FINDING NATURAL LAW

An Empirical Examination of Natural Law Theory in Court Opinions, Practitioner Briefs, and Legal Scholarship[*]

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February 2026

ABSTRACT

A natural law moment is upon the legal academy. Presumed defunct, natural law theory is an apparently fashionable answer to varied legal questions, from interpretive debates in constitutional law to theoretical issues in jurisprudence. Academic interest in natural law grows, yet little is known about how the once-parochial theory—holding that *what the law is* depends on consistency with moral principles—is used.

With data on court opinions, attorney briefs, and academic scholarship, this article surveys how and how often natural law theory is used across the law. Although usage is growing in recent years, the article shows that natural law remains uncommon overall in legal practice. By contrast, natural law phrases are used much more often in legal scholarship. The gap between scholarship and practice is explored with LLM classification and case examples. Finally, implications for theory of law debates in jurisprudence are discussed.

[*]This article uses data from JSTOR, but the findings and conclusions are solely those of the authors. OpenAI's ChatGPT 4o-mini was used in the text data classification tasks, which are described in-text and in the appendices. We are grateful to Mike Alvarez, Mitchell Linegar, and Jonathan Katz for helpful comments and suggestions on this project. We would also like to thank the Free Law Project/CourtListener for the court opinion data. Finally, special thanks to Brian Leiter and Emad Atiq for inspiring this work in the University of Chicago Law and Philosophy Workshop.

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INTRODUCTION

To observers in the legal academy, natural law theory is having its "moment." Lectures,[1] articles,[2] and books[3] urging a return or at least re-examination of natural law proliferate. The reasons for a second look likewise blossom. Some urge a return to natural law because of the failings or inconsistencies of certain legal theories, most prominently originalism[4] or textualism.[5] Others are turning to natural law to ground or justify constitutional theories.[6] Still others argue the resurgence of natural law "portends sinister changes to American law," labeling the theory "radical," "frighteningly undemocratic," and "fundamentally incoherent."[7]

Whether natural law will replace other theories or transform American law depends on its precise formulation. Although there is agreement on a "unifying princi-

[1] *We are living through a natural law moment in constitutional theory*, HARVARD LAW TODAY (Apr. 16, 2024) (discussing the Herbert W. Vaughan Memorial Lecture at Harvard Law School).

[2] Dennis J. Wieboldt III, *Our Natural Law Moment(s)*, 24 GEO. J.L. & PUB. POL'Y (forthcoming).

[3] *See, e.g.,* ADRIAN VERMEULE, COMMON GOOD CONSTITUTIONALISM (2022) (217 citations on Google Scholar).

[4] *See* Adrian Vermeule, *Beyond Originalism*, THE ATLANTIC (Mar. 31, 2020). *But see* Garrett Epps, *Common-Good Constitutionalism Is an Idea as Dangerous as They Come*, THE ATLANTIC (Apr. 3, 2020) (suggesting that "[w]e need not list the other 20th-century authoritarian regimes that embraced eternal values but ruled by terror").

[5] *See, e.g.*, William Baude, *The 2023 Scalia Lecture: Beyond Textualism?*, 46 HARVARD J. L. PUB. POL'Y 1331, 1347 (2023) ("Indeed, to some, natural law is so foundational that textualism's inability to deal with it might be cause for discarding textualism entirely.").

[6] *See* J. Joel Alicea, *The Natural Law Moment in Constitutional Theory*, 48 HARV. J.L. & PUB. POL'Y 307, 308 (2024) (increasingly finding that "so many legal scholars sought to ground constitutional theory in the natural law tradition"). *But see* ADRIAN VERMEULE, COMMON GOOD CONSTITUTIONALISM 1 (2022) ("I certainly do not advocate a revival of the classical law because it is the original understanding. The suggestion is not that, as good originalists deep down, we should adopt the view of the classical legal tradition in a derivative fashion. As we will see, all attempts to combine originalism with the classical view of law are ultimately incoherent, an attempt to mix oil and water.").

[7] K. Wilson, *The Resurgence of 'Natural Law' Theories Should Scare Us All*, CURRENT AFFAIRS (Mar. 27, 2023); *see also id.* (calling natural law theory "a legal philosophy that justifies state enforcement of theocratic morality").

ple" that "the grounds of legality are partly moral in nature,"[8] the remaining details of natural law theory are somewhat contested. The future of natural law theory, though, also depends on whether and how practicing lawyers and judges actually adopt it. But scholars have not yet attempted to measure or quantify the impact of natural law theory on legal practice. This paper is the first to empirically assess the influence and popularity of natural law theory across the legal sphere. The primary aim of this exercise is two-fold: first, to determine when, why, and how natural theory is being used; and second, to discuss the implications of natural law usage on theories of law.

First, the paper quantifies the uses of natural law. Using data on different sets of legal actors, we examine the extent to which natural law theory is "taking off" in the legal sphere. Specifically, we collect text data from judges, legal academics, and practicing lawyers to quantify the extent to which natural law phrases are used or cited. We find that words or phrases associated with natural law theory are rarely used by judges or attorneys. A slight uptick in usage can be seen post–2020, but the baseline levels are small as a percentage of the entire corpus.[9] By contrast, legal academics use natural law-relevant terms much more frequently. Using case examples and large language model ("LLM") classification tasks, we also examine how such phrases are used in context by judges, lawyers, and academics. We quantify, for example, which natural law thinkers are most often cited in practice, which phrases are most common, and from where such citations may be coming (e.g. law review articles, positive law, religious texts).

[8] Emad Atiq, Andrei Marmor, & Alexander Sarch, *The Nature of Law*, STAN. ENCYCLOPEDIA PHIL. (Summer 2025).

[9] Among legal briefs the usage of natural law phrases is below 0.08% in 2025, and among court opinions the usage is at 0.12% in 2025. *See infra* Figure 9 .

We find that not all of these uses are true appeals to natural law. The LLM classification results and case readings suggest a variety of use cases, including, for instance, academic critiques of natural law (particularly in relation to legal positivism).[10] Alternative uses are also common in court opinions, which may, for example, justify legal decisions by reference to the logical or scientific "laws of nature." These are not jurisprudential uses, and therefore the total percentages may overestimate the extent of support for natural law among legal scholars and practitioners.

Altogether the data here assembled shows that, at this point, there is little *direct* evidence that natural law theory is commonly or prominently used in legal practice. It may be too soon to see natural law's ultimate impact if legal practice follows legal scholarship. Indeed, because we do find more usage of natural law-relevant terms in legal scholarship, the impact of natural law theory may be more keenly felt in the years to come. Alternatively, the gap between natural law practice and natural law scholarship may persist, implying perhaps misplaced academic focus or a failed attempt at advocacy by a subset of legal academics. Nevertheless, natural law theory may indirectly inform the priors, beliefs, or ideology of practicing attorneys and judges in difficult to observe ways.[11]

Next, the paper shows what the data implies for debates in legal theory and jurisprudence. Specifically, we ask whether the empirical evidence undermines (or not) the legal positivist theory of law. The potential problem is that widespread us-

[10] Of all legal scholarship articles with natural law phrases, published between 2000 and 2025, more than 20% also included references to positivism. While we cannot quantify exactly how many of these are defenses of positivism against natural law, the high usage rate of both terms shows that scholars are often referencing debates among positivist and natural law theorists.

[11] Again, we note that there is some evidence natural law phrases are increasingly employed in legal practice and legal scholarship, even if overall usage rates in court opinions and attorney briefs remain low.

age or reliance on moral principles, if treated as legally obligatory by legal actors, could be inconsistent with certain versions of positivism. Indeed, whether morality is necessarily a criterion of legal validity is a central issue in general jurisprudence and evidence of how judges use (or do not use) moral principles is relevant to this debate.[12] For example, to the extent judicial opinions reflect a judge's decision-making process, usage evidence can help settle whether (as Dworkin argued)[13] judges rely on moral principles to determine what the law is.

We argue that the evidence is reconcilable with standard positivist explanations. In particular, because natural law usage rates remain low by legal officials, it is an outlier practice.[14] To the extent further explanations are needed, we show that some natural law phrases are used in contexts far removed from jurisprudential concern. Other uses are, in some subfields, licensed by conventional practice or

[12] Of course, not all moral principles that are invoked by judges—even according to natural law theorists—are necessarily law. Ronald Dworkin, for instance, maintains only that certain moral principles necessary for constructive interpretation are law. *See, e.g.*, RONALD DWORKIN, LAW'S EMPIRE 225 (1986) ("According to law as integrity, propositions of law are true if they figure in or follow from the principles of justice, fairness, and procedural due process that provide the best constructive interpretation of the community's legal practice."); *cf.* Emad Atiq, Andrei Marmor, & Alexander Sarch, *The Nature of Law*, STAN. ENCYCLOPEDIA PHIL. (Summer 2025):

> "The justificatory aspect of interpretation involves coming up with an account of legal content that doesn't just broadly fit what people say and do in the community, but that's morally attractive to some extent. Dworkin maintained that philosophers should embrace the same approach to understanding legal content."

[13] *See, e.g.*, Emad Atiq, Andrei Marmor, & Alexander Sarch, *The Nature of Law*, STAN. ENCYCLOPEDIA PHIL. (Summer 2025):

> "Dworkin argued that positivists cannot explain central aspects of legal reasoning and practice. One set of arguments appealed to the role of 'principles' in adjudication. Judges and other legal officials tasked with figuring out the law frequently base their conclusions on principles of justice and fairness."

[14] In other words, it is not the case that "there is a practice of convergent behavior by people who evince a certain attitude towards that behavior." Brian Leiter, *Explaining Theoretical Disagreement*, 76 U. CHI. L. REV. 1215, 1221 (2009). For the rule of recognition to be satisfied, more is required: "[Officials] do not simply converge mindlessly, as it were, but instead take themselves to have obligations to engage in that behavior." *Id.*

certain positive legal standards. Lastly, the paper suggests that the higher use of natural law phrases by academics could be due to a variety of factors, including especially the normative and advocacy dimensions of legal scholarship.

Finally, we conclude with a brief discussion of how data can be used to further study how legal movements and legal theories are used across the law. Although the legal theories in judicial opinions and academic scholarship are commonly studied, there seems to be less attention devoted to quantifying how practicing lawyers use different theories or schools of thought.[15] We therefore argue for more attention to how lawyers use legal theories in advocacy. Because so much of law occurs outside the courtroom and the academy, how attorneys use or interpret various theoretical legal arguments may be of practical significance and further academic interest.[16]

I. BACKGROUND

This section briefly outlines natural law theory and rival positivist theories. First, we survey recent work arguing the relevance of natural law to contemporary legal debates. Next, we briefly outline the major tenets of general jurisprudence relevant to this paper. In particular, this section demonstrates how data is relevant to debates in jurisprudence and how natural law usage may or may not challenge certain theories of law. A full survey of work in general jurisprudence is beyond the scope of the paper, but the section aims to show that evidence of how judges, academics, and lawyers *use* natural law language is relevant.

[15] *But see* Adam Feldman, *How Academic Briefs Shape Supreme Court Decisions*, SCOTUSBLOG (Feb. 6, 2026) (empirically examining the legal subfields that draw academic scholar briefs).

[16] *See also* Brian Leiter, *Explaining Theoretical Disagreement*, 76 U. CHI. L. REV. 1215, 1228 (2009) (discussing how one of the "great theoretical virtues of legal positivism as a theory of law is that it explains why the universe of legal cases looks like a pyramid—precisely because it explains the pervasive phenomenon of legal agreement").

A. A Natural Law Revival?

There has been some debate over the scope and use of natural law theory over time. Some have argued that a "revival of natural law," understood as the idea that positive law "should be evaluated according to a higher moral law," occurred after World War II.[17] More recent work suggests that a "fundamental change in American legal thought... took place in the late 19th and early 20th centuries."[18] Whereas before the change certain "natural laws" were found not made, this "understanding of law almost completely disappeared" so that, "[a]fter the change, lawyers believed that natural law plays no role in our legal system."[19]As a result of this fundamental shift, one scholar observes:

> "Today, if a lawyer tries to discuss natural law in court, the judge will look puzzled, and opposing counsel will start planning the victory party. Natural law is no longer a part of a lawyer's toolkit."[20]

Despite natural law's alleged irrelevance to legal practice,[21] its popularity has apparently persisted in parts of the legal academy, with some scholars suggesting "natural law is so much talked of and so often endorsed and yet so rarely understood" as far back as the 1950s.[22]

[17]Rodger D. Citron, *The Nuremberg Trials and American Jurisprudence: The Decline of Legal Realism, the Revival of Natural Law, and the Development of Legal Process Theory*, 2006 MICH. ST. L. REV. 385, 387 (referencing work by Edward Purcell and Richard Primus).

[18]STUART BANNER, THE DECLINE OF NATURAL LAW: HOW AMERICAN LAWYERS USED NATURAL LAW AND WHY THEY STOPPED 1 (2021).

[19]STUART BANNER, THE DECLINE OF NATURAL LAW: HOW AMERICAN LAWYERS USED NATURAL LAW AND WHY THEY STOPPED 1 (2021).

[20]STUART BANNER, THE DECLINE OF NATURAL LAW: HOW AMERICAN LAWYERS USED NATURAL LAW AND WHY THEY STOPPED 1 (2021).

[21]*But see Note: Justice Breyer: The Court's Last Natural Lawyer?*, 136 HARV. L. REV. 1368 (2023) (arguing for conceiving of Justice Breyer's jurisprudence as part of the "natural law tradition").

[22]David C. Bayne, *The Supreme Court and the Natural Law*, 1 DEPAUL L. REV. 216 (1952).

This paper intervenes in this particular debate with data. Although recent survey work has gauged what law professors believe about natural law,[23] no comprehensive empirical study of how natural law is used over time exists.[24] This paper fills the gap and expands the existing scope of focus by examining usage of natural law by attorneys, judges, and academics. The inclusion of practicing attorney usage of natural law theory is especially important, since the vast majority of legal work is performed outside the courts or the legal academy.[25]

Perhaps more importantly, this paper asks whether recent efforts to expand the import of natural law theory have been successful. As discussed above, efforts to establish natural law theory as a "live option" in constitutional theory may change several interpretive practices. For example, a shift to natural law theory may halt anti-vaccination efforts, strengthen cooperative organizations, increase the power of the bureaucracy, and diminish the strength of individual private rights.[26] It is

[23] *See* Eric Martinez & Kevin Tobia, *What Do Law Professors Believe About Law and the Legal Academy?*, 112 GEO. L.J. 111, 177 (2023):

> "The consensus as revealed by our study regarding the natural law versus positivism debate was more definitive. Just over one-fifth of participants (21.4%) endorsed natural law theory as the best account of the nature of law, complicating the notion that natural law is undergoing a 'revival' while lending credence to the claim that it is and/or has been in 'decline'—at least compared to some hypothesized past time in which the majority of experts endorsed natural law theory. In contrast, 73.8% of scholars endorsed positivism as providing the best account of the nature of law, challenging the claim that 'positivism... is dead.'"

[24] *But see* Dennis J. Wieboldt III, *Our Natural Law Moment(s)*, 24 GEO. J.L. & PUB. POL'Y (forthcoming) (surveying "natural law moments in twentieth-century American legal history which emerged in response to then-novel developments in the legal academy—namely, the advent of legal realism and, decades later, originalism").

[25] *See, e.g.,* Richard E. Miller & Austin Sarat, *Grievances, Claims, and Disputes: Assessing the Adversary Culture*, 15 LAW & SOC. REV. 525 (1981) (finding most disputes don't reach court); *see also* Robert D. Cooter and Daniel L. Rubinfeld, *Economic Analysis of Legal Disputes and Their Resolution*, 27 J. ECON. LIT. 1067 (1989).

[26] Adrian Vermeule, *Beyond Originalism*, THE ATLANTIC (Mar. 31, 2020); *see also id.* ("Thus the state will enjoy authority to curb the social and economic pretensions of the urban-gentry liberals who so often place their own satisfactions (financial and sexual) and the good of their class or social milieu above the common good.").

therefore of interest to know how natural law is being received in the courts and legal trenches, and whether it presages a shift in American law across such a wide variety of issues.

B. Natural Law and Legal Positivism

What exactly is at stake also depends on the precise contours of natural law theory which are accepted. It is therefore useful to briefly characterize what most scholars take the central concepts of natural law theory (and rival theories) to be.

For our purposes, the important issue is what determines the grounds or criteria of legal validity. The question is whether law "must conform in its content to some basic precepts of universal morality—what theorists called 'natural law.'"[27] The famous natural law claim that an 'unjust law cannot be law" is, according to some, not "simply a theoretical posit or implication" but "likely informed by historical legal practice."[28] Although recent work claims that "the norms of universal morality enjoy a kind of trans-jurisdictional and *a priori* legality" and are "very widely embraced by jurists and legal officials," we are aware of no empirical evidence that shows this in the historical or contemporary eras.

But such empirical evidence is important to debates in jurisprudence. Indeed, on the positivist view, whether morality is a criterion of legal validity is essentially an empirical issue:

[27] *See, e.g.*, Emad Atiq, Andrei Marmor, & Alexander Sarch, *The Nature of Law*, STAN. ENCYCLOPEDIA PHIL. (Summer 2025); *see also id.* ("Most famously, Aquinas maintained that law just is an ordinance of reason promulgated by one who has care for the community. On one interpretation of Aquinas' claim, unless what the authorities require is consistent with reason, the requirement is no law at all.").

[28] *Id.*

> "But the Rule of Recognition, on Hart's view, is a social rule, meaning its content—that is, the criteria of legal validity—is fixed by a complex empirical fact, namely, the actual practice of officials (and the attitude they evince towards the practice). So it looks like the only dispute about the criteria of legal validity that is possible, on Hart's view, is an empirical or 'head count' dispute: namely, a dispute about what judges are doing, and how many of them are doing it, since it is the actual practice of officials and their attitudes towards that practice that fixes the criteria of legal validity according to the positivist."[29]

For the positivist, note however that not all invocations of moral principles necessarily threaten the positivist theory.[30] After all, not every norm or rule that a court invokes turns into law, even if courts consider themselves bound by such norms or rules. Judges may be bound by the rules of grammar and mathematics, for example, even though those rules are not law per se.[31] Empirical evidence of *historical* usage is also not necessarily fatal to positivism, as most positivists take general jurisprudence to be providing a theory of law for the *modern* state.[32]

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[29] Brian Leiter, *Explaining Theoretical Disagreement*, 76 U. CHI. L. REV. 1215, 1222 (2009).

[30] H.L.A. HART, THE CONCEPT OF LAW 185-186 (2d ed. 1961) ("it is no sense a necessary truth that laws reproduce or satisfy certain demands of morality, though in fact they have often done so"); *see also* Leslie Green & Thomas Adams, *Legal Positivism*, STAN. ENCYCLOPEDIA PHIL. (Winter 2025) (describing the positivist "separability thesis" as "consistent with... moral principles [being] part of the law").

[31] *See, e.g.,* Emanuel Tucsa, *The Gold Standard: Legal Theory and Fuller Revisited*, 86 *Wash. U. Juris. Rev.* 85 (2020).

[32] *See, e.g.*, H.L.A. HART, THE CONCEPT OF LAW 24 (2d ed. 1961) (describing "[t]he legal system of a modern state is characterized by a certain kind of supremacy within its territory and independence of other systems which we have not yet reproduced in our simple model").

Empirical evidence of usage of natural law principles will help settle whether positivists have "overlooked" important elements of legal practice.[33] Scholars recently have claimed as much, arguing, for instance, that:

> "A sampling of the historical record serves to introduce a general puzzle that positivists have overlooked but ought to address. For much of legal history, ordinary officials classified moral principles as law on seemingly *a priori* grounds, a practice that at least on its surface seems inconsistent with positivism. In addition to relying on principles of fairness, impartiality, and justice in adjudication, judges regularly attributed a species of universal legality to such principles. These are not just passing references to the 'laws of justice,' as a judge might refer to the 'laws of chess' in a case that happens to implicate some extra-legal normative structure. Rather, 'moral laws' have been used in ways that bear all the markings of juridical law: they have been cited, analyzed, and made the basis for prominent holdings."[34]

Such uses are, it is argued, evidence of resort to "reason and justice" to settle *what the law is*.[35] As we show below, this line of argument rests on a false premise. Using

[33]Empirical evidence may also be relevant to determining whether jurisprudence has moved beyond the Hart-Dworkin debate. *See* Brian Leiter, *Beyond the Hart/Dworkin Debate: The Methodology Problem in Jurisprudence*, 48 AM. J. JURIS. 17 (2003).

[34]Emad Atiq, *Legal Positivism and the Moral Origins of Legal Systems*, 36 CANADIAN J. LAW & JURIS. 37, 38 (2023).

[35]*See, e.g.*, Emad Atiq, *Legal Positivism and the Moral Origins of Legal Systems*, 36 CANADIAN J. LAW & JURIS. 37, 43 (2023) ("Notably, the legality of the 'laws of justice' is not explained in terms of obedience to customs or conventions. Rather, on Pomeroy's account—who, it should be emphasized, does not have an anti-positivist axe to grind—the legality of equitable principles was presented by jurists as following self-evidently from the fact that the principles conform to requirements of reason and justice. Moreover, the legality of such principles was expressly distinguished from the legality of rules derived from the customs of nations, even when moral and customary requirements seemed to coincide.").

quantitative evidence, we show that the use of natural law language is uncommon in court opinions and legal briefs. However, we show that natural law phrases are common in legal scholarship and, across domains, usage rates are trending upward.

II. Empirical Evidence

This section turns toward the empirical evidence. Using text data from court opinions, attorney briefs, and academic articles, we quantify how often and in what contexts natural law-relevant terms and phrases are used by legal actors.

Our methodology is to define a set of core phrases and track their usage over time in different types of legal textual data.[36] To begin, it is therefore helpful to introduce our core set of natural law-relevant terms and phrases, which we will refer to throughout the remainder of the article. The core phrases are as follows:

> "law(s) of natural justice," "law(s) of morality," "moral law(s)," "law(s) of nature," "natural law(s)," "just law(s)," "unjust law(s)," "law(s) of justice," "procedural justice," "substantive justice"

Although these natural law-relevant phrases are commonly used in the natural law theory literature,[37] they are not guaranteed to be legitimate invocations of natural law. Indeed, in what follows we will see that some usages of these phrases are almost certainly not invoking natural law theory but natural law in an entirely distinct sense (e.g. scientific "laws of nature"). Similarly, we cannot be certain that

[36] Another approach is to define a list of thinkers, papers, books, etc. and look for citations to those. *See, e.g.*, Matthew Estes & Ransi Clark, *Courting the Academy: The Judicial Role in Popularizing Legal Scholarship*, 35 Kan. J.L. & Pub. Pol'y (2026) (forthcoming).

[37] *See, e.g.,* Emad Atiq, *Legal Positivism and the Moral Origins of Legal Systems*, 36 Canadian J. Law & Juris. 37 (2023) (noting, for instance, "moral laws," "laws of justice," "natural laws," "laws of nature" being natural law phrases); *see also* 1 William Blackstone, Commentaries on the Laws of England (mentioning "law of nature" over two dozen times).

other ways of invoking natural law concepts or principles are not in use, although we discuss further below why we think other uses of natural law theory are likely to be non-obvious or indirect and, therefore, difficult to empirically verify.[38]

Moreover, although we want to cast a "wide net" to find potential uses of natural law theory, the influence of certain aspects of natural law theory may be difficult to detect with direct textual evidence. For example, one natural law theorist argues that although certain natural law terminology (e.g. *lex* and *ius*) are not directly used in American legal practice, closely related concepts derived from natural law (e.g. "letter" and "spirit" of the law) are used.[39] Indirect appeals to nature are made in the guise of terms such as "basic needs," a prominent example being *Obergefell v. Hodges*. In his majority opinion in favor of gay marriage, Justice Anthony Kennedy opined:

> "Marriage is sacred to those who live by their religions and offers unique fulfillment to those who find meaning in the secular realm. Its dynamic allows two people to find a life that could not be found alone, for a marriage becomes greater than just the two persons. Rising from the most basic human needs, marriage is essential to our most profound hopes and aspirations."[40]

Justice Kennedy views marriage as central to the human condition, but the majority opinion uses none of the specific phrases we are looking for.[41]

[38] *See infra* Figure B5 (showing court opinion usage for an expanded set of twenty natural law phrases does not rise above 0.30%).

[39] *See* Jeremy Christensen, *The Classical Legal Tradition as Our Tradition* 33-34 (2026) (forthcoming).

[40] *Obergefell v. Hodges*, 576 U.S. 644, 656-657 (2015).

[41] The dissenting opinion of Justice Thomas includes the phrase "law of nature" multiple times. *See Obergefell v. Hodges*, 576 U.S. 644, 726 (2015) (Thomas, J., dissenting) (citing John Locke); *id.* at 726, n.4 (citing Blackstone and Rutherforth quotes that use the phrase "law of nature").

The methodology used here will not pick up such indirect uses of natural law theory, unless the text also contains one of the core natural law-relevant phrases. And if "in our tradition," as William Baude suggests, "natural law principles, to the extent they functioned as positive law, functioned through unwritten law" then one might expect to see few instances of our natural law phrases.[42] To our knowledge, this paper is the first empirical exercise to examine whether this is true across legal texts.

With these sets of terms and phrases in mind, we now turn to quantifying their usage over time in different legal texts: (1) court opinions, (2) attorney briefs, and (3) academic legal scholarship.

A. Court Opinions: CourtListener Judicial Mentions of Natural Law

First, we look at natural law terms and phrases in court opinions. Using the CourtListener database, which has millions of published court opinions, we search for each term or phrase separately and combined to see how many opinions employ natural law-relevant terminology each year.[43] In Figure 1, we begin by plotting the number of court opinions with at least one of our natural law phrases each year in the left panel. The gray points are the raw count of court opinions each year with a natural law phrase, and the solid orange line is the smoothed trend over time. The right panel shows the total number of court opinions available in the CourtListener

[42] William Baude, *The 2023 Scalia Lecture: Beyond Textualism?*, 46 HARVARD J. L. PUB. POL'Y 1331, 1347 (2023)

[43] Please note here and in what follows we always exclude all documents (opinions, briefs, or scholarship) with the terms "patent" or "intellectual property" from the population of study. This is because of the well-known formulation in IP law that "laws of nature, natural phenomena, and abstract ideas" are "[e]xcluded from patent protection." *Diamond v. Diehr*, 450 U.S. 175, 185 (1981); *see also Mayo Collaborative Services v. Prometheus Laboratories, Inc.*, 566 U.S. 66 (2012).

database each year (gray points), with a smoothed trend line added as well (solid orange line).

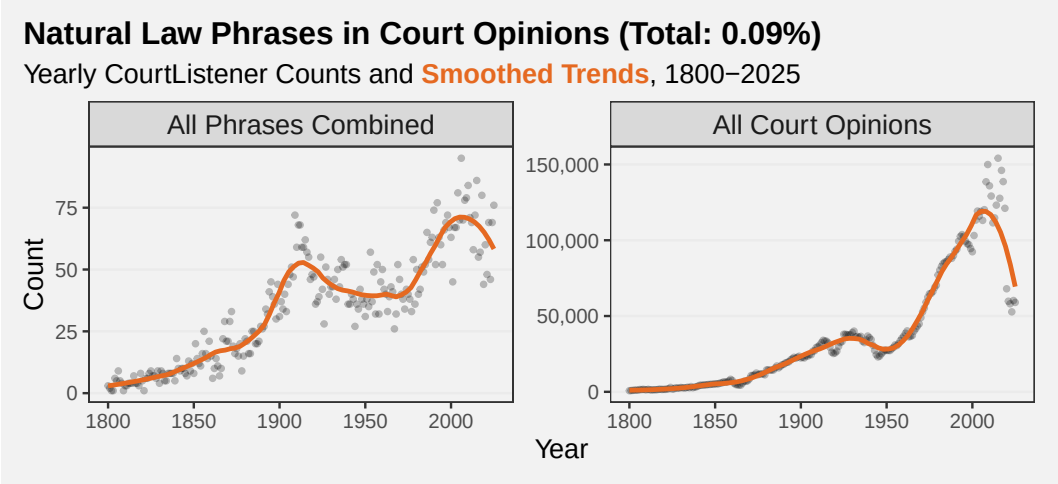

Figure 1: Natural Law Phrases in Court Opinions

Note: The left panel shows the combined phrase counts for each year (gray points) and smoothed trend (orange line) among all CourtListener published opinions. The right panel shows the total number of CourtListener published opinions each year (gray points) and smoothed trend (orange line).

As shown in Figure 1, natural law phrases are used in less than 100 of the 150,000 court opinions each year. Particular phrases are used sparingly and with decreasing probability over time. In Figure 2, for example, we break up usage by phrase and look at the share of CourtListener opinions mentioning the phrase each year. Many phrases are used only a few hundred times from 1800–2025. Some phrases are used more often (e.g. "law(s) of nature"), but become more and more uncommon with time. Indeed, Figure 2 shows that each natural law-relevant phrase appears in a very small percentage ($< 0.1\%$) of all court opinions post-2000.

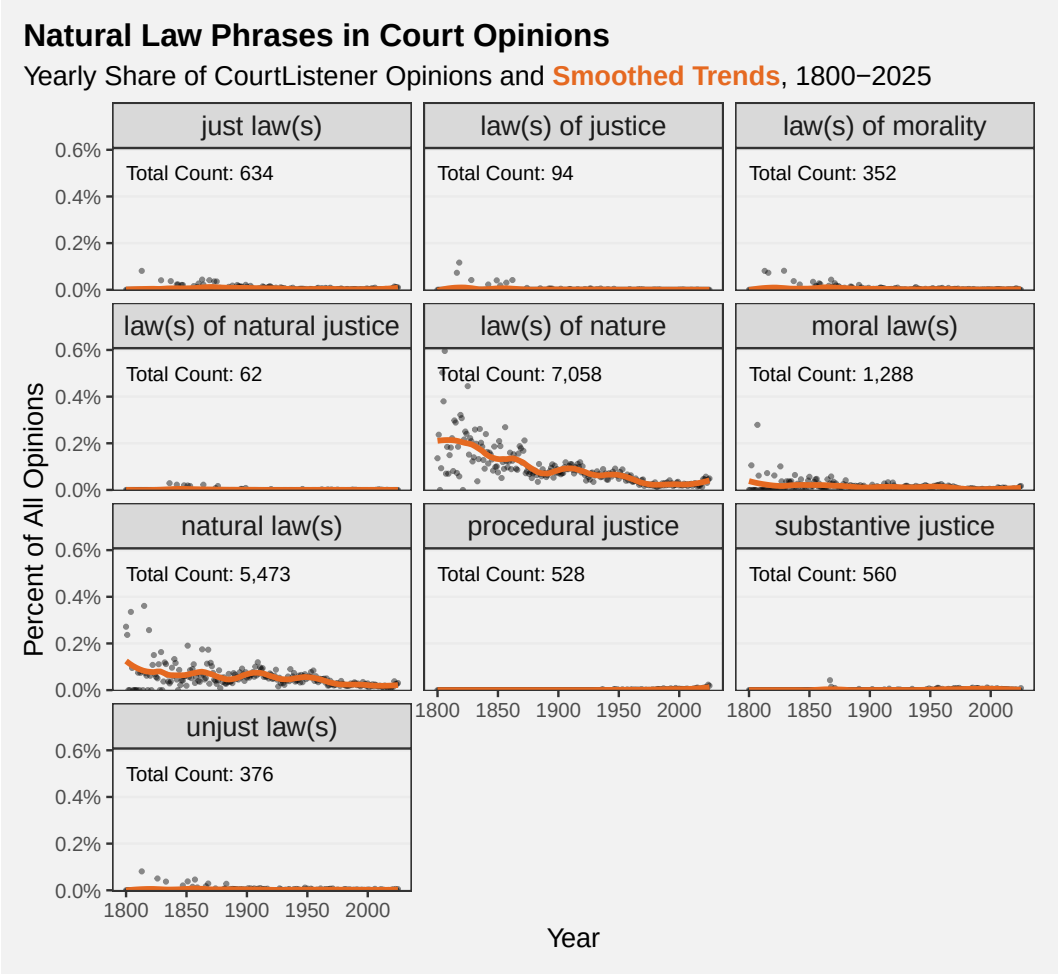

Figure 2: Natural Law Usage by Phrase in Court Opinions

Note: Each panel shows the percentage of all CourtListener opinions each year that contain the natural law-relevant phrase (gray points) and the smoothed trend (orange line).

1. Usage and Context: LLM Classification and Contextual Information

Count information is the primary evidence of interest, but other usage information can shed light on contexts in which natural law theory is used. Toward that end, we also extracted further information from the judicial opinions with natu-

ral law-relevant text. Using a large language model (LLM),[44] we analyzed short snippets containing the matching natural law text to return structured classification responses. In each prompt, we provided the LLM with some contextual information (e.g. case id), the first 200 characters of the opinion, and then the natural law-relevant snippets. Each snippet was an excerpt of the judicial opinion, 200 characters before and after each matching natural law term or phrase. The LLM classification tasks for each natural law-relevant court opinion with available text data from CourtListener were analyzed. Computer readable full text was only available from 2010, so the LLM exercise is limited to recent years.

The LLM was provided this information for each natural law-relevant judicial opinion and told to answer the following questions, with Yes-No questions noted below by "(Y/N)":[45]

1. **Court Name.** What is the name of the court? Use the case URL and the first 200 character text as primary clues.

2. **Law Review Citation.** Does the text cite or mention a law review article? (Y/N)

3. **Natural Law Reference.** Does the text cite or mention a natural law thinker? (Y/N)

4. **Canonical Terms and Phrases.** Which of the following canonical terms are present in the text: "laws of natural justice," "laws of morality," "moral law,"

[44] In each LLM classification exercise, we used gpt-4o-mini for all tasks. *See infra* Appendix (for precise instructions and context provided to the LLM).

[45] *See infra* Appendix (containing exact prompting instructions, context/input fields, and formatted data output instructions).

"laws of nature," "natural law," "just law," "unjust law," "laws of justice," "procedural justice," and "substantive justice."

5. **Natural Law Thinkers.** Which natural law thinker(s), if any, are cited or mentioned?

6. **Religious References.** Does the text cite or mention a religious text, practice, or tradition, including a Catholic teaching?

7. **Positive Law.** Does the text cite or mention positive law (e.g., the U.S. Constitution, Declaration of Independence, statutes, regulations, etc.)?

8. **Type of Positive Law.** If the text cites or mentions positive law, classify it as exactly one of: 'constitutional', 'statutory', 'regulatory', or 'other'.

9. **Legal Subfield.** Classify the opinion's most likely legal subfield as exactly one of the following options: contracts, torts, property, constitutional law, criminal law, administrative law, civil procedure, evidence, federal courts, international law, tax, corporate/securities, labor/employment, family law, environmental law, intellectual property, jurisprudence/legal theory, or other.

10. **Scientific Usage of Natural Law.** Does the text refer to 'laws of nature' or 'natural law' in a scientific sense (e.g., physical, biological, scientific laws), rather than jurisprudence/philosophy?

Many of these questions were chosen with an eye toward the prior literature on natural law.[46] For example, and as noted above, the canonical terms and phrases

[46]Questions about religious references are important to ask, for instance, given the common association between natural law theory and Catholicism.

were selected to try to be as broad as possible without capturing ambiguous usages.[47] Other questions were trying to probe the relation between the natural law term or phrase and positive laws, given that some canonical legal documents (e.g. the Declaration of Independence) notably reference natural law (i.e. "Laws of Nature"). Our final question tried to determine if certain natural law-relevant terms were being used in a scientific way: for instance, whether the court opinion was referring to a "law of nature" in the physical science sense.

With LLM classification tasks, there are no accuracy guarantees. Nevertheless, existing research shows high rates of agreement between human expert classification and LLM classification. For example, in political science, GPT-4 encoding of text data (news articles and tweets) correctly classifies texts up to 95% of the time, where correctness is measured with human expert classifications.[48] Nevertheless, in the LLM classification results that follow, we try to point out areas where the LLM classifier succeeded and others where the results may require cautious interpretation. For instance, in asking the LLM to pick out which natural law thinkers the text cited or mentioned, the LLM sometimes erred by returning certain thinkers who are not natural law theorists but merely discuss natural law theory (e.g. Hart).

Results from LLM classification tasks are displayed in Figure 3. The plot shows results from our yes-no classification tasks to shed further light on how natural law phrases are being used in court opinions. For example, we see that most court opinion texts with a natural law-relevant phrase also mention a positive law (e.g.

[47] We would have liked to have included a search for "justice", for instance, but this term is widely used in law not as a moral appeal but as a mere citation to the opinion of a Supreme Court Justice.

[48] Michael Heseltine & Bernhard Clemm von Hohenberg, *Large Language Models as a Substitute for Human Experts in Annotating Political Text*, 11 RESEARCH AND POLITICS 1 (2024); *see also* Hemanth Asirvatham, Elliott Mokski, & Andrei Shleifer, *GPT as a Measurement Tool*, Working Paper No. 34834, NAT'L BUREAU OF ECON. RESEARCH (Feb. 2026).

state constitution) in nearby text. Many court opinions with natural law phrases also cite a natural law thinker (39.5%), with Blackstone being the most commonly mentioned natural law theorist.[49] Most opinions don't reference religion or cite to law review articles, although a small percentage do (3.8% and 3.9%, resp.).

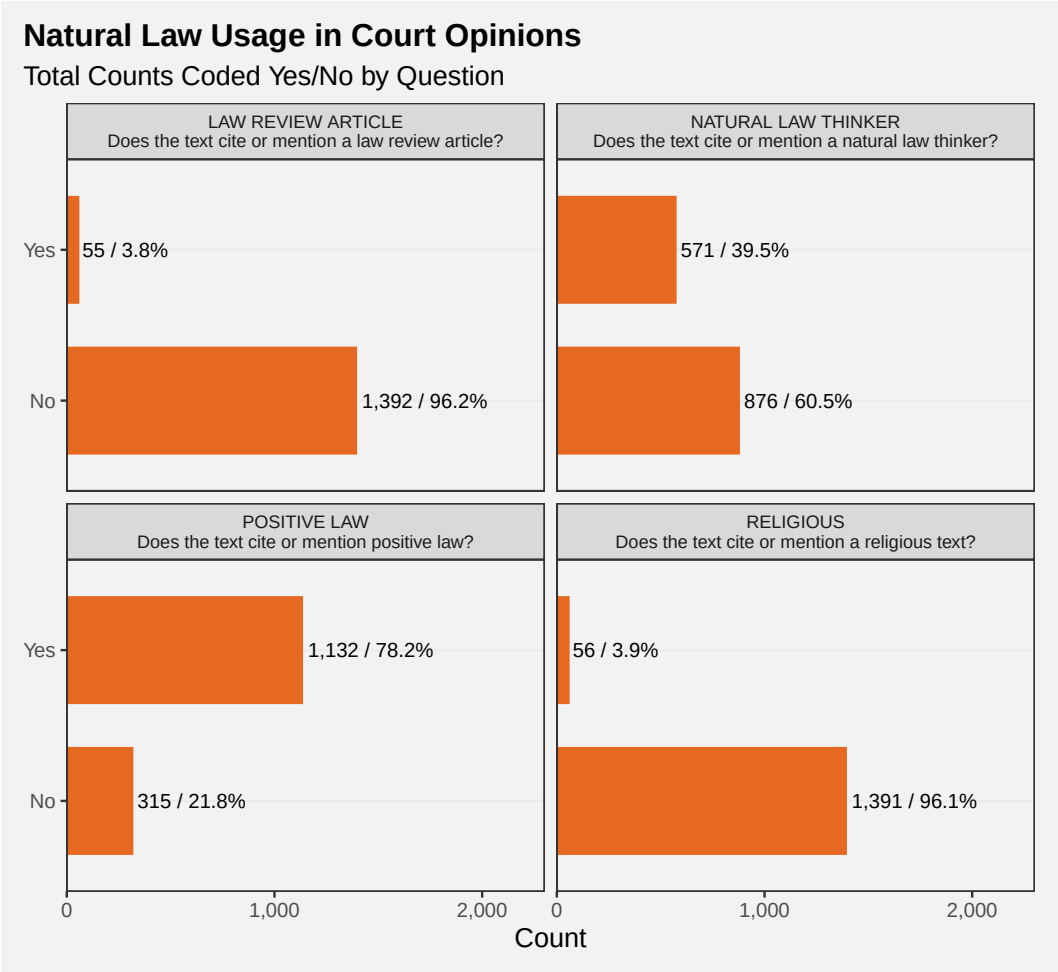

Figure 3: Natural Law Usage in Court Opinions: Yes/No Questions

Note: Please see the Appendix for the exact instructions and questions for the LLM classification tasks.

[49] *See infra* Figure B1 (top-left panel).

Additional questions and answers are summarized in the appendix. See especially Figure B1 for further classification tasks relating to court opinions, including which natural law thinkers are being mentioned most frequently, the legal subfield for the opinion (e.g. torts, criminal law, contracts, etc.), and additional information.

B. Legal Practitioners: Lexis Briefs, Motions, and Pleadings

Next, we turn to natural law phrases in practitioner briefs, motions, and pleadings. Unlike court opinions, attorney briefs, motions, and pleadings are not often studied. Yet attorneys constitute the bulk of legal practice, and empirical evidence on how attorneys use legal theories or arguments is important to understand how disputes may resolve outside the court dispute resolution process.

1. All Available Lexis Briefs, Motions, and Pleadings

Toward that end, we began by manually creating a time series using the Lexis briefs, motions, and pleadings database. Searching for our ten core natural law phrases, we recorded how many briefs, motions, and pleadings contained at least one natural law phrase each year that Lexis data was available.[50] We also recorded the total number of briefs, motions, and pleadings available in the Lexis database each year.

Our primary usage results are shown in Figure 4. The left panel shows the number of briefs, motions, and pleadings with a natural law phrase each year from 1953-2025 in gray points, with a smoothed trend line plotted in green. The total number of briefs, motions, and pleadings available are analogously plotted in the right panel.

[50] As before, we exclude all texts with the terms "patent" or "intellectual property."

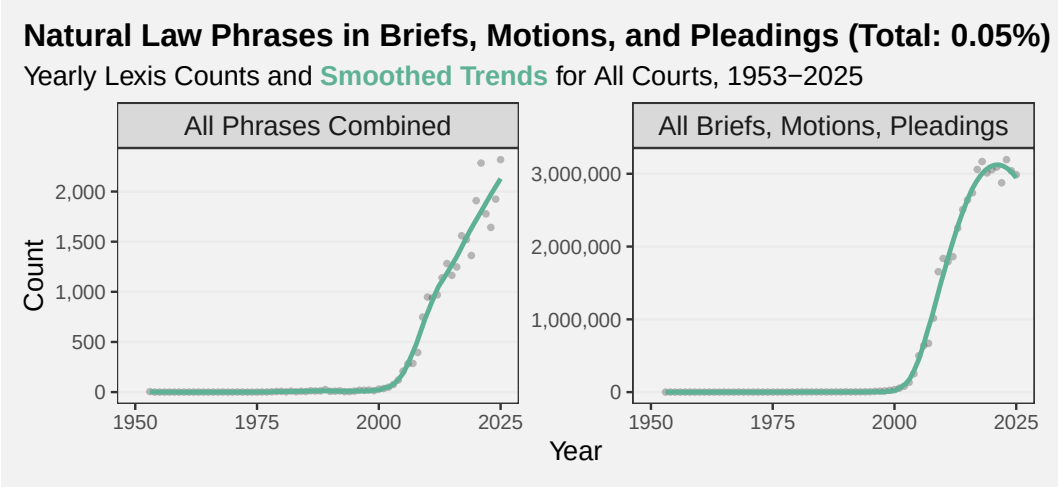

Figure 4: Natural Law Phrases in Briefs, Motions, and Pleadings

Note: The left panel shows the combined phrase counts for each year (gray points) and smoothed trend (green line) among all Lexis briefs, motions, and pleadings. The right panel shows the total number of Lexis briefs, motions, and pleadings each year (gray points) and smoothed trend (green line).

As seen in Figure 4 above, the natural law phrases are used in a small portion of briefs: post-2000, natural law phrases are generally used in fewer than 2000 briefs out of millions of total Lexis briefs. Data pre-2000 may be unreliable due to small sample size, although we also see relatively few uses for any of our phrases pre-2000. As with court opinions, some of the core natural law phrases are used much more often than others. In Figure 5, for example, we show that "law(s) of nature" and "natural law(s)" are the most commonly used phrases in the Lexis briefs, motions, and pleadings.

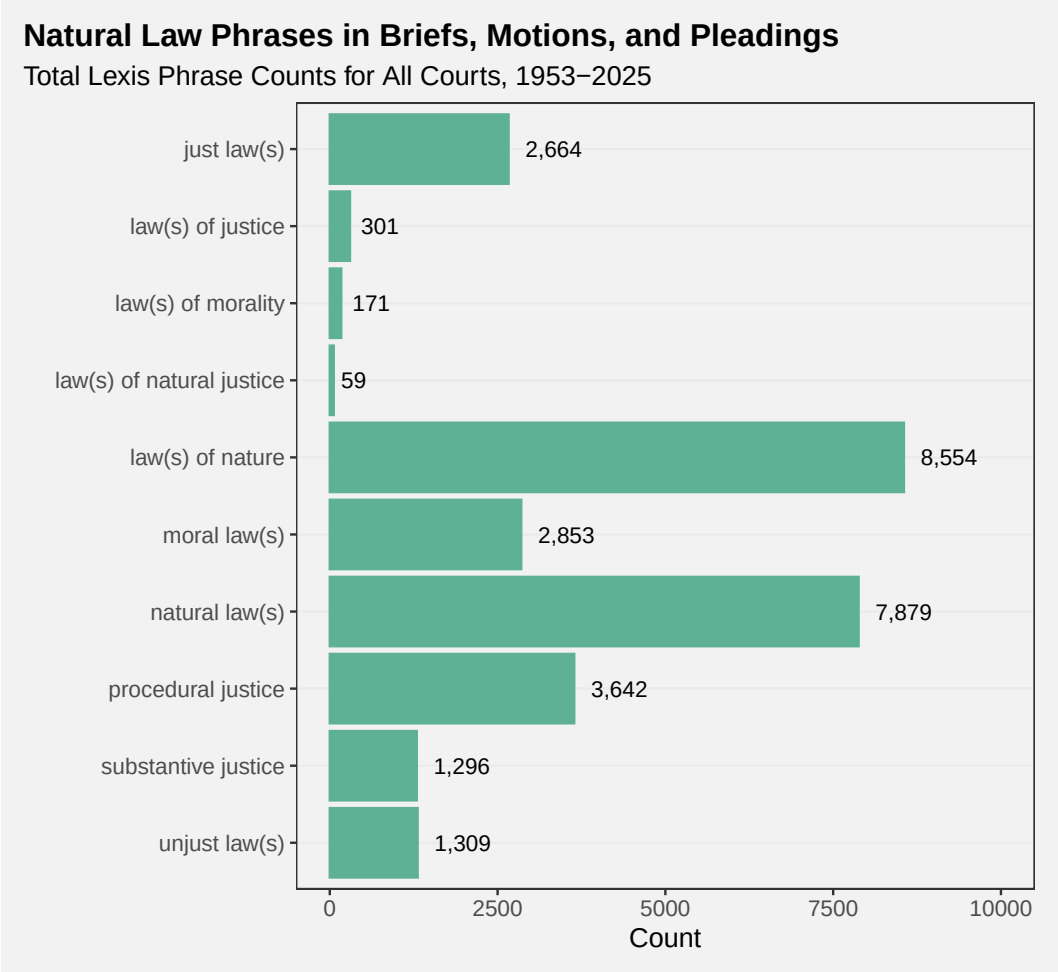

Figure 5: Natural Law Usage by Phrase in Briefs, Motions, and Pleadings
Note: The totals here are for each phrase in all available Lexis briefs, motions, and pleadings.

2. Supreme Court Briefs, Motions, and Pleadings: LLM Classification and Contextual Information

What about the context surrounding uses of the natural law phrases? As with court opinion snippets, we processed the text search results with an LLM to further understand how natural law theory is being employed by attorneys. Focusing on matching Supreme Court briefs, motions, and pleadings only, we fed text snippets in a

window around the natural law phrases to a LLM and asked the same questions as before.

Results from the LLM classification yes-no tasks are shown in Figure 6. The results show that the majority of briefs invoking a natural law phrase are also citing a natural law thinker (70.1%), with Blackstone once again being the most commonly cited natural law thinker.[51] Unlike court opinions, the LLM classifies relatively few attorney briefs as citing or mentioning a positive law (31.1%). This may be due to the different roles of judges and attorneys, with attorneys (especially in *amicus* briefs) able to rely more on persuasive but not authoritative legal sources. This may also explain the higher percentage of briefs mentioning a law review article (10.8%) than court opinions which mention a law review article (3.8%).

Additional questions and answers are summarized in the appendix. See especially Figure B2 for further classification tasks relating to SCOTUS briefs, including which natural law thinkers are being mentioned most frequently, the type of brief (e.g. amicus brief, petitioners brief, etc.), and additional information.

[51] *See infra* Figure B2 (top-right panel).

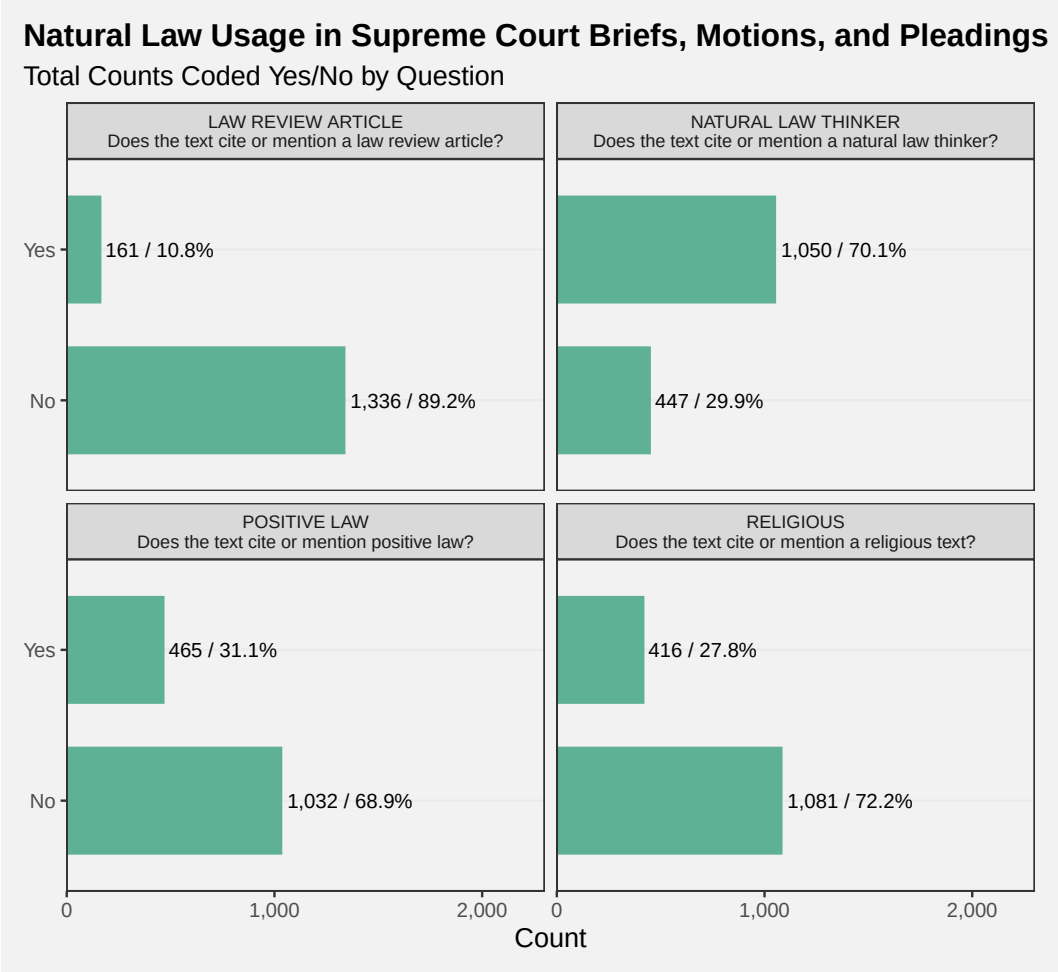

Figure 6: Natural Law Usage in SCOTUS Briefs: Yes/No Questions

Note: Please see the Appendix for the exact instructions and questions for the LLM classification tasks.

C. Legal Academic Scholarship

Finally, we examine natural law usage in legal scholarship. Using computer readable text data from law articles in JSTOR,[52] we repeat the search and LLM classification exercises to locate natural law-relevant academic legal scholarship.

[52] Specifically, we use all articles with discipline field marked "law" plus all articles containing the following words/phrases: "law," "legal," "courts," "judicial,", or "tort."

First, we display the count information: how many academic legal articles contain at least one of the natural law phrases and has this increased over time? The number of academic articles mentioning a natural law phrase is shown in the left panel of Figure 7. The gray points show the raw data and the blue line is a smoothed trend line. The total number of available articles in the JSTOR legal scholarship data is plotted in the right panel.

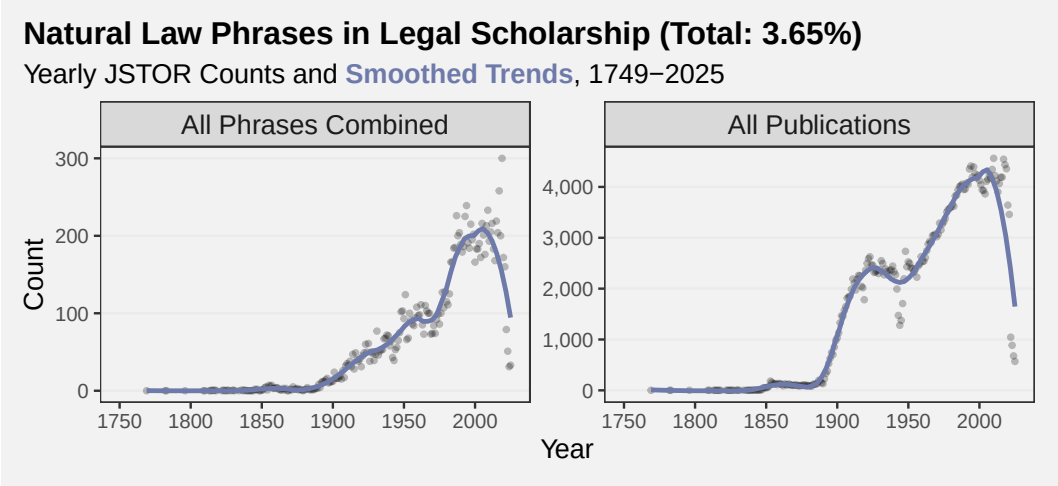

Figure 7: Natural Law Phrases in Legal Scholarship

Note: The left panel shows the combined phrase counts for each year (gray points) and smoothed trend (blue line) among JSTOR law articles. The right panel shows the total number of JSTOR law articles each year (gray points) and smoothed trend (blue line).

As shown above in Figure 7, hundreds of academic articles contain at least one natural law phrase in recent years, with usage trending up over time until recent years. This is likely due to the lower number of very recent articles available in the JSTOR database.[53] Overall, we see that 3.65% of all available academic scholarship

[53] Indeed, other estimates suggest that recent years should have near 5,000 law review articles. *See* Frank Fagan, *The Coming Law Review Shortage*, 2026 U. ILL. L. REV. 187, 189-190 (2026) (suggesting a "back-of-the-napkin... rough estimate" of annual law review capacity around 5,656 articles).

contains at least one natural law phrase, which is much higher than the totals for court opinions (0.09%) and attorney briefs (0.05%).

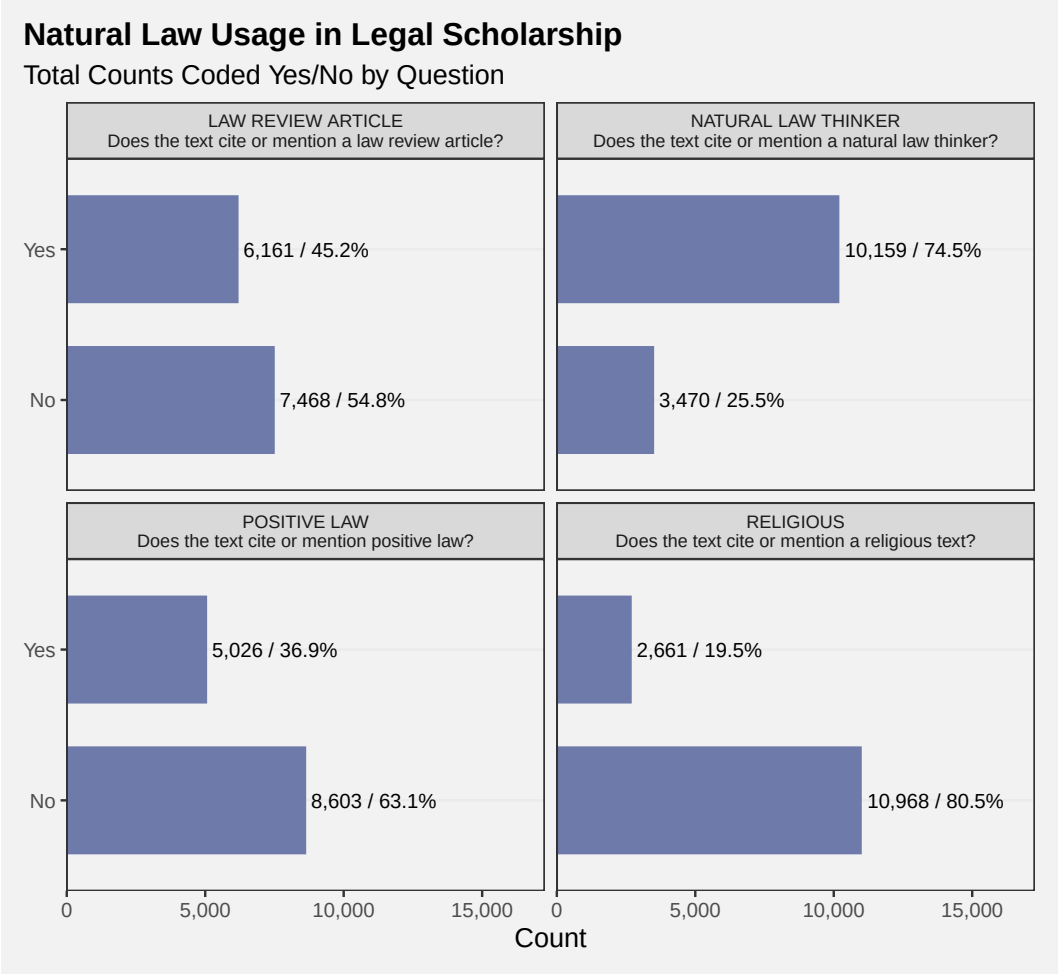

Figure 8: Natural Law Usage in Legal Scholarship: Yes/No Questions

Note: Please see the Appendix for the exact instructions and questions for the LLM classification tasks.

What about results from the LLM classification tasks? Classification results from yes-no questions are shown in Figure 8. Perhaps unsurprisingly, legal scholarship is more likely to mention other legal scholarship and to cite more natural law thinkers. Indeed, we see a huge variety of natural law thinkers being mentioned in

academic articles, with Grotius, Aquinas, Locke, and Finnis each being mentioned in more than 400 articles.[54] The LLM doesn't classify many articles as citing or mentioning positive law. As discussed below, this may be due to the persuasive or advocacy role of legal scholarship.

Another notable difference between the natural law usage in court opinions and legal scholarship is in the composition of legal subfields.[55] Considering only the post-2010 legal scholarship to be comparable to our text readable sample of CourtListener opinions, the most frequent use of natural law language was in "jurisprudence or legal theory." This category forms 54% of the total legal scholarship post-2010. Other large categories are criminal law with 8%, constitutional law with 6%, and international law also with 6%. In contrast, among judicial opinions, the highest usage was in criminal law (41%) followed by constitutional law (12%).[56]

It is no surprise that much of natural law-relevant legal scholarship is in "jurisprudence." In contrast, court opinions that are classified as "jurisprudence or legal theory" only formed 3% of the total court opinions in the corpus. Court opinions in international law using natural law language are extremely rare (0.4% of total court opinions).[57] Yet prior literature identifies international law as the "area in which natural law was most prominent, because of the absence of international

[54] *See infra* Figure B3 (top-right panel).

[55] The GPT classification of legal subfields is incomplete for several reasons. For one, an opinion and article could be relevant to several legal subfields, but we restrict it to be one subfield. For another, the snippet might provide limited context for the case or article. Nevertheless, this is a useful exercise because it can give us some sense of the subfields of legal texts that use natural law-relevant phrases.

[56] GPT subfield classifications are biased towards false negatives, in the sense that GPT only classifies to a certain subfield if there is high confidence. If there is any ambiguity, it tends to default to the "Other" category. For court opinions, this category consisted of 23% of texts, whereas for legal scholarship the number was under 11%.

[57] This is also perhaps not surprising, since US courts do not often opine on international treaties, whereas academic articles are free to discuss international law.

legislatures capable of generating positive law. "[58] Further work might examine the ways in which natural law is invoked specifically in the international law context.

Additional questions and answers are summarized in the appendix. See especially Figure B3 for further classification tasks relating to academic scholarship, including which natural law thinkers are being mentioned most frequently, usage of core phrases, and additional information.

III. DISCUSSION

This section discusses our findings and provides additional context to the top-line numbers described above. First, we show top-line trends and compare our findings to other legal theories. Second, we augment the count and LLM classification empirical findings with case examples to illustrate further how natural law theory is being used by different legal actors. The goal is to provide context for the variety of uses of "natural law" across legal texts. Next, we also discuss potential jurisprudential problems and responses posed by the usage of natural law by the courts, the academy, and the bar. We argue that because, at least at this time, natural law usage is an outlier practice, it is not necessary that a theory of law account for its use. Finally, we discuss why natural law phrases may appear more commonly in legal scholarship than legal practice.

A. Summarizing the Findings

This sub-section begins the discussion with overall trend data. We show that natural law terms are trending upward in recent years, although overall usage rates of

[58] STUART BANNER, THE DECLINE OF NATURAL LAW: HOW AMERICAN LAWYERS USED NATURAL LAW AND WHY THEY STOPPED 241-242 (2021).

our core natural law phrases remain low in legal practice. We also compare usage relative to other legal theories or movements (e.g. originalism).

First, we compare rates and trends in the three domains—briefs, court opinions, and legal scholarship—in the post-2000 years.[59] In Figure 9, we plot the percentage of documents in a domain with any of the natural law-relevant phrases. The colored lines are smoothed best-fit lines, which are plotted alongside the observed yearly percentages (gray points).

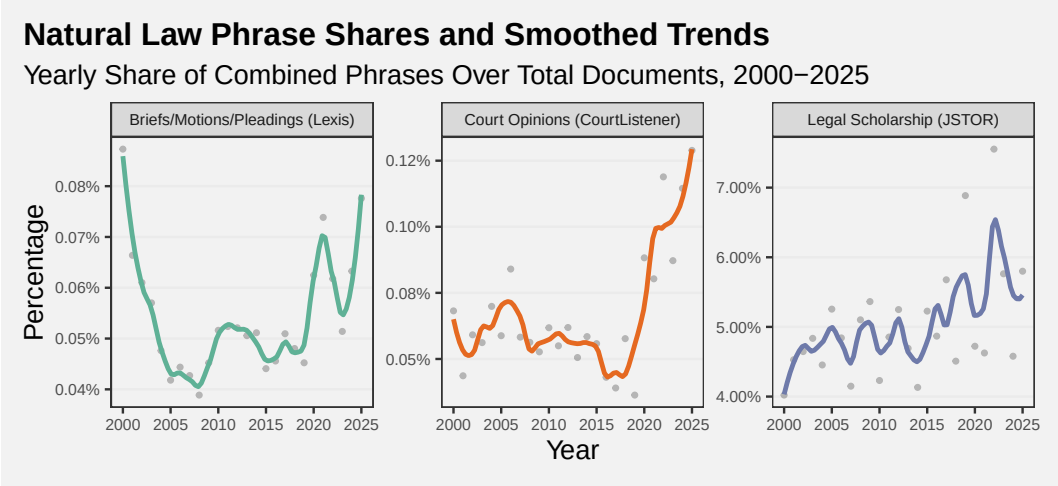

Figure 9: Natural Law Phrase Shares and Smoothed Trends

Note: Each panel is the percentage of total documents with any of the natural law-relevant phrases each year (gray points), with smoothed trends (colored lines). Note the different *y*-axis levels.

The results in Figure 9 suggest that the yearly percentage of briefs or court opinions with natural law-relevant phrases is increasing in recent times, although the overall rates remain very low. Indeed, in most years fewer than 0.10% of briefs or court opinions contain one of the natural law phrases. By contrast, the legal scholarship series (blue line, right panel) shows between 4-7% of academic law

[59]The post-2000 coverage for all three data sources is higher than 20th century coverage. In other words, there may be concern that the sample size of documents is too small in earliest periods to say anything definitive, so we focus more squarely in this section on post-2000.

articles contain natural law phrases. Although we discuss possible reasons below, we note here that the gap in usage between legal scholarship and legal practice (court opinions, attorney briefs) is large and persistent.

Our overall time trends confirm extant observations from the literature. Consider, for example, the following claim that natural law has persisted as a topic of study in law schools:

> "In law schools, natural law never ceased to be a topic of study. This academic interest in natural law has had almost no effect on the working legal system, where natural law has been relied upon by only the most idiosyncratic of judges and lawyers. The history of our use of natural law has nevertheless continued to exert influence on the legal system, which still contains doctrines and practices that were once based on the law of nature."[60]

Indeed, we find relatively high usage of natural law-relevant phrases in legal scholarship despite low usage levels in legal practice. As observed above, however, this does not imply natural law has not influenced aspects of the legal system.

How does the popularity of our natural law phrases compare to other legal theories? In Figure 10, we compare natural law usage in court opinions (dashed black line) to originalism, plain meaning, positivism, and textualism phrases. The results for other theories are shown as solid red lines in each panel below.

[60] STUART BANNER, THE DECLINE OF NATURAL LAW: HOW AMERICAN LAWYERS USED NATURAL LAW AND WHY THEY STOPPED 7 (2021).

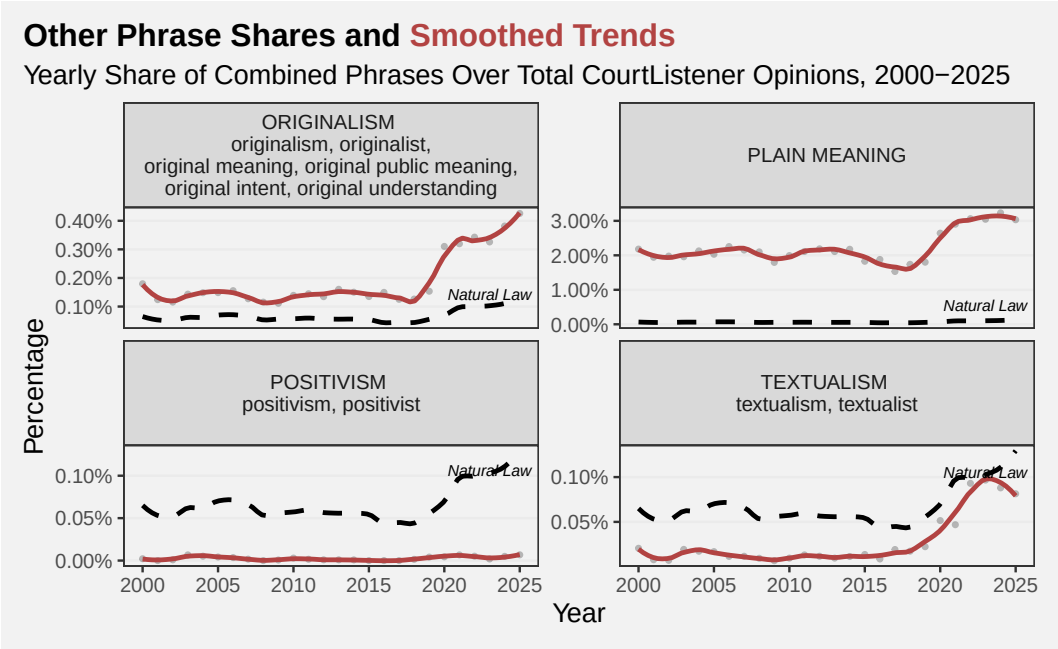

Figure 10: Other Phrase Shares and Smoothed Trends

Note: In each panel the natural law CourtListener shares are plotted in the black dashed line. The red lines are smoothed trends for other legal phrases. Note the different *y*-axis levels.

Perhaps the most relevant comparison is to originalism, which, like natural law theory, has a set of phrases with which it is often associated. In the top left panel, we see that originalist phrases—such as "original meaning," "original understanding", etc.—are more commonly found in court opinions than natural law phrases in all years 2000-2025. Yet the starkest difference doesn't occur until post-2016, when originalist terms sharply increase in usage. The other panels are shown for comparison also, with our natural law phrases being more commonly employed than "positivist/positivism" or "textualism/textualist" but much less frequently used than an interpretive canon like "plain meaning," a very popular phrase which appears in 1-3% of all court opinions 2000-2025.

For further context, Figure B4 plots the share of court opinions mentioning prominent legal subfields. For example, Figure B4 shows that criminal law phrases ("crime" or "criminal") appear in 20-30% of CourtListener opinions each year from 2000-2025. By this benchmark, natural law theory (as well as other theories) appears to be not so central to legal practice. Still, further work might shed light on whether natural law theory is of comparable import as various doctrines in certain legal subfields.[61]

B. Natural Law Usage in Context

In this sub-section, we provide further context for how the natural law phrases are used in different legal texts.

1. Citations to Positive Law

The first type of usage are natural law phrases used because they have been incorporated into some positive law. For example, in a parental rights case,[62] we find reliance on the following legal proposition:

> "[T]he right of a parent, under natural law, to establish a home and bring up children is a fundamental one and beyond the reach of any court."[63]

[61] For example, it could be useful to know how commonly the various doctrines and theories from 1L courses appear in published court opinions and legal briefs.

[62] *People v. Superintendent, Adirondack Corr. Facility*, 36 N.Y.3d 187, 223 (2020).

[63] *People ex rel. Portnoy v. Strasser*, 303 N.Y. 539, 542 (1952).

Other texts cite historic legal documents with natural law phrases, like "the Laws of Nature and Nature's God" in the Declaration of Independence.[64] Still other texts cite state constitutions[65] or other court precedent. For instance, at least some legal briefs cite the following passage from a Supreme Court case on state boundaries:[66]

> "Yet, whenever, as in the case of Missouri v. Illinois, 180 U.S. 208, the action of one State reaches through the agency of natural laws into the territory of another State, the question of the extent and the limitations of the rights of the two States becomes a matter of justiciable dispute between them, and this court is called upon to settle that dispute in such a way as will recognize the equal rights of both and at the same time establish justice between them."[67]

These quotations show that some of the natural law phrases have been incorporated into certain positive legal standards, across a variety of disputes. And the LLM classification suggests that potentially a sizable portion (appr. 30%) of the attorney briefs and academic articles may be using a natural law phrase in the context of some positive law.

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[64] *See, e.g.,* Brief of Amicus Curiae of Focus on the Family, Family Research Council, and Alliance Defense Fund, *Elk Grove Unified School Dist. v. Newdow*, No. 02-1624 (Dec. 19, 2003), U.S. S. Ct. Briefs LEXIS 1075, at *15.

[65] Some cite, for example, this provision of the Maryland Constitution:

> "[W]herefore, no person ought by any law to be molested in his person or estate, on account of his religious persuasion...unless, under the color of religion, he shall disturb the good order, peace or safety of the State, or shall infringe the laws of morality..."

See, e.g., Petition for Writ of Certiorari, *Archdiocese of Wash. v. Moersen*, No. 07-323 (Sep. 7, 2007), 2007 U.S. S. Ct. Briefs LEXIS 2591, at *50.

[66] *See* Brief of the City of Memphis, Tennessee et. al., *Mississippi v. Tennessee*, No. 220143 (Sep. 5, 2014), 2014 U.S. S. Ct. Briefs LEXIS 4743, at *16 (citing *Kansas v. Colorado*).

[67] *Kansas v. Colorado*, 206 U.S. 46, 97-98 (1907).

2. Religious Citations

Other mentions and citations more directly rely on natural law precepts. For example, a variety of texts mention natural law and Catholic doctrines to support a legal argument. Consider, for example, texts discussing sterilization and family planning:

> "However, the second line of argument against sterilization—that it is violative of natural law—is more difficult to attack. This is balanced, however, by the fact that it has much less impact upon lay Catholics. As a result, Catholics may be more willing to accept sterilization as opposed to contraception or abortion as a method of family limitation."[68]

Other law reviews simply note that certain family planning exercises are condemned in Catholic teaching as against natural law theory:

> "Both the Catholic Church and the Church of England have condemned artificial insemination as immoral and contrary to the laws of nature."[69]

Other texts mention religion in free-exercise cases, which often include natural law-relevant language embedded in certain positive laws (e.g. state constitutions).[70]

Overall, the GPT evidence suggests many of the texts across domains—legal scholarship, court opinions, and attorney briefs—include religious dimensions in certain contexts. This is perhaps unsurprising given the historical influence of natural law on early constitutions and other laws. The association between Catholic

[68] Robert Michael Dombroff & Harris T. Lifshitz, *Overpopulation: No Strength in Numbers*, 93 FAM. L.Q. 6 (1972).

[69] *A Child Conceived through Artificial Insemination by a Third-Party Donor Is Illegitimate: Gursky v. Gursky*, 63 MICH L. REV. 160, 168 N.45 (1964).

[70] *See, e.g.*, *Fulton v. City of Philadelphia*, 593 U.S. 522, 576 n. 43 (2021) (Alito, J., concurring) (citing Maryland Declaration of Rights).

doctrines and natural law-relevant phrases is also expected, given the close association between certain natural law theorists (e.g. Aquinas) and Catholicism.[71]

3. Citations to Natural Law Theorists

We also find a number of explicit citations to natural law theorists. In the attorney briefs, for example, we find citations to: Pufendorf;[72] Martin Luther King, Jr. and St. Thomas Aquinas;[73] Madison;[74] Paine;[75] Locke;[76] Justinian;[77] Kent;[78]

[71] Although we note that not all natural law thinkers are associated with Catholicism.

[72] Brief for Legal Historians as Amici Curiae, *Blumenthal v. Trump*, No. 20-5 (Aug. 10, 2020), 2020 U.S. S. Ct. Briefs LEXIS 4919, at *27-30.

[73] Brief for the High Impact Leadership Coalition as Amicus Curiae, *Hollingsworth v. Perry*, No. 12-144 (Jan. 28, 2013), 2013 U.S. S. Ct. Briefs LEXIS 557, at *9 ("A just law is a man-made code that squares with the moral law or the law of God. An unjust law is a code that is out of harmony with the moral law. To put it in terms of St. Thomas Aquinas: An unjust law is a human law that is not rooted in eternal law and natural law.").

[74] Brief of Mountain States Legal Foundation, *Horne v. USDA*, No. 14-275 (Mar. 9, 2015), 2015 U.S. S. Ct. Briefs LEXIS 942, at *17-18 ("James Madison—who insisted on inclusion of the Takings Clause—understood property rights to be a function of natural law as well, originating in the 'diversity in the faculties of men' for acquiring property.") (citing James Madison, *The Federalist No. 10* at 42).

[75] Petition for Writ of Certiorari, *Wolf v. United States*, No. 11-850 (Nov. 1, 2011), 2011 U.S. S. Ct. Briefs LEXIS 2950, at *284-285 ("government is formed to protect peoples natural rights: Rights of Man Thomas Paine an affirmation to the United States principles natural law of forming a new government which was affirmed today by the United States")

[76] Petition for Writ of Certiorari, *Fitzgerald v. Thompson*, No. 09-930 (Feb. 1, 2010), 2010 U.S. S. Ct. Briefs LEXIS 1205, at *44 ("The Framers' concept of 'property' as used in the Constitution drew upon principles of natural law espoused by John Locke, the English philosopher whose writings on natural rights influenced the Founders.")

[77] Brief of Amicus Curiae The Florida Shore and Beach Preservation Association, *Renourishment v. Florida*, No. 08-1151 (Oct. 5, 2009), 2009 U.S. S. Ct. Briefs LEXIS 1038, at *31 ("According to Justinian's Institutes 'by the law of nature the air, running water, the sea, and consequently the shores of the sea' were 'common to mankind.' JUSTINIAN, INSTITUTES II:I:1.").

[78] Petition for Writ of Certiorari, *Cimini v. Smith*, No. 09-633 (Nov. 20, 2009), 2009 U.S. S. Ct. Briefs LEXIS 3017, at *19 ("The Common Law right to a trial by jury was the only method for providing necessities for a child if a parent failed in their natural law obligation. Kent's Commentaries on American Law.").

Hobbes;[79] Grotius and Cicero;[80] Benjamin Franklin;[81] and Finnis.[82] And, of course, Blackstone is very prominent according to the GPT counts, appearing in more court opinions and legal briefs than any other thinker. Many of the references are to Blackstone's proposition that self-defense is "the primary law of nature."[83]

More broadly, the GPT counts for most cited natural law thinkers in-text suggest that scholars especially are drawing on a wide range of natural law theorists and citing them quite often: hundreds of articles with our natural law phrases mention Grotius, Aquinas, Locke, Finnis, Hobbes, and others. We do note, however, that some thinkers that GPT picks out as "natural law thinkers" are obviously not proponents of natural law. Instead, some thinkers (e.g. citations to HLA Hart) are simply engaged in writing about or debating natural law and therefore use certain natural law phrases.[84]

[79] Brief of Professors of Philosophy, Criminology, Law and Other Fields as Amici Curiae, *McDonald v. City of Chicago*, No. 08-1521 (Nov. 23, 2009), 2009 U.S. S. Ct. Briefs LEXIS 1242, at *12 n.2 (citing Hobbes for proposition that self-defense is a natural law right—"a covenant not to defend myself with force from force is void.").

[80] Brief for Amici Curiae Disabled Veterans for Self-Defense, *District of Columbia v. Heller*, No. 07-290 (Feb. 5, 2008), 2008 U.S. S. Ct. Briefs LEXIS 146, at * 10 ("Grotius, like Cicero, based his work on natural law. Grotius says that under the law of nature self-defense is justified.").

[81] Brief Amici Curiae National Association of Police Organizations, Int'l Brotherhood of Police Officers, & Federal Law Enforcement Officers Ass'n, *Dickerson v. United States*, No. 99-5525 (Mar. 9, 2000), 2000 U.S. S. Ct. Briefs LEXIS 190, at *27 ("The right against self-incrimination did evolve as an essential part of due process and as a fundamental principle of liberty and justice. Thus, Ben Franklin in 1735 called it a natural right ('the common Right of Mankind'), and Baron Geoffrey Gilbert, the foremost English authority on evidence at the time, called it part of the 'Law of Nature."').

[82] Brief of Amicus Curiae Legal Scholar Adam J. Macleod, *Arlene's Flowers Inc. v. Washington*, No. 17-108 (Aug. 21, 2017), 2017 U.S. S. Ct. Briefs LEXIS 3015, at *31 n.2 (citing JOHN FINNIS, NATURAL LAW AND NATURAL RIGHTS 111-18 (2nd ed, 2011)).

[83] *See, e.g.*, Amicus Curiae Brief of Mountain States Legal Foundation, *District of Columbia v. Heller*, No. 07-290 (Feb. 11, 2008), 2008 U.S. S. Ct. Briefs LEXIS 194, at *13-14 ("Famed British jurist William Blackstone, upon whose scholarship many of the Framers relied, wrote that 'Self-Defense, therefore, as it is justly called the primary law of nature, so it is not, neither can it be, in fact, taken away by the law of society.' 3 William Blackstone, Commentaries on the Laws of England 4 (1765-1769).").

[84] This nuance is evidently too difficult for an LLM to pick out at this point.

4. Citations Treating Moral Principles as the Law of the Land

Finally, we ask whether the writers of these texts are treating the moral principles and natural laws as the *law of the land.* That is, whether they treat the natural law as authoritative and binding law. We find some references that clearly do treat natural law as determining the law of the land. For example, in an *amicus* brief opposing "homosexual activism," a party petitioning for *certiorari* writes:

> "[A] just law is a man-made code that comports with the moral law or the law of God. An unjust law is a code that is out of harmony with the moral law. Consequently, an unjust law is a human law that is not rooted in eternal law and natural law and is thus no law at all."[85]

In another case, a petitioning party argues that crime can serve as a basis for restitution in a private right of action on natural law grounds:

> "[N]atural law demands that the scales of justice be balanced by the malefactor towards the party he has injured. The more serious of those harmful acts, which society defines as 'crimes,' are not exempt from this universal principle of cause and effect. It is the very principle which civil restitution is premised upon. The Respondents neglected their duty to society and to the Petitioner and caused him harm. ... As a general principle, every act or omission consciously or willfully perpetrated which harms another person, constitutes a cause of action in a claim for damages in tort law. It follows then that every criminal act

[85]Petition for Writ of Certiorari, *Glenn v. Holder*, No. 12-553 (Oct. 31, 2012), 2012 U.S. S. Ct. Briefs LEXIS 4667, at *109-110.

> or omission which injures another, also gives rise to a civil claim for damages."[86]

A final example comes from an international law case concerning the Alien Torts Statute, which an *amicus* brief describes as limited by the natural law:

> "The purpose of the ATS is to provide a civil tort remedy for criminal or other acts, committed in violation of the law of nations or treaties. It follows from that purpose that the operation of the ATS must conform to the rule of law so that natural law is paramount to positive law."[87]

Elsewhere, the same *amicus* brief has a section titled "Implied Incorporation and Supremacy of Natural Law," and states that "natural law is supreme over positive law."

Yet other texts explicitly reject natural law as a binding authority. For example, natural law is mentioned disapprovingly in an *amicus* brief for *Lawrence v. Texas*:[88]

> "The attraction of natural law is its seemingly universal reasonableness; but specific applications to specific issues lose that quality of universality. When a court announces that the abstract principle of 'equal concern and respect' mandates (or precludes) affirmative action, or the principle of personal autonomy mandates (or precludes) assisted suicide, the judge is not in any realistic sense 'applying' natural law, but is merely applying his own opinion about affirmative action or assisted

[86] Petition for Writ of Certiorari, *Keyter v. McCain*, No. 061069 (Jan. 9, 2007), 2007 U.S. S. Ct. Briefs LEXIS 1340, at *32.

[87] Brief of the Rutherford Institute as Amicus Curiae in Support of Petitioners, *Kiobel v. Royal Dutch Petroleum Co.*, No. 10-1491 (Dec. 21, 2011), 2011 U.S. S. Ct. Briefs LEXIS 2796, at *21.

[88] 539 U.S. 558 (2003).

> suicide. There is no reason the judge's opinion should prevail over that of the people."[89]

Interpreting the counts above in light of some case examples, it is clear that not all mention natural law in a positive or approving manner. Nevertheless, one might argue disapproving citations are meaningful for assessing the impact or salience of a theory.

5. The Alternative Uses of "Laws of Nature"

The terms "laws of nature" and "natural law" have the highest usage among our candidate terms. But some legal subfields do not always use the term in a jurisprudential sense. Our counts include many alternative uses of these particular terms.[90]

First, the term "laws of nature" is commonly used to establish or refute the credibility of evidence. Such a usage is intended to give the sense that proffered explanations are "in contradiction to the physical facts, in contravention to human experience and the laws of nature." In *United States v Conley*, for example, the court opinion uses laws of nature in this sense:

> "We will not find a witness incredible as a matter of law except in 'extreme situations'—for example, where 'it would have been physically impossible for the witness to observe what he described, or it was im-

[89] Brief for the Center for Law and Justice International as Amicus Curiae, *Lawrence v. Texas*, No. 02-102 (Feb. 18, 2003), 2003 U.S. S. Ct. Briefs LEXIS 205, at *17-18 (citing Professor Michael W. McConnell, *The Right to Die and the Jurisprudence of Tradition*, 1997 UTAH L. REV. 665, 682-83 (1997)).

[90] As noted above, recall also that we omitted intellectual property and patent cases for using "laws of nature" as a term of art.

> possible under the laws of nature for those events to have occurred at all."'[91]

In this example, the court is referring to laws of nature in a non-jurisprudential sense: namely, that the evidence is neither incredible nor impossible given the (scientific) laws of nature.

Other similarly texts refer to "laws of nature" in the sense of physical laws of science.[92] Consider, for instance, *Citizens for Higgins Lake Legal Levels v. Roscommon Cnty. Bd. of Comm'rs*:

> "The trial court summarized defendant's duty as maintaining the legal level 'subject to the laws of nature and the limitations of the dam.' The legal level was 'not a minimum or a maximum level nor is it a level that can be expected to be hit on exactly on a daily basis due to the laws of nature and the limitations and functioning of the current dam structure.' Moreover, the trial court stated that defendant had 'a duty to maintain the dam and comply with the state permitting requirements."'[93]

Further examples use "natural law" or "laws of nature" to establish a variety of legal rules, legal duties, and factual findings.[94] For example, courts have declined to

[91] *United States vs Conley*, Nos. 23-2494 & 23-2519 (7th Circuit, May 15, 2025)

[92] Physical, MERRIAM-WEBSTER'S COLLEGIATE DICTIONARY (11th ed. 2003) (defining "physical" as "having material existence: perceptible especially through the senses and subject to the laws of nature").

[93] *Citizens for Higgins Lake Legal Levels v. Roscommon Cnty. Bd. of Comm'rs*, No. 353969, at *7 (Mich. Ct. App. Mar. 17, 2022) (unpublished).

[94] *See, e.g., Lewey v. Fricke Coke Co.*, 166 Pa. 536, 545-547 (Pa. 1895) ("The law does not require impossibilities. It recognizes natural conditions, and the immutability of natural laws. The owner of the surface cannot see, and because he cannot see the law does not require him to take notice of, what goes on in the subterranean estates below him ... No amount of vigilance will enable him to detect the approach of a trespasser who may be working his way through the coal seams underlying adjoining lands."); *Conway v. State Water Resources Control Bd.*, 235 Cal. App. 4th

find that the "laws of nature" entail certain conclusions about blood alcohol content levels.[95] Finally, "laws of nature" may increasingly be used in environmental law, with regulations requiring land uses consistent with "the natural laws governing the physical, chemical and biological environment."[96]

C. A Challenge to the Positivist Theory of Law? The Outlier Explanation

As discussed in the introduction, the empirical exercise here is useful not only to understand whether natural law theory is having its "moment," but to help settle certain disputes in jurisprudence. For example, the data assembled here sheds light on whether legal officials often rely on natural law and moral principles to determine *what the law is*.

The data show that natural law terms may sometimes be used to determine law. But the particular examples sketched above show that some portion of the texts identified employ natural law in a different sense. For example, some invocations of the "laws of nature" are used in a scientific way. The data series shown here should perhaps be interpreted as a bound then on judges, attorneys, and scholars using natural law in a theoretical or jurisprudential sense.

671, 679-680 (Cal. Ct. App. 2015) ("[W]here lack of available alternatives is a constraint imposed by present technology and the law of nature, rather than the Board specifying a particular manner of compliance, there is no violation of Water Code section 13360.").

[95] *Fowler v. State*, 2014 Ark. App. 460, *6-7 (Ark. Ct. App. September 10, 2014) ("this court specifically declined to extend 'the proposition that the unquestioned laws of nature compel a conclusion that appellant's blood-alcohol content was [either] decreasing or increasing at the time' a breathalyzer test was given").

[96] *Colen v. N.J. Dep't of Envtl. Prot.*, 2021 N.J. Super. Unpub. LEXIS 2944, at *8 (New Jersey Superior Court-Appellate Division December 3, 2021) (internal quotations omitted) ("In enacting CAFRA in 1973, the Legislature found that certain portions of the coastal area are now suffering serious adverse environmental effects.... N.J.S.A. 13:19-2. In light of these effects, all of the coastal area should be dedicated to those kinds of land uses which promote the public health, safety and welfare, protect public and private property, and are reasonably consistent and compatible with the natural laws governing the physical, chemical and biological environment of the coastal area.")

Still, even taking all the results as approving jurisprudential uses of natural law, is there a problem for positivist explanations of the law? At first blush, the answer is no. After all, usage rates of natural law phrases is very low in court opinions and attorney briefs, motions, and pleadings. Because they hold that only convergent legal practice determines *what the law is*, positivists might respond that an outlier or fringe practice of relying on natural law principles requires no explanation. To be sure, in other cases the positivist will concede that there is a legal convention or authoritative legal text licensing judges and attorneys to rely upon morality or policy arguments.[97] But, in many cases, there is simply no convergent practice of relying on natural law or moral principles among legal officials.

Another line of explanation available to positivists is that legal actors invoking natural law know that natural law is not actually law. It is nevertheless invoked for persuasive or other means. This is certainly a possibility, given the large gap between legal scholarship and legal practice use rates. If scholars and practitioners (judges and attorneys) aren't invoking for different reasons, it's difficult to imagine how the usage gap emerged. Indeed, it seems plausible that scholars are invoking natural law not in an effort to say *what the law is* but for some other persuasive purpose. Perhaps publication incentives or the structure of the legal academy explain the difference.

Another possibility is that judges and attorneys do, in fact, rely on moral principles but cannot directly note such reliance in-text. Certain realists, for example, might suggest that extra-legal considerations do factor into judicial decision-making all the time. But for practical reasons—e.g. reputational concerns with clients, leg-

[97] This is perhaps best exemplified by the state constitutional texts that invoke a natural law principle. *See supra* Section III.B.1.

islators, etc.—the true decision-making process is not well-reflected in the text of court opinions. We cannot completely rule out this possibility and concede that not all considerations make their way into the text of an opinion. Still, if natural law considerations are, in fact, important to judges it would be odd for attorneys to not mention them in their own briefs, motions, and pleadings.[98]

An alternative view, advanced by Stuart Banner, is that the decline of natural law among legal professionals does not imply the content of the law would be much different under either positivist or natural law theories. What has changed is how the function of the law is viewed, that is, as something to be made rather than something to be found. As Banner explains:

> "We no longer use the term 'natural law' to describe this process, but it is similar to the process that judges used when natural law was part of the legal system. That said, there are some differences between the way judges think about such cases today and the way they thought about them in the heyday of natural law. A 19th-century judge who understood himself to be finding the law of nature would be inclined to think in terms of timeless principles, while a 21st-century judge who considers herself an interstitial policymaker would emphasize present-day circumstances."[99]

In other words, natural law concepts can always be smuggled in the guise of positive law, and the more positive law there is, the more opportunity for smuggling.

[98] Perhaps the transcripts of trials may contain references to natural law and morality. Future studies may further examine the text of in-court arguments, subject to data availability.

[99] STUART BANNER, THE DECLINE OF NATURAL LAW: HOW AMERICAN LAWYERS USED NATURAL LAW AND WHY THEY STOPPED 249 (2021).

D. The Gap Between Practice and the Legal Academy

Finally, we ask why natural law usage rates appear to differ so dramatically between legal scholarship and legal practice. Indeed, the core natural law phrases in recent years appear in $4-7\%$ of legal scholarship but less than 0.12% of court opinions or attorney briefs.

One possibility is that some natural law usages may be trying to change the law or legal practice. The advocacy role of legal scholarship is widely recognized, so it may be unsurprising when natural law phrases appear in scholarship even if they are not presently the law of the land. Certain commentators are more or less explicit about their advocacy. Adrian Vermeule, for example, very explicitly calls for a change in legal theory and legal practice when he writes:

> "[P]recisely to the extent that American lawyers are genuinely originalist, they should have the courage to discard originalism altogether in favor of the classical law, the fundamental matrix for the thinking of the whole founding generation. The truly principled originalist would immolate his own method and transform himself into a classical lawyer, in an act of intellectual self-abnegation and self-overcoming."[100]

Judges and practicing attorneys are less obviously trying to change prevailing legal standards, but we cannot rule out that some natural law phrases are being employed by either group in an attempt to change law.

The different roles of judges/attorneys and legal academics may explain the different levels of natural law usage. Yet some puzzles remain. For example, the composition of phrases used differs between the two groups. In Figure 11, we

[100] ADRIAN VERMEULE, COMMON GOOD CONSTITUTIONALISM 1-2 (2022).

plot the share of natural law phrases in court opinions (top panel) and academic articles (bottom panel) over time. The phrases have been grouped into three categories: nature phrases (e.g. "laws of nature" and "natural law"), justice phrases (e.g. "just laws" , "laws of justice", "procedural justice", and "substantive justice"), and morals phrases (e.g. "laws of morality" and "moral laws"). As seen in the figure, nature phrases dominate court opinion usage, whereas usage is much more split in academic articles between nature and justice phrases.

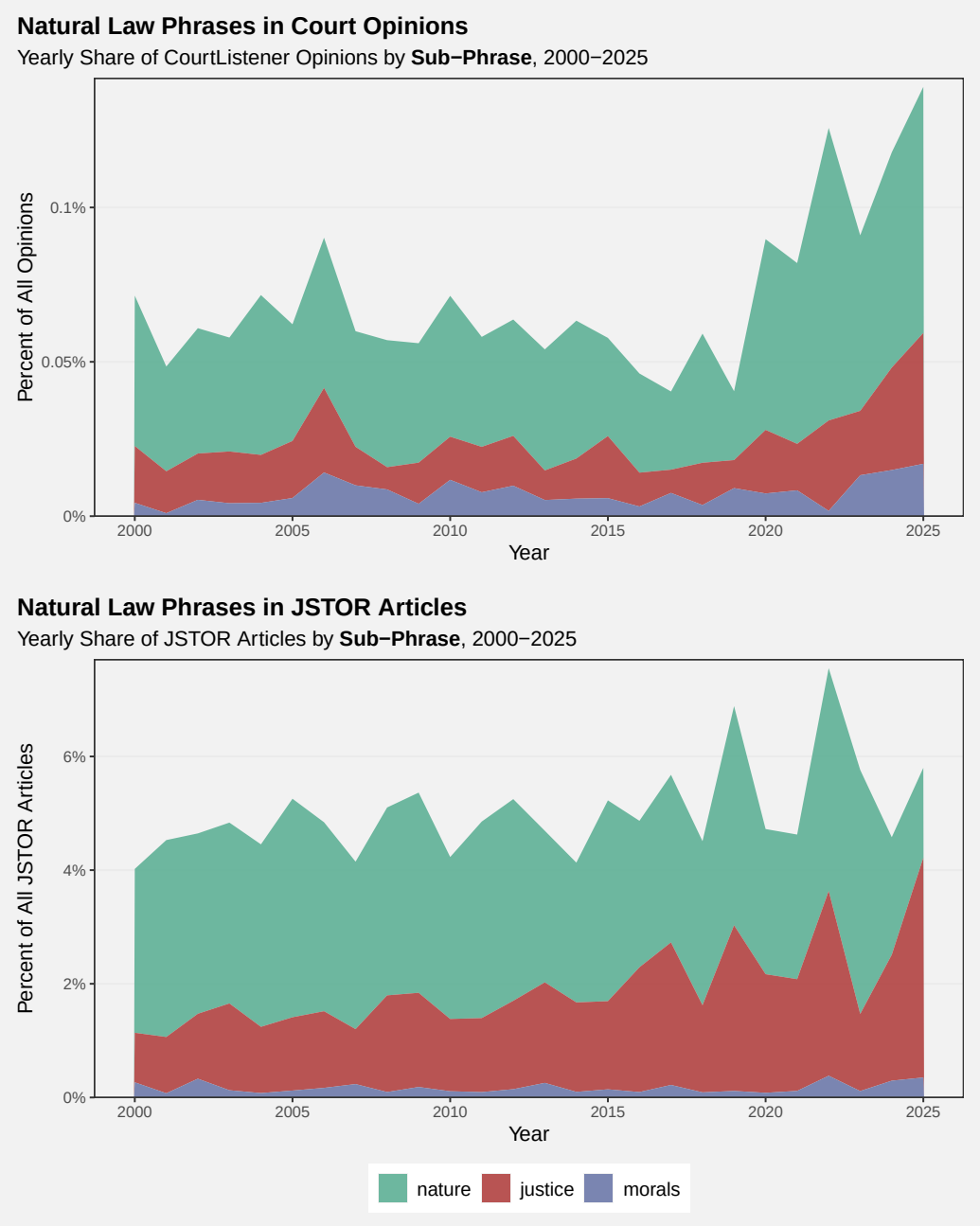

Figure 11: Share of Texts by Phrase Groups

Note: The categories have combined the different natural law phrases into three buckets: phrases containing nature/natural, phrases containing just/justice, and phrases containing moral/morality.

To be sure, some of the natural law phrases are close substitutes. Whether compositional differences reflect a deeper usage difference, however, may be of interest for future study. At this time, we emphasize that the natural law differences between the legal academy and legal practice are not merely differences of usage levels, but also differences in the sets of phrases used over time.

CONCLUSION

The empirical exercise here confirms and challenges developing natural law narratives. Although we do find a recent uptick in usage of natural law phrases, the data show that overall usage rates remain low in the legal practice of judges and attorneys. Close attention to particular examples shows, moreover, that usage is varied, with some natural law phrases being used in non-jurisprudential ways. Indeed, disambiguating how certain natural law phrases are used in practice demonstrates that our estimates may be an *upper bound* on natural law usage.

Still, the data confirm that the rise of natural law theory is real. Compared to early 2000s usage, for instance, the data reveal that natural law phrases are being used today more often in legal scholarship, court opinions, and attorney briefs. Despite the general decline in natural law from the 19th-century, there have been notable instances where natural law theories made a come back in U.S. law, at least among legal scholars.[101] And scholarly interest in bringing back natural law

[101] One such time was the rise of totalitarianism in Europe, which caused some legal commentators to attribute that rise to rejections of natural law. Their concern was that positivism bound judges and made it impossible to do what was just quickly enough. Legal realism that arose at this time, was in this sense, a middle ground, which allowed judges to consider the effects of law. *See generally*, Stuart Banner, THE DECLINE OF NATURAL LAW: HOW AMERICAN LAWYERS USED NATURAL LAW AND WHY THEY STOPPED 221-231 (2021); *see also* Dennis J. Wieboldt III, *Our Natural Law Moment(s)*, 24 GEO. J.L. & PUB. POL'Y (forthcoming); David C. Bayne, *The Supreme Court and the Natural Law*, 1 DEPAUL L. REV. 216 (1952).

recently rose in tandem with the Covid-19 pandemic, with some legal scholars suggesting natural law could address the urgent needs of that crisis.[102] Whether natural law theory will take even firmer hold in the coming years remains to be seen, but text data and computational tools (LLMs) may be used to assess how the theory is employed across the law.

Additional data on other legal movements can also shed light on when and why legal theories are invoked. Little is known comprehensively, for instance, on when and why legal theories take hold in practice.[103] Yet a growing empirical literature demonstrates that legal theories have consequences, with certain legal movements having a large impact on judicial decision-making.[104] The consequences of shifts in legal paradigms is ultimately of interest for understanding how judges, attorneys, and academics influence the resolution of legal disputes and determine the optimal development of legal doctrines.

[102] *See, e.g.*, Adrian Vermeule, *Beyond Originalism*, THE ATLANTIC (Mar. 31 2020).

[103] Data can also be used to identify additional gaps between legal practice and legal scholarship, which may be of interest for a variety of educational or academic purposes.

[104] *See* Elliott Ash, Daniel L. Chen & Suresh Naidu, *Ideas Have Consequences: The Impact of Law and Economics on American Justice*, 141 Q. J. ECON. 845 (2026) (studying impact of law and economics on judicial decision-making).

APPENDICES

A. Appendix A: LLM Prompt (Court Opinions Example)

Appendix A contains information on the LLM prompting and classification instructions. The following prompt was provided to the LLM for each court opinion with a natural law-relevant search term or phrase. The prompts for the briefs and academic articles were analogous.

```
You are extracting structured metadata from a U.S. court
opinion snippet. Return ONLY valid JSON (no markdown,
no commentary).

Context fields:
Court hint (V10): [V10]
First 200 chars of opinion: [FIRST_200]

TASKS (use best effort; if unknown, use null):
1) court_name: What is the name of the court? Use V10 and the
first_200 text as primary clues. Return a court name string (e.g.,
'Supreme Court of the United States', 'U.S. Court of Appeals for
the Ninth Circuit', 'California Supreme Court', etc.) or null.
2) year: What is the year of the case/opinion? Use the first_200
text as the primary clue (e.g., a date line, reporter citation,
docket header). Return a 4-digit year as a number (e.g., 1998)
or null.,
3) law_review_article: Does the text cite or mention
a law review article? Return 'yes' or 'no'.
```

```
4) natural_law_yes_no: Does the text cite or mention a natural
law thinker? Return ‘yes’ or ‘no’.
5) terms: which of the following canonical terms are present
in the text (case-insensitive;
include plural/singular variants)?
   Canonical options: "law(s) of natural justice)",
   "law(s) of morality",  "moral law(s)", "law(s) of nature",
   "natural law(s)", "just law(s)", "unjust law(s)",
   "law(s) of justice", "procedural justice",
   "substantive justice"
   Return as a JSON array of canonical strings
   (subset of the options). If none, return [].
6) natural_law_thinker: Which natural law thinker(s), if any,
are cited or mentioned? Return a JSON array of names.
If none, return [].
7) religious: Does the text cite or mention a religious text,
practice, or tradition, including a Catholic teaching?
Return ‘yes’ or ‘no’.
8) positive_law: Does the text cite or mention positive
law (e.g., the U.S. Constitution, Declaration of Independence,
statutes, regulations, etc.)? Return ‘yes’ or ‘no’.
9) positive_law_cited: If the text cites or mentions
positive law, classify it as exactly one of:
‘constitutional’, ‘statutory’,
‘regulatory’, or ‘other’. If no positive law is cited,
```

```
return null.
10) legal_subfield: Classify the opinion's most likely
legal subfield as exactly one of the following options:
   "contracts", "torts", "property",
   "constitutional law", "criminal law",
   "administrative law", "civil procedure", "evidence",
   "federal courts", "international law", "tax",
   "corporate/securities", "labor/employment", "family",
   "environmental", "intellectual property",
   "jurisprudence/legal theory", "other"
   If none fit, return 'other'. If the snippet is primarily
   about jurisprudence, theory, or philosophy of law,
   use 'jurisprudence/legal theory'.
11) scientific_natural_law: Does the text refer to
'laws of nature' or 'natural law' in a scientific sense
(e.g., physical, biological, scientific laws), rather than
jurisprudence/philosophy? Return 'yes' or 'no'.

OUTPUT JSON SCHEMA (exact keys):
{
  "court_name": string|null,
  "year": number|null,
  "law_review_article": "yes"|"no",
  "natural_law_yes_no": "yes"|"no",
  "terms": array,
```

```
  "natural_law_thinker": array,
  "religious": "yes"|"no",
  "positive_law": "yes"|"no",
  "positive_law_cited": "constitutional"|"statutory"|
  "regulatory"|"other"|null,
  "legal_subfield": string|null,
  "scientific_natural_law": "yes"|"no"
}

SNIPPET TEXT: [SNIPPET]
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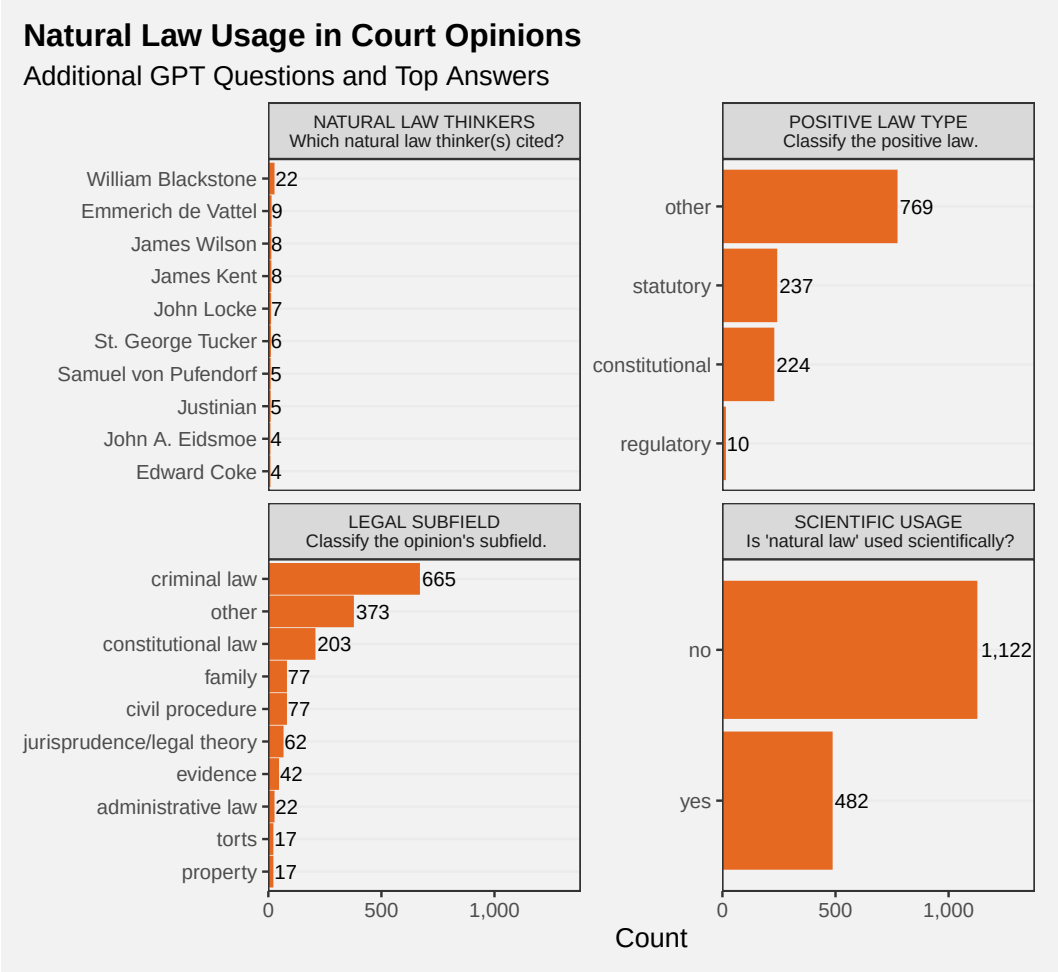
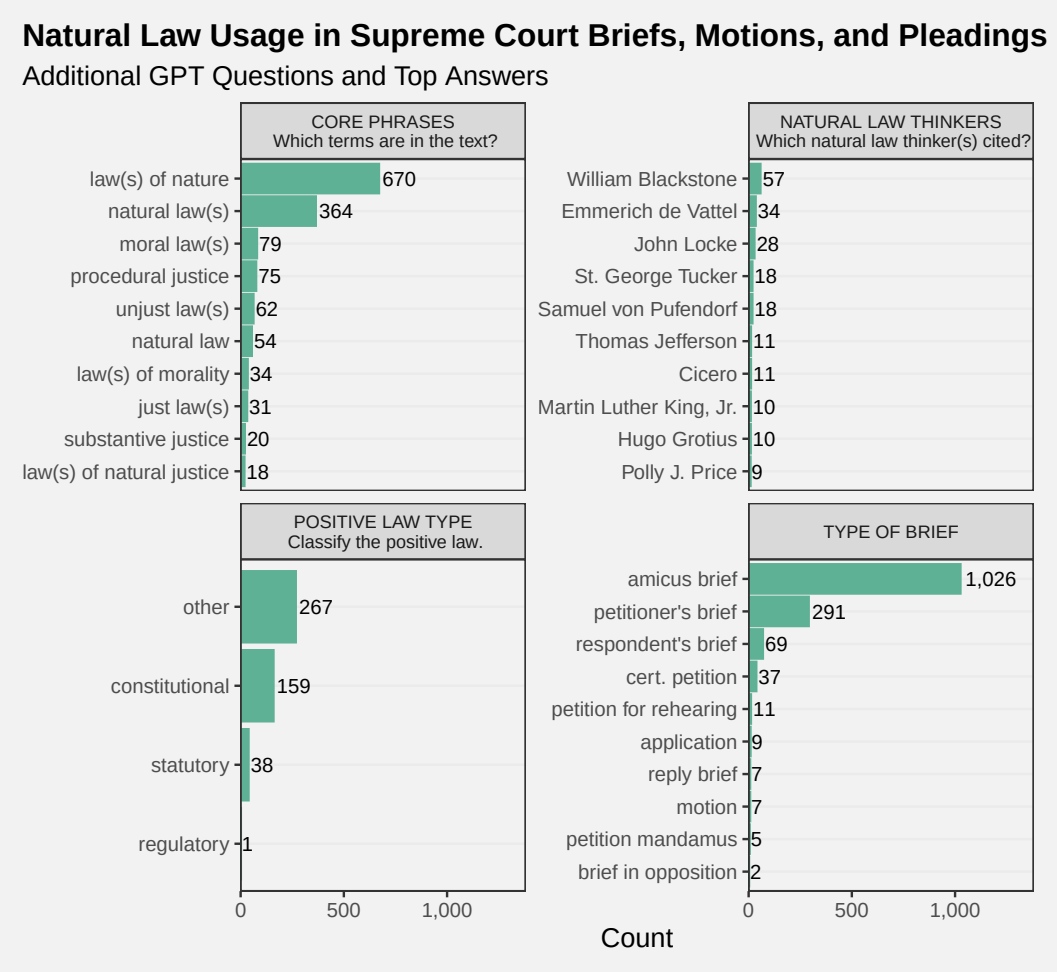
B. Appendix B: Additional Plots

Appendix B contains additional results plots.



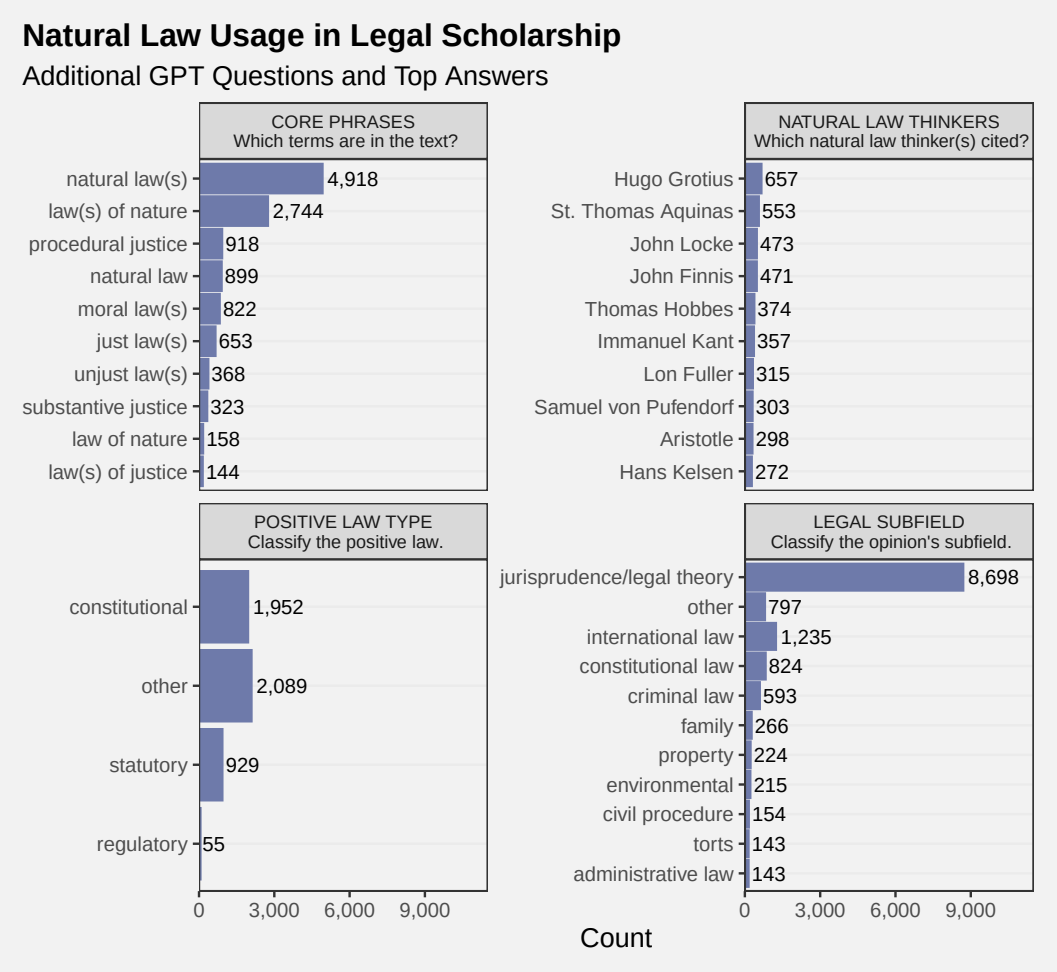
Appendix Figure B1: Natural Law Usage in Court Opinions: Other Questions

Note: Please see the LLM Prompt Appendix for the exact instructions and questions for the LLM classification tasks.



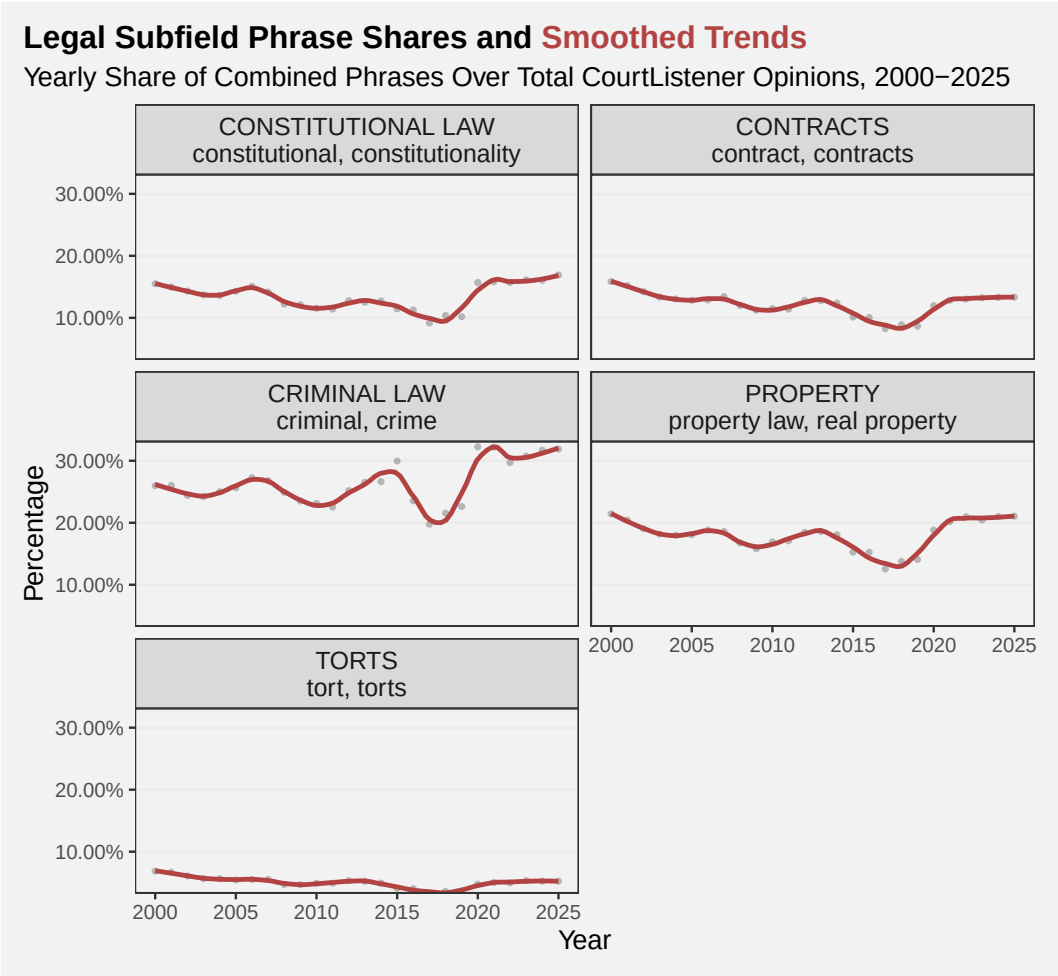
Appendix Figure B2: Natural Law Usage in SCOTUS Briefs: Other Questions

Note: Please see the LLM Prompt Appendix for the exact instructions and questions for the LLM classification tasks.



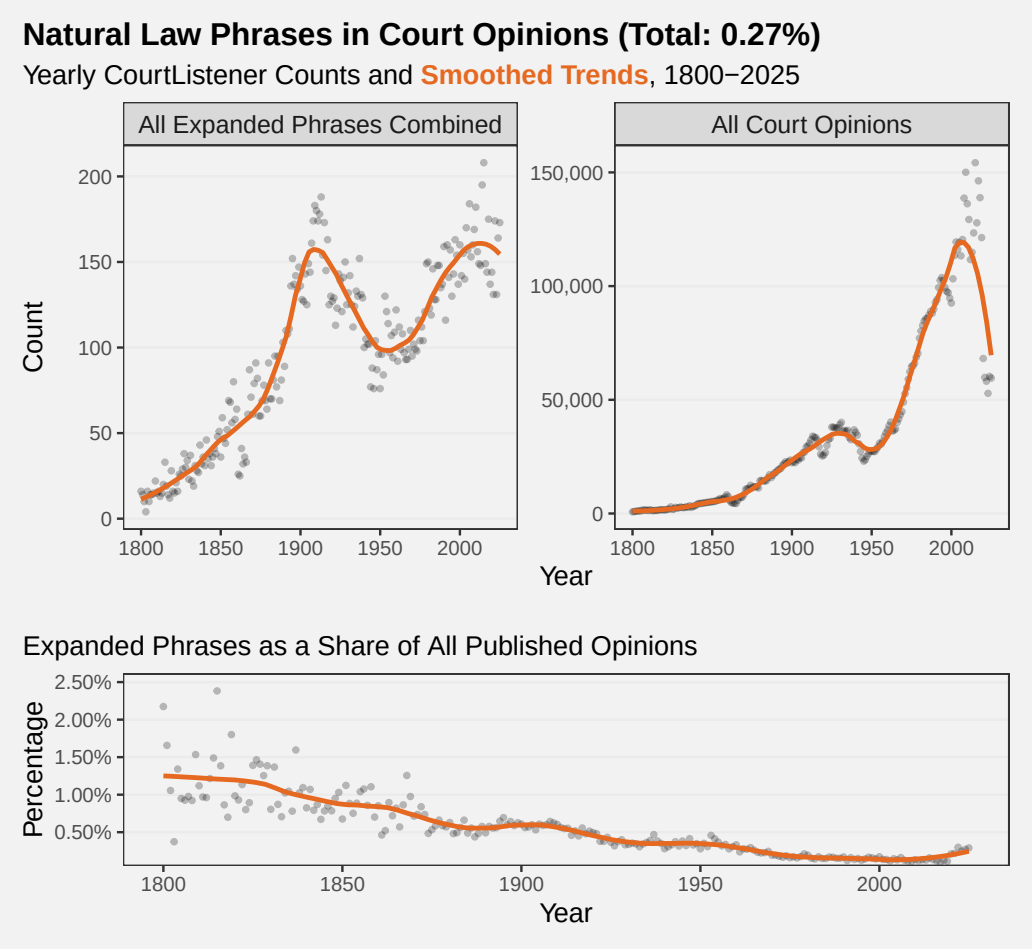
Appendix Figure B3: Natural Law Usage in Legal Scholarship: Other Questions

Note: Please see the LLM Prompt Appendix for the exact instructions and questions for the LLM classification tasks.



Appendix Figure B4: Legal Subfield Phrase Shares and Smoothed Trends

Note: The yearly share of CourtListener opinions for each legal subfield are shown yearly (gray points) and smoothed trends (red lines).



Appendix Figure B5: Expanded Natural Law Phrases in Court Opinions

Note: The top-left panel shows the combined expanded phrases counts for each year (gray points) and smoothed trend (orange line) among all CourtListener published opinions. The top-right panel shows the total number of CourtListener published opinions each year (gray points) and smoothed trend (orange line). The bottom panel shows the percentage of opinions each year with one of the expanded phrases (gray points) and smoothed trend (orange line). The expanded phrases include the phrases mentioned in-text plus the following phrases: "natural justice," "natural rights," "universal law," "immutable law," "inalienable rights," "law of reason," "moral order," "natural order," and "natural reason."