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Judicial Networks

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Abstract and Keywords

We present a comprehensive summary of the networks of actors and concepts in the courts with particular attention to those that are thought to influence political outcomes across branches. We explore burgeoning literatures in networks of legal precedents, issues, judges, clerks, jurists, lawyers, and legal briefs. In addition to discussing the frequently employed tools and measures used to study these networks, we describe the varying processes of data collection. In doing so we highlight the relative strengths and weaknesses of the current literature and lay out an agenda for further research in the courts and beyond.

Keywords: Networks, courts, citations, judges, clerks, lawyers, amicus curiae, interest groups

Introduction

This chapter presents a comprehensive summary of the literatures that benefit from the study of judicial networks. We pay particular attention to networks in which exciting scholarly advances are concentrated and those that show great promise in contributing to the literature on judicial behavior and extant decision-making models. Throughout the discussion, we identify the necessary tools and measures to study these networks and describe the varying processes of data collection while highlighting the strengths and weaknesses of both the classic and most recent literatures.

In what follows, we classify judicial networks into three broad types. First, we explore the literature on *citation networks*, or networks of judicial opinions linked by references to one another. Citation networks provide crucial insights into the foundations of judicial decision-making by exposing the opinions judges believe to be most significant. Second,

we look at the networks created by considering the interactions among judges, law clerks, lawyers, and other relevant figures, which we call *prestige networks*. Such networks have the potential to reveal possible peer effects among judges and the roles of social and professional relationships in determining judicial outcomes. Finally, the developing literature on *amicus curiae networks*, which map connections among signatories of “friend of the court” legal briefs, helps identify which extralegal actors enjoy the greatest influence on the courts. More importantly, perhaps, these networks expose the often secretive relationships among organized interests that are potentially relevant across branches of government and in a host of democracies.

Citation Networks

Citation networks are the most commonly studied networks in the judicial literature. They map connections among judicial opinions, as measured by references and citations (Caldeira, 1985; Post and Eisen, 2000; Fowler et al., 2007; Fowler and Jeon, 2008; Bommarito et al., 2010; Cross et al., 2010; Lupu and Voeten, 2012). These citations represent the traditional legal principle of *stare decisis* in action. Literally meaning “to stand by things decided,” *stare decisis* mandates the reliance on “legal doctrines, principles or rules established by prior court opinions” (Hansford and Spriggs, 2006, 5)—that is, precedent—to inform judicial rulings. The social network analysis of these citation patterns offers unique insights into debates within and among the three traditional jurisprudential models.

Legal or formalist models of judicial decision-making are strictly apolitical and conceive of justices as independent actors who make their decisions based on legal precedent (Leiter, 1999; Richards and Kritzer, 2002). In other words, judicial actors do not make law in a substantive sense; rather, justices operate in a highly constrained, rule-dominated environment and solidify laws that “in some Platonic sense, already exist” (Gilmore, 1977, 62). However, strictly mechanical theories of jurisprudence are largely dead, at least at the US Supreme Court (Kritzer and Richards, 2010), and judicial scholars have offered alternative models that allow for varying degrees of influence of preferences on citation behavior (Lupu and Fowler, 2013; Choi and Gulati, 2008; Bartels, 2009).

Attitudinal models, in almost perfect opposition to legal models, claim that justices base their rulings on sincere ideological preferences alone (Rohde and Spaeth, 1976; Banks, 1992; Segal and Spaeth, 1993, 2002; Brenner and Spaeth, 1995). Strategic models offer an alternative paradigm of judicial behavior that emphasizes judges’ roles as

sophisticated, strategic actors who base their decisions on fealty to precedent as well as a number of extralegal factors, including but not limited to ideological preferences, consideration and anticipation of others' preferences and choices, and the institutional and political contexts in which they operate (Epstein and Knight, 1998; see also George and Epstein, 1992). In short, judges make calculated decisions based on assessments of long-term consequences and implications for the political system as a whole (Baum, 2006), and thus judicial behavior cannot be assessed solely through individual-level attributes.

Though the strategic model explicitly accounts for contextual influences on judicial behavior, over the last two decades both attitudinal and legal models have slowly made room for the relevance of political and social (as opposed to ideological) considerations that may themselves help construct individual preferences and notions of the correct way to interpret the law (Baum, 2006; see also Segal and Spaeth, 2002; Kornhauser and Sager, 1993). After all, judges do not operate in isolation. Many of the judicial actors who cross paths professionally have been socially acquainted for years, and judges do—indeed, are encouraged to—communicate with their state-level and international counterparts in order to exchange perspectives, judicial philosophies, and information (Slaughter, 2004; Katz and Stafford, 2010). Judges also frequently argue with one another over the content of opinions and circulate drafts for comment and revision (Maltzman and Wahlbeck, 1996), and since judges and lawyers are taught to argue and reason by analogy, citation to precedent is the single most important rhetorical device they possess (Levi, 1949).

However, even fealty to judicial precedent is far less straightforward than it appears at first glance: “There are many techniques ... judges may use to evade precedents they do not wish to follow” (Lee, 2005, 5). Judges must often sort through a variety of similar and contradictory preceding opinions when making a decision (Spaeth, 1979) and in many instances rely on abstract argumentation (Dworkin, 1978) rather than existing precedent to construct an opinion on a novel case. Nor are interpretations of preceding opinions set in stone; Hansford and Spriggs (2006) show that judges may revisit and reinterpret prior noteworthy opinions as either positive or negative in order to institutionalize their own ideological preferences, so precedent both constrains and galvanizes present judicial decision-making. The reputation and prestige of certain courts also may prove directly or implicitly influential on judges' citation decisions. Certain courts are indubitably more highly regarded than others (Mott, 1936; Caldeira, 1983; Gleason and Comparato, 2014), and seats on certain courts are more highly coveted by jurists (e.g., the US Court of Appeals for the District of Columbia). However, the hypothesis that the “prestige factor” has an independent effect on how frequently a court's opinions are cited is more controversial, especially when applied to horizontal citations (citations between opinions

that are issued by courts at the same level). When a court's opinion includes vertical citations (citations of opinions that are issued by a higher court), the court is likely either adhering to the requirement of mandatory or binding precedent—the rule, under *stare decisis*, that a court must abide by the precedents issued by higher-ranking courts with the requisite appellate jurisdictional power—or conforming to the expectation that lower courts should take their judicial cues from all courts that outrank them. But many horizontal citations have multiple interpretations with implications for strategic models of judicial behavior and may indicate that a court confers greater legitimacy upon the opinions of certain peer courts over others. Given the variation in reputational esteem within the state and federal court systems, studying the citation practices of prestigious courts may help illuminate the effects of prestige on a court's citation counts and thus may help reconstitute legal/formalist models as more political than previously believed.

Each jurisprudential model permits and has already helped pave the way for the applicability of network methods to the study of the judiciary. The ubiquity of judicial interactions, among and across all court systems, justifies the assessment of common law as a complex, adaptive system—in other words, as a network (Post and Eisen, 2000; Katz, Stafford, and Provins, 2008; Katz et al., 2011). Yet citation networks are somewhat ill-equipped for causal analysis. For example, is it the legal validity of the opinions themselves or the social connections between the opinions' authors (judges) that drive frequent citations? While authors have offered opposing perspectives on this question (Hinkle, 2015; Choi and Gulati, 2008), the undisputed value of citation networks lies in their use for identifying the opinions that judges themselves, as opposed to third-party legal scholars, deem the most influential or the most relevant. The opinions that emerge in central positions within citation networks perform well against qualitative scholarly rankings of the most important decisions (Fowler and Jeon, 2008; Gerhardt, 2008; Cross et al., 2010). Furthermore, certain centrality measures indicate the opinions that judges may deem the most strategically relevant. Hitt and Kassow (2015) argue that precedents that are cited frequently by both conservative and liberal opinions—so-called brokerage precedents—are less constrained by the application of *stare decisis*. Since brokerage precedents are used to justify decisions that span the ideological gamut, they may serve as post hoc rationalizations for decisions made “in an attitudinal manner” (Hitt and Kassow, 2015, 2). Nevertheless, even conceding that judges may choose to cite certain prior opinions to advance ideological or political purposes (Lupu and Fowler, 2013; Hitt and Kassow, 2015), citation networks underscore that reliance on precedent still drives the practice of constitutional law (Gerhardt, 2008), since citations remain the most effective way for a judge to confer instant legitimacy upon an opinion (Segal and Spaeth, 1993; Cross et al., 2010; Cross, 2012; Lupu and Voeten, 2012).

While invaluable, judicial networks are arduous to construct. Fowler and Jeon (2008) and Fowler et al. (2007) have ambitiously mapped complete networks of majority Supreme Court opinions from the eighteenth century to the early 2000s. Bommarito et al. (2010) have constructed an early-stage historical network of Supreme Court decisions, before *stare decisis* was institutionalized. Lupu and Voeten (2012) have turned their attention to the relevance of precedent in international courts, mapping a complete network of European Court of Human Rights decisions from the court's formation until 2006. Hitt and Kassow (2015) have mapped a network of all US circuit court citations from 1947 to 2007 that refer to Supreme Court precedents, in order to identify the decisions that bridge ideological divides—that is, the Supreme Court opinions that are most frequently cited by both liberal and conservative circuit court opinions. Hinkle (2015) has compiled a data set of all Fourth Amendment-related circuit court decisions over a fifty-seven-year period. This recent attention to the lower courts is a harbinger of the construction of further and more expansive lower-court networks as well as a scholarly focus on how court systems' hierarchical positions may affect judicial behavior. In all types of citation networks, nodes represent judicial opinions and vertices represent citations and references between opinions. In most cases, networks have a clear direction: either a case is cited by other judicial opinions or a case cites other opinions. Most networks are structured chronologically, with an arc (a directed edge) directing the head node, the opinion that cites others, to the tail node, the opinion that is being cited (Bonmarito et al., 2009).

The centrality score(s) of each opinion often serves as a proxy for assessing the power or influence of a given opinion. Thanks to Kleinberg (1998) and his work distinguishing inward and outward directed edges, citation networks literature has relied on authority and hub centrality scores to distinguish between two types of influence. Authority scores, measured as eigenvector centrality, are calculated as quality-weighted functions of the number of edges leading to a particular node—in other words, they measure the number of times an opinion is cited, weighted according to the quality of cases that cite the opinion (Fowler et al., 2007; Fowler and Jeon, 2008). Opinions with high authority scores are most likely to be considered significant, and an opinion that achieves the maximum authority score increases its probability of being cited by the Supreme Court to a greater extent than an opinion deemed significant by third-party legal scholars or media outlets (Fowler et al., 2007).

One-directional authority, as denoted by eigenvector centrality scores, however, has been shown to be insufficient for measuring the true relevance of a judicial opinion. For example, if a recently issued opinion cites a large number of precedents, but has not yet itself been cited by other opinions, its eigenvector centrality score would be zero and the opinion would be (unfairly) dismissed as insignificant (Fowler et al., 2007). Reliance on

authority scores alone risks discounting the importance of nodes that may become central as the network continues to evolve. Hub scores, by contrast, measure the number of important cases that an opinion cites, also weighted according to quality. A high hub score indicates an opinion that is well grounded in common law. These scores are particularly valuable for analyzing changes in courts' priorities, cases' relevance, and legal rubrics over time. Fowler and Jeon (2008) show that opinions that were later overturned tend to have higher hub centrality scores; in addition, the hub centrality scores of opinions that overturn precedent are even higher. In other words, cases that overturn previous decisions are more grounded in precedent than cases that are later overturned.

Relationships between nodes, and thus nodal positions, change as more opinions are issued and more and more citations enter the network. Because new nodes and edges frequently enter a citation network, the number of possible relationships that can be formed over time is, in theory, infinite. Measuring citation networks over time is crucial for isolating genuine influence within a network from the effects of selection (Burk, Steglich, and Snijders, 2007): In other words, when Opinion A cites Opinion B, does this citation tell us something valuable about the inherent legal significance of Opinion B, or merely about the practical and legal constraints facing the author of Opinion A?

Longitudinal analyses that assess network properties and nodal attributes observed at various points in time present an appealing solution, but due to the dynamic nature of citation networks, any method would have to account for the continuous evolution of the network. Snijders (2001) has used continuous-time Markov chain models to get around this problem, a methodological approach that estimates the probability distribution of relational changes in future networks according to the properties of the current network (as opposed to based on past configurations). For example, Burk, Steglich, and Snijders (2007) devised an actor-oriented model that predicts the probability of independent actors' behavioral changes based on the current state of the network at any selected point in time.

While there is a growing literature exploring methods for network dynamics, much of the previous scholarship has opted to assess networks at discrete points in time—for example, to map and assess citation networks for each decade across a court's entire history. For almost any given time period, citation networks in American federal and state-level judiciaries are organized around several clusters of important opinions that are cited by a large number of others as well as a far greater number of unimportant opinions that are cited by only a few others, or by none at all (Albert and Barabasi, 2002; Fowler, 2006; Fowler et al., 2007; Fowler and Jeon, 2008). This pattern also occurs in younger constitutional court systems, such as the European Court of Human Rights (Lupu and Voeten, 2012). Any complex citation network will naturally contain at least one case

that is not cited by another judicial opinion (i.e., an authority score of 0), as well as at least one case that does not cite another judicial opinion (a hub score of 0). Cases that do not cite any others are known as “sinks” (Bommarito et al., 2010) and are valuable because they exemplify entirely new elements of judicial thinking—legalistic philosophies and protocols that are not explicitly indebted to any previous judicial decision.

Sinks are crucial to our understanding of historical citation networks. Networks of opinions issued in the first quarter century of the American republic, for example, will naturally contain a lot of sinks due to the absence of a large, preexisting body of rulings. To establish a clear pattern of judicial precedent, then, courts must go through a “loading phase” (Bommarito et al., 2010), during which the norm of *stare decisis* is constructed. Goodhart (1930) argues that *stare decisis* did not become institutionalized in the United States until around 1900, although Bommarito et al. (2010) maintain that US citation networks began exhibiting a clear structure in the 1820s. During the inchoate years of the American federal court system, however, there was a noticeable lack of meaningful clustering in citation networks—and thus scholars may expect the same structure in networks for recently established courts. Bommarito et al. (2010) devised a measure of centrality specifically for assessing early-stage networks characterized by an abundance of sinks. The authors’ sink-based distance measure is inspired by betweenness centrality¹ and measures the shortest path between two sinks in a given network. Opinions with high sink-based scores thus represent the decisions responsible for connecting isolated opinions with one another—the very process that ensured the emergence of complex citation networks.

Hitt and Kassow (2015) have utilized a less common centrality measure, introduced by Burt (2004) and closely related to betweenness, to assess the ability of certain opinions to bridge “structural holes” in a larger citation network (i.e., the ability of certain opinions to directly connect distinct clusters of subnetworks). Constraint scores measure the ability of an opinion to connect clusters of nodes with one another, particularly if the nodes in each cluster are not themselves highly connected (Hitt and Kassow, 2015). Constraint scores thus offer an alternative to betweenness measures for larger, more complex networks; Burt (2005) suggests that betweenness is best suited for smaller, more compact networks, since betweenness scores do not account for whether an opinion brokers between two close connections or two distant connections.

Citation networks are crucial for understanding the full extent of judicial decision-making. For legal/formalist models in particular, these networks help clarify not just whether judges rely heavily on precedent to inform their decisions, but rather on *which* cases and opinions judges base their rulings. Thus, the most heavily cited opinions in an increasingly large legal corpus should help to clarify one of the central questions of

judicial decision-making: whether judges rely on opinions purely for their legal value or for their comportment with those judges' own ideological or political preferences. Opinions with consistently high authority scores over time are more likely to represent legal arguments that span the ideological divide and are more widely respected. In addition, the foray into textual analysis of court decisions and the construction of text/semantic networks (see, e.g., Kok and Domingos, 2008) may shed some light on whether and how judicial actors distinguish their ideological and legal rationales in written opinions. For example, Hinkle et al. (2012) have shown that district court judges use so-called hedging, or ideologically equivocal, language when their preferences are not aligned with the majority of the judges on the requisite circuit court that is empowered to reverse district court rulings.

Continued study of historical networks should aid in illuminating the opinions that remain consistently relevant over long periods versus *flash in the pan* decisions, which do not stand the test of time. However, citation networks are unable to distinguish between highly central opinions that are cited as brilliant precedent and those that are consistently cited as cautionary tales (i.e., examples of what not to do). Positive citations explicitly commend the legal authority and/or reasoning of a prior opinion, while negative citations question or denounce a previous ruling (Hansford and Spriggs, 2006), but citation networks have no clear method for separating the two. Notorious opinions (e.g., *Plessy v. Ferguson* or *Dred Scott v. Sandford*) thus may have high centrality scores, but do not provide much help in identifying new foundations of judicial legitimacy. Clark and Lauderdale (2012) have developed a genealogical model that identifies antecedents in a particular case's doctrinal trajectory, which may help distinguish substantively novel opinions from those that simply pay lip service to a particular legal tradition and thus help correct for inflated significance due to citation counts. In order to tease out these nuances, network centrality cannot be studied in isolation; future analyses will likely rely on supplemental empirical measures (e.g., measures of judicial ideology, public opinion, or discourse quantifiers).

Prestige Networks

Jurisprudential models that permit judges to make strategic decisions based on social, political, and institutional factors require, among other things, a broader frame for analyzing judges' conceptions of legitimacy—that is, how judges (and other legal and political actors) confer authority upon a decision (Gibson, 2007). Neither precedent nor ideological preferences can fully explain historical and contemporary examples of judges' amending their behavior in response to other political actors (Clark, 2009); in the midst

of President Franklin Roosevelt's notorious "court-packing" scheme in 1937, for instance, the Supreme Court strategically reversed course on its opposition to Roosevelt's New Deal legislative package. The Court overturned its own precedent to uphold labor and minimum-wage protections in an effort both to combat Roosevelt's attempted power grab and to retain the Court's legitimacy in the eyes of the Congress and a public that overwhelmingly supported the president's priorities (Caldeira, 1987). In 2012, political analysts and news reports suggested that Chief Justice John Roberts switched his vote on the constitutionality of the Affordable Care Act's (ACA) individual-mandate requirement at the eleventh hour, speculating that Roberts ultimately chose to uphold the act in a 5-4 decision due neither to legalistic considerations nor to political ideology, but rather to concern for his and the Court's reputation (Crawford, 2012); this rationale has been shown to magnify the effect of the public's perceived ideological proximity to the Court on their diffuse support for it (Christenson and Glick, 2015a).²

These examples are part of a long legal tradition of voting fluidity that suggests the need to incorporate the relationships among various political actors in all types of institutions in order to explain puzzling judicial behavior. Maltzman and Wahlbeck (1996) suggest that the context of the decision-making process is relevant to explaining judicial behavior, because ideological preferences are not always strict, and judges' assessments of possible legal outcomes and the effects on their court's institutional legitimacy evolve over the course of a case's consideration. This suggests that judges may be susceptible to new and understudied pathways of influence, such as peer effects and socially constructed norms (e.g., the perceived power of a particular court, judge, legal actor, or opinion). Thus, formally mapping social communities of judicial actors should prove exceedingly valuable for illuminating the entire context in which judges operate and possibly for refining strategic models of judicial decision-making to account for these effects.

Prestige networks, or purely social networks, compromise a burgeoning arena of judicial network analysis that promises significant reconceptualization of how power and legitimacy are constructed in the judiciary. While analyses of citation networks and most amicus curiae networks are also predicated on the hypothesis that definitions of legal legitimacy may be at least in part socially constructed and thus constitute an independent influence on judicial decision-making, both judicial opinions and amicus briefs are *prima facie* founded in logically compelling legal arguments. Not so for prestige networks, which evaluate the authority and the legitimacy of judicial actors³ based wholly on social status and reputational esteem. The implicit hypothesis of prestige network analyses is that peer effects may play a role in the decision-making process of judges. Given that Judge A enjoys a particular degree of esteem or prestige (she is well respected, and her merit is deemed of superior quality by her colleagues), will Judges B, C, and D be more

likely to imbue an opinion penned by Judge A with authority and legitimacy and, as a result, cite Judge A's opinions more often? If so, we may concede that Judge A enjoys a certain degree of prestige relative to her peers.

However, it is extremely difficult to divine a causal relationship between the frequency of the citations of a judge's opinions and that judge's level of relative esteem, thanks to a significant endogeneity problem: Are more prestigious judges more frequently cited by their peers, or do more frequent citations of their opinions confer prestige upon judges? In addition, all peer citations are not necessarily created equal; if a judge cites a particular opinion that is outside of her court's appellate jurisdictional path, that citation may exist for a multitude of extralegal reasons, including ideological bias toward or against other judges (Gulati and Choi, 2007). Finally, citations of particular opinions are extricable from the judges who wrote those opinions; many citations do not mention judges by name, and as a result, "citations are not connected clearly enough to individual judges ... to be fully satisfactory measures of those judges' prestige" (Klein and Morrisroe, 1999, 375). Thus, while analyzing the degree to which prestige may influence citations is an important and preeminent goal of judicial scholarship, defining and measuring prestige itself—via social networks—is a necessary prelude to determining its influence.

Prestige networks distinguish between institutional prestige, a concept substantively comparable with legitimacy, and social prestige, since "institutional authority alone does not explain the prestige and influence across judges" (Katz and Stafford, 2010, 460). However, operationalizing prestige separately from the context of institutional legitimacy is challenging. Until recently, surveys were the most frequently employed method for measuring prestige (McGuire, 1993; Wasserman and Faust, 1994), along with the assessments of judicial scholars and other observers (Blaustein and Mersky, 1972, 1978). However, due to the systemic biases (including nonresponse) inherent in survey measurements and the intellectual value of defining peer prestige according to the assessments of judges themselves, scholars have devised creative proxies for reputational esteem.

Among judges, prestige may be operationalized as the flow of law clerks from one judge to another (Katz and Stafford, 2010; Baum, 2014), since the hiring process for federal judicial clerks is notoriously selective. Judges want to hire the best clerks in order to maximize their effectiveness, and the best clerks seek to work with the best judges in order to maximize their career prospects (Wald, 1990). The professional benefits of a prestigious clerkship for a recent law school graduate are obvious, while the intellectual quality and management styles of law clerks have been shown to have a significant impact on federal judges' workloads and final rulings (Peppers, 2006; Ward and Weiden, 2006). In other words, clerks and judges need each other and mutually benefit one

another. Katz and Stafford (2010) suggest that there is a natural selection process through which the highest-quality clerks are hired by the most prestigious judges, making the movement of law clerks a credible measure of social prestige. Katz and Stafford (2010) find that the distribution of degree centrality scores,⁴ the raw number of connections enjoyed by each node or judge in the network of approximately nineteen thousand clerks hired by federal courts during the Rehnquist era (1995–2004), is highly skewed; only 1.7 percent of the judges in the network enjoy ten or more clerk-fueled connections to other judges. These results suggest that there is high inequality in social power, at least among judges.

Measuring judges' prestige via the movement of law clerks alone, however, neglects the fact that clerks are selected not simply according to academic merit but also according to ideological preferences; a conservative judge is not likely to hire a liberal law clerk, no matter how impeccable the prospective clerk's law school transcript. Since the 1990s ideological ties between judges and clerks have remained consistently strong (Baum, 2014), likely thanks in tandem to increased polarization among judicial elites (Lazarus, 2005; Baum and Ditslear, 2001) and to the fact that—due to the increase in applications for federal clerkships and for lack of a more effective signaling mechanism—judges are likely to assess the ideological tenor of a prospective hire according to the preferences of judges the applicant previously clerked for (Baum, 2014).

The use of clerk movement as a heuristic for social prestige among judges suggests that judicial actors *other than judges* may be relevant in assessments of judicial decision-making. In other words, judges' opinions may be susceptible to the influence of reputable private lawyers, law professors, attorneys general, or solicitors general, particularly when drafting opinions that are not heavily constrained by precedent and particularly when the actor enjoys a high level of social prestige. McGuire (1993) finds that the most socially powerful private lawyers in a network of approximately seven hundred litigators who have argued before the Supreme Court are overwhelmingly former law clerks, former staffers in the Office of the US Solicitor General, former law professors at elite universities, and employed by the largest and most famous Washington, DC, private firms. Katz et al. (2011) measure the prestige of law professors in a network of all tenured or tenure-track law faculty at American Bar Association-accredited American universities according to the flow of faculty members between universities. Professors with high outward-directed degree scores⁵ work at universities that hire faculty from the most prestigious law schools, while professors with high hub scores work at law schools that place their graduates in the most prestigious tenure-track jobs. The authors also calculate closeness centrality, which controls for a node's position within the network itself (see Wasserman and Faust, 1994) and thus for a professor's (and the professor's law school's) overall influence on the structure of an institutional community.⁶ Professors

with the highest degree and hub centrality scores enjoy the highest levels of social prestige and authority. While these findings may seem intuitive, their implications are important: The existence of peer effects within the judicial system has the potential to create an intellectual echo chamber in which the most influential actors all hail from the same narrow experiential sphere.

The validity of prestige networks, of course, depends on the credibility of the available proxy for network power. For example, while the law clerk market may appear to naturally select for quality, critics have pointed out the “rapidity with which clerkship matches are made” (Avery et al., 2007, 452) and the first-mover advantage granted to well-known judges who snap up the most in-demand students before these students have the chance to consider other, possibly more compelling, offers (Priest, 2003). Thus, the reality of law clerks’ hiring might compromise the integrity of the selection process and thus the network as a reliable indicator of prestige. The practical realities of any prestigious industry or institution for which networks can be constructed are likely to engender the same problem. Thus, the value of prestige networks in assessing possible peer effects among judges will likely emerge from a corpus of work rather than from making the case for the reliability of a particular type of network.

Amicus Curiae Networks

Nonjudicial actors—such as private citizens, official legal actors, and organized interest groups—may interact with the judicial system by indicating their political preferences to federal and state judges via amicus curiae briefs. These “friend of the court” legal briefs are written by actors who are not parties to a case but believe they can offer information relevant to it. Amicus briefs are thought to be one of the most effective (and cost-effective) methods of legal advocacy available to nonjudicial actors (Krislov, 1963); indeed, the presence of these briefs has been shown to affect judicial decision-making (Collins, 2008; Box-Steffensmeier, Christenson, and Hitt, 2013).

Recently scholars have begun to construct networks based on amicus briefs. The richness of the data allows for a number of possible network constructions. Most simply, ties might be drawn between actors that have signed onto the same case, creating an issue network in which shared interest about an issue in a particular case joins actors. More pointedly, perhaps, network ties might be drawn only between those who are arguing for the same decision in the same case; that is, tying all those in support of or in opposition to the petitioner/respondent. This outcome network would then indicate not merely that the issue was of interest to both parties, but also that they wanted a similar outcome. However, while interesting in their own right, these constructions provide little clue as to

who works with whom. The actors in these network constructions do not need to know one another, let alone communicate, in order to be tied together. Indeed, groups filing separate briefs may be advocating for distinct legal and social issues, which begs the question of how best to construct a social network from amicus briefs.

Amicus briefs are frequently co-signed by multiple parties. That is, organizations and/or individuals often choose to join forces and share resources by constructing and signing briefs together, indicating their shared political priorities in an attempt to affect judicial outcomes (Hojnacki, 1997; Clark and Wilson, 1961). This process requires negotiation between co-signatories and agreement on the argument and details of the brief, which can be costly (Caldeira and Wright, 1988) and difficult (Wasby, 1995). As such, it is natural to use the act of co-signing to construct ties between actors before the courts. Contrary to the other constructions, networks built on co-signing are both “purposive” and “coordinated,” providing leverage on which actors work together and to what ends (Box-Steffensmeier and Christenson, 2014).

These networks are by nature nondirected networks. That is, one cannot consistently and objectively distinguish co-signers of Supreme Court amicus briefs in terms of senders and receivers or leaders and followers. Despite the fact that one of the organizations may be listed first as the filer of the amicus brief, to give more weight to such an organization would be inappropriate. Often the reports are filed alphabetically or in some other manner that gives no indication of a lead signatory (Gibson, 1997; Box-Steffensmeier and Christenson, 2014). Amicus networks have been considered primarily in terms of one-mode projections from a two-mode or bipartite graph. Despite the fact that interest groups are tied by virtue of signing the same brief, a one-mode projection has been justified based on the process of creating the brief, which requires coordinated action and denotes a deliberate link between organizations. While interest groups undoubtedly interact broadly, an interest group network based on amicus briefs suggests that the interests draw one another together to create the brief, not the other way around, with the brief drawing the interests together. In sum, the brief is simply a physical manifestation of a true social network. Having said that, the one-mode projection does throw away some information on the briefs and thus suggests a potential pathway for future scholarship.⁷

While both individuals and organized groups sign amicus briefs, the networks literature has focused primarily on groups. In the study of judicial decision-making it has become common practice, beginning with Gibson (1997),⁸ to focus on the effect of amicus briefs from organized interest groups, corporations, and associations rather than from individuals and governments (see also Collins, 2008; Box-Steffensmeier, Christenson, and Hitt, 2013). Indeed, Collins (2008) notes that a preponderance of amicus signers are interest groups. Thus, this work dovetails with that of interest group scholars (see

Chapter 17 of this book) and is poised to play a role well beyond the judicial branch. In addition to legally defined interest groups and lobbies—a weak definition that misses almost 50 percent of actual interest groups (LaPira and Thomas, 2013)—all of the organized groups, corporations, and associations in the amicus network have political stakes and objectives. Moreover, they participate in the political process by virtue of constructing a brief. As such, amicus briefs may help expand the compendium of interest groups far beyond what the literature is frequently able to study.

Indeed, the comprehensiveness of the amicus data is one of its strongest features. In addition to the broad collection of organizations that act as amici, amicus briefs have been collected by Box-Steffensmeier and Christenson (2014) from the 1930s onward, though they have a longer history (see Krislov, 1963). There were large periods of growth in amicus brief filers in the 1960s and 1970s, leading to the massive involvement of today, with around five thousand organizations signing briefs in each of the most recent decades (Box-Steffensmeier and Christenson, 2014). These conditions provide the opportunity to make comparisons over time and to dynamically model the network. In addition, these organizations span a host of issues and industries, as well as sizes. Box-Steffensmeier and Christenson (2014, 2015) utilize business directories to gather attribute data on signers from the first decade of the millennium. In doing so, they find a broad range of industries, with the greatest number of signers in the services division, according to the Standard Industrial Classification (SIC).

The breadth of these data stands in stark contrast to collecting interest group networks based on mass surveys or small sample interviews. Traditionally, scholars have relied on one method or the other. In the former, scholars might ask respondents to recall their major partners via egocentric network batteries (see, e.g., Huckfeldt, Johnson, and Sprague, 2002, 2004; Huckfeldt and Sprague, 1987, 1991; Mutz and Mondak, 2006). In the latter, they might conduct interviews that ask respondents to identify their partners and may even follow that by interviewing the partners named in the first interview, that is, snowball sampling (see, e.g., Heaney, 2004, 2006). Both approaches may suffer from relatively high costs and nonresponsiveness. Moreover, responses are likely to suffer from weak and selective memories, wherein organizations only (choose to) remember certain other organizations (e.g., friends over enemies, major over minor players, ethical over unethical behavior). However, there are of course limits to the amicus data that these approaches do not suffer, including the ability to ask precisely the questions of interest and confirm the division of labor among partners.

The aforementioned purposive and coordinated nature of these briefs also provides some improvement over various other data used to construct networks of interest groups. Consider, for example, the collections of data offered by the Lobbying Disclosure Act of 1995 (LDA) and the Federal Elections Committee (FEC). The LDA filings disclose who

lobbies whom and on which issues and bills. Networks that employ LDA data link lobbyists and/or organizations based on their lobbying the same member of Congress or for the same bill or issue (see, e.g., Scott, 2007; Koger and Victor, 2009; LaPira, Thomas, and Baumgartner, 2014). The network is therefore based on a shared interest or policy domain. The FEC filings contain information on who contributes to campaigns, including lobbyists and organizations, from which ties are drawn between interest groups that contribute to the same candidate. While both approaches offer important insights, especially pertaining to individual lobbyist behavior (see, e.g., LaPira, Thomas, and Baumgartner, 2014), neither provides indications of coordination and shared purpose on the part of the linked interest groups. In both cases, interest groups may be drawn together that neither worked together nor wanted to see the same political outcomes. In contrast, using amici networks is attractive because scholars can distinguish the polarity of advocacy. In sum, studying interest group networks based on amicus briefs has the potential to deepen the study of interest group networks by focusing on interest groups' collaborative behavior in pursuit of a specific political outcome.

Interest groups often coordinate to share resources, disseminate information, and signal broad support (Hula, 1999). Less understood are how to measure the networks of the vast expanse of special interests, how network strategies compare across policy domains, and how networks have changed over time. These general questions motivate more micro-level considerations about which groups are the most attractive partners, which characteristics are sought out as complements, and which are considered threatening to cooperation. To these ends, Box-Steffensmeier and Christenson (2014) present evidence of an increasingly transitive network resembling a host of tightly grouped factions and leadership hub organizations employing mixed coalition strategies. Egocentric networks of organizations show that three major theoretically posited coalition strategies are present in the data: "lone wolves," who work alone; "teammates," who work with cliques of varying sizes; and "leaders," who pull together otherwise disparate groups. Driving these network strategies is assortative mixing based on industry area, budget, sales, and membership. In a related piece, Box-Steffensmeier and Christenson (2015) dig deeper into the different network strategies employed across industry and issue areas. They focus on membership interest groups, which by virtue of representing the interests of voluntary members face particular organizational and maintenance constraints. Coupling exponential random graph models (ERGMs) and multidimensional scaling provides a compact spatial representation in which religious, labor, and political organizations do not share the same network structure as each other or as the business, civic, and professional groups.

Scholars have begun to explore these naturally occurring networks of signatories to assess which actors enjoy the most influence on the courts. Kearney and Merrill (2000)

call for quantitative studies on the influence of amicus briefs that stem from the aforementioned theoretical models of judicial behavior. In their comprehensive study they find that briefs drafted by more experienced lawyers are more likely to be filed under the successful party, briefs supporting respondents have a higher success rate than those supporting petitioners, and briefs cited by the justices' opinions are not associated with being on the winning side. Ultimately, they find that the number of briefs filed on behalf of either party is limited and thus argue that there is little evidence that greater disparities in brief numbers equate to greater chances of success. Collins (2008), however, finds that justices will be more likely to make liberal (conservative) decisions when there is a greater number of liberal (conservative) briefs. In evaluating the case and related arguments, one might also wonder whether judges take into account the relative power of interest groups, above and beyond the sheer number of supporters for the liberal and conservative positions. Box-Steffensmeier, Christenson, and Hitt (2013) find that when the two sides of a case have similar numbers of briefs, the social network power of an interest group—as measured by its eigenvector centrality in the network—is a valuable signal to judges. The results provide insights into the conditions under which the quality of interest groups may matter as much if not more than the quantity.

These papers are only the tip of the proverbial iceberg for research focused on any of the branches of government that may benefit from an understanding of interest groups' social networks. There are works in progress exploring the effects of interest group power—frequently construed as a measure of social network centrality—on the progress of bills through the legislative process (Box-Steffensmeier, Christenson, and Craig, 2013) and on the duration of executive nominations (Box-Steffensmeier, Christenson, and Ratliff, 2013). For organizations that have lobbied over several years, one can investigate the effect of their networks on their life spans (Box-Steffensmeier, Christenson, and Leavitt, 2015), as well as how different factors affect network formation and dissolution over time (Box-Steffensmeier and Christenson, 2015). In addition, scholars can divide the data into subsets to focus on types of groups and/or cases. Kawai and Iida (2011) examine whether having cross-cutting brokerage positions across different types of groups has an impact on the success of patent cases, while Box-Steffensmeier et al. (2016) focus on the networks of groups interested in environmental cases.

Delving into this network has also motivated the development of promising new measures and methodologies. Hansford (2012), for example, classifies relationships between groups as positive if they co-sign a brief and includes an obliquely derived negative tie between groups who sign ideologically opposing briefs in order to calculate a measure of ideological scores for Supreme Court cases over time. Relatedly, Christenson et al. (2015) offer an approach to measure the political ideology of each interest group based on the directions of their briefs. Moreover, the intricacies of the amicus network data have

inspired research on new methodologies that can be used to explore the network. As a response to the difficulties of detecting communities with these data, Peng et al. (2015) offer a flexible, group-corrected stochastic block model under a Bayesian framework. Likewise, the network has led to modifying the frequently employed ERGM to account for unobserved heterogeneity, which is both pervasive and damaging in these models. In particular, Box-Steffensmeier et al. (2014) have proposed a solution in the form of an ERGM that includes a frailty or random effect term.

Opportunities also exist for making use of amicus curiae briefs beyond the US Supreme Court. Amici interests may file briefs in federal circuit courts, districts courts, and state courts under certain conditions and at the judges' discretion (Gidiere, 2012).⁹ Indeed, recently attention has been paid to the US Court of Appeals, where amicus briefs have been shown to occur in great numbers (Collins and Martinek, 2010) and influence the decision-making of appeals court judges, contingent on a judge's ideology (Collins and Martinek, 2015). However, there is a relative dearth of scholarship on amicus coalitional activity in the lower courts. One exception is Gleason (2013), who argues that powerful state actors—specifically, state attorneys general—are able to mobilize their like-minded counterparts and engage in coalitional advocacy via amicus briefs before the Supreme Court. This suggests that the successful political efforts of state actors at the federal level might be replicable via amici activity at the state level.

Outside of the United States, the study of amici advocacy in civil and mixed-law systems is rare due to practical constraints; amici activity is a relatively recent phenomenon in nations outside of the British common law tradition. The gradual acceptance of amici participation in civil law systems in Europe is arguably a direct result of European Council regulations mandating that the court systems of all EU member states permit some amici access. This usually occurs in antitrust cases (see Kochevar, 2013); however, France began permitting formal amicus brief submissions in 1989 (Duncan, 1994), and the Israel Supreme Court accepted its first amicus brief in 1996 (Doron and Totry-Jubran, 2005). In addition, since 2000 Latin American courts—particularly in Argentina and Colombia—have ruled that they will allow amici to not only submit written briefs but also participate in oral arguments according to “fairly broad” protocols (Johnson and Amerasinghe, 2009).

The increasing legitimacy of amici participation in nationally based civil law courts has paved the way for third-party interests to advocate in international courts and adjudicatory bodies structurally modeled after civil law regimes (Johnson and Amerasinghe, 2009), galvanizing the political and social advocacy of nonstate actors (particularly nongovernmental organizations). Kochevar (2013) suggests that NGOs itching for policy influence pushed for the acceptance of amici participation in non-

common-law systems and built on domestic successes to increase amici advocacy before international courts. Third-party interests are permitted conditional representation before international courts and tribunals, such as the UN's International Court of Justice and the European Court of Human Rights (Bartholomeusz, 2005), while since the late 1990s the World Trade Organization's Dispute Panels and Appellate Body has permitted NGOs and global civil society organizations to submit formal briefs in trade disputes (Eckersley, 2007). In some instances, supranational organizations like the European Commission, in addition to NGOs, have been permitted to advocate as amici in investment arbitration disputes that occur through interstate trade-based institutions such as the International Centre for the Settlement of Investment Disputes (ICSID) and the North American Free Trade Agreement (NAFTA) (Levine, 2011). And as the practice of amici participation before international courts and tribunals increases, as trends suggest it will (Shelton, 1994; Ala'i, 2000; Hollis, 2002; Howse, 2003; Bartholomeusz, 2005; Eckersley, 2007), assessments of early-stage international amici networks will be able to provide insights into the social power of nonstate actors on the global stage, an area of global governance that remains understudied. In sum, there is great potential to use *amicus curiae* to better understand special interest behavior and political outcomes across various levels and countries.

Future Directions

A review of judicial networks highlights the progress made in this area of study and promising routes for future empirical and theoretical advancements. Within the citation networks literature, for example, identifying positive and negative citations will be crucial to advance the field. Likewise, a consideration of a myriad of alternative measures for prestige in the complex network of judges, clerks, and lawyers will likely to lead to advances. Amicus networks at any level of the courts offer exciting advances for both judicial and interest group scholars, but progress here will require greater attention to the context of the cases that organizations act on, as well as the frequency of cosigning.

More generally, further work comparing network configurations as well as the implications of particular actors within it is needed. Exploring whether alternative networks are more effective or better suited for the purpose of the individual nodes and/or the collective network, for example, deserves more scholarly attention. Empirically and theoretically examining the role of certain nodes in an egocentric network is also a promising route to better understanding various judicial networks. This agenda also blends with methodological advancements, namely the development of egocentric ERGMs. These models take potential covariates as predictors for whether or not a given

node belongs to a particular role or group (Krivitsky, Handcock and Morris, 2011; Salter-Townshend and Murphy, 2015). Frailty ERGMs (FERGMs) are also likely to be helpful to judicial scholars, as these models take into account unmeasured, unmeasurable, and unimagined covariates—which we take to be the rule, not the exception—in the formation of various judicial networks. In other words, the FERGM adds a random effect to relax the assumption of a perfectly specified model for the often used ERGM. This methodological advancement seems especially useful for human behavioral networks (Box-Steffensmeier et al., 2014). Another recent methodological advancement that holds promise for greater substantive understanding is longitudinal or dynamic network analysis, which allows scholars to examine the evolution of judicial networks over time. Thus, one can examine not just the formation, but also the dissolution of ties, as in temporal ERGMs (TERGMs) (Hanneke et al., 2010; Desmarais and Cranmer 2010, 2012; Leifeld et al. 2016) and separable temporal ERGMs (STERGMs) (Krivitsky and Handcock, 2014). Related advances in stochastic actor-oriented network dynamics allow researchers to test a variety of hypotheses on the influences of network change (Snijders, 2001, 2005; Snijders et al., 2010).

Jones (2008) urges judicial scholars to use complex systems and network analysis to “identify and understand individual human behaviors that result in dramatic human group behavior and use this understanding to optimally design institutions that constrain this behavior in ways that promise social welfare”—a lofty but critical goal. The judicial branch is replete with network data, and the works we have discussed here have already made invaluable contributions to our understanding of social, political, and economic behavior. Still, it should be clear that we have only scratched the surface, which makes it an exciting time to study judicial networks.

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Notes:

(¹) Betweenness centrality scores calculate the number of times a node appears on the shortest path between an edge and all other edges in a network. Nodes with high betweenness scores are the actors/entities that are crucial to maintaining overall network

connectivity; these are the nodes that indirectly connect non-associated clusters with one another.

(²) Relatedly, Christenson, and Glick (2015b) show that while the ACA decision had little to no effect on the public's support for general healthcare reform, it bumped up public opinion on the individual mandate provision.

(³) These actors include judges on the bench; litigants; and advocates, who make the arguments before the court and write and sign amicus briefs.

(⁴) Degree centrality scores, unlike eigenvector centrality, are not weighted according to the quality of ties.

(⁵) An outdegree score simply measures the number of connections coming from a node.

(⁶) Closeness centrality is calculated as the sum of the distance—the length of the shortest path from one node in the network to another—of one node to all other nodes, distinguishing closeness measures from betweenness, which accounts for the number of times a node appears on the shortest path between two other nodes. See Freeman (1979).

(⁷) For a brief bipartite exploration of these data, see the appendix in Box-Steffensmeier and Christenson (2014).

(⁸) Gibson (1997) was among the first to compile systematic data on amicus participation, but there was a lot of research on amicus briefs prior to that time; inclusion of the amicus data in the database reflected the long-standing interest in amici.

(⁹) Even the Supreme Court has rules about who can file amicus briefs, though in practice almost nobody gets barred.

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