sadl, and Weinshall 2022, 711) but explicated at the state supreme court level. These findings may also have implications for how emotions interact with personality-driven approaches to thinking-fast theory (Hall 2018; Black et al. 2020). Second, this study positions oral arguments as an important institutional design in framing behavior under a thinking-fast theory, previously identified as a promising approach (D'Elia-Kueper and Segal 2015; Hall 2017; Epstein and Weinshall 2021, 34). Lastly, this analysis demonstrates the usefulness of analyzing raw textual data with NLP and deep learning within the judicial politics literature.

[2]New York uses an unintuitive nomenclature and calls their state supreme court the Court of Appeals; the Court also calls its jurists "judges" rather than "justices." I opt to use justices for the remainder of this article for simplistic comparisons to other courts. Moreover, the exact number of cases considered can be found in the Data and Methods section.

https://doi.org/10.1017/jlc.2025.10008 Published online by Cambridge University Press

Theory and previous research

Oral arguments at the federal and state levels

Since the early 2000s, scholarship on US Supreme Court oral arguments has expanded markedly. Johnson (2001) established formative, early evidence that information gathered during oral arguments is used by justices to make substantive policy choices. Indeed, 80% of the issues in justices' questions during oral arguments are original to oral arguments (Johnson 2004), providing a compelling motivation to analyze them. Oral arguments also shape judicial behavior and outcomes. They provide justices with supplementary information and fresh perspectives that otherwise could have been overlooked (Segal and Spaeth 2002; Conlon and Karaba 2012). The quality of the arguments presented also uniquely influences the decision of justices (Johnson, Wahlbeck, and Spriggs 2006; McAtee and McGuire 2007). Ringsmuth, Bryan, and Johnson (2012) provided original evidence that high-quality arguments from attorneys can actually change a justice's vote. Effective oral arguments also resolve any lingering questions from briefs and allow justices to assess the opinions of their colleagues for coalition building (Johnson 2004; Black, Johnson, and Wedeking 2012). Experimental research has demonstrated the institutionally legitimizing effects of oral arguments (Cann and Goelzhauser 2023), albeit with mixed results at state supreme courts (Black et al. 2024).

How do scholars measure these effects of oral arguments? Litigants who face more – and more verbose – questions are less likely to win the case or individual justices' votes (Johnson et al. 2009; Epstein, Landes, and Posner 2010). To estimate more nuanced effects, the content of arguments themselves has been employed in clever measures of implicit biases (Shullman 2004; Johnson et al. 2009; Wistrich, Rachlinski, and Guthrie 2015; Vunikili et al. 2018). A seminal approach by Black et al. (2011) analyzed "bags of words" to measure unpleasant and pleasant emotions directed at each litigant using a dictionary of language. The authors find relatively more unpleasant emotional words directed toward a particular party can predict how the US Supreme Court will rule with 73% accuracy. These measures, unfortunately, do not capture the contextual understanding of emotion positioned within a justice's entire question. Recent advancements in NLP and deep learning address this shortcoming by understanding the complex, contextual position of emotion in sophisticated, difficult sentences seen in the judicial setting (Dickinson 2019). Other innovations of the same ilk include Dietrich, Ryan, and Sen (2018) and Chen et al. (2025), both of whom use the physical attributes of oral arguments such as vocal pitch and facial expressions, all suggesting that emotional speech contains information beyond the legal, political, and textual.

However, Sorenson (2023) departs from the canonical "questions" used by many studies on oral arguments in distinguishing statements from questions during judicial speech. She finds that they are theoretically and empirically distinct; more questions increase the chance of a litigant winning while more statements decrease their odds. This result has broad implications for how justices communicate information during oral arguments with Sorenson explaining that "certain types of communications are helpful while others are intended to monopolize time and convey specific attitudes" (1569). To maintain theoretical validity, I draw on this approach in the hypotheses below, data collection, and variable construction.

https://doi.org/10.1017/jlc.2025.10008 Published online by Cambridge University Press

All the prior empirical work on oral arguments has focused exclusively on the US Supreme Court.[3] Thus, to examine the level of interest for this study, a state supreme court, I borrow heavily on the federal level oral argument literature to compare and contrast findings in a subnational judiciary setting.[4]

Decision-making: how do justices think?

Normative theories explaining why courts and justices reach their decisions cover a range of literatures.[5] Legalists purport that justices employ legal factors such as precedent, statutory analysis, constitutional analysis, textualism, originalism, and particularly briefing (Maltzman and Bailey 2011; Hall 2018; Hazelton and Hinkle 2022; 2024). Attitudinal theory takes the view that justices make decisions primarily using policy or ideological preferences inelastic to external actors or factual stimuli of a particular case (Segal and Spaeth 1993; 2002). Much of the empirical social science literature has focused on testing the latter theory, positing that precedent, originalism and textualism, and other legal factors inadequately explain judicial behavior as opposed to personal policy and ideological preferences (Segal and Spaeth 1999; Howard and Segal 2002; Bailey and Maltzman 2008).

However, cracks emerged in attitudinal theory. Epstein and Knight (2013) point to unanimous decisions, filling the docket with "easy cases," and the success of the US government. Strategic theory fills those gaps by describing judicial decision-making as the actions of rational actors seeking to achieve their goals, influenced by the preferences of others, expected choices, and institutional arrangements (Maltzman, Spriggs, and Wahlbeck 2000; Epstein and Knight 1998; 2013). Recent research has focused on bridging strategic accounts to others (Epstein and Weinshall 2021), such as justices utilizing precedent to produce outcomes consistent with their own policy preferences (Hansford and Spriggs 2006).

An accumulating body of research examines strategic theory's institutional structures specifically at state supreme courts. Scholars developed decision-making theories for these states by examining political preferences and characteristics of justices, case facts and legal variables influencing judicial choice, institutional arrangements, and the external environment surrounding courts (Brace and Hall 1990; 1993; 1997).[6] This work suggests that the attitudinal model could describe judicial behavior at the state level, but with institutional structure caveats (Brace and Hall 1995; Hall and

[3]There are a few caveats to this statement. Some work has been done on arguments at US Circuit Courts (Dietrich, Ryan, and Sen 2018) and other international courts (Jacobi, Robinson, and Leslie 2023). But the most portable counterexample to US Supreme Court oral arguments, state supreme courts, has yet to be examined.

[4]It should be further noted that there is substantial work on state supreme courts themselves which is weighed in the subsequent section for their institutional implications on theoretical expectations (Hall 2017).

[5]Posner (2008) identifies nine: attitudinal, strategic, sociological, psychological, economic, organizational, pragmatic, phenomenological, and legalistic. However, I focus on legalist, attitudinal, and strategic (rational choice is an umbrella that strategic falls under) theories because those have been the focus of political science research (D'Elia-Kueper and Segal 2015).

[6]It should be noted that the bulk of these studies' underlying evidence presents methodological quandaries. First, many directly interpret interaction terms in nonlinear models to make conclusory assertions (Ai and Norton 2003, 129). Second, their focal predictors don't comport with modern approaches to estimate judicial ideology, likely resulting in bias (Bonica and Woodruff 2015).

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Brace 1996).[7] Indeed, the culmination of this research resulted in a neo-institutionalism theory of judicial decision-making at state supreme courts (Brace and Hall 1990).

An emerging theory has been how a justice sides with a litigant "not because they are rationally advancing an economic or any other interest but because of an emotional response" (Epstein, Sadl, and Weinshall 2022, 711).[8] Unsurprisingly, experimental research has found that humans, including the jurist, rely on heuristics or mental shortcuts using intuition, emotion, physical attractiveness, and personality to maximize efficient decision-making and minimize intense cognitive effort (Guthrie, Rachlinski, and Wistrich 2007; Rachlinski, Guthrie, and Wistrich 2011; Wistrich, Rachlinski, and Guthrie 2015; Black et al. 2016; Spamann and Klohn 2016; Epstein, Parker, and Segal 2018; Segal, Sood, and Woodson 2019; Waterbury 2024). These cues stem from the neurobiological and cognitive processes involved in legal decision-making (Kahan 2015; Liu and Li 2019). However, this line of theory has been forced to contend with the extensive legal training and expertise that justices possess which would expectantly reduce biased reasoning (Posner 2008; Kahan 2015). Liu and Li (2019), nonetheless, find in experimental research that justices employ those same skills to rationalize or "decorate" a biased decision with the trappings of legalism (659). This result yields broad implications for the legal field, but for the instant study how scholars should measure effects of biases if they are being masked in decision-making.

Oral arguments as a source of emotional content and biased decision-making

Accordingly, considering where in appellate proceedings a biasing effect of heuristic processing may occur is requisite to explaining that effect. During briefing? During oral arguments, as that literature may suggest (Black et al. 2011)? Or some combination of those? Scholars offer different answers. Black et al. (2016) and Hazelton and Hinkle (2022) demonstrate that emotion in briefing as a bias can have a negative effect. They propose that such strongly emotional language "decreases an attorney's perceived credibility" and professionalism (Black et al. 2016, 397). These findings support the presence of heuristic cues in judicial decision-making, particularly during briefing, by justices relying on credibility cues that bias systematic decision-making (382). These may also be symptoms of personality, particularly conscientiousness, for a mediating effect on emotionality in briefs (Black et al. 2020).[9] A conscientious justice is likely to penalize emotional language even more because this personality trait devalues emotion (Black et al. 2020, 118), suggesting additional extra-legal factors in decision-making. Hall et al. (2022) also find evidence that personality traits may influence US Supreme Court decision-making.

Yet, the other promising location of the effect on decision-making is oral arguments. Compelling research gives reason to suspect oral arguments, especially emotional arguments, are uniquely positioned to influence decision-making as

[7]Melinda Hall (2017) includes the institutional arrangements of the judicial selection methods, maximum terms of office, opinion assignment practice, and voting rules.

[8]The authors are referring to a thinking-fast judging theory.

[9]Matthew Hall (2018) also analyzes the conscientious personality trait of justices but in a purely legal setting. See this book for further details on personality theory in the context of legalism.

https://doi.org/10.1017/jlc.2025.10008 Published online by Cambridge University Press

compared to briefing (Johnson 2004; Black et al. 2011; Dickinson 2019). Descriptively, it is true that US Supreme Court oral arguments contain emotionally charged speech by justices (Black et al. 2011; Black, Johnson, and Wedeking 2012). Arguments also raise novel issues unseen in litigant briefs (Johnson 2004), giving fresh fodder for the justices to consider. They certainly pay attention to that fodder, as it has the ability to change their votes (Ringsmuth, Bryan, and Johnson 2012). They are also a conversation among the panel of justices as they direct questions at each attorney, later used during coalition building (Johnson 2004; Black et al. 2016). But why is emotional language expressed during oral arguments? Cognitive research shows that, under high information load, decision-makers tend to shift from deliberate, rule-based reasoning to heuristic shortcuts that rely on emotional cues (Chaiken and Ledgerwood 2011). The shortcut relevant to this emotional content identified by judicial politics scholars is the affect heuristic: a rapid, intuitive judgment formed by tagging stimuli with positive or negative affective valence (Finucane et al. 2000; Kahneman 2011). In the context of judicial behavior, this implies that when cognitive demands are high (Black et al. 2020; Hazelton and Hinkle 2022; 2024; Waterbury 2024), justices may unconsciously form impressions of litigants or arguments based on emotional tone, and then use those impressions to guide decision-making (Liu and Li 2019). These impressions serve as cognitive anchors that simplify the choice before them. Later, due to professional norms and institutional expectations (Black et al. 2024), the justice may engage in a post hoc rationalization, using legal reasoning to justify the initial intuition (Liu and Li 2019). This process could unfold in four steps: (1) information strain; (2) unconscious affective tagging; (3) intuitive judgment on case merit; and (4) post-hoc legal rationalization. These steps form the micro-foundations of the affect heuristic mechanism in legal decision-making, providing a potential, stepwise account of how emotion during oral arguments may influence judicial behavior at the individual level.

Why should we expect this particular process to operate specifically in judicial settings, and not just any high-stakes decision environment? Courts, and especially state supreme courts, possess unique institutional features that make them fertile ground for this kind of cognitive processing (Hall 2018). First, justices must write or join written opinions to explain their decisions across a wide array of subject areas that they may be unfamiliar with (Meyer et al. 2006). This necessity of public justification supports the presence of rationalization, the final step in the mechanism. Second, oral arguments are fast-paced, collegial, and adversarial, with justices engaging in real-time questioning of both litigants and one another (Black, Johnson, and Wedeking 2012). This increases information strain and introduces dynamic, social cues into the environment, amplifying the likelihood of automatic emotional responses (Kahneman 2011). Third, state high court judges face large caseloads and limited clerical resources (Hughes, Wilhelm, and Vining 2015; Boyea and Brace 2021). The NYCOA decides upward of 100 cases per year, which further taxes cognitive bandwidth and encourages the use of intuitive processing (Chaiken and Ledgerwood 2011).[10] Finally, state courts are smaller institutional environments with repeat-player attorneys. Many lawyers appear before the same panels of justices across multiple terms, creating ongoing affective associations that may influence credibility judgments (McGuire 1995; Black et al. 2016). Taken together, these

[10]These data show that the NYCOA heard on average 120 cases each year from 2014 to 2021.

https://doi.org/10.1017/jlc.2025.10008 Published online by Cambridge University Press

conditions make the state supreme court oral argument setting an especially powerful site for observing affect-based cognitive processing.

These considerations also help explain why we should expect oral arguments over written briefs to be a particular source of affect-based biases. While briefs arrive well in advance and can be digested slowly with clerical assistance, oral arguments happen live and demand immediate processing under conditions of cognitive load.[11] In contrast to the systematic reading of briefs, oral arguments require justices to hold numerous facts and doctrines in memory, adapt to novel issues, and participate in a collaborative and strategic performance with other justices. These institutional features encourage heuristic processing, making it more likely that emotion expressed by justices during oral arguments shapes their final votes on the merits.

Thus, I expect that oral arguments will likely be a source of expressed emotional content that can ultimately be explicative of decision-making at a state supreme court. This expectation is given as the first hypothesis:

> *H1: A state supreme court justice who directs more positive emotion in speech toward the appellee during oral arguments is more likely to vote favorably for the appellee by affirming.*

Oral arguments may prove – or fail to prove – to be the genesis of an emotional bias in judicial decision-making, but additional analysis will be needed to fully disentangle the emotional content in briefs from later moments of exposure to isolate the cognitive microfoundations at play. Nonetheless, H1 provides the literature with an empirically testable foundation for state supreme courts that future research can build from.

Political science research has also shown that linguistic clarity in opinion writing is a factor considered strategically by US Supreme Court justices to promote lower court compliance with their decisions (Black et al. 2016); it's entirely conceivable that such a factor is portable to oral arguments as the general principles encouraging clarity apply, but likely under differing mechanisms for this procedural setting. The same heuristic processing that incorporates emotions during oral arguments can also be induced when speech is linguistically clear and understandable (Kahneman 2011). When textual stimuli are unclear and difficult to read, systematic processing is mobilized because of cognitive strain and analytical reasoning (Chaiken and Ledgerwood 2011). If a justice's speech is linguistically unclear, I suspect that cognitive strain is experienced by the justice and other justices listening. Conversely, clear speech might be revealing of heuristic processing, which would be expressed by justices during oral arguments. Thus, these expectations are given as the second hypothesis:

> *H2: A state supreme court justice who uses more linguistically simple speech toward the appellee during oral arguments is more likely to vote favorably for the appellee by affirming.*

The precise mechanisms underlying how clarity shapes decision-making are not directly assessed herein. Rather, H2 seeks to test if this factor plays a role in the assertion that oral arguments influence state supreme court outcomes.

[11]The NYCOA grants thirty minutes of argument per litigant (22 CRR-NY 500.18).

https://doi.org/10.1017/jlc.2025.10008 Published online by Cambridge University Press

Data and methods

The New York Court of Appeals

A lack of data on state supreme courts has hindered the analysis of their respective oral arguments (Weinshall and Epstein 2020).[12] A review of the germane literature reveals no robust database on oral arguments before a state supreme court. Therefore, I collect original data on the NYCOA to examine its arguments and test the effects of emotionality on decision-making at the subnational level.

The NYCOA comprises seven justices, including one Chief Justice. To hear a case, the NYCOA or the lower Appellate Division court must grant a Motion for Leave to Appeal (22 CRR-NY 500.20-22).[13] Yet, although the court exercises some docket control, its caseload remains comparable to that of its peers (Meyer et al. 2006; Hinkle and Nelson 2016). The Court regularly schedules oral arguments for its cases, permitting thirty minutes per litigating party – appellant and appellee – with opportunities for rebuttal by the appellant (22 CRR-NY 500.18).[14]

Selection of a single court presents potential concerns for this study's design if there are peculiar institutional designs and characteristics. If the NYCOA had unusual institutional features uncommon at other state supreme courts, there would likely be reproachable implications for its analysis such as biased measures. These abnormalities would also likely hinder generalization. However, the evidence suggests that the Court is not entirely unique. Table 1 presents theory-driven institutional features of the Court and the proportion of other state supreme courts sharing that feature. While a majority is not achieved across all institutional features, the table demonstrates a plurality for most, giving little reason to suspect detrimental implications. The table also presents no particular features that raise alarm for subsequent data collection or variable construction.

There are also strengths in selecting the NYCOA as the research setting as opposed to other courts or selecting multiple. Nicholson-Crotty and Meier (2002) explain how selecting a single state can permit validity and generalization through sufficient intra-state variation, added internal and construct validity, and more detailed variables. By selecting the NYCOA as a single-state case, a richer data collection is permitted while maintaining variance across time periods and among individual justices. The focal independent variables employed all leverage variance between justices in a multilevel structure of cases. Moreover, the NYCOA enjoys measurably more opinion citations than others and historical prestige (Hinkle and Nelson 2016, 180). The Court is closely watched in terms of the national judiciary and media due to its prestige and hearing paramount cases (Meyer et al. 2006), which strains hypothesis propositions (Nicholson-Crotty and Meier 2002).[15] In other words, the standing of the NYCOA

[12]Notable exceptions are Brace, Langer, and Hall (2000); Brace and Butler (2001); Hall and Windett (2013). However, these data don't provide a relevant framework for analyzing state supreme court oral arguments.

[13]The NYCOA will also hear parties involving a "certified question" (22 CRR-NY 500.27). These concern determinative questions of New York law pending before other courts, commonly at a United States Court of Appeals.

[14]The NYCOA again uses a confusing nomenclature for its cases by calling the two parties respondent/appellant. For simplifying comparison across courts, I opt for a more standard naming scheme of appellant/appellee.

[15]A sample of issues the Court has opined on include statutory interpretation, government's role in morals and morality, judicial federalism, censorship, constitutional reform, criminal law and capital punishment, rules of evidence, education, family law, and antitrust and labor law (Meyer et al. 2006). The data collected

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Table 1. The NYCOA's Institutional Features as Compared to Other State Supreme Courts

Institutional feature	NYCOA	% Other supreme courts
Judicial selection method	Assisted appointment	58
Term in office	14 years	12
Opinion assignment	At random	22
Order of vote	Same as discussion	65
Order of discussion	Reporting justice, reverse seniority, CJ last	40

Note: The institutional features considered are theoretically relevant to theories of decision-making specified for state supreme courts (Hall 2017). For term in office, I include states with a range of 12–15 years. The source for opinion assignment and deliberation rules is Hughes, Wilhelm, and Vining (2015).

raises the stakes of decision-making because its opinions are consumed by an array of institutions (Epstein and Knight 1998; 2013).

With data selection attended to, the task of its collection remains. The State of New York provides an online database, Court-PASS, for accessing court records of a particular NYCOA case. Considering the terms from 2014 to 2021, I collect from this system oral argument transcripts, the Court decision, litigants' briefs, and filed amicus briefs.[16] In total, there are 822 cases in the data which nearly captures the NYCOA's entire docket during the years considered.[17] To obtain the prior case record, I use LexisNexis to gather the lower appeals court opinions – often the NY Appellate Division – and the district court opinion – often the NY Supreme Court.[18] These other panels of lower court justices, which range in size from three to seven, are included in the models via variables that measure their influence on the appellate court. Wherever possible, I capture the judicial decision-making record spanning from when a case enters a district court's docket all the way to the NYCOA's opinion.[19] These data allow measurement of the briefing NYCOA justices receive prior to oral arguments. From these data, NYCOA cases spanning 2014 to 2021 form a justice-level dataset.[20] I append justices' utterances toward attorneys during arguments to create the raw textual dataset employed in downstream NLP tasks.[21]

The outcome variable, justice votes, I also gather from LexisNexis and code as 1 if a justice in a case voted to affirm and 0 if they voted to reverse.[22]

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further demonstrate the Court regularly hears business law cases concerning the largest multinational corporations.

[16]The use of NLP described later in the article should allow these documents' text to capture higher order meanings such as skepticism, sarcasm, and sincerity. In other words, the NLP methods can encode these meanings in the absence of tonality in recorded audio. Moreover, an excerpt of an oral argument transcript can be found in Section A.1 of the Supplemental Appendix.

[17]The omitted cases are those with official oral argument transcripts unavailable via Court-PASS. However, this is less than ten cases and likely does not have substantive implications for the analysis.

[18]As a reminder, NY flips the typical court nomenclature and calls its district-level courts a "supreme court." However, in practice, these courts are structurally designed similarly to other state district courts.

[19]The data do not include decisions on motions or other pleadings that aren't adjudicative of the case outcome.

[20]See Table C.4 in the Supplemental Appendix for descriptive statistics of the variables included in the subsequent analysis' models.

[21]The term "utterances" is borrowed from the linguistics field applied to judicial politics (Black et al. 2011). Please see Section A.1 of the Supplemental Appendix for an excerpt of an oral argument transcript to understand what this term means practically.

[22]I did not consider partial reversals as separate from the court deciding to reverse. I don't expect this to have a substantial impact on measuring the outcome variable as partial reversals are uncommon by the NYCOA. See

https://doi.org/10.1017/jlc.2025.10008 Published online by Cambridge University Press

The Muppets go back to law school: deep learning with BERT

NLP and deep learning have made significant, recent advances in the field (Dickinson 2019; Hall et al. 2022). Notably, Google in 2018 released its "BERT" transformer model (Devlin et al. 2018). Transformers are an innovation in the machine learning discipline whose architecture leverages both the power of learning via "attention" and also embeddings which are encodings of contextual meaning for an input, such as text (Vaswani et al. 2017). These embeddings are central to how the model feeds data through attention heads to represent abstract ideas such as emotion in a high-dimensional vector space where movements in this space are semantic meanings such as skepticism, sarcasm, or sincerity. At a high level, the goal of BERT is to take an embedding and then attend the other embeddings in the vector space to update that initial embedding based on the others in the sequence (Devlin et al. 2018).[23] The key contribution this model makes is a flexible approach to empirically representing contextual, semantic meanings that can then be used in a downstream task such as classifying a sentence as positive, neutral, or negative. BERT and other deep learning models are now ubiquitous in the NLP field and are already being deployed in judicial politics (Hall et al. 2022), largely attributed to their contextual understandings of words through embeddings. I leverage a domain-specific pre-trained model, LEGAL-BERT, that is fine-tuned in later downstream tasks in a process known as transfer learning (Chalkidis et al. 2020).[24] Indeed, the researchers find predictive results improve when fine tuning the out-of-the box BERT model for domain-specific tasks such as emotion analysis of legal texts (Chalkidis et al. 2020, 2).

I deploy the LEGAL-BERT model in transfer learning on the downstream task of emotion analysis. The advantage of a transformer for this analysis is that the order of words and their contextual meaning are not lost, an improvement over previous studies that measured emotion with non-contextual methods (Black et al. 2011; Wistrich, Rachlinski, and Guthrie 2015). I employ the SigmaLaw-ABSA corpus of 2,000 legal opinion texts which were annotated by expert hand-coders for negative, neutral, and positive emotion (Mudalige et al. 2020). After training the model on the pre-coded dataset, I run inference with a deep learning model to classify utterances as 0 for negative, 1 for neutral, and 2 for positive. After fine-tuning LEGAL-BERT on the SigmaLaw-ABSA corpus, the model attains an F1 score of 0.74.[25] Coding details, model training, model accuracy, and hyperparameter selection are all discussed in Section B.1 of the Supplemental Appendix.

However, a quandary still remains for classifying utterances in the data. Sorenson (2023) finds that questions and statements are both empirically and theoretically distinct in their effect on judicial behavior. There are more than 85,000 utterances in the data and many hundreds of documents; discriminating between questions and statements for all of them would be impractical. Accordingly, I hand-code several

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Section C.5 of the Supplemental Appendix for the share of decisions as partial reversals (i.e., defined by the NYCOA as modifications of the lower court decision) in each calendar year from 2014 to 2021.

[23]BERT is an encoder-only transformer that may be used for a variety of downstream tasks.

[24]This legal-specific BERT model was pretrained on 12 GB of English legal text including legislation, court cases, and contracts (Chalkidis et al. 2020).

[25]The F1 score is a common metric used in deep learning settings to evaluate a classifier model's performance; it is the mean of precision and recall, balancing how precise and accurate the model is at classifying outcomes.

https://doi.org/10.1017/jlc.2025.10008 Published online by Cambridge University Press

thousand utterances within the NYCOA data as either a statement or a question for transfer learning on the LEGAL-BERT. Another deep learning model uses these hand-coded outcomes to predict out-of-sample utterances as either a statement or a question.[26] The model's classification achieves a 0.75 F1 score out-of-sample for all classes. See Appendix B.2 of the Supplemental Appendix for further details on the coding, training procedure, and hyperparameter selection.

Features of oral arguments, briefs, and cases

Several variables are employed as the focal, or main effect, measures to test the theoretical expectations concerning judicial behavior. Using the LEGAL-BERT embeddings classified by their associated emotional content, I calculate the average positive, negative, and neutral emotion at the justice-case-litigant level. I compute these averages separately for statements and for questions. To capture the relative level of emotionality, the average justice-level emotion directed at the appellee is subtracted from the average overall emotion directed at the appellant. Thus, for each type of utterance, the main effect measures of emotionality are represented as the Δ Statement Emotion and Δ Question Emotion where positive values indicate more positive emotion relative to the appellant and negative values indicate more negative emotion relative to the appellant. While this operationalization of emotionality does not directly capture all moments of emotional exposure between the litigant and the justice, it does offer observational insight into the emotional disposition of the justice throughout oral arguments.

To evaluate the clarity of arguments, I employ the Dale-Chall reading ease score.[27] The score allows quantification of readability based on a list of 3,000 words that are easily or not easily understood (Chall and Dale 1995). This method takes the number of words in a given sentence and decomposes the text to compute the readability score. I do this separately for statements and questions and then calculate by justice the relative difference between the appellee and appellant. This operation yields the remaining main effect measures: Δ Statement Clarity and Δ Question Clarity. Doing so captures the relative amount of easily understandable judicial speech directed at a particular litigant, which primarily locates roots in evidence that US Supreme Court opinion clarity is reflective of decision-making (Black et al. 2016).

The remaining model covariates are included as controls, drawn from various literature including judicial politics and political ideology.[28] These include: Ideological Alignment, the absolute distance between a justice's ideology and the median ideology of all justices presiding on that case (Martin and Quinn 2002; Bonica and Woodruff 2015); Δ Amici Briefs, the difference between the number of amicus curiae briefs filed for the appellee minus the number for the appellant (Collins 2004); Δ Attorney General Support, a dummy variable coded 1 if the attorney general supported the appellee either as the litigating party or filed amicus curiae briefs in support minus the same variable but for the appellant (Epstein and

[26]This methodology is more flexible than Sorenson's (2023) automated coding as it does not result in false-positives for punctuation irregularities in the transcripts.

[27]The Python SpaCy module is employed for this analysis.

[28]The complete description of each covariate and their methodology is in Section C of the Supplemental Appendix.

https://doi.org/10.1017/jlc.2025.10008 Published online by Cambridge University Press

Knight 2013); Δ Resources, a measure of how well-equipped the appellee is for litigation minus the appellant (Collins 2004); Salience, a dummy variable if relevant media outlets in New York state provided coverage of the case (McAtee and McGuire 2007; Vining and Wilhelm 2011); Case Complexity, a latent construct of the number of provisions cited in the briefs and the number of legal issues raised by a case (Goelzhauser, Kassow, and Rice 2021); and Issue Area, a representation of what area of law a case concerns (Johnson 2004).[29] To account for briefing prior to oral arguments, I construct several variables: Lower Court Similarity a measure of the linguistic similarity between the substantive content of the NYCOA opinion and the lower court opinion(s) (both district and lower appeals court); and Δ Brief Similarity, a measure of how similar the content in the appellee's brief is to the case opinion minus the similarity for the appellant (Hinkle 2015; Hazelton, Hinkle, and Spriggs 2019; Hazelton and Hinkle 2022).[30] These measures do not inherently capture emotional language as the main effect does by using classified LEGAL-BERT embeddings, but rather the extent to which the NYCOA borrows textual content from briefs or lower court opinions which Hazelton and Hinkle (2022) empirically show as an indicator of judicial decision-making.

Results

I test my hypotheses by relying on case-justice-level data estimated by the following primary statistical model:

$$\begin{aligned} y_{ij} = {} & \beta_0 + \beta_1 \Delta\text{Quest. Sent.}_{ij} + \beta_2 \Delta\text{State. Sent.}_{ij} \\ & + \beta_3 \Delta\text{Quest. Clarity.}_{ij} + \beta_4 \Delta\text{State. Clarity.}_{ij} + \beta_5 \text{Ideo. Align.}_{ij} \\ & + \beta_6 \Delta\text{Amici Briefs.}_{i} + \beta_7 \Delta\text{AG Support.}_{i} + \beta_8 \Delta\text{ Resources.}_{i} \\ & + \beta_9 \text{Salience.}_{i} + \beta_{10} \text{Complexity.}_{i} + \beta_{11} \text{Issue Area.}_{i} \\ & + \beta_{12} \text{Lwr. Court Simil.}_{i} + \beta_{13} \Delta\text{Brf. Simil.}_{i} + u_i + \epsilon_{ij} \end{aligned}$$

for $i = 1, \ldots, n$ where i is each case and j is each justice ruling on i case, $\epsilon_{ij} \sim \mathcal{N}\left(0, \sigma_e^2\right)$ is the level 1 variation, and $u_i \sim \mathcal{N}\left(0, \sigma_u^2\right)$ is the level 2 variation. I test whether the main effect differs when justice-level fixed effects (FE) are omitted by running the above specification (Models 1 and 2 in Table 2) without including individual justice names.

Simulated data with interactive effects are used later to present easily interpretable quantities of interest: the predicted probability of a justice's vote. Nonlinear models pose challenges for directly interpreting interaction effects, particularly as compared to standard linear models (Ai and Norton 2003). Thus, I do not substantively interpret coefficient sizes in the subsequent analysis. Fortunately, alternative strategies, such as predicted probabilities held at margins of a predictor, allow for simulating

[29]See Section C.2 of the Supplemental Appendix for a detailed methodology of how case complexity is computed.

[30]Prior research has found that linguistic similarity between legal texts is explanatory of the former's influence on the latter; in this instance, litigant briefing and lower court opinion(s) on the NYCOA opinion (Hazelton, Hinkle, and Spriggs 2019; Hazelton and Hinkle 2022). Like Hazelton and Hinkle (2022), I employ a cosine similarity score to measure this influence. See Section C.3 of the Supplemental Appendix for a discussion of the methodology.

https://doi.org/10.1017/jlc.2025.10008 Published online by Cambridge University Press

substantively meaningful scenarios that are intuitive when assessing theoretical expectations. After reviewing overall results in Table 2, predicted probabilities for cases and justices themselves are presented in subsequent sections to further examine the hypotheses.

Table 2 presents results for the main effects considered in my hypotheses: emotion and clarity differentials. The effect of Δ Emotion is shown when not including FE for individual justices (Model 1), and the effect with their inclusion (Model 2). This pattern is repeated but for the effects of Δ Clarity without FE (Model 3) and with FE (Model 4). The table separates other covariates between levels of variation to aid in interpretation. I report log-odds coefficients from the multilevel logistic regressions which estimate the direction of each effect and its statistical significance. These coefficients indicate an increased or decreased effect of a justice voting for the appellee (i.e., affirm).

The results in Table 2 are consistent with hypothesis expectations. Emotion contained within questions, when directed more at the appellee, has a statistically significant ($p < 0.01$), positive effect of 0.33 for a justice voting to affirm. This result remains robust when directly controlling for variation among justices presiding in the case (Model 2). However, the effect for differentially more emotion contained within statements is not statistically significant ($p > 0.05$). These results taken together suggest that emotion communicated during oral arguments has an effect on judicial behavior when that emotion is posed as a question. This result, while not initially considered in the hypotheses, is not entirely novel. It is also not unsurprising within this article's theoretical framework of judicial behavior given prior research

Table 2. Oral Argument's Impact on Justices: Multilevel Logit Regression with Random and Fixed Effects

	Emotion effect		Clarity effect	
	Model 1	*Model 2*	*Model 3*	*Model 4*
Judge-level variables				
Δ Question emotion	0.33** (0.11)	0.30** (0.11)		
Δ Statement emotion	0.36 (0.20)	0.37 (0.21)		
Δ Question clarity			0.07** (0.02)	0.07** (0.02)
Δ Statement clarity			0.04 (0.03)	0.05 (0.03)
Ideological alignment	−0.40** (0.15)	−0.42 (0.76)	−0.42** (0.15)	−0.44 (0.76)
Intercept	1.21 (2.05)	1.19 (2.27)	1.42 (2.09)	1.03 (2.30)
Case-level variables				
Δ Amici briefs	0.51 (0.40)	0.55 (0.40)	0.51 (0.41)	0.52 (0.40)
Δ Attorney general support	1.93* (0.97)	1.86 (0.97)	1.93* (0.96)	1.88 (0.99)
Δ Resources	0.09 (0.07)	0.09 (0.07)	0.09 (0.07)	0.10 (0.07)
Salience	−0.45 (0.94)	−0.44 (0.94)	−0.51 (0.97)	−0.54 (0.96)
Complexity	0.13 (0.27)	0.15 (0.27)	0.17 (0.28)	0.16 (0.28)
Issue area	−0.05 (0.37)	−0.04 (0.37)	−0.08 (0.38)	−0.04 (0.38)
Lower court similarity	0.32 (2.35)	0.40 (2.34)	0.17 (2.39)	0.78 (2.37)
Δ Brief similarity	0.04 (0.54)	−0.02 (0.54)	0.01 (0.55)	−0.03 (0.54)
Var: Groups (intercept)	3.74	3.73	3.82	3.80
Justice FE		✓		✓
Log likelihood	−595.0	−590.1	−593.3	−588.1
Observations	1,286	1,286	1,286	1,286
Groups	308	308	308	308

Note: The outcome is a justice voting to affirm. In all instances, the differential indicates more emotion or speech directed at the appellee. Models include case-level random intercepts and justice-level fixed effects (when indicated in the table). Standard log-odds coefficients are reported. Standard errors are in parentheses.
*p < 0.05;**p < 0.01

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that statements do not communicate the same information as questions (Sorenson 2023). I refrain from concluding that a lack of significance for statements does not generally limit implications or contravene theoretical expectations. Nonetheless, subsequent models focus on questions' effects. The remaining models (2–3) in Table 2 present coefficients for Δ Clarity that support H2 expectations. Linguistic clarity contained within questions that is differentially directed at the appellee has a statistically significant ($p < 0.001$), positive effect of 0.07 for a justice voting to affirm. This result also remains robust when directly controlling for variation among justices presiding in each case (Model 4). As with emotion, linguistic clarity of statements does not have a statistically significant ($p > 0.05$) effect on a justice voting to affirm. Lastly, comparing Table 2's models with FE (Models 1 and 3) to those without (Models 2 and 4), respectively, does not reveal any substantive differences in the coefficients to warrant further analysis. Justice-level FE are omitted in subsequent models to ease the estimation of predicted probabilities.

The findings may be confounded by unobserved factors. I test alternative model specifications under which the main effect remains robust.[31] See Section D in the Supplemental Appendix for complete results of the robustness testing.

Figure 1 displays the main effects from Table 2 – each justice's predicted probability of voting to affirm. These quantities of interest allow for an intuitive interpretation of effect sizes and their substantive relation to hypothesis expectations. Specifically, the figure addresses H1 and H2 in that I expect there to be a greater probability than a coin-flip (random chance or > 50%) for positive margins of emotion and clarity. When a justice directs relatively more positive emotion toward the appellee, Figure 1 shows if that litigant is more likely to win the justice's vote. I expect the results to evaluate whether emotional and linguistic cues revealed during oral arguments forecast justices' votes.

The figure demonstrates that as the appellee is treated with more positive emotion by a justice relative to the appellant, they are more likely to receive that same justice's vote when all other covariates are held constant. At one-unit of Δ Question Emotion, the probability that a justice votes for the appellee is 84.01% (75.16, 90.12). For Δ Statements Emotion, the probability is 84.74% (74.69, 91.27) also held at one-unit. Figure 1 shows these probabilities decrease slightly using Δ Clarity as the predictor. With all other covariates held constant, the probability a justice votes for the appellee is 80.47% (70.81, 87.50) held at one-unit of Δ Question Clarity. The probability is 81.06% (71.56, 87.92) held at one-unit of Δ Statement Clarity. While these probabilities have wide confidence intervals, the figure suggests that these cues are important enough to substantially reflect good odds (> 80%) of winning justice votes. In other words, a justice's emotion and linguistic clarity reflected in their speech forecasts their decision (Black et al. 2011; Dietrich, Ryan, and Sen 2018; Dickinson 2019; Chen et al. 2025).

[31]I test if the main effect was driven by one particular justice by interacting a justice name with question emotion and question clarity. I also consider whether COVID-19 during these Court terms had biased results; this included running models excluding the 2020 and 2021 terms which yielded substantially similar results as the primary models. These results indicate little evidence that not using videoconferencing altered emotion's relation to justice votes. Lastly, I estimate models that include random effects for the natural court to examine if the main effect is robust against personnel changes on the Court. See Tables D.1–3 of the Supplemental Appendix for these results.

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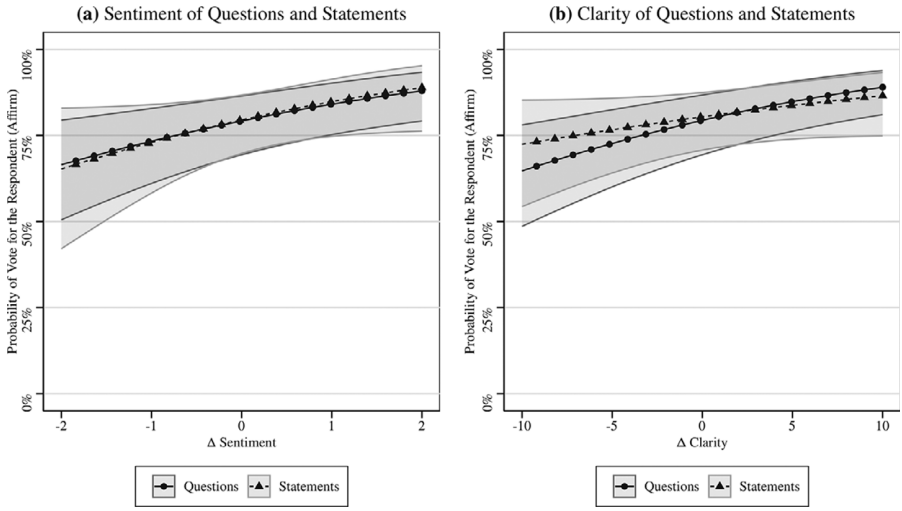

Figure 1. Predicted Probabilities for Oral Argument's Impact on Justices. *Notes*: Figure 1(a) is derived from Model 1 and Figure 1(b) is derived from Model 3 in Table 2. The figure shows predicted probabilities for justices voting to affirm at margins of Δ Emotion (left panel) and Δ Clarity (right panel). Shaded areas represent 95% confidence intervals. The values of other continuous covariates are held constant at their means and categorical covariates at their reference level.

The evidence from Figure 1 also suggests that oral arguments may be unique in state supreme court decision-making and should be incorporated into state-level theories (Hall 2017). Indeed, the results support Epstein and Weinshall's (2021) assessment that emotion "complicates our efforts to explain [justices] behavior" (31) using just strategic or legal accounts. Understanding state supreme court decision-making with purely legalistic, personality, strategic, and attitudinal factors is probably insufficient because it omits critical information (Dietrich, Ryan, and Sen 2018). However, these findings may not translate well to theories specified and tested for the US Supreme Court. These results, nonetheless, offer novel evidence for both hypotheses in that emotionality and linguistic clarity in justices' questions to litigants during oral arguments explain and forecast state supreme court decision-making.

Sorenson's (2023) distinction between questions and statements (positive vs. negative effects) materializes differently at the state level. In each panel of Figure 1, there are virtually identical predicted probabilities for statements and questions, unsurprising given the lack of statistical significance for statements in Table 2. The figure shows that the difference between questions and statements is 0.73% for Δ Emotion and 0.59% for Δ Clarity. This finding seems to indicate that, while there is no negative effect seen for statements as Sorenson (2023) observes, we are unable to fully parse the mechanisms between questions and statements without additional research. The lack of statistical significance for statements in Table 2, however, encourages focusing on question's effect for subsequent analyses.

Strategic processing: institutional actors and case characteristics

There are alternative mechanisms from case characteristics and external actors that can motivate justices to decide the case on strategic factors (Epstein and Knight

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Table 3. Oral Argument Questions' Interactive Effect with Legalistic Predictors

	Salience interaction		AG support interaction	
	Model 4	*Model 6*	*Model 7*	*Model 8*
Judge-level variables				
Δ Question emotion	0.32** (0.11)		0.31** (0.11)	
Δ Question clarity		0.07** (0.02)		0.07** (0.02)
Intercept	1.09 (1.97)	1.17 (1.98)	0.95 (1.98)	1.42 (2.01)
Case-level variables				
Salience	−0.57 (0.91)	−0.56 (0.9)		
Δ Question emotion × salience	−0.11 (0.34)			
Δ Question clarity × salience		−0.04 (0.06)		
Δ Attorney general support			1.77 (0.95)	1.80 (0.95)
Δ Question emotion × Δ AG support			0.02 (0.36)	
Δ Question clarity × Δ AG support				0.03 (0.07)
Var: Groups (intercept)	3.29	3.29	3.29	3.29
Log likelihood	−595.2	−591.5	−593.6	−593.1
Observations	1,286	1,286	1,286	1,286
Groups	308	308	308	308

Note: The outcome is a justice voting to affirm. In all instances, the differential indicates more emotion or speech directed at the appellee. Models include case-level random intercepts and justice-level fixed effects (when indicated in the table). Standard log-odds coefficients are reported. Standard errors are in parentheses.
*p < 0.05;**p < 0.01

1998), fitting under a systematic reasoning explanation rather than heuristic processing (Todorov, Chaiken, and Henderson 2002; Kahneman 2011). Prior research suggests that salience raises the stakes of decision-making and decreases justice's susceptibility to be swayed by oral arguments (McAtee and McGuire 2007; Black, Johnson, and Wedeking 2012). Moreover, litigants with the support of government have greater credibility and odds of receiving a favorable ruling for that side, largely due to judicial deference to the state (Segal 1988; Epstein and Knight 2013). Additional model specifications test these alternatives with interactive effects for two relevant case factors: salience and government involvement.

Table 3 displays coefficients for the main effects of questions in oral arguments interacted with select measures relevant to strategic theories of judicial decision-making (Segal 1988; Epstein and Knight 1998; McAtee and McGuire 2007). The interaction with salience is shown for Δ Question Emotion (Model 5) and Δ Question Clarity (Model 6). This pattern is repeated but for the interaction of New York Attorney General (AG) support with the same effects, Model 7 and Model 8 respectively. In Table 3, I again report log-odds coefficients from the multilevel logistic regressions which assess the direction of the effects and their statistical significance.[32] These coefficients indicate the extent of the likelihood a justice votes for the appellee as the interactions shift values.

The results in Table 3 do not give reason to suspect that the effect of emotion or clarity on justice votes is dependent on case salience or government intervention. Emotion contained within questions that is differentially directed at the appellee remains statistically significant ($p < 0.01$) with a positive effect of 0.32 for a justice voting to affirm among salient cases. A similar sign and significance level for Δ

[32]The other covariates in the model are not reported in order to streamline focus on the interactions. Table E.1 in the Supplemental Appendix contains full results for Table 3.

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Question Clarity is observed. The interaction term coefficients for emotion and clarity and case salience are statistically insignificant ($p > 0.05$); I interpret the extent to which the effect shifts in Δ Question Emotion and Δ Question Clarity, as you go from non-salient to salient cases and negative differential AG support to positive differential AG support, to be null. In other words, there is not a statistical difference observed in effects for emotion and linguistic clarity when considering strategic theory-driven alternative explanations of decision-making.

These findings in context with hypothesis expectations further support the idea that emotion expressed by judges during oral argument is relevant to case outcomes and thus, decision-making. Previous research on decision-making as a function of rational actors' action seeking to achieve their preferences may yet be highly explicative at the US Supreme Court. (Maltzman, Spriggs, and Wahlbeck 2000; Epstein and Knight 1998; 2013). However, the evidence presented here complicates this limited explanation at the NYCOA.

Does the legal or ideological justice avoid thinking fast?

Justices have unique preferences and judging styles, with distinct policy goals (Segal and Spaeth 1993; 2002) that interact with institutional actors (Maltzman, Spriggs, and Wahlbeck 2000; Epstein and Knight 1998; 2013). Although attitudinal and strategic decision-making has been a focus of research (D'Elia-Kueper and Segal 2015), justices consume litigants' briefs and lower court opinions prior to voting and writing opinions (Maltzman and Bailey 2011; Hall 2018; Hazelton and Hinkle 2022). Accordingly, I carefully evaluate the pro forma legal information that very likely shapes justices' behavior throughout the appellate proceedings. Evidence suggesting that the hypothesis expectations are not dependent on these interactions will be particularly compelling for suggesting that oral arguments influence state supreme courts via emotional judicial speech.

Figure 2 presents predicted probabilities for Δ Question Emotion and Δ Question Clarity both interacted with Δ Brief Similarity. The accompanying Table 4 shows the raw coefficients for these interactions.[33] The interaction of Δ Brief Similarity, as the construct High-Quality Brief where Δ Brief Similarity is greater than 0, is shown with Δ Question Emotion (Model 9) and with Δ Question Clarity (Model 10), respectively. What this measure implies practically from the data is the appellee's brief having been more textually incorporated into the NYCOA's opinion as opposed to the appellant which is indicative of briefing's influence on decision-making (Hazelton, Hinkle, and Spriggs 2019; Hazelton and Hinkle 2022; 2024).

The interaction term's coefficients in Table 4 show that the extent of brief incorporation is not relevant to the effects of emotion and clarity. Models 9–10 yield statistically insignificant ($p > 0.05$) coefficients for the interactive terms with Δ Question Emotion and Δ Question Clarity. I interpret the extent to which the effect of shifts in Δ Question Emotion and Δ Question Clarity, as you go from negative to positive brief incorporation, as a null effect. However, the constituent term for Δ Question Emotion is not significant ($p > 0.05$); this could mean that the effect has sample size limitations within the model. The coefficient for Δ Question Clarity

[33]Like for Table 3, I omit the other covariates to streamline focus on the interactions. Table E.2 in the Supplemental Appendix contains full results for Table 4.

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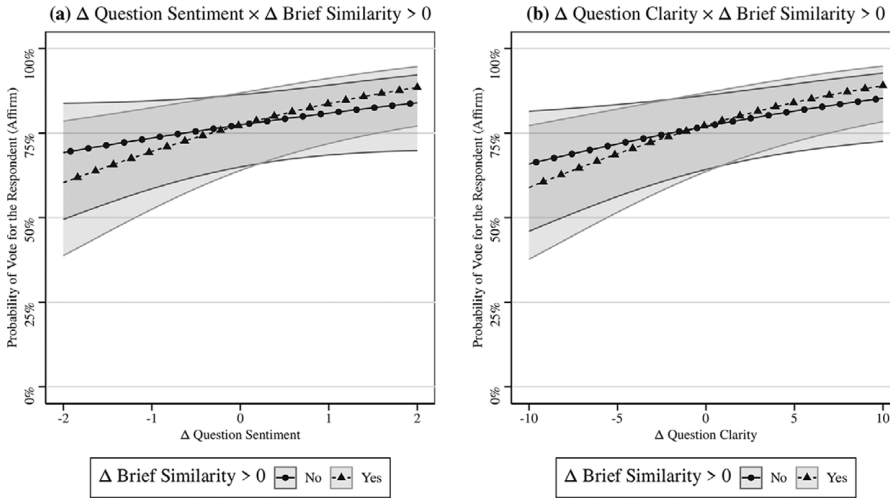

Figure 2. Predicted Probabilities for Oral Argument Questions' Effect with High-Quality Briefing. *Notes*: Figure 2(a) is derived from Model 9 and Figure 2(b) is derived from Model 10 in Table 4. The figure shows predicted probabilities for justices voting to affirm at margins of the constituent terms Δ Question Emotion and Δ Question Clarity in the interaction with Δ Brief Similarity > 0. Shaded areas represent 95% confidence intervals. The values of other continuous covariates are held constant at their means and categorical covariates at their reference level.

Table 4. Oral Argument Questions' Effect on High-Quality Briefing

	Emotion	Clarity
	Model 9	*Model 10*
Judge-level variables		
Δ Question emotion	0.21 (0.14)	
Δ Question clarity		0.05* (0.03)
Intercept	0.66 (1.87)	0.46 (1.89)
Case-level variables		
Δ Brief similarity > 0	0.00 (0.47)	0.02 (0.47)
Δ Question emotion × Δ Brief similarity > 0	0.19 (0.20)	
Δ Question clarity × Δ Brief similarity > 0		0.03 (0.04)
Var: Groups (intercept)	3.29	3.29
Log likelihood	−630.1	−628.4
Observations	1,346	1,346
Groups	323	323

Note: The outcome is a justice voting to affirm. High-Quality Brief = (1, 0) is a construct of Δ Brief Similarity where values are greater than 0. Models include case-level random intercepts. Standard log-odds coefficients are reported. Standard errors are in parentheses.
*p < 0.05;**p < 0.01

retains its significance as compared to Table 2, but a more modest level ($p < 0.05$). Turning toward Figure 2, all other covariates held constant, when an appellee's brief is differentially more incorporated by a justice, the probability a justice votes for them is 83.66% (71.84, 91.13) held at a one-unit increase of Δ Question Emotion. When an appellee's brief is not more incorporated by a justice, a justice votes with an 80.87% (68.47, 89.16) probability held at the same margin. These probabilities decline when

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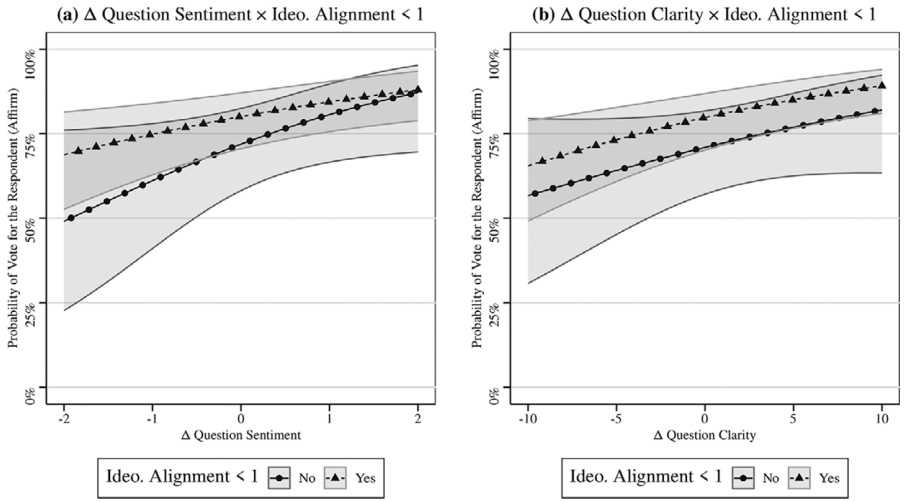

Figure 3. Predicted Probabilities for Oral Argument Questions' Effect with Ideologically Aligned Justices. *Notes*: Figure 3(a) is derived from Model 11 and Figure 3(b) is derived from Model 12 in Table 5. The figure shows predicted probabilities for justices voting to affirm at margins of the constituent terms Δ Question Emotion and Δ Question Clarity in the interaction with Ideological Alignment < 1. Shaded areas represent 95% confidence intervals. The values of other continuous covariates are held constant at their means and categorical covariates at their reference level.

Δ Question Clarity is the predictor. When an appellee's brief is differentially more incorporated by a justice, the probability a justice votes for them is 78.69% (65.48, 87.79) held at one-unit of Δ Question Clarity. When an appellee's brief is not more incorporated by a justice, a justice votes with a 77.88% (65.40, 86.76) probability held at the same margin.

Regardless of whose brief is more incorporated in the NYCOA's opinion, decision-making is predictable by the models. This result is not entirely unexpected given that the US Supreme Court justices very often raise novel issues during arguments not seen in briefs (Johnson 2004). However, emotion's influence may be more varied. The evidence taken together suggests that when the Court preferentially incorporates text from briefs into the opinion (Maltzman and Bailey 2011; Hall 2018; Hazelton and Hinkle 2022), it can be partially explained by emotional content during oral arguments.

On the other hand of considering justices' preferences and policy goals, I also test the hypotheses against ideological influences. Figure 3 again presents predicted probabilities for the interaction term with ideological alignment to test the attitudinal theory's mediating effect on emotion (Maltzman, Spriggs, and Wahlbeck 2000; Epstein and Knight 1998; 2013). Table 5 shows the raw coefficients used in the figure.[34] Column 1 contains the interaction of Ideological Alignment with Δ Question Emotion (Model 11) and Column 2 with Δ Question Clarity (Model 12), respectively. The interaction term, Aligned, takes a value of one when Ideological Alignment is less than 1.

[34]I again omit the other covariates to streamline focus on the interactions. Table E.3 in the Supplemental Appendix contains full results for Table 5.

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Table 5. Oral Argument Questions' Effect for Ideological Alignment

	Emotion	Clarity
	Model 11	*Model 12*
Judge-level variables		
Δ Question emotion	0.49 (0.25)	
Δ Question clarity		0.06 (0.04)
Ideological alignment < 1	0.46* (0.23)	0.48* (0.23)
Δ Question emotion × Ideo. alignment < 1	−0.19 (0.27)	
Δ Question clarity × Ideo. alignment < 1		0.01 (0.05)
Intercept	0.53 (2.00)	0.07 (1.98)
Case-level variables		
Var: Groups (intercept)	3.29	3.29
Log likelihood	−595.7	−594.5
Observations	1,286	1,286
Groups	308	308

Note: The outcome is a justice voting to affirm. Aligned = (1, 0) is a construct of Ideological Alignment where values are less than 1. Models include case-level random intercepts. Standard log-odds coefficients are reported. Standard errors are in parentheses.
*p < 0.05;**p < 0.01

Practically, this measure represents when there is minimal difference in ideology between a justice and the median ideology of the other justices on a given panel.[35]

The interaction term coefficients in Table 5 again demonstrate that the extent of ideological alignment is not fully relevant to the effects of emotion and clarity. Models 11–12 yield statistically insignificant ($p > 0.05$) coefficients for the interactive terms with Δ Question Emotion and Δ Question Clarity. I interpret the extent to which the effect of shifts in Δ Question Emotion and Δ Question Clarity, as you go from more to less difference in alignment, as a null effect. However, the constituent terms for Δ Question Emotion and Δ Question Clarity are not significant ($p > 0.05$). This interpretation perhaps dampens the evidence for questions and clarity influence being independent of ideology, but it is not altogether conclusive given the lack of significance for the interaction terms themselves. There could again be sample size limitations restricting variance for emotion and clarity in the specified models. Fortunately, the accompanying figure, Figure 3, provides additional interpretative context for these coefficients. The probability an ideologically aligned justice votes for the appellee is 84.37% (75.56, 90.41) held at one-unit of Δ Question Emotion. When the justice is not ideologically aligned, they vote for the appellee with an 80.55% (66.53, 89.62) probability held at the same margin of question emotion. These results remain consistent with Δ Question Clarity as the predictor. The probability an ideologically aligned justice votes for the appellee is 80.81% (71.49, 87.61) held at one-unit of Δ Question Clarity. When the justice is not ideologically aligned, they vote for the appellee with a 72.08% (58.59, 82.50) probability held at the same margin of question emotion.

Comparing Figure 1's results with Figure 3 reveals similar probabilities for justice votes at both levels of the interactions. While the margins are noticeably larger, this comparison eases concerns from Table 5 and gives credence to the main effect being

[35]See Section C.1 of the Supplemental Appendix for additional details on how the Ideological Alignment variable was constructed.

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most likely limited to sample size in the interaction, as opposed to larger confounding issues from ideological alignment.

Conclusion

Justices are too often modeled as cold, calculating machines advancing their ideological preferences (Segal and Spaeth 1993; 2002), pursuing nebulous strategic goals (Epstein and Knight 1998; Maltzman, Spriggs, and Wahlbeck 2000), or deciding as a legalist "apolitical, apartisan, value-free umpire" (Hall 2018; Hazelton and Hinkle 2022; Epstein and Knight 2013, 13). Legal realists, attitudinalists, and proponents of strategic theory aimed to dispel unrealistic decision-making conceptions, yet often view justices as wholly engaged in rational goals or strict legal analysis. This article departs from these incomplete conceptualizations by incorporating emotion as a heuristic during oral arguments into state supreme court decision-making through a "thinking-fast" theory (Epstein, Sadl, and Weinshall 2022). This contribution to the theory aids recent realizations by scholars across multiple disciplines that emotion is important for explaining judicial behavior (Black et al. 2011; Wistrich, Rachlinski, and Guthrie 2015; Segal, Sood, and Woodson 2019; Epstein, Parker, and Segal 2018; Epstein and Weinshall 2021) and now has evidence from the oral argument stage of proceedings. However, the results do not rule out the possibility that strategic, attitudinal, or legal theories explain certain behavior. The findings of this article are most beneficial when used to supplement these other theories, as they are "complementary, or at the least, not mutually exclusive" (Epstein, Sadl, and Weinshall 2022, 703).

Using a novel dataset comprising nearly a thousand decisions and millions of words from justices, I demonstrate that oral arguments likely influence state supreme court decision-making. The interaction term analyses performed show that emotion and linguistic clarity probably play at least some role in this influence while controlling for other factors, which is theorized to operate under an affect heuristic processing model of cognition (Chaiken and Ledgerwood 2011; Kahneman 2011). Although there are fewer indications of an impact from clarity in judicial speech, emotion often explains decision-making. As Sorenson (2023) finds, this predictor is not always immune to other factors and often varies between statements and questions during oral arguments. The implications of these conclusions span multiple literatures. First, previous research had not yet linked the content and process of oral arguments to decision-making before state supreme courts, despite considerable research doing exactly that for the US Supreme Court (Johnson 2001; 2004; Johnson, Wahlbeck, and Spriggs 2006; Black, Johnson, and Wedeking 2012; Ringsmuth, Bryan, and Johnson 2012). This article addresses that gap and provides evidence that the information conferred during oral arguments explains judicial votes, even when considering well-tested alternative explanations. Second, this article proffers opportunities for the thinking-fast theory beyond state supreme courts to provide a decision-making framework portable to elite actors across institutions, including the US Supreme Court, legislatures, and executives. Third, the results have policy implications. Policymakers should consider the impact of overloaded dockets, barriers to entry for lawyers, and legitimizing factors such as decorum when designing state supreme courts and allocating resources (McGuire 1995; Cann and Goelzhauser 2023; Black et al. 2024). Promoting professionalism and introducing fresh attorney faces during oral arguments may discourage emotional behavior in favor of objective

https://doi.org/10.1017/jlc.2025.10008 Published online by Cambridge University Press

legal doctrine and arguments. Lastly, this article employed novel methodologies of NLP and transformer models for large-N text data. Judicial politics and political science broadly are increasingly adopting methods such as deep learning models and this trend is expected to grow with the development of large language models (LLM) (Hall et al. 2022).

The limitations of this study are apparent. The data collected cover only 1 state supreme court in the US, which may limit generalizability. However, previous research has shown that single-state studies can still provide valuable analysis given certain criteria (Nicholson-Crotty and Meier 2002). In this study, New York provided a rigorous empirical testing ground for state supreme court oral arguments, as its characteristics did not present immediate anomalies compared to other state high courts.[36] Furthermore, even a restrictive interpretation of these results, comparing only the NYCOA to the US Supreme Court, still has implications for understanding how emotion influences judicial behavior, consistent with a thinking-fast theory of judging. Another key limitation is that the data collected did not measure emotion at the moment of exposure to case briefs, such as their issues, topics, or scenarios (Black et al. 2016), or attorney speech. Collecting data on these exposures would allow comparing emotion during multiple phases, oral arguments and briefing, to consider a more complete picture of the decision-making process.

Several avenues for future research remain open. To fully parse out the theoretical mechanisms explored in this article, we need more research that measures emotional exposure at additional steps in the decision-making process: briefing emotional content, litigants' emotional speech toward justices, and the emotional content of the court's opinion. Particularly compelling analyses may measure the emotional content of attorney speech and associated judicial speech line-by-line, response-by-response to yield a clear chain of emotional exposure. Measuring these points will allow a deeper understanding of the decision-making mechanisms explained by affect heuristic processing and how oral arguments shape that. The other obvious next line of future research is to explore all state supreme courts. The principal limitation of this inquiry is the effort required to collect and analyze the necessary data; such a dataset would span hundreds of thousands of cases and tens of millions of utterances. This study focused on textual emotion analysis, but future research may consider Dietrich, Ryan, and Sen's (2018) vocal pitch measure to evaluate the differences between written and vocalized emotionality.

Supplementary material. The supplementary material for this article can be found at http://doi.org/10.1017/jlc.2025.10008.

Data availability statement. Replication code and data can be found at the Journal of Law and Courts Dataverse (https://doi.org/10.7910/DVN/2NB75D).

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[36]See Table 1 for how the NYCOA is not abnormal in its institutional characteristics and design.

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Cite this article: Altmann, Thomas. 2025. "Justices on Autopilot: Thinking-Fast Evidence from State Supreme Court Oral Arguments." *Journal of Law and Courts*, 1–26, doi:10.1017/jlc.2025.10008