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Yonatan Lupu and James H. Fowler

ABSTRACT

Common law evolves not only through the outcomes of cases but also through the reasoning and citations to precedent employed in judicial opinions. We focus on citations to precedent by the U.S. Supreme Court. We demonstrate how strategic interaction between justices during the Court's bargaining process affects citations to precedent in the Court's opinion. We find that the majority-opinion writer relies more heavily on precedent when the Court's decision is accompanied by separate opinions. We also show that diversity of opinion on the Court, a factor often overlooked, has a significant relationship with citations to precedent. Finally, our results indicate that the ideology of the median justice influences citation practices more than ideology of the majority-opinion writer.

1. INTRODUCTION

Common law evolves in large part through judicial choices that modify, distinguish, and sometimes overturn existing precedent. As scholars have increasingly recognized this, the role of legal doctrine in judicial decision making has gained prominence in the academic literature (Bailey and Maltzman 2008; Gennaioli and Shleifer 2007; Bartels 2009; Landa and Lax 2009; Lax 2011). Changes to the law are reflected not only in the outcomes of cases but also in the content of judicial opinions (Tiller and Cross 2006). We can use the content of opinions to provide important

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insights into existing debates regarding judicial behavior (McGuire et al. 2009; Corley 2008; Way and Turner 2003). A key dimension of opinion content on which scholars have focused is citations to precedent (Choi and Gulati 2008; Clark and Lauderdale 2010), which affect the legal interpretation of a case and its long-term impact (Fowler et al. 2007).

We build on the existing literatures on doctrine and precedent in collegial courts by offering a theory that explains why judges cite significantly more precedents—and more influential precedents—in some cases than in others. Certainly, citation practices are affected to some extent by the legal characteristics of a case. However, we argue that citation practices are also significantly affected by the strategic interaction between judges during the court's bargaining process. Scholars of judicial behavior have recently made important advances by focusing on the strategic behavior of judges on collegial courts (Epstein and Jacobi 2010). Using this approach, they have sought to explain how strategic constraints influence such factors as the judge chosen to write the court's opinion (Rohde 1972; Maltzman and Wahlbeck 1996a; Maltzman, Spriggs, and Wahlbeck 2000), the voting decisions of individual judges, including when they change their original votes (Brenner and Spaeth 1988; Bonneau et al. 2007), and the outcomes of cases (Rohde and Spaeth 1976). Political scientists have also attempted to understand the role of ideology, generating a debate between those who believe that the majority-opinion writer's opinion is most important (Murphy 1964; Bonneau et al. 2007; Maltzman and Wahlbeck 1996b; Rohde and Spaeth 1976; Slotnick 1979) and those who argue that the median judge is the most influential (Anderson and Tahk 2007).

This paper applies the logic of strategic behavior to judges' citations to precedent. We focus on the U.S. Supreme Court, which is among the most researched and influential common-law courts. We argue that two aspects of the Court's bargaining process have significant effects on citations to precedent. First, the justice assigned to write the Court's majority opinion will preemptively accommodate his or her colleagues to maintain the majority coalition and prevent them from writing separate opinions. This will result in majority opinions that are more heavily embedded in precedent when there is greater ideological diversity on the Court. This mechanism also allows for the median justice to exert greater ideological influence over citation practices than the majority-opinion writer. Second, once the majority-opinion writer has accommodated as many colleagues as possible, he or she will continue to be influenced by the decisions of those colleagues to write separate opinions. We argue

that the greater the number of justices joining these opinions, the more time and resources the majority-opinion writer will devote to writing an opinion that sets an enduring precedent. As a result of this process, majority opinions will be more embedded in precedent when more justices join separate opinions.

We make several contributions to the growing literatures on legal doctrine and judicial opinion content. First, we explain how the majority-opinion writer's decisions regarding citations to precedent are systematically influenced by the decisions and ideology of other justices. Second, we demonstrate that the diversity of ideology on the Court, an often overlooked factor, has a significant relationship with the extent to which the Court's majority opinion is embedded in precedent. Third, we find that decisions to write separate opinions have significant relationships with the majority-opinion writer's citations to precedent. This, in turn, suggests that justices write separate opinions not only on the basis of a preference for making their opinions known but also potentially to influence the majority opinion. Finally, our results provide a novel test of the agenda-control and median-justice models against each other, as it pertains to this dimension of judicial behavior. We find that the ideology of the median justice influences citations to precedent to a broader and more significant extent than does the ideology of the majority-opinion writer herself.

2. STRATEGIC BEHAVIOR ON THE U.S. SUPREME COURT

The dominant frameworks used by judicial behavior scholars today are strategic models that assume that individual members of the Court are not entirely free to act on their personal preferences (Rohde 1972). Instead, they are constrained by their strategic interaction with one another and must therefore take into account each other's preferences and tactics. We have learned much from applying strategic models to judicial behavior (Epstein and Jacobi 2010), yet many questions remain unanswered.

While existing scholarship has done much to explain the strategic concerns weighing on justices' voting decisions, only recently has it turned to systematically explaining the effects of the judicial process on the Court's opinions. Opinion content—the Court's reasoning and citations to precedent—is often more important, particularly in the long run, than the ruling between the parties in the case (Friedman 2006; Hansford and Spriggs 2006). Recent studies of opinion content include

Corley (2008), who argues that the language of party briefs is often used in the Court's opinions; Corley, Howard, and Nixon (2005), who analyze the rates of citations to the Federalist Papers in Court opinions over time; Hume (2006), who argues that Supreme Court justices strategically cite nonbinding texts and prominent authors; Way and Turner (2003), who conduct a content analysis of concurring opinions in the Rehnquist Court; and Choi and Gulati (2008), who argue that circuit court judges exhibit various biases in their citation choices. Others have used the content of opinions to place Court opinions along an ideological scale (McGuire et al. 2009; Clark and Lauderdale 2010). A related literature analyzes how judicial behavior explains the evolution of legal doctrine (Jacobi and Tiller 2007; Landa and Lax 2009). Other studies provide formal models to explain how the Court's bargaining process influences the policy position embodied in the Court's opinion (Anderson and Tahk 2007; Lax and Cameron 2007).

The role of precedent in judicial decision making is also a key concern for analysts of common-law courts (Spaeth and Segal 2001). Supreme Court opinions, as well as those of other common-law courts, are in large part important for the precedent that they set, not only for the individual disputes that they resolve. Recent analyses have adopted strategic models to explain issues related to precedent, such as when the Court overturns its own precedent (Spriggs and Hansford 2001), the Court's interpretation of precedent (Spriggs and Hansford 2002), the extent to which precedent affects judicial decisions (Bailey and Maltzman 2008), and the relationship between the age of a precedent and the likelihood that it will be followed (Hansford and Spriggs 2006).

We build on these literatures by explaining how the strategic interaction between justices affects citations to precedent in the Court's opinion. In so doing, we also hope to contribute to an important debate regarding the role of ideology in the judicial bargaining process. While the majority of Supreme Court scholars agree that ideology plays a key role, several theories have been proposed to explain how it affects the process. The agenda-control model holds that the writer of the Court's majority opinion has disproportionate control over the judicial process (Murphy 1964; Epstein and Knight 1998), although scholars generally recognize that this power is not monopolistic (Maltzman and Wahlbeck 1996b; Rohde and Spaeth 1976; Slotnick 1979). A contrary view, based on the median-voter theorem (Downs 1957), holds that the justice with the median ideology will play the most important role in the process

(Anderson and Tahk 2007). Others argue that the median justice in the majority coalition is the key player (Carrubba et al. 2011).

3. THEORY OF STRATEGIC CITATIONS

An important limitation of many studies of Supreme Court decision making is the lack of accounting for the variety of voting alternatives. Most research focuses on justices' dichotomous choice of joining or not joining the majority in the case. Anderson and Tahk (2007) go a long way toward addressing this problem by providing a formal model that uses the range of voting options to predict voting and policy outcomes. We build on Anderson and Tahk (2007) by incorporating the range of the justices' options to explain the citations to precedent in the Court's majority opinion. We assume that during the opinion-writing process, Supreme Court justices behave as strategic decision makers, choosing among their voting options and writing their opinions on the basis of, in part, the expected behavior of their colleagues (Maltzman and Wahlbeck 1996b). We also assume that justices are concerned with public policy and want the outcomes of cases and the Court's opinion to reflect as closely as possible their policy preferences (Spriggs and Hansford 2001; Epstein and Knight 1998). In keeping with much of the existing literature, we assume that the Court's members have information regarding each others' preferences and behavior during the opinion-writing process. Finally, unlike earlier literature that assumed that justices are unconstrained in pursuing their preferred policy outcomes (Murphy 1964), we follow the more recent approach that recognizes the constraints placed on individual justices by the Court's bargaining process (Spriggs and Hansford 2001; Maltzman, Spriggs, and Wahlbeck 2000).

In this paper, we focus on the extent to which the Court's opinion is embedded in the Court's precedent. An opinion that is more embedded in precedent relies more heavily on citations to precedent to justify the Court's decision. Opinions that simply cite a greater number of precedents could be considered more embedded in precedent under this definition. However, embeddedness in precedent also takes into account the extent to which the opinion cites cases that have influenced the Court's corpus of jurisprudence. Some precedents are relatively obscure, while others have shaped a large number of subsequent cases. Thus, the opinions that are most embedded in precedent cite not only large numbers of previous cases but also relatively influential ones.

Supreme Court majority opinions vary greatly in terms of embed-

dedness in precedent. While some are thoroughly justified with citations to prior cases, deeply embedding themselves in precedent by delineating which cases they are following, interpreting, distinguishing, or overturning, other opinions do this to a significantly lesser extent. For two reasons, this variation is consequential for our understanding of the judicial process. First, the extent to which a Court majority opinion is embedded in precedent significantly affects both the extent to which that opinion will be cited as precedent by future cases (Fowler et al. 2007) and the probability that the decision will be overturned (Fowler and Jeon 2008). Second, the precedent cited in a Court opinion is important for interpreting the Court's rationale for its decision and interpreting the new precedent in the opinion. Common law evolves not only through the outcomes of cases but also through the interpretation and reinterpretation of precedent. If this could be explained entirely by the underlying legal characteristics of the case, then perhaps this variation would be a less intriguing concept to investigate; however, our argument is that this view would overlook the important ways in which the judicial process shapes the Court's opinions and, consequently, the development of legal doctrine. We analyze the ways in which strategic interaction affects the majority-opinion writer and, consequently, the extent to which he or she cites precedent.

Justices want to set enduring precedent, and the probability of doing so is improved by citing important precedents (Fowler et al. 2007; Fowler and Jeon 2008). These concerns are balanced by other factors, which means that justices do not simply maximize citations in their opinions. Instead, the opinion writer has a certain ideal set of cases that he or she would prefer to cite in the Court's opinion. This ideal point is influenced by three factors. First, as the legal model would suggest, certain inherent characteristics of the case, such as the type and complexity of the legal issues involved, constrain the majority-opinion writer. It is difficult to imagine, for example, a Supreme Court opinion on abortion rights that does not cite the landmark case of *Roe v. Wade* (410 U.S. 113 [1973]). Conversely, citing precedents that have no relationship to the present case may damage the writer's reputation with respect to his or her colleagues and to analysts of the Court.[1] Second, opinion writing is costly because justices have limited time and resources (Lax and Cameron

1. In some instances, justices do cite cases specifically to note that they do not control in a case. However, even such citations imply that another actor may have believed such a precedent to be relevant.

2007), so justices must apportion these strategically among their various assigned opinions and other responsibilities. The marginal cost of including a citation to precedent includes the time spent researching that case and explaining its relationship to the present case (for example, why it controls or does not, why it should be distinguished, and so on). Individually, these costs are not large but should have an impact on opinion writing in the aggregate. Justices have finite numbers of clerks, each of whom has a large caseload, and while it is well known that clerks work long hours, there is a limit to their workload. As Posner (2000, p. 383) argues, "citing is not costless—there is the bother of finding the citation, and the possibility of criticism for misciting or failing to cite."[2] Finally, as the attitudinal model suggests, another key determinant of the majority-opinion writer's ideal opinion is his or her ideology, which informs his or her preferences with respect to the relevant precedent. As Wahlbeck, Spriggs, and Maltzman (1998, p. 297) argue, "[J]ustices care not just about the direction of the outcome, but also about the content of the opinions that accompany the Court's rulings."

Nonetheless, the strategic interaction that takes place in two aspects of the bargaining and opinion-writing process causes the majority-opinion writer to deviate from his or her ideal set of citations to precedent. In his classic analysis of Supreme Court behavior, Howard (1968, p. 55) argues that, "[c]learly, judges of all ideological persuasions pondered, bargained, and argued in the course of reaching their decisions, and they compromised their ideologies too." The first aspect of this strategic interaction is the preemptive accommodation of others' preferences by the majority-opinion writer (Maltzman, Spriggs, and Wahlbeck 2000). In many cases, if the majority-opinion writer were to write his or her ideal opinion, an insufficient number of his or her colleagues would agree to join it, and thus a majority coalition would not be sustained. Spriggs, Maltzman, and Wahlbeck (1999) refer to an example that illustrates the importance of understanding the relationship between this aspect of the bargaining process and the Court's opinion. In *Hawaii v. Standard Oil Company of California* (405 U.S. 251 [1972]), Justice Thurgood Marshall circulated a majority opinion with which Justice Potter Stewart did not entirely agree. Stewart then circulated a concur-

2. Likewise, Cross et al. (2010, p. 38) argue, "Citing cases is not costless (as precedents must be found and evaluated before use)." Landes and Posner (1976, p. 252) argue, "The extensive research and writing that lawyers, judges, and law clerks devote to discovering, marshalling, enumerating, and explaining precedents are not costless undertakings." See also Harnay and Marciano (2003).

ring opinion offering a separate line of reasoning for the Court's decision. After reading this draft opinion, Marshall revised the majority opinion to incorporate Stewart's reasoning. As a result, Stewart withdrew his opinion and joined Marshall's opinion.

As this example demonstrates, other justices may demand that certain changes be made before they join an opinion, and the majority-opinion writer often changes the opinion as a concession to them (Rohde and Spaeth 1976). Similarly, Wahlbeck, Spriggs, and Maltzman (1998, p. 298) argue that "[a] strategic justice who has been assigned the majority opinion will recognize that it is sometimes rational to yield on some issues" (see also Epstein and Knight 1998; Murphy 1964). Thus, to maintain a majority coalition, the majority-opinion writer must adjust the opinion in a way that accommodates the preferences of his or her colleagues. To some extent, this will require the writer to justify his or her own reasoning in greater detail to convince colleagues, which he or she can do in part by citing authoritative precedents that support the reasoning as well as negatively citing opposing precedents and explaining why they should not apply. This process will also often require the majority-opinion writer to take into account additional lines of reasoning to bring others into the majority, as in the example of *Hawaii v. Standard Oil,* which will also result in the opinion being more embedded in precedent. In some cases, appeasing a fellow justice may require the author to remove a line of reasoning, although our expectation is that such instances will be outnumbered by the instances in which convincing fellow justices to join in an opinion requires either adoption of new lines of reasoning or a more thorough justification of the author's preferred reasoning (including the possible refutations of contrary arguments).

We argue that, all else equal, the more diverse the set of the preferences on the Court, the more the majority-opinion writer will have to deviate from his or her ideal set of citations to accommodate his or her colleagues. On a fairly homogenous Court, this aspect of the process should have relatively little effect on the opinion because the majority-opinion writer will need to modify his or her argument relatively little to accommodate others. As Wahlbeck, Spriggs, and Maltzman (1999, p. 495) argue, "The closer a justice's preferences are to those of the majority opinion author, the more likely he or she will agree with the opinion." On a more heterogeneous Court, however, other justices will require more significant modifications because their preferences are further from those of the opinion writer. Heterogeneity leads to a greater degree of accommodation by the opinion author (Maltzman, Spriggs,

and Wahlbeck 2000). Similarly, Staudt, Friedman, and Epstein (2007, p. 372) argue that it causes a "diffusion of the original author's opinion."[3] In other words, the extent to which the accommodation mechanism affects the majority-opinion writer increases with ideological diversity. On a more heterogeneous Court, convincing a majority of justices to join the opinion will require a more thoroughly justified argument that is more deeply embedded in the Court's precedent. This reasoning leads to our first hypothesis.

Hypothesis 1. The greater the variance of ideologies on the Court, the more embedded in precedent the Court's majority opinion will be.[4]

A related conclusion follows from this hypothesis. While there are certainly reasons to believe that the majority-opinion writer has significant agenda-setting powers and a set of preferences regarding the Court's opinion, these preferences are not determinative. As the logic above indicates, the majority-opinion writer must significantly deviate from his or her ideal set of citations toward colleagues' preferences in order to maintain a majority. We extend the logic of Anderson and Tahk (2007) in arguing that the ideology of the median justice will be the most significant in this process because the majority-opinion writer must accommodate the median justice to maintain a winning coalition. While they argue "that with the assumption of separable preferences, the modern Supreme Court's decision making often can be reasonably approximated by the issue-by-issue median of the justices" (Anderson and Tahk 2007, p. 812), we add that not only can the Court's decision be explained by this factor but so can the precedents cited in the Court's opinion. Thus, we suggest that the judicial process imposes significant bounds on the agenda-setting powers of the majority-opinion writer. This leads to the following hypotheses:

3. This suggests that if accommodation results in a diffusion or dilution of the majority opinion, there should be a point at which the author cannot accommodate an additional justice without overly diluting the opinion or potentially losing another member of the coalition. This has the potential to result in the Court issuing a plurality (rather than majority) opinion. We hope to explore these dynamics further in future work.

4. We focus on the ideological variance of the whole Court rather than that of the majority coalition because the final majority coalition is not known to the majority-opinion writer during the process but is, instead, a result of the opinion-writing process. The majority-opinion writer knows which of his colleagues were in the conference coalition, but as multiple studies have shown, many justices switch their votes during the postconference process.

Hypothesis 2. The ideology of the median justice significantly influences how embedded in precedent the Court's majority opinion will be.

Hypothesis 3. The ideology of the majority-opinion writer does not influence how embedded in precedent the Court's majority opinion will be.

As to whether certain types of median-justice ideology cause majority opinions to be less or more embedded in precedent, alternative theories exist. Scholarly work on Supreme Court ideology generally places individual justices on a conservative–liberal dimension (Martin and Quinn 2002; Segal and Cover 1989). One common interpretation of this dimension, particularly among legal scholars and often among judges themselves, is that conservatives are strict constructionists, originalists, or textualists who tend to emphasize the meaning of a text itself and, in some cases, the intent of its drafters. Justice Antonin Scalia, a vocal supporter of such a philosophy, has often argued that judges should strictly limit the bases upon which they make their decisions (Scalia 1998). Liberals, however, are often characterized as loose constructionists or developmentalists who favor the concept of a "living Constitution," the interpretation of which evolves over time. As Justice Oliver Wendell Holmes famously wrote in *Missouri v. Holland* (252 U.S. 416, 433 [1920]), "The case before us must be considered in the light of our whole experience and not merely in that of what was said a hundred years ago." Thus, liberals often make decisions based on the history of the interpretation of an underlying text (Tribe 1998). To the extent that the correlation between the conservative–liberal dimension of judicial ideology and the textualist–living-Constitution dimension holds, we might expect that liberal justices generally prefer to embed their opinions in precedent more than conservative justices do, who would focus more on founding texts, such as the Constitution and statutes, as well as the debates underlying those texts. This would suggest that when the median justice on the Court is liberal, the Court's opinions are more embedded in case precedent. Nonetheless, an alternative reading of the living Constitution concept would be that liberal justices prefer not to bind themselves with case precedents, which reflect a prior (and at times, in their perspective, obsolete) understanding of the Constitution. In addition, even if conservative justices prefer to cite founding texts, it is unclear why they would not also prefer to cite case precedent that has interpreted such texts or otherwise supports their view. To attempt to wade through the consequences of these alternative interpretations of legal philosophy

is beyond the scope of this paper, and therefore we are hesitant to speculate ex ante about whether having liberal median justices results in majority opinions more embedded in precedent or vice versa. Our key point on this issue is a more modest one: strategic concerns allow the median justice greater control than the majority-opinion writer over the extent to which the opinion is embedded in precedent.

The second key aspect of the strategic interaction that occurs during the bargaining and opinion-writing process is the attempt by the majority-opinion writer to justify the Court's decision and his or her reasoning in the face of competing, separate opinions. This mechanism is activated because, while the majority-opinion writer wants to maximize support for the ideas expressed in his or her opinion, in most cases he or she cannot accommodate all of his or her colleagues. This may occur because in equilibrium the majority-opinion writer cannot accommodate an additional justice's views without losing the support of another colleague. In these cases, one or more justices may therefore write a separate opinion, either by concurring or dissenting, in whole or in part. These separate opinions have an important impact on the majority opinion. Because justices are concerned with policy outcomes, the majority-opinion writer prefers to set a precedent that will be more likely to be followed by the Court in the future as well as by lower courts. The presence of other opinions threatens this goal. As several scholars have argued, decisions accompanied by separate opinions are more likely to be overturned (Brenner and Spaeth 1995; Banks 1992; Schmidhauser 1962). As Murphy (1964, p. 66) argues, "The greater the majority, the greater the appearance of certainty and the more likely a decision will be accepted and followed in similar cases." Finally, as O'Brien (1996, p. 322) argues, "When individual opinions are more highly prized than opinions for the Court, consensus declines and the Court's rulings and policy-making appear more fragmented, less stable, and less predictable."

Thus, the presence of separate opinions creates two concerns for the majority-opinion writer: the possibility of being overturned and the possibility of not being followed or interpreted in the way the majority-opinion writer intends. These concerns cause the majority-opinion writer to devote greater time and resources to making his or her own argument more convincing and refuting the arguments made in the separate opinions, a process we refer to as competitive justification. We expect that this will result in a majority opinion that is more thoroughly embedded in case precedent. When strengthening his or her own line of reasoning

to make it more convincing to lower and future courts, the majority-opinion writer will likely do so in part with citations to case precedents that support his or her reasoning (and possibly by distinguishing cases that do not support it). In addition, when addressing the competing arguments made in the separate opinions, he or she will likely cite certain cases discussed in those opinions that he or she would not have otherwise cited—if only to argue why those cases do not control in the present case or to otherwise differ with the separate opinion's reading of those cases. Hume (2006, p. 817) makes a similar point, arguing that justices cite greater numbers of "rhetorical sources: references to prominent authors and texts that are nonbinding on case outcomes" to enhance the legitimacy of their opinions. This reasoning leads to the following two hypotheses:

Hypothesis 4. The greater the number of justices joining concurring opinions, the more embedded in precedent the Court's majority opinion will be.

Hypothesis 5. The greater the number of justices joining dissenting opinions, the more embedded in precedent the Court's majority opinion will be.

4. RESEARCH DESIGN

4.1. Measure of Embeddedness in Precedent

The key to our ability to test our hypotheses is a sound measure of the extent to which a Supreme Court majority opinion is embedded in precedent. We acknowledge that this concept is open to several interpretations and, therefore, any measure should be viewed with caution.[5] Nonetheless, scholars often speak in qualitative terms of certain Court opinions relying more on precedent than others. We therefore argue that if the precedent cited in opinions can be compared qualitatively, it is possible to measure it quantitatively.

As a measure of embeddedness in precedent, we adopt the hub scores developed by Fowler et al. (2007) and Fowler and Jeon (2008). Because

5. For a discussion of the potential limitations of citation analysis, see Landes, Lessig, and Solimine (1998, p. 279), who, despite these issues, argue that citation counts can be used "as a proxy for measuring influence or quality." Likewise, Posner (2000, p. 402) argues that "citations analysis guided by economic theory offer substantial promise of improving our knowledge of the legal system, in particular its academic and judicial subsystems."

many readers may be unfamiliar with the methodology used to calculate these scores, we briefly describe it. Most importantly, these measures are not simple counts of citations. This procedure relies on network analytic methods to identify two kinds of conceptually important opinions: hubs and authorities. A hub is an opinion that cites many other decisions, helping to define which legally relevant decisions are pertinent to a given precedent. An authority is an opinion that is widely cited by other decisions, which means that it has influenced those decisions in some way. Most decisions act as both hubs and authorities, and the degree to which they fulfill these roles is mutually reinforcing within the network of cases. An opinion that is a good hub cites many good authorities, and an opinion that is a good authority is cited by many good hubs. Two factors directly affect the hub score of a case: the number of other cases it cites and the authority scores of the cases it cites. Thus, while it is possible for a case to have a large hub score by simply citing many unimportant cases, the cases with the largest hub scores are ones that cite many authoritative precedents.

The hub scores and authority scores for all opinions are formally defined in a system of simultaneous equations, which can be solved using matrix algebra. Suppose that $\boldsymbol{x}$ is a vector of authority scores and $\boldsymbol{y}$ is a vector of hub scores and that these vectors are normalized so the sum of their squares is 1. Let each opinion's authority score x_i be proportional to the sum of the hub scores of the cases that cite it: $x_i \propto a_{1i}y_1 + a_{2i}y_2 + \ldots + a_{ni}y_n$ (where n is the number of cases). Also, let each opinion's hub score be proportional to the sum of the authority scores that it cites: $y_i \propto a_{i1}x_1 + a_{i2}x_2 + \ldots + a_{in}x_n$. This yields $2n$ equations that can be represented in matrix format as $\lambda_x = A^T\boldsymbol{y}$ and $\lambda_y = A\boldsymbol{x}$. Kleinberg (1998) shows that the solution to these equations converges to $\lambda_{x^*} = A^TA\boldsymbol{x}^*$ and $\lambda_{y^*} = AA^T\boldsymbol{y}^*$, where λ is the principal eigenvalue and $\boldsymbol{x}^*$ and $\boldsymbol{y}^*$ are the principal eigenvectors of the symmetric positive definite matrices A^TA and AA^T, respectively. This procedure can be used for any set of opinions and citations. Thus, the hub score for case i at time t is equal to the ith value of the principal eigenvector of AA^T, where A is the adjacency matrix of opinions and citations at time t.

To demonstrate the face validity of these measures, Fowler and Jeon (2008) show that they are consistent with expert opinions of the most influential cases and can be used to predict which cases will be identified as important in the future. Moreover, they use the scores to show that the Court is careful to ground overruling opinions in past precedent (that is, overruling opinions have significantly larger hub scores) and

that the care that the Court exercises increases with the importance of the decision that is overruled. More recently, Lupu and Voeten (2012) calculate the hub and authority scores of the opinions of the European Court of Human Rights and use those scores to demonstrate the importance of strategic behavior on that court.

It should be noted that these scores are dynamic. For example, the hub score of a given opinion may change over time as the cases that it cites are cited (or not cited) by other cases, thus changing their authority scores. For the purposes of this paper, we are interested only in the initial hub score (Initial Hub Score) of an opinion; in other words, we want to know the extent to which a Supreme Court opinion was embedded in precedent when it was published. We have several reasons to believe that hub scores provide a good measure of the extent to which an opinion is embedded in precedent. First, hub scores take into account not just the quantity of case precedents cited in an opinion but also their authority scores—or how influential those cases are in the body of the Court's precedent. This is important to our argument regarding an opinion writer's rationale for embedding his or her opinion in precedent. Assuming that the writer wants to improve the extent to which the opinion is convincing, citing more influential precedents may be more effective than citing relatively obscure precedents. Second, we note that the hub and authority scores methodology does not take into account the type of citation (for example, whether it is a positive or negative citation, whether it is a single citation or a string citation, whether the citation comes early or late in the opinion, and so on). This fits well with our logic of the ways in which the judicial process affects the extent to which a majority opinion is embedded in precedent. For example, we noted above that to some extent the majority-opinion writer may add citations to precedents that are brought up in separate opinions largely to provide an argument for why those cases should not be followed or why the writer of the separate opinion has misinterpreted them. As Posner (2000, p. 385) argues, even negative citations are "motivated by the authority of the previous case." Many such citations probably result from a strategic response to a separate opinion. By taking all such citations into account, the hub score thus provides a measure of embeddedness in precedent that is especially useful for testing the effects of strategic interaction.

To use Initial Hub Score to provide a measure of how embedded in precedent the Court's majority opinion is, we introduce two controls. First, we recognize that the methodology used by Fowler and Jeon (2008)

results in a gradual decrease in Initial Hub Score over time. This is because hub scores are normed to sum to a constant, while the size of the network of cases gradually increases over time. Thus, in each of our models, we introduce the control Year, which is the year in which the opinion was issued. Second, to better understand whether the judicial process simply affects the number of precedents cited in the majority opinion or the overall embeddedness of the opinion in precedent, we include the control Outward Citations in some models, which is the number of citations to other Supreme Court decisions. Because our dependent variable is bound to be positive and includes several (70) of the values clustered at zero (that is, opinions that cite no case precedent), we use Tobit regression in all of our models (Tobin 1958).

4.2. Explanatory Variables

We test our hypotheses by verifying whether the preferences and tactics of the majority-opinion writer's colleagues have the predicted relationships with Initial Hub Score. The unit of analysis for this study is an individual Supreme Court case, as each case contains one majority opinion and, thus, one Initial Hub Score. Unless specified otherwise, we obtained our data regarding Supreme Court decisions from the United States Supreme Court Database (Spaeth 2001). Our sample includes the cases from the 1953–95 terms. To test hypotheses 1–3, we rely on the measures of Supreme Court justices' ideologies developed by Martin and Quinn (2002). Ideology Variance is a measure of the variance of the sitting justices' ideologies, and it should have a positive, significant relationship with Initial Hub Score if hypothesis 1 is correct.[6] Ideology Median is a measure of the ideology of the median justice, and it should have a significant relationship with Initial Hub Score if hypothesis 2 is correct. Finally, the majority-opinion writer's ideology (Writer Ideology) should not have a significant relationship with Initial Hub Score if hypothesis 3 is correct. If hypotheses 4 and 5 are correct, the numbers of justices joining concurring opinions (Concurrers) and dissenting opinions (Dissenters), respectively, should have positive, significant relationships with Initial Hub Score.

We also control for several additional characteristics of cases that may influence the extent to which a majority opinion is embedded in

6. A potential limitation of Ideology Variance is that, in some cases, it may take into account the ideologies of Court members who are very unlikely to join a majority coalition. Unfortunately, it is not practical to determine, ex ante, the potential members of a majority coalition.

precedent. First, it is reasonable to expect that more complex cases would require the Court to cite a greater number of its previous decisions independent of the influence of the justices' bargaining process. We therefore follow leading studies (Bailey, Kamoie, and Maltzman 2005; Johnson, Wahlbeck, and Spriggs 2006) by controlling for the underlying complexity of a case (Complexity) by using a measure initially constructed by Wahlbeck, Spriggs, and Maltzman (1998) and based on a factor analysis of two components: the number of issues raised by the case and the number of legal provisions involved. Second, when more amicus briefs are filed in a case, opinion authors may have more information regarding the relevant precedents (Spriggs and Wahlbeck 1997), which would result in the opinion author citing a greater number of these precedents. We therefore control for the number of amicus briefs filed in the case (Amicus Briefs), using data provided by Kearney and Merrill (2000).

Third, opinion writers may be more likely to thoroughly cite precedent in more salient cases. Prior research also shows that judges are more likely to join separate opinions in salient cases (Hettinger, Lindquist, and Martinek 2004; Maltzman, Spriggs, and Wahlbeck 2000). We therefore control for two measures of salience. Legal Salience indicates whether the Court's opinion formally alters precedent or declares unconstitutional a local, state, or federal law (Collins 2008). Public Salience indicates whether a story regarding the decision appeared on the front page of the *New York Times* on the day after the decision (Epstein and Segal 2000). Finally, we expect that the type of legal authority being interpreted by the Court may significantly affect the extent to which the Court cites case precedent. In particular, when the Court is interpreting the provisions of a statute, we expect that it will have a smaller number of potentially relevant precedents to choose from than, for example, when it is interpreting a constitutional provision. We therefore include a control (Statutory) coded as one for cases of statutory construction and zero for other cases. Table 1 reports the summary statistics of the variables in our models, and Table 2 reports the cross correlations between these variables.

5. RESULTS AND ANALYSIS

Model 1, reported in Table 3, estimates the relationship between other justices' tactics and preferences and the Initial Hub Score. There are several key findings in this model. First, the significant and positive

Table 1. Summary Statistics

Variable	Mean	SD	Min	Max
Initial Hub Score	6.667	12.642	0	175.356
Concurrers	.824	1.243	0	8
Dissenters	1.703	1.516	0	4
Ideology Variance	5.083	1.615	.246	12.842
Ideology Median	.341	.506	−.998	1.395
Writer Ideology	−.072	2.15	−6.424	4.297
Complexity	.014	.422	−.534	4.445
Amicus Briefs	2.279	3.672	0	78
Legal Salience	.099	.299	0	1
Public Salience	.163	.369	0	1
Statutory	.386	.487	0	1
Outward Citations	19.124	16.47	0	195

coefficient for Ideology Variance indicates that as ideological diversity on the Court increases, the majority-opinion writer must accommodate a greater range of views in citing precedent in the majority opinion, which supports hypothesis 1. In broader terms, this indicates that majority opinions written during periods of ideological disagreement on the Court tend to be more embedded in precedent, which has important implications for the ways in which the Court sets new precedents during such periods.

A second key finding in model 1 is that Ideology Median has a significant relationship with Initial Hub Score, as predicted by hypothesis 2. This finding is important for at least two reasons. First, the significant coefficient on Ideology Median supports the median-justice model of the judicial process because it indicates that the preference of the pivotal justice significantly impacts citations to precedent in the Court's opinion. Second, the negative coefficient on Ideology Median suggests that the majority-opinion writer is more likely to to embed his or her decisions in precedent as the median justice becomes more liberal. As discussed above, this might be interpreted as indicating that a liberal judicial philosophy tends toward a greater emphasis on case precedents than a conservative philosophy that favors founding texts, yet we must be circumspect with regard to this interpretation. Alternatively, the finding may indicate that Supreme Court precedents over the past 50 years, particularly during the Court under Chief Justice Earl Warren, have tended to be liberal in outcome and thus are more often cited by liberal justices than by conservative justices. We hope that this finding will contribute to the debate in the legal and political science communities

Table 2. Cross Correlations

Variable	Initial Hub Score	Concurrers	Dissenters	Ideology Variance	Ideology Median	Writer Ideology	Complexity	Amicus Briefs	Legal Salience	Public Salience	Statutory
Concurrers	.239										
Dissenters	.187	−.164									
Ideology Variance	.076	.009	.042								
Ideology Median	−.036	.011	.088	.194							
Writer Ideology	.054	.042	.086	.007	.156						
Complexity	.134	.042	.054	.046	−.062	−.017					
Amicus Briefs	.131	.117	.066	−.009	.172	.049	.043				
Legal Salience	.249	.133	.012	.028	−.050	−.049	.040	.081			
Public Salience	.293	.158	.122	−.015	−.061	.016	.105	.270	.178		
Statutory	−.273	−.152	−.105	−.050	.030	−.066	−.004	−.009	−.213	−.140	
Outward Citations	.703	.249	.289	.054	.081	.098	.181	.263	.191	.260	−.233

Table 3. Tobit Models of Initial Hub Scores

	(1)	(2)
Concurrers	.523***	1.948***
	(.139)	(.177)
Dissenters	−.103	1.446***
	(.094)	(.115)
Ideology Variance	.372***	.503***
	(.084)	(.118)
Ideology Median	−.731*	−.907*
	(.295)	(.403)
Writer Ideology	.043	.202**
	(.051)	(.065)
Complexity	−.289	2.624***
	(.358)	(.430)
Amicus Briefs	−.119**	.181***
	(.042)	(.049)
Legal Salience	3.507***	6.276***
	(.668)	(.932)
Public Salience	3.145***	5.748***
	(.511)	(.708)
Statutory	−2.047***	−4.412***
	(.213)	(.242)
Outward Citations	.520***	
	(.029)	
Year	−.122***	−.029
	(.013)	(.016)
Constant	236.184***	57.922
	(25.998)	(30.570)

Note. Robust standard errors are in parentheses. $N = 4{,}705$.
*$p < .05$.
**$p < .01$.
***$p < .001$.

regarding the consequences of legal philosophy and will spark additional research regarding the relationship between ideology and citations to precedent. The median-justice model, as opposed to the agenda-control model, is further supported by our third key finding. The insignificant coefficient on Writer Ideology indicates that in terms of the extent to which the Court's opinion is embedded in precedent, the writer is not free to let his or her personal ideology dictate the result, as predicted by hypothesis 3.

Model 1 also demonstrates important results with respect to the relationship between judicial tactics and opinion writing. The variable Concurrers has a significant, positive relationship with Initial Hub Score, which serves to confirm hypothesis 4. This result indicates that the in-

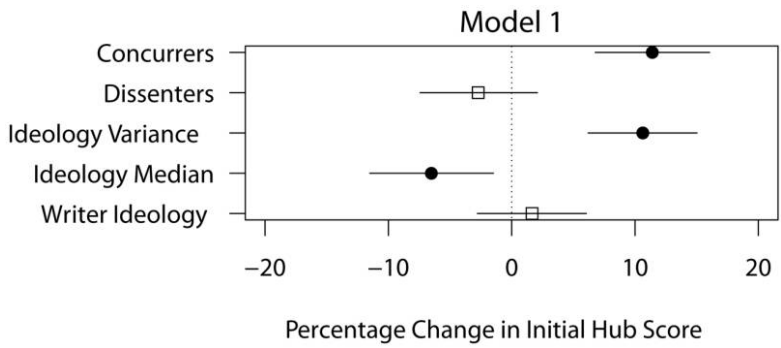

Figure 1. Marginal effects based on model 1, with 95 percent confidence intervals

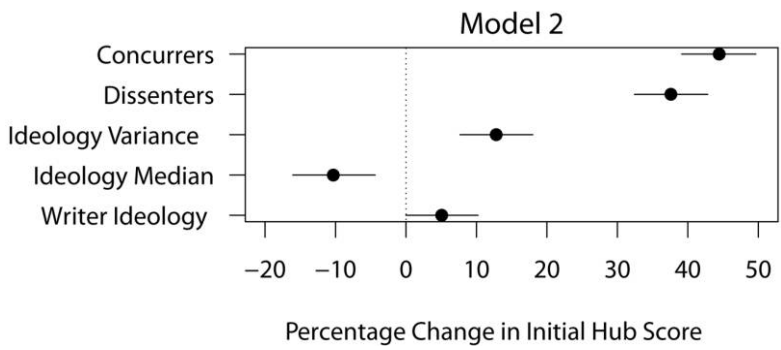

Figure 2. Marginal effects based on model 2, with 95 percent confidence intervals

stitution of concurring-opinion writing plays a key role in the judicial process. While Anderson and Tahk (2007) argue that this institution facilitates stable equilibrium decision-making outcomes, our results suggest that concurring opinions may also be a tool through which the justices prevent shirking by the majority-opinion writer (Moe 1984; McCubbins and Schwartz 1984). While the majority-opinion writer often may prefer to use fewer resources in crafting an opinion, the possibility of having to contend with concurring opinions creates an incentive for him or her to craft the opinion more thoroughly.

Some results in model 1 do not meet our expectations. Most important, the coefficient on Dissenters is not significant, contrary to our prediction in hypothesis 5. In addition, we also expected Amicus Briefs

and Complexity to have significant, positive relationships with Initial Hub Score, but these expectations are not confirmed by this model. It should be noted that by controlling for Outward Citations, model 1 reveals the relationship between the explanatory variables and the extent to which the case cites precedents that have been widely cited by other cases. By removing this control, as we do in model 2, we can examine the extent to which the explanatory variables are associated with the sheer number of cases cited by the Court's opinion, which is an important aspect of embeddedness in precedent. For models 1 and 2, Figures 1 and 2 compare the percentage changes in Initial Hub Score given a 1-standard-deviation increase in the key independent variables.

In model 2, we find that Amicus Briefs, Complexity, and Dissenters all have significant, positive coefficients. The result with respect to Amicus Briefs suggests that while they serve the important function of providing information to the Court regarding the precedents relevant to the case, the effect of this information is that the majority opinion cites a greater number of precedents, but not necessarily more influential precedents. Although Complexity is associated with larger values for Initial Hub Score, this association is not significant when we control for the number of cases cited in the majority opinion. This suggests that opinions in more complex cases tend to cite greater numbers of precedents, but not more widely cited precedents. Finally, while model 2 indicates that Dissenters has a significant relationship with Initial Hub Score, this relationship also becomes insignificant when we account for Outward Citations. A possible reason for this may be that the cases preferred by the dissenting justices have generally low authority scores and that, as a result, when the majority-opinion writer strategically revises the Court's opinion to address those cases, the hub score of the opinion does not significantly increase. Indeed, it may be the case that the precedents preferred by justices who have been in the ideological minority on the Court over a long period have generally lower authority scores in large part because the majority does not prefer to cite them. We hope to explore these questions in future work by gathering data on the precedents cited by dissenting (and concurring) opinions and analyzing the relationships between these cases and those cited in majority opinions.

An additional difference between models 1 and 2 that should be noted is that, in the latter, Writer Ideology has a significant, positive relationship with Initial Hub Score. This, combined with the result of model 1, indicates that more conservative majority-opinion writers tend to cite greater numbers of precedents, yet this does not result in opinions that

are necessarily more embedded in precedent overall. This finding suggests that the majority-opinion writer does have certain agenda-setting powers, yet these are limited. In both models, Ideology Median has a significantly ($p < .05$) larger coefficient than Writer Ideology, which suggests that, despite the writer's ability to tailor the majority opinion to his or her own preferences to some extent, the citation preferences of the median justice ultimately influence the opinion to a greater degree.

5.1. Robustness Tests

We tested several alternate specifications of models 1 and 2 to confirm the robustness of our results. All of these models, reported below, yielded results substantially similar to the findings reported in Table 3. First, we reestimated models 1 and 2, using ordinary least squares (OLS) regression to confirm that our results were not dependent on our use of the Tobit model (Table 4). Second, it may be the case that the mechanisms of the judicial bargaining process operate differently in cases in which the justices are more easily able to come to agreement on a decision. While not all unanimous decisions can rightly be characterized as having been easy cases ex ante, some probably are. Because the mechanisms that we described may not apply to such cases, we test alternative specifications that exclude all unanimous decisions (Table 4). The results indicate that our main findings are not driven by the inclusion of unanimous decisions in our sample. Third, while we believe that our coding of Concurrers in the main models best takes into account the mechanisms we wish to test, it can be argued that a sensible alternative coding of the variable is dichotomous—that is, coding as one those cases for which a concurring opinion was written and as zero otherwise. The results of this alternative coding, shown in Table 4, indicate that our results are not contingent upon this coding decision.

Opinion-writing norms on the Court may have changed over time in several ways not captured by the linear time trend included in the main models. While the linear time trend accounts for some of the ways advances in technology have facilitated legal research and, therefore, citations to precedent, it may be that a significant shift in this linear trend occurred in 1989, when electronic databases first became available. We therefore tested alternative specifications that include a variable indicating whether a case was decided in 1989 or later (Table 5). The lack of significance on the coefficient for Post-1989 indicates that although electronic databases have likely reduced the cost of finding precedents to cite, they have not, on average, increased the extent to which opinions

are embedded in precedent when we control for other factors. Another key factor that may have affected citation practices over time in ways not captured by the linear time trend is the change of chief justice. Many norms on the Court change under different chief justices, including the ways in which the Court handles the bargaining process. We therefore tested alternate specifications that include fixed effects for the chief justice (Table 5). In these models, Chief Justice Warren Burger is used as a baseline category. Most of the chief justice coefficients are not significant, although it does appear that the Warren Court's decisions had smaller values for Initial Hub Score than the Burger Court (when we do not include the control Outward Citations). Finally, bargaining norms and citation practices may differ between individual court terms, possibly as individual justices leave and join the Court. We therefore tested models that include fixed effects for the Court's term (Table 5). In these models, we excluded Ideology Variance and Ideology Median because they covary with the Court's term, so these models do not serve to test hypotheses 1 and 2. In Table 5, we have omitted the coefficients for individual terms to save space. Overall, the results of the robustness tests demonstrate that, despite any changes to citation practices over time, the mechanisms of preemptive accommodation and competitive justification have a consistent effect on the extent to which the Court's majority opinion is embedded in precedent.

Several other factors could be argued to affect the Court's citation practices. First, individual justices vary with respect to the extent that they value precedent (Bailey and Maltzman 2008), and this may affect their propensity to cite precedent when assigned to write the Court's opinion. We therefore tested alternate specifications using fixed effects for the majority-opinion writer (Table 6). In these models, we removed the variable Writer Ideology because of its correlation to the identity of the majority-opinion writer. To save space, we omitted the coefficients for individual justices. The key results of these models are consistent with the results of the main models, which indicates that although individual justices vary in terms of their personal preferences toward citations to precedent, the mechanisms that affect citation practices apply independently. Patterns of Supreme Court citations may also differ by type of case. It may be that the Court cites precedent in different ways when hearing appeals from different sources. For example, in cases from specialized courts with expertise in a given subject matter, the Court may be more careful to justify its decision with citations to precedent. We therefore tested alternative specifications, using fixed effects for the

Table 4. Robustness Tests I

	OLS Models ($N=4,705$)		Unanimous Cases Excluded ($N=3,040$)		Alternative Coding of Concurrers ($N=4,705$)	
	(1)	(2)	(1)	(2)	(1)	(2)
Concurrers	.512***	1.916***	.719**	2.737***	1.267***	4.318***
	(.139)	(.176)	(.244)	(.311)	(.268)	(.345)
Dissenters	−.115	1.410***	.161	1.611***	−.151	1.270***
	(.094)	(.113)	(.166)	(.227)	(.088)	(.111)
Ideology Variance	.360***	.488***	.575***	.738***	.370***	.499***
	(.084)	(.117)	(.116)	(.169)	(.079)	(.104)
Ideology Median	−.761**	−.927*	−.864*	−1.151*	−.707*	−.834*
	(.292)	(.397)	(.414)	(.564)	(.286)	(.375)
Writer Ideology	.040	.198**	.069	.341***	.048	.224**
	(.051)	(.065)	(.075)	(.094)	(.060)	(.078)
Complexity	−.339	2.531***	−.154	3.324***	−.295	2.656***
	(.359)	(.429)	(.490)	(.563)	(.304)	(.393)

Amicus Briefs	−.115**	.181***	−.135 *	.194**	−.118**	.191***
	(.042)	(.049)	(.054)	(.061)	(.039)	(.051)
Legal Salience	3.508***	6.247***	3.419***	6.411***	3.523***	6.417***
	(.670)	(.932)	(.881)	(1.268)	(.438)	(.571)
Public Salience	3.137***	5.714***	2.839***	5.640***	3.180***	5.976***
	(.511)	(.706)	(.635)	(.873)	(.371)	(.482)
Statutory	−1.904***	−4.234***	−2.666***	−5.083***	−2.040***	−4.475***
	(.211)	(.234)	(.291)	(.333)	(.273)	(.353)
Outward Citations	.513***		.532***		.521***	
	(.028)		(.034)		(.009)	
Year	−.125***	−.035*	−.148***	−.042	−.122***	−.027
	(.013)	(.015)	(.019)	(.022)	(.013)	(.017)
Constant	242.873***	68.540*	285.255***	80.723	236.743***	54.217
	(25.985)	(30.336)	(36.473)	(43.630)	(25.750)	(33.511)

Note. Robust standard errors are in parentheses.

*$p < .05$.

**$p < .01$.

***$p < .001$.

Table 5. Robustness Tests II

	Availability of Electronic Databases		Chief Justice Fixed Effects		Term Fixed Effects	
	(1)	(2)	(1)	(2)	(1)	(2)
Concurrers	.523***	1.948***	.522***	1.933***	.515***	1.934***
	(.139)	(.177)	(.139)	(.176)	(.137)	(.174)
Dissenters	−.103	1.445***	−.104	1.449***	−.082	1.495***
	(.094)	(.115)	(.094)	(.115)	(.093)	(.117)
Ideology Variance	.381***	.489***	.372***	.312*		
	(.094)	(.131)	(.096)	(.133)		
Ideology Median	−.747*	−.884*	−.923**	−1.201**		
	(.302)	(.413)	(.336)	(.453)		
Writer Ideology	.044	.201**	.045	.180**	.045	.158*
	(.052)	(.065)	(.051)	(.065)	(.051)	(.066)
Complexity	−.286	2.618***	−.275	2.631***	−.343	2.649***
	(.359)	(.431)	(.358)	(.431)	(.358)	(.429)
Amicus Briefs	−.120**	.181***	−.120**	.183***	−.098*	.198***
	(.042)	(.049)	(.042)	(.049)	(.041)	(.049)
Legal Salience	3.507***	6.276***	3.495***	6.251***	3.299***	6.092***
	(.668)	(.932)	(.668)	(.930)	(.669)	(.925)

Public Salience	3.138***	5.757***	3.138***	5.841***	2.932***	5.598***
	(.512)	(.710)	(.513)	(.712)	(.499)	(.694)
Statutory	−2.052 ***	−4.405 ***	−2.058 ***	−4.322 ***	−2.025 ***	−4.324 ***
	(.212)	(.241)	(.211)	(.239)	(.210)	(.240)
Outward Citations	.520***		.520***		.521***	
	(.029)		(.029)		(.028)	
Year	−.124***	−.026	−.151***	−.070	−.450	.698
	(.016)	(.019)	(.033)	(.043)	(.332)	(.472)
Post-1989	.128	−.183				
	(.430)	(.501)				
Chief Justice Rehnquist			.620	−.740		
			(.506)	(.620)		
Chief Justice Warren			−.511	−1.990 *		
			(.728)	(1.006)		
Constant	240.584***	51.652	293.197***	139.567	879.106	−1,358.155
	(30.506)	(36.514)	(65.206)	(85.882)	(648.337)	(921.035)

Note. Robust standard errors are in parentheses. Coefficients for individual terms are omitted. $N = 4{,}705$.

*$p < .05$.

**$p < .01$.

***$p < .001$.

Table 6. Robustness Tests III

	Opinion Writer Fixed Effects (N = 4,705)		Source Fixed Effects (N = 4,607)	
	(1)	(2)	(1)	(2)
Concurrers	.525***	1.931***	.395**	1.756***
	(.134)	(.176)	(.135)	(.171)
Dissenters	−.061	1.455***	−.168	1.344***
	(.092)	(.114)	(.094)	(.112)
Ideology Variance	.369***	.478***	.352***	.512***
	(.087)	(.115)	(.083)	(.117)
Ideology Median	−.545	−.811*	−.673*	−.898*
	(.300)	(.401)	(.291)	(.402)
Writer Ideology			.036	.216**
			(.053)	(.066)
Complexity	−.234	2.680***	−.295	2.408***
	(.352)	(.426)	(.355)	(.437)
Amicus Briefs	−.120**	.177***	−.112**	.184***
	(.043)	(.050)	(.042)	(.049)
Legal Salience	3.423***	5.995***	3.167***	5.630***
	(.661)	(.876)	(.678)	(.929)
Public Salience	3.218***	5.873***	2.791***	5.494***
	(.508)	(.708)	(.507)	(.706)
Statutory	−2.059***	−4.406***	−1.599***	−3.910***
	(.215)	(.246)	(.215)	(.244)
Outward Citations	.518***		.520***	
	(.027)		(.028)	
Year	−.129***	−.073**	−.110***	−.015
	(.021)	(.026)	(.013)	(.015)
Constant	249.948***	144.228**	210.646***	27.755
	(41.172)	(51.814)	(26.015)	(30.209)

Note. Robust standard errors are in parentheses. Coefficients for individual majority-opinion writers and sources are omitted.

*$p < .05$.

**$p < .01$.

***$p < .001$.

source of the case (as provided in the Spaeth [2001] database). In Table 6, to save space, we omitted the coefficients for individual sources. The extent to which justices cite precedent may also vary significantly according to the subject matter of the case. In some areas, there have been many more Supreme Court decisions, which resulted in more citations in the Court's opinions. In such areas, it may be relatively costless for a justice (or his or her clerk) to include string citations to precedents on a similar subject matter. This may result in larger values for Initial Hub Score in cases addressing subject matters that are more often addressed.

In our main models, this concern is indirectly addressed by addressed by variables such as Complexity, Amicus Briefs, Legal Salience, Public Salience, and Statutory, all of which are highly correlated with the subject matter of the case. In alternative specifications, we tested the effects of subject matter directly by replacing these variables with fixed effects for the subject matter of the case, using the variable Value in the Spaeth (2001) database (Table 7). Interestingly, opinions from several subject-matter areas do tend to have significantly larger values for Initial Hub Score, including those involving the First Amendment and privacy rights. In addition, cases involving economic activity, federal taxation, federalism, judicial power, and unions tend to have smaller values for Initial Hub Score. Nonetheless, the key results reported above are consistent in these models, which indicates that the mechanisms that influence citation practices apply independent of case subject matter.

6. CONCLUSIONS

We have stressed the need for scholars to analyze the content of Supreme Court opinions because of the importance of such analysis to the Court and to the larger legal community. Without accounting for the content of opinions, studies of judicial decision-making limit their ability to explain the complete outcome of cases. We have presented a theory that explains how the judicial bargaining process influences the decisions made by the majority-opinion writer and, in turn, the development of the Court's opinions. We focus on the majority-opinion writer's decisions to cite case precedent, demonstrating how strategic interaction influences these decisions. Our theory provides a structure for analyzing how strategic interaction systematically influences the citations to precedent in U.S. Supreme Court majority opinions and, in turn, the development of legal doctrine.

Our results provide several insights into judicial behavior on the U.S. Supreme Court and, possibly, other collegial common-law courts. First, the analysis indicates that separate opinion-writing decisions have a greater significance than previously thought. In the past, we may have assumed that a justice's rationale for joining a separate opinion is to inform the legal community of his or her difference of opinion regarding the rationale stated in the majority opinion. Others argue that these opinions result from judicial egocentrism (Caldeira and Zorn 1988) and diminish the weight of law in the majority opinion (Walker, Epstein, and Dixon 1988). However, our finding is that separate opinions are asso-

Table 7. Robustness Tests IV

	Subject Matter Fixed Effects	
	(1)	(2)
Concurrers	.252*	1.999***
	(.126)	(.175)
Dissenters	−.246**	1.504***
	(.088)	(.115)
Ideology Variance	.321***	.483***
	(.075)	(.109)
Ideology Median	−1.094***	−1.677***
	(.272)	(.392)
Writer Ideology	−.049	.077
	(.048)	(.065)
Civil Rights	−1.619	.739
	(1.069)	(1.401)
Criminal Procedure	−1.520	.386
	(1.061)	(1.395)
Due Process	−1.629	1.174
	(1.118)	(1.462)
Economic Activity	−2.870**	−1.554
	(1.057)	(1.389)
Federal Taxation	−2.154*	−3.629**
	(1.071)	(1.403)
Federalism	−3.507**	−.510
	(1.130)	(1.419)
First Amendment	13.930***	18.856***
	(1.328)	(1.804)
Judicial Power	−2.197*	−.877
	(1.069)	(1.407)
Privacy	6.138**	9.035**
	(2.086)	(3.136)
Unions	−2.145*	−2.602
	(1.079)	(1.416)
Outward Citations	.514***	
	(.025)	
Year	−.130***	−.021
	(.013)	(.015)
Constant	252.973***	41.036
	(25.868)	(30.543)

Note. Robust standard errors are in parentheses. $N = 4{,}704$.
*$p < .05$,
**$p < .01$,
***$p < .001$

ciated with a more extensive reliance on precedent to justify a decision, which suggests that the decisions to write such opinions may be motivated in part by an interest in influencing the majority opinion. More research on this point is clearly needed, but our argument further suggests that the institution of separate opinion writing creates an incentive for majority-opinion writers to embed their decisions more firmly in precedent, which may help to promote the norm of stare decisis.

The analysis in this paper also provides new insights regarding judicial ideology. While scholars have generally focused on determining which justice's ideology is pivotal in the judicial process, our results demonstrate that the ideology of the Court as a whole plays an important role. As the diversity of viewpoints among the justices increases, the Court produces majority opinions more embedded in past precedent. This finding indicates that, during periods of ideological disparity, the Court produces opinions that are more deeply connected to other cases, which previous research shows are more likely to set enduring precedent themselves (Fowler et al. 2007; Fowler and Jeon 2008). If this is the case, it would imply that more diverse courts are better able to set future precedents, which is consistent with general arguments about the benefits of group diversity (Page 2007). This also suggests that the development of common-law legal doctrine depends not only on the ideological direction of courts but also on the extent to which they include judges with multiple viewpoints.

Certainly, a significant amount of research remains to be done regarding the role of precedent in common-law courts, citations to precedent, and opinion content generally. Citation to precedent constitutes but one dimension of opinion content, and we have focused on one dimension of citation behavior. Many other aspects of citation behavior remain to be analyzed, including the extent to which judges writing separate opinions take citation cues from each other and the extent to which courts likewise mimic each other's citations. Understanding behaviors such as these will certainly provide greater insight into the role of citations in the judicial process. More generally, studies of judicial opinion content can likely be pushed forward in the future through the use of content analytic tools, which will allow us to construct more nuanced measures of various aspects of opinion content.

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