Crafting the Law:
How Opinion Content Influences Legal Development

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Why do some judicial opinions become widely cited while others languish in disuse? We theorize that both efficiency and persuasiveness structure the effect an opinion has on legal development. Precedents that are both unanimous and well grounded in the law have greater persuasive value while citation to precedents that are easier to read allow a judge to craft an opinion more efficiently. In order to test these hypotheses in the context of both vertical and horizontal citation, we use a database of published search and seizure cases from federal circuit courts and state high courts from 2000 to 2010. We estimate the impact of an opinion's readability, the number of footnotes it contains, its use of precedent, and whether there it contains a dissenting opinion on the number of times each year the opinion is cited and its vitality in the United States Supreme Court, the precedent's own court, the precedent's sister courts, and all remaining state and federal courts. We thus track vertical influence both up and down the judicial hierarchy and evaluate horizontal influence both within the precedent's own jurisdiction and across jurisdictional lines.

Norma Leah McCorvey (Jane Roe) gave birth before the U.S. Supreme Court decided *Roe v. Wade*, and Linda Brown never attended a school desegregated by judicial order (Rosenberg 1991). Yet, despite the fact that the judicial branch failed to provide either plaintiff the relief she sought, the cases bearing the names of these two women have been widely heralded as landmark ones; the Court's opinions in these cases have had wide-ranging implications for legal controversies regarding discrimination, privacy, and the meaning of the 14th Amendment nationwide.

Judicial opinions have both short-term and long-term effects. In the short-term, judicial decisions resolve a controversy between the parties to the case. While the parties care deeply about the outcome of their dispute, the broader impact of a judicial ruling lies in its long-term effects on the development of law. In the course of resolving a particular dispute, a judicial opinion provides rules by which courts should resolve similar disputes in the future (Aldisert 1989). As *Roe* and *Brown* demonstrate, it is these long-term effects of a judicial opinion that can have a profound impact on society by influencing how law develops. Existing case law may place constraints on how judges interpret the law, but each case also constitutes an opportunity to craft an opinion that has the potential to bind future judges to a particular understanding of the law (Hansford and Spriggs 2006; Bailey and Maltzman 2011). In order to understand how the law develops over time, both in terms of legal constraints and what opportunities are available to judges to promote their policy preferences, we must understand what factors make some opinions influential and others obscure.

Despite the evident variation in the long-term impact of judicial opinions and the importance of understanding legal development, scholars have developed and tested relatively few theories to explain why some opinions become prominent while others languish in disuse. In this paper, we develop a theory of how opinion characteristics play a role in legal development. We hypothesize that both efficiency and persuasiveness structure future judges' choice of citations and, by extension, the long-term effect that an opinion has on the development of the law. Opinions that are both unanimous and well grounded in the law have greater

persuasive value while citation to precedents that are easier to read allow future judges to produce their own opinions more efficiently. In short, we expect opinions that can be understood more efficiently and opinions that are more persuasive will tend to have a greater impact on legal development.

We conceptualize legal development in terms of how an opinion is used in future cases. This approach makes it important to account for variation in citation practices across institutional contexts. The principle of stare decisis mandates citation to a legally relevant opinion by a subordinate court, yet imposes no such obligations on a superior court (Schauer 2008). There are also differences between how an opinion is cited by its own court and how it is cited by its sister courts (Hinkle 2015). To account for these variations, we test our hypotheses separately for both types of vertical citation and both types of horizontal citation. We also include a residual category in order to account for all possible manifestations of an opinion's impact on legal development. In order to be able to test all types of citations, both vertical and horizontal, we examine opinions written by courts that are only subordinate to the U.S. Supreme Court. Specifically, we test our theory using a database of search and seizure cases containing all published circuit court cases and state high court cases from 2000 to 2010. We estimate the impact of an opinion's readability, the number of footnotes it contains, the number of precedents it cites, and whether there is a dissenting opinion on the impact the opinion has on legal development. Legal development is examined in terms of both the total number of citations to an opinion and an opinion's vitality, which is the number of times it has been positively treated minus the number of times it has been negatively treated.

Our results indicate that both persuasiveness and efficiency shape a judicial opinion's legacy. In most contexts other than the U.S. Supreme Court, opinions that are easier to read, have fewer footnotes, are more thoroughly grounded in existing precedent, and are unanimous are more likely to accumulate high citation counts and to have higher levels of vitality. Overall, our findings make two contributions to the understanding of how law develops. The primary contribution is that judges have some degree of control over an

opinion's future legal impact. Both an opinion's efficiency and persuasiveness are directly subject to manipulation. A second thread is also woven throughout our findings: the degree to which opinion characteristics matter is conditional on institutional context. For example, the U.S. Supreme Court's extensive agenda control leaves little reason to prioritize efficiency, and we find no significant relationship for such variables in the Supreme Court context. Such differences throughout the judicial hierarchy suggest the need for future research delving into these nuances in even greater detail.

Background

The votes of appellate judges are affected by both their own ideology and legal concerns (Segal and Spaeth 2002; Bailey and Maltzman 2011). Yet, the outcome of a judicial decision is only a very small part of a judicial opinion; judicial decisions must justify those outcomes based on the arguments presented by the parties and the dictates of past cases.

To this end, a bevy of recent research has expanded the judicial behavior project beyond a single-minded focus on case outcomes toward a broader understanding of judicial opinion writing, seeking to understand why judges choose to cite some opinions but not others. Legal justifications provide the most obvious explanation for variation in citation practices because judges' justifications are limited by the doctrine of stare decisis. Judicial opinions on the same issue issued by higher courts and by the same court in years past are binding on a judge's decision in the present case and must be followed. Opinions written by sister courts—those courts who share a rung of the judicial hierarchy with the court deciding the present case—are merely persuasive, meaning that they can provide some support for an opinion but need not be followed. Opinions by lower courts are similarly nonbinding. This bears out empirically. Hinkle (2015) finds that the legal constraint inherent in a binding precedent conditions the effect of ideological distance on a judge's decision to negatively treat a precedent.

Aside from legal considerations, ideology matters, too. Judges—at both the U.S. Supreme Court and the federal appellate court levels—are more likely to treat positively opinions written by their ideological allies (Hansford and Spriggs 2006). This effect is conditioned by the vitality of the opinion; the effect of ideology is dampened among decisions that are cited more often.

Beyond decisions about which opinions they should cite, judges face a host of rhetorical decisions when crafting an opinion. Should their opinion be long, featuring an extended discussion of relevant law, or should it be concise? Should the opinion be written technically—accessible only to legal specialists—or written in clear prose? These are all decisions that relate to resources: clear, concise writing takes time, and Maltzman, Spriggs and Wahlbeck (2000) demonstrate that judges, like all professionals, have finite resources. Even at the U.S. Supreme Court, workload and timing considerations play an important role throughout the opinion writing process. The justices of the nation's highest court are particular with regard to the sources of the arguments they employ, being more likely to crib language from the lower court opinion when it is a published one written by a prestigious judge and from the parties' briefs when the attorney is experienced and ideologically compatible (Corley 2008; Corley, Collins and Calvin 2011).

Beyond the sources of the legal arguments judges make, other variation in the language employed by judges has a large systematic component. Owens and Wedeking (2011) demonstrate that, while the clarity of a judicial opinion is unrelated to the author's ideology, both dissents and opinions joined by a minimum winning coalition are particularly clear. Similarly, Owens, Wedeking and Wohlfarth (2013) find that the U.S. Supreme Court alters the language of its opinions to evade review by Congress, becoming more likely to obfuscate in its opinions in the face of an ideologically distant Congress. Hinkle et al. (2012) find that U.S. District Court judges engage in similar behavior, becoming more likely to use hedging language when they are not aligned with the majority of the judges on the appellate court that will review their decisions.

State supreme court judges are similarly strategic in the language they employ. State supreme court judges are strategic in their opinion writing as it concerns their continued service on the bench, grounding their decisions in state law (thereby making the decisions nonreviewable by a higher court) when those opinions are likely to cause them electoral problems (Nelson 2014). Elected judges, at least in recent years, write more readable opinions than their counterparts in states that do not require judicial elections (Nelson 2015).

Less research explores the consequences of these linguistic decisions on the legacy of an opinion. Corley and Wedeking (2014) find that the level of certainty expressed in a judicial opinion affects the treatment it will receive by future courts; opinions expressing more certainty are more likely to be positively treated by lower courts.

Though this research underscores the strategic nature of opinion drafting throughout the judicial hierarchy, these individual studies tend to only examine the behavior of judges or the citation practices on a single court. Yet, the precedents of a higher court are binding down the entire judicial hierarchy. The literature is largely silent on cross-court citation practices, particularly as they concern judicial federalism. To this end, we investigate the longer-term consequences of the language used in a judicial opinion, expanding the scope of our search to both the federal and state judicial hierarchies.

Efficiency, Persuasiveness, and Hierarchy

Both federal and state judges who answer only to the United States Supreme Court have a far-reaching impact on the development of law. The doctrine of stare decisis places relatively little constraint on such judges, while rendering virtually all of their decisions decisive throughout their respective jurisdictions. Yet the impact of individual precedents is uncertain and varied. The ever-increasing proliferation of available precedents complicates the apparently clear doctrine of stare decisis. Even directly subordinate lower courts may not be able to follow all precedents, and the variety of options may present an opportunity to

selectively use preferred precedents. Moreover, judges from a wider audience may ignore or acknowledge a precedent for a variety of reasons. Decisions that are used more widely have a greater impact on the development of law. Yet fairly little is understood about the factors that determine which judicial opinions have a greater or lesser impact.

One of the challenges in exploring nuances in the course of legal development is the task of quantifying how much impact a legal decision has on changing the law. A case may have such a tremendous impact on clarifying the demands of the law that it effectively circumvents all subsequent litigation, thereby appearing to have little future relevance. While such is perhaps an extreme scenario, the effects of a judicial opinion often range beyond courtrooms. With no practical way to assess such effects, we turn our attention to the development of legal doctrine as it manifests within the legal system. Specifically, we look to the frequency and nature of citations to an opinion to gauge its impact on the course of law. Citations to an opinion provide evidence that its reasoning and arguments live on and continue to influence subsequent judges. Consequently, it is plausible to assume that, in general, opinions that are cited a greater number of times have more of an impact on legal development than those that languish in disuse.

Citations do not tell the complete story. A precedent may be discussed for the express purpose of limiting, narrowing, or even rejecting its analysis. This type of citation is known as a negative treatment. Conversely, a positive treatment is a discussion of a precedent that explicitly expands the application of legal doctrine set forth in a precedent. While the substantial majority of citations do not reach either extreme, both positive and negative treatments play an important role in assessing an opinion's impact. A precedent's overall legal vitality can be assessed by subtracting the number of negative treatments from the number of positive treatments (Hansford and Spriggs 2006). A precedent with high vitality has a strong impact on the law that has been strengthened over time while a precedent with low vitality has little, if any, lasting influence on the course of legal development.

The focus of this study is explaining how features of an opinion help explain variation in

legal impact. Specifically, we explore two type of factors that we theorize drive the extent to which an opinion is used in other courts. First, efficiency is likely to play a role given the ever-growing number of precedents available. Many judges throughout the court system have increasing caseloads and limited time and resources with which to resolve those cases. A judge (or someone on their staff) must familiarize themselves with the content of an opinion in order to cite it. Precedents written in a manner that makes them more efficient to process cognitively may be used more simply because they are more accessible. In short, busy judges will be more likely to rely upon a precedent when they can read and understood its content in less time.

Two features of an opinion are likely to make it more efficient for other judges throughout the legal system to swiftly and easily understand its content. The first is simply the opinion's readability. Automated measures of the complexity or accessibility of a text have been available for some time (Flesch 1948; Smith and Senter 1967). Text with more complex syntax and content is classified as less readable while clear, straightforward, and simple prose is classified as more readable. The latter type of text takes less time to process. When there is a choice available, a judge researching a point of law is likely to latch on to a clear principle in a more readable opinion rather than slog through an overly convoluted exposition of a similar point in an alternative precedent. Consequently, we hypothesize that more readable opinions will have a greater impact on legal development in terms of both number of citations and overall vitality.

> *Efficiency Hypothesis 1: Opinions that are easier to read are more likely to be cited and have greater vitality.*

Readability scores, while very useful, are not specifically designed to evaluate legal texts. One feature they overlook is the number of footnotes. In the context of legal writing, footnotes may play a substantial role in the time necessary to read and process an opinion. Each footnote requires a hesitation in the flow of reading while the reader follows the divergent idea and then returns to the main text. This is akin to the difference between driving a mile

down a single street and driving the same distance, but doing so by diverging from the main street to drive down a series of dead end streets and then returning the the main road. Even if the same distance is covered, the latter takes more time and effort. While a reader may choose to simply ignore footnotes, even a quick read often involves at least glancing at footnotes to see whether they merit attention. This break in concentration makes a precedent less efficient to process.[1] We hypothesize that precedents with more footnotes will have a smaller impact on the development of law.

Efficiency Hypothesis 2: Opinions with fewer footnotes are more likely to be cited and have greater vitality.

The hierarchy of the judicial system creates institutional differences that lead us to expect variation in how precedents are used. The doctrine of stare decisis makes decisions of higher courts binding on lower courts and within the same court at a later date, but precedents are only persuasive across jurisdictional lines (Hinkle 2015). To parse the effects of institutional structure, we separate all courts into one of five categories based on their relationship to the court that crafted an opinion. Figure 1 illustrates this breakdown of the potential sources of citation. First, a precedent may be cited by the U.S. Supreme Court, the direct superior of the opinion-writing court. Another possibility is a horizontal citation. There are two basic types of horizontal citation. First, an opinion may be cited by the same court at a later date. Second, an opinion may be cited by a sister court, which is a different court at the same level. For federal circuit cases, the other federal circuits constitute sister courts. For state courts of last resort, the analogous courts from other states constitute sister courts. Another possibility is that an opinion may be cited by the lower courts that are directly subordinate to the opinion-writing court.[2] Finally, an opinion may be cited by any court that does not fit within any of the previous categories.

[1] See what we mean?

[2] Although the phrase "lower courts" may be used more generically to simply refer to trial courts, in this paper we use the phrase to specifically denote those trial courts that are in the same jurisdiction as the opinion-writing court.

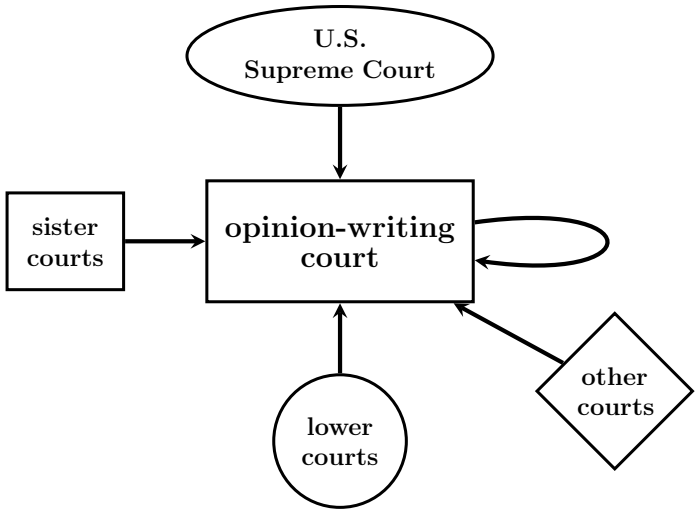

Figure 1: Stare Decisis and Legal Development

This discussion of institutional variation illustrates the reality that the relevance of efficiency is not necessarily universal. The importance of time and resource constraints means that efficiency is most likely to have an impact where those concerns are paramount. In the context of the U.S. Supreme Court this logic is least applicable. The justices have sufficient time to look at each case in considerable depth. As a result, this context is one where we do not expect the readability of a precedent or the number of footnotes employed to have a noticeable effect on the use of a precedent.

Efficiency Hypothesis 3: Efficiency Hypotheses 1 and 2 will have little or no effect on vitality and citiation by the U.S. Supreme Court.

The second type of factor likely to influence how much an opinion shapes legal development is how persuasive the opinion is. Specifically, we look at two measurable features that reflect persuasiveness. The first is the amount of case law an opinion cites. Given the central role of stare decisis on our common law system, opinions that are well-grounded in existing precedents are more likely to be perceived as well-reasoned and persuasive by subsequent judges. The second indicator of persuasiveness is the absence of any dissenting opinions. Explicit dissensus signals the existence of a plausible alternative analysis which,

in turn, undermines the persuasiveness of the arguments set forth in the majority opinion. This is especially true in light of the norm of consensus in both federal circuit courts and state courts of last resort.[3] We hypothesize that both a greater number of citations and the unanimity of an opinion will result in it having a greater influence on the development of law.

Persuasiveness Hypothesis 1: Opinions that contain more citations to case law are more likely to be cited and have greater vitality.

Persuasiveness Hypothesis 2: Opinions from which one or more judges dissent are less likely to be cited and will have lower vitailty than unanimous opinions.

Like efficiency, the effect of an opinion's persuasiveness may depend on the context. First, persuasiveness is not likely to influence the U.S. Supreme Court any more than efficiency. Given their resources, agenda control, and the uniqueness of their caseload, Supreme Court justices essentially address legal issues de novo. They are not likely to be significantly influenced by the legal arguments presented below. Second, at the opposite end of the spectrum, there is also little reason to expect opinion persuasiveness to have an impact on lower courts. Such courts are bound by the doctrine of stare decisis to apply precedents handed down by their superior (Aldisert 1989). Given this constraint, there is little reason for the persuasiveness of a precedent to influence citation. This hypothesis and all the forgoing hypotheses are summarized in Table 1.

Persuasivness Hypothesis 3: Persuasivness Hypotheses 1 and 2 will have little or no effect on vitality and citiation by the U.S. Supreme Court and lower courts that are directly subordinate to the opinion-writing court.

[3]For example, in our dataset 81% of opinions are unanimous.

	USSCT	Same Ct.	Sister Cts.	Lower Cts.	All Other Cts.
Efficiency					
Readability	n.s.	+	+	+	+
Footnotes	n.s.	-	-	-	-
Persuasiveness					
Cases Cited	n.s.	+	+	n.s.	+
Dissent	n.s.	-	-	n.s.	-

Table 1: Summary of Hypotheses for Both Citations and Vitality

Data and Research Design

Not all legal issues provide the same level of opportunity to influence legal development. Some more obscure areas of law may lead to less frequent citation of an opinion simply because the topic is not litigated very often. In order to control for this reality, at least to some extent, we focus our empirical analysis on one broad issue area, Fourth Amendment search and seizure law. This topic is well-suited for this study because it incorporates a discrete set of legal issues that are routinely raised in both state and federal litigation, and relevant cases can be identified by the simple expedient of finding cases that cite the Fourth Amendment of the United States Constitution.[4] Using Lexis, we collected every such published opinion from a federal circuit court or a state court of last resort between 2000 and 2010.[5] After excluding all opinions that do not address the merits, do not identify the author, or are too brief for textual analysis (i.e., less than 150 words), the resulting dataset contains 7,604 cases.

The unit of analysis is the opinion. We examine two types of outcome variables for each opinion. The first is the number of times an opinion has been cited as of December 31, 2013. Even the most recent opinion in our dataset is available for citation for a minimum of three years. Since this type of outcome is a count that shows evidence of overdispersion, we model

[4]The legal publication, *Shepard's Citations*, provides this list.

[5]Fedearl appellate courts with subject-specific jurisdiction are not included in this study.

it using negative binomial models. The second type of outcome variable is the vitality of an opinion, the number of times it has been treated positively minus the number of times it has been negatively treated. This outcome is modeled using ordinary least squares regression. For each types of outcome variable, we employ five separate models to examine the use of a precedent by five different types of courts. There are separate models for use of a precedent by the U.S. Supreme Court, the same court as the opinion-writing court, a sister court of the opinion-writing court, lower courts directly subordinate to the opinion-writing court, and all other courts. All of these outcome variables are calculated using information from *Shepard's Citations*, a legal publication that provides data on both the citation and treatment of precedents. Since some treatment categories in *Shepard's* can be both ambiguous and heterogeneous, we follow the advice of Spriggs and Hansford (2000) and only utilize treatment categories that clearly indicate either positive or negative treatment. Using their classification, 'Followed' is the only *Shepard's* treatment classified as positive while negative treatments include 'Distinguished,' 'Criticized,' 'Limited,' 'Questioned,' 'Overruled,' and 'Disapproved.'

The key explanatory variables are *Readability*, *Footnotes*, *Cases Cited* and *Dissent*. Our measure of *Readability* follows Nelson (2015) who used confirmatory factor analysis to combine five different common measures of opinion readability into a single measure. More information about the readability scores used to formulate the measure is available in Appendix A. The variable has mean zero and a standard deviation of 1 with higher scores indicating more readable judicial opinions. *Footnotes* is the number of footnotes in an opinion. This measure was extracted using a simple Python script with follow-up checks to verify accuracy. In addition to information on cases which cite an opinion, *Shepard's Reports* also provides a list of all case law cited within an opinion. Using this Table of Authorities for each opinion in our dataset, we extracted the number of all judicial opinions cited by an opinion for the variable *Cases Cited*. Finally, *Dissent* is a dichotomous variable that equals one when an opinion was accompanied by one or more dissenting opinions and zero otherwise.

We include control variables for characteristics of the opinion and its author that might be correlated with both citation and our key explanatory variables. Opinions that are longer often address more legal questions than shorter opinions, and opinions that address more questions will tend to be cited more since they potentially apply to a wider range of future cases. Therefore, we control for the natural log of the number of words in an opinion. The extent of an opinion's impact on the development of law will also be related the the length of time it has been available to be used by other courts. Although our data include opinions written over the course of only one decade, it is still important to control for the difference between an opinion available for 13 years and one available for three years. The variable *Years Available* captures this important quantity. While the primary focus of this project is on the effect of opinion characteristics on legal development, the characteristics of the judge who authors an opinion may be a factor as well. In order to account for this possibility we control for a variety of characteristics of the opinion author including prior experience as a prosecutor, gender, race, legal education, and judicial tenure.

Results

We first examine the evidence that opinion efficiency and persuasiveness play a role in the overall number of times an opinion is cited in each of the five different types of courts we examine. Table 2 provides the results of these models. Our hypotheses anticipate *Readability* and *Cases Cited* having a positive effect while *Footnotes* and *Dissent* are expected to have a negative effect. The context-specific expectations are that we do not expect such variables to matter in the Supreme Court model and *Cases Cited* and *Dissent* are not expected to matter in the Lower Courts model. Overall, the results provide fairly consistent support for these hypotheses. Opinions that are easier to read are cited more in all contexts except the U.S. Supreme Court and those differences are statistically significant.[6] A greater number

[6] All discussion of statistical significance is as the 0.05 level.

of footnotes in an opinion leads to fewer citations as anticipated, although this effect is not statistically significant in the Lower Courts model (or the Supreme Court model). In short, there is widespread support for the idea that opinions that can be read more efficiently are used more frequently. The Supreme Court's use of precedent is a clear exception to this general pattern since its limited caseload leaves little need to focus on efficiency.

	USSCT	**Same Ct.**	**Sister Cts.**	**Lower Cts.**	**All Other Cts.**
Opinion Characteristics					
Readability	−0.012	0.109*	0.066*	0.137*	0.046*
	(0.065)	(0.012)	(0.018)	(0.017)	(0.016)
Footnotes	−0.003	−0.008*	−0.007*	0.001	−0.010*
	(0.005)	(0.001)	(0.002)	(0.002)	(0.001)
Cases Cited	0.001	0.004*	0.002*	0.006*	0.006*
	(0.003)	(0.001)	(0.001)	(0.001)	(0.001)
Dissent	0.510*	−0.246*	−0.093*	−0.010	−0.185*
	(0.140)	(0.028)	(0.044)	(0.041)	(0.038)
ln(Word Count)	0.709*	0.754*	0.755*	0.786*	0.739*
	(0.143)	(0.026)	(0.040)	(0.038)	(0.035)
Years Available	0.103*	0.091*	0.128*	0.101*	0.131*
	(0.020)	(0.003)	(0.005)	(0.005)	(0.005)
Author Characteristics					
Prosecutor	−0.207	−0.222*	−0.371*	−0.009	−0.232*
	(0.139)	(0.023)	(0.036)	(0.033)	(0.031)
Female	−0.012	−0.014	−0.018	0.144*	−0.012
	(0.149)	(0.026)	(0.039)	(0.037)	(0.035)
Minority	0.052	0.014	−0.014	0.198*	0.015
	(0.194)	(0.034)	(0.053)	(0.050)	(0.047)
Top Law School	0.138	0.207*	0.253*	0.298*	0.347*
	(0.128)	(0.022)	(0.034)	(0.033)	(0.030)
Tenure	0.012	0.007*	0.016*	0.010*	0.020*
	(0.008)	(0.001)	(0.002)	(0.002)	(0.002)
Constant	−10.467*	−4.691*	−7.083*	−4.239*	−5.928*
	(1.171)	(0.206)	(0.322)	(0.298)	(0.280)
N	7,604	7,604	7,604	7,604	7,604

Table 2: Citation Model: Negative binomial regression estimates of the effect of opinion and author characteristics on the number of citations to an opinion from a range of sources including the U.S. Supreme Court, the same court as the opinion-writing court, sister courts of the opinion-writing court, courts directly subordinate to the opinion-writing court, and all other courts that do not fall within one of the previous categories. Standard errors are reported in parentheses below each coefficient, and * denotes a p-value less than 0.05.

Persuasiveness also plays the role we expect for citation in the Same Court, Sister Courts, and All Other Courts models. In all three of these contexts, opinions that cite more precedents and those that are not accompanied by a dissenting opinion are cited significantly more often. *Cases Cited* also has a significant positive impact on citation by lower courts, although we did not expect such an effect in that context. There is no evidence that *Cases Cited* influences citation by the Supreme Court, and the presence of dissent actually increase citations. This finding likely reflects the reality that the Supreme Court is more likely to discuss hotly disputed legal issues, which are precisely the type of issues most likely to generate dissenting opinions.

Next we turn to the examination of an opinion's vitality as an additional way to conceptualize the impact an opinion has on legal development. Table 3 provides these results. More readable opinions enjoy significantly higher vitality in both the Same Court and Lower Courts models. Opinions that employ more footnotes have lower vitality in the Same Court, Sister Courts, and All Other Courts models. The significance of both of these variables provides further evidence that an opinion's impact on legal development is greater when subsequent judges can read and understand it more efficiently. Moreover, once again we see a lack of evidence that these variables related to efficiency have an impact on the Supreme Court.

Features that indicate an opinion is more persuasive also influence that opinion's vitality. Opinions that cite a greater number of cases have greater vitality in the Same Court, Sister Courts, and All Other Courts models. The presence of dissent has the expected negative impact in the same three models. As anticipated, neither indicator of persuasive value has a statistically significant impact on treatment by lower courts. These court are directly subordinate to the opinion-writing court and are required by law to apply its rulings. In this context there is less room for the persuasiveness of an opinion to play a role. Also as anticipated, neither of the indicators of persuasiveness show evidence of influencing an opinion's vitality in the Supreme Court model.

	USSCT	Same Ct.	Sister Cts.	Lower Cts.	All Other Cts.
Opinion Characteristics					
Readability	0.001	0.131*	−0.001	1.014*	−0.019
	(0.001)	(0.045)	(0.010)	(0.240)	(0.026)
Footnotes	0.000	−0.014*	−0.002*	−0.008	−0.007*
	(0.000)	(0.004)	(0.001)	(0.023)	(0.002)
Cases Cited	0.000	0.025*	0.002*	0.000	0.005*
	(0.000)	(0.003)	(0.001)	(0.014)	(0.001)
Dissent	0.002	−0.761*	−0.113*	−0.403	−0.309*
	(0.002)	(0.114)	(0.025)	(0.603)	(0.065)
ln(Word Count)	0.000	1.310*	0.087*	6.810*	0.531*
	(0.002)	(0.098)	(0.021)	(0.520)	(0.056)
Years Available	−0.001*	0.120*	0.014*	0.537*	0.073*
	(0.000)	(0.014)	(0.003)	(0.073)	(0.008)
Author Characteristics					
Prosecutor	0.003	−0.364*	−0.027	−0.669	−0.148*
	(0.002)	(0.093)	(0.020)	(0.492)	(0.053)
Female	0.002	0.069	0.030	1.137*	−0.069
	(0.002)	(0.104)	(0.023)	(0.551)	(0.059)
Minority	0.002	−0.159	−0.030	0.523	−0.171*
	(0.002)	(0.138)	(0.030)	(0.735)	(0.079)
Top Law School	0.001	0.311*	0.067*	2.916*	0.300*
	(0.002)	(0.090)	(0.020)	(0.478)	(0.051)
Tenure	0.000	0.001	0.000	0.090*	0.010*
	(0.000)	(0.005)	(0.001)	(0.028)	(0.003)
Constant	0.000	−10.422*	−0.705*	−55.116*	−4.461*
	(0.013)	(0.778)	(0.171)	(4.131)	(0.443)
N	7,604	7,604	7,604	7,604	7,604

Table 3: Vitality Model: Regression estimates of the effect of opinion and author characteristics on the vitality of an opinion based on how it has been treated by a range of sources including the U.S. Supreme Court, the same court as the opinion-writing court, sister courts of the opinion-writing court, courts directly subordinate to the opinion-writing court, and all other courts that do not fall within one of the previous categories. The vitality of each opinion for each type of citing court is the number of positive treatments of the opinion minus the number of negative treatments. Standard errors are reported in parentheses below each coefficient, and * denotes a p-value less than 0.05.

There is widespread evidence that both efficiency and persuasiveness influence how much impact an opinion can have on legal development. In order to further elaborate on the extent of this influence, we present a series of predicted outcomes in Table 4. For each model, we present the predicted outcome for three types of opinions: an inefficient and unpersuasive

opinion, an average opinion, and an efficient and persuasive opinion. Predicted outcomes for an average opinion are calculated using the median value of each variable. The other two types of predicted outcomes are generated by placing the efficiency and persuasiveness variables at their 25th percentile and 75th percentile in turn.[7] Since *Dissent* is a dichotomous variable, it is set at 1 for unpersuasive opinions and 0 for all other predicted outcomes. Overall, the predicted outcomes highlight the wide variation in usage of an opinion across institutional contexts. In the eight years the average opinion is available for citation it is cited 29 times in its subordinate courts while only 1 out of 37 opinions is cited by its superior, the U.S. Supreme Court. Horizontal use of a precedent is also more likely in the opinion-writing court than in its sister courts.

	USSCT	**Same Ct.**	**Sister Cts.**	**Lower Cts.**	**All Other Cts.**
Predicted Citations					
Inefficient & Unpersuasive	0.046	8.39	1.329	24.79	3.77
Average	0.027	11.67	1.518	28.87	4.78
Efficient & Persuasive	0.027	12.75	1.580	33.96	5.12
Predicted Vitality					
Inefficient & Unpersuasive	−0.002	0.96	0.05	5.83	0.42
Average	−0.004	1.99	0.17	6.87	0.74
Efficient & Persuasive	−0.004	2.35	0.20	7.44	0.77

Table 4: Predicted Outcomes for Different Types of Opinions: Estimates of the predicted outcomes from each model across different opinion types. Unless otherwise stated each variable is held at its median. The references to efficiency and persuasiveness indicate that the relevant variables are set at the 75th percentile and for inefficient and unpersuasive opinions the relevant variables are set at the 25th percentile. Since *Dissent* is a binary variable with a mode of 0, it is set at 1 for examples of an unpersuasive opinion and 0 for all other cases.

Since opinions are cited most frequently in the lower courts and by the opinion-writing court, we focus our discussion of the substantive impact of efficiency and persuasiveness on those two contexts. How much an opinion is cited and the way that opinion is treated are both substantially affected by how the opinion is constructed. A well-constructed opinion that is both efficient and persuasive is cited by 9 more lower court opinions than a poorly-constructed opinion that is inefficient and unpersuasive. The difference for citations from the

[7]Summary statistics for all variables are provided in Appendix B.

same court is 4 citations. The impact on vitality is noticeable as well, although vitality is on a smaller scale. The average opinion has a vitality of two in its own court and approximately seven in the lower courts. For an inefficient and unpersuasive opinion these numbers each drop by one. Since vitality is the number of positive treatments minus the number of negative treatments, Vitality dropping by one represents either one less positive treatment or one more negative treatment. Each positive or negative treatment seeks to expand or contract the future application of an opinion, so a change of even a single treatment represents an important difference in terms of legal impact. An efficient and persuasive opinion does not increase the expected vitality by a full treatment compared to the average opinion, but the changes in both models are still substantial.

The control variables in our models also shed some interesting light on the process of how law develops. As expected, opinions that are longer and have been available to be cited for more years generate a larger number of citations. With the exception of the U.S. Supreme Court context both of these measures are also associated with an opinion having a higher vitality. Some characteristics of the opinion author are also correlated with an opinion's impact on the law. Oddly enough, an author's prior job experience as a prosecutor can have a negative effect. Opinions penned by a prior prosecutor are less likely to be cited in the same court, sister courts, and other courts, and they have significantly lower vitality in the same court and other courts. The author's gender only has an effect in the Lower Courts models in which opinions by female judges are cited more and have greater vitality. Non-Caucasian judges are also cited more in lower courts, but their opinions have lower vitality in the All Other Courts model. Opinions authored by a judge from one of the top-14 law schools are both cited more and have greater vitality in all contexts except the U.S. Supreme Court. A similar effect is present for the effect of an author's judicial tenure on the number of citations. But the number of years a judge has held her present position only significant increases vitality in the Lower Courts and All Other Courts models.

Discussion and Conclusions

These results provide unambiguous evidence that, conditional on characteristics of the author, the legacy of an opinion is influenced both by its own persuasiveness and later judges' concerns for efficiency. First, we theorized that, because judges have only a finite amount of time, efficiency concerns would predict an opinion's future influence. The empirical evidence supports this theory. Opinions that are more readable and less laden with footnotes tend to accumulate more citations and have higher levels of opinion vitality.

Second, we hypothesized that, because judges have a desire for good legal policy, opinions that are particularly persuasive, as indicated by the agreement of the panel deciding the opinion and how well-grounded the opinion was in extant precedent, would be particularly influential. Again, the evidence supports the theory. Both unanimous and more heavily grounded decisions tend to be cited more often by later courts and exhibit higher levels of vitality.

By casting our net widely to examine use of an opinion in a variety of institutional contexts we uncover not only interesting general trends, we also unmask important variation within the judicial hierarchy. The results clearly demonstrate that citation practices on the U.S. Supreme Court differ markedly from the rest of the court system. There is no evidence that concerns of persuasiveness or efficiency affect our nation's highest judges. The explanation here is simple: Supreme Court justices write many fewer decisions than any other judge in the country, alleviating the need for efficiency in selecting what opinions to cite. Regarding persuasiveness, the nine most elite legal minds in the land are not likely to look to their subordinates for guidance.

Another variation generated by institutional context is that an opinion's legacy in lower courts differs from its long-term effect in the same court or in its sister courts. Indeed, persuasiveness concerns are not reliable predictors of an opinion's vitality in lower courts. This makes sense; these opinions are legally binding on lower courts and therefore constrain judges on these courts regardless of the presence of a dissent or the number of opinions cited

in the opinion.

These contextual differences in the impact of persuasiveness and efficiency on legal development underscore the importance of examining judicial politics throughout the judicial hierarchy. While individual levels of the hierarchy can tell part of the story, these results indicate that a single-minded focus on any individual court—particularly the U.S. Supreme Court—may tell a story that is not generalizable throughout the judicial hierarchy. Thus, in addition to the obvious gains provided by the presence of institutional variation in an analysis such as this one, an examination of a fuller judicial hierarchy provides substantial opportunities for additional theoretical development.

An important caveat to this study is that we do not intend it to be an exhaustive description of features that influence how much an opinion impacts the development of law. Persuasiveness and efficiency are but two factors in what is certainly a highly complex process. Perhaps most noticeably absent, ideology has frequently been shown to have an important influence on citation practices (Hansford and Spriggs 2006; Hinkle 2015). The structure of this research design precludes a meaningful exploration of ideology since use of a precedent by a wide variety of judges (with varying ideological preferences) is complied into a single citation or vitality measure. However, exploring the role of ideology is fundamental to extending our understanding of an opinion's long-term impact on legal development. We look forward to turning to this challenge in future work.

Appendix A: Measuring Readability

This appendix explains the readability measures used in our analyses. We measured the readability of the opinions using several different measures of readability, and then we combined the measures using a factor analysis. In this appendix, we first explain the formulas we used to measure opinion readability. Then, we describe the results of the factor analysis. Comprehensive information on the validity of this measure is available in Nelson (2015).

The Flesch Reading Ease scale (FRES) measures the readability of a text on a scale from 0-100 with higher scores indicating texts that are easier to understand (Flesch 1948).

$$\text{FRES} = 206.835 - 1.015\left(\frac{\text{Total Words}}{\text{Total Sentences}}\right) - 84.6\left(\frac{\text{Total Syllables}}{\text{Total Words}}\right) \tag{1}$$

Scores less than 30 are typically readable to individuals with a college degree, and scores ranging from 60-70 are readable by the average teenager.

The Flesch-Kincaid Grade Level (FKGL) measures the number of years of education typically required to read a text (Flesch 1948):

$$\text{FKGL} = 0.39\left(\frac{\text{Total Words}}{\text{Total Sentences}}\right) + 11.8\left(\frac{\text{Total Syllables}}{\text{Total Words}}\right) - 15.59 \tag{2}$$

The Gunning-Fox Index (Gunning 1952) uses a slightly different formula to measure the same quantity of interest as the FKGL:

$$\text{FOG} = 0.4\left[\left(\frac{\text{Total Words}}{\text{Total Sentences}}\right) + 100\left(\frac{\text{Number of Words with 3+ Syllables}}{\text{Total Words}}\right)\right] \tag{3}$$

The Simple Measure of Gobbledygook (SMOG) is another measure of the number of years of education necessary to read a text:

$$\text{SMOG} = 1.0430\sqrt{\text{3+ Syllable Words} \times \frac{30}{\text{Total Sentences}}} + 3.1291 \tag{4}$$

The Automated Readability Index (Smith and Senter 1967) also provides a grade-level estimate of the difficulty of the text:

$$\text{ARI} = 4.71\left(\frac{\text{Total Characters}}{\text{Total Words}}\right) + 0.5\left(\frac{\text{Total Words}}{\text{Total Sentences}}\right) - 21.43 \tag{5}$$

Finally, we included a simplistic measure of readability: the average sentence length:

$$\text{ASL} = \frac{\text{Total Words}}{\text{Total Sentences}} \tag{6}$$

Having estimated the readability of each opinion using each measure, we combined the six separate indicators into a single measure of readability using a confirmatory factor analysis. The results indicate that the quantity of interest is strongly unidimensional (the eigenvalue of the second factor is only 0.34), and each of the indicators loads onto the factor at a level above 0.80. Table 5 provides the factor loadings.

Indicator	Loading
FRES	-0.94
FKGL	0.99
FOG	0.99
SMOG	0.98
ARI	0.82
ASL	0.89

Table 5: Factor analysis loadings. This table provides the loadings of each of the indicators of readability on the first factor extracted using Confirmatory Factor Analysis.

Appendix B: Summary Statistics

	5%	25%	50%	75%	95%
Continuous Variables					
Readability	-1.7	-0.6	0.1	0.7	1.5
Footnotes	0	1	4	8	24
Cases Cited	7	14	23	37	73
ln(Word Count)	7.3	7.9	8.3	8.8	9.4
Years Available	3	5	8	11	13
Tenure	1	5	10	18	28
		0		**1**	
Dichotomous Variables					
Dissent		81%		19%	
Prosecutor		67%		33%	
Female		77%		23%	
Minority		89%		11%	
Top Law School		62%		38%	

Table 6: Summary Statistics

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