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Small-Group Dynamics, Ideology, and Decision Making on the US Courts of Appeals

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There is some evidence that judges who specialize in particular legal areas vote in more ideologically consistent ways than do nonspecialists. Upon replicating those individual results across multiple legal areas in the US courts of appeals, we assess how this increasing reliance on ideology by specialists affects decision making by others on a three-judge panel. We find that judges who serve with a specialist are especially likely to vote in a manner consistent with the ideological position of the specialist with whom they serve. These results suggest that specialization has the potential to facilitate panel effects across numerous legal policy areas.

> The extent to which people specialize within organizations is a dimension or attribute of organizational structure, and like other structural attributes it can shape what those organizations do.
>
> —Baum (2011, 4)

The psychology of small-group decision making is well understood. Yet, as Martinek (2010) has noted, such theories have not been widely applied to investigations of decision making in courts. This is curious, because these theories fit well with the nature of the task that most appellate courts face. Levine and Moreland (1994) define a small group as a collection of individuals who interact regularly, share a common frame of reference, and are behaviorally interdependent. Judges on appellate courts readily meet these criteria (Martinek 2010). Here we apply insights from psychology and theories of small-group decision making in an effort to understand an important question: to what extent do the characteristics of judges alter the decision making of copanelists on the US courts of appeals and, ultimately, the policy outputs of those courts? This question has potentially wide-ranging implications for understanding decision making within collegial courts as well as within other small groups that contribute to policy formation, such as congressional committees, agencies, or juries where members may have varying levels of expertise depending on the subject under consideration (e.g., Frey, Schultz-Hardt, and Stahlberg 1996).

Specifically, we isolate one potentially salient individual characteristic—subject matter specialization—and seek to determine the effects of this characteristic on decision making in the US courts of appeals. Evidence from specialized courts (Miller and Curry 2009) and, in one particular issue area, from the courts of appeals more generally (Curry and

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Miller 2015) suggests that judges who are specialists will be more ideological than those who are not. Therefore, as a preliminary matter, we seek to confirm this finding across multiple issue areas in courts of general jurisdiction. Our more important question centers on the extent to which enhanced ideological decision making by specialists affects decision making by nonspecialists who serve on panels with a specialist. As we note below, small-group theory suggests that such a spillover effect is possible; demonstrating the existence of such an effect among appellate judges—and, to the extent possible, making inferences about the mechanisms by which those panel effects occur—highlights the importance of understanding how specialization, not to mention other background characteristics, influences decision making. This focus on small-group decision making may initially strike readers as unorthodox, given that our study's dependent variable is the individual vote choice. In reality, however, with this emphasis on group dynamics we seek to elucidate a more individual-level objective: we aim to shed additional light on the circumstances that may serve to condition the influence of ideology on a judge's decision making.

We examine judicial specialization—captured by specialization in opinion authorship—as it pertains to published and unpublished cases involving antitrust litigation, environmental law, securities litigation, and search-and-seizure matters across all federal circuit courts in order to investigate the circumstances under which specialization may alter the dynamics of small-group decision making and, thus, judicial outcomes. We begin by discussing the empirical literature on judicial specialization. Then we provide an overview of relevant scholarship on small-group decision making and judicial panel effects, describe the four areas of law we examine, and present hypotheses that consider the relevance of opinion specialization and ideology to decision making. We then discuss measurement and modeling issues, as well as our data collection strategy, before presenting our results. Those results lead us to conclude that opinion specialists are more ideological than their nonspecialist peers and that judges who serve with a specialist are particularly likely to adopt the ideological position of the specialist with whom they serve. Further, and consistent with research on small-group decision making that we outline below, a series of auxiliary analyses leads us to conclude that these effects are not likely the result of a simple exchange of votes within the panel and may be driven by an exchange of information. We conclude by assessing the potential implications of these results, speculating about the broader consequences of judicial specialization, and proposing several directions for future research.

THE LANDSCAPE OF JUDICIAL SPECIALIZATION

In order to establish a theoretical foundation for our expectation that specialists will be more ideological in their decision making than their nonspecialist counterparts and to highlight potential mechanisms by which specialists may influence their nonspecialist colleagues, we turn to the emerging literature on the effects of specialization and expertise in judicial decision making. Although ideology's influence on judicial decision making is well established in many contexts (Hettinger, Lindquist, and Martinek 2004; Segal and Spaeth 2002; Goldman 1975; Goldman 1966), relatively few studies have investigated its relationship to judicial choice in conjunction with specialization in particular subject matters (Miller and Curry 2009; Unah 1998; Hansen, Johnson, and Unah 1995; see Baum 1977). To the extent that such forays have been made, they have centered on the idea that specialization may be especially relevant to ideology's influence within difficult or technical areas of law. Extant scholarship has suggested that such a relationship likely derives in part from an enhanced capacity of specialists to apply ideological principles in certain types of situations, because in such instances these specialists are particularly motivated

and well equipped to impose their ideological worldviews (Miller and Curry 2009; see also Posavac, Sanbonmatsu, and Fazio 1997).

Indeed, aspects of individual judicial specialization have been found to amplify ideological decision making in limited instances (e.g., Miller and Curry 2009). Collins (2008) has noted that ideologically driven behavior is particularly prone to occur when judges view cases as being salient, and it seems probable to us that legal specialization could operate to make cases salient for specialists that typical nonspecialists might well view as being more esoteric (McAtee and McGuire 2007; Unah and Hancock 2006). Importantly, psychological research dovetails with the above findings, insofar as domain-specific expertise has been found to enhance attitudinal consistency (Judd and Downing 1990; Krosnick 1990; McGraw and Pinney 1990). Cognitive psychology posits two mechanisms of information processing. One, frequently referred to as System 1, is quick, associative, and "based on low-effort heuristics" (Chaiken and Trope 1999, ix; see also Chaiken, Liberman, and Eagly 1989); by contrast, so-called System 2 processes are slower, more logical, rule-based, and effortful (Kahneman 2011; Stanovich and West 2000). Importantly, a growing body of psychological research indicates that the systematic processing that characterizes System 2 mechanisms is especially likely to accentuate ideological decision making.[1] As one group of scholars has put it, "If ideologically motivated reasoning is expressively rational, then we should expect those individuals who display the highest reasoning capacities to be the ones most powerfully impelled to engage in it" (Kahan et al. 2013, 28). Bearing in mind scholarship, discussed below, that concludes that judges also utilize these two modes of information processing (Guthrie, Rachlinski, and Wistrich 2007), this assessment becomes even more sensible if one conceives of specialization's influence on judicial decision making as primarily related to motivation. As has been generally noted elsewhere (e.g., Miller and Curry 2013; Miller and Curry 2009; Krosnick 1990; McGraw and Pinney 1990), specialists tend to be better able and more highly motivated to process information systematically than nonspecialists. "Increases in level[s] of motivation are associated with a greater likelihood of systematic [System 2] processing" (Chen, Duckworth, and Chaiken 1999, 47), and, as noted above, scholars have found the utilization of such processing to be affiliated with ideologically motivated reasoning. Therefore, if judicial specialization enhances one's motivation to engage in higher-level or System 2 information processing, it may simultaneously work to accentuate ideological decision making in certain circumstances.

With regard to opinion specialization in particular, it has been suggested that, analogous to scholarship on congressional committee outliers (see Maltzman 1997; Gilligan and Krehbiel 1995; Londregan and Snyder 1995; Maltzman and Smith 1995), nonspecialists allow opinion specialists to speak for the panel due to their greater facility in a particular area of law. In order to compensate these specialists for investing their time and energy in that legal area, nonspecialists on the panel may acquiesce to more ideological opinions than they otherwise would (Curry and Miller 2015). Indeed, ceding a measure of influence to specialists in this way would carry with it particular institutional advantages. Specialists may be positioned to write higher-quality judicial opinions that reduce policy uncertainty. They may also encounter less difficulty in synthesizing the legal and factual intricacies inherent in the resolution of a case. Considerations of this sort should make nonspecialists especially willing to cede some measure of their influence to their specialist colleagues, as we explore below.

SMALL-GROUP DECISION MAKING AND THE FEDERAL APPELLATE COURTS

Judges on the US courts of appeals engage in small-group decision making (Martinek 2010). Studies demonstrating the existence of panel effects in the courts of appeals (e.g.,

Kastellec 2013; Boyd, Epstein, and Martin 2010; Farhang and Wawro 2004) indicate as much, though these extant studies have not tended to frame their findings within the specific context of small-group theory. Of particular relevance to our purposes, scholarship pertaining to group decision making and performance indicates that the influence of member expertise on group decisions can be contingent upon several factors (Bonner, Baumann, and Dalal 2002). Organizational perspectives on decision making have also found that knowledge about the expertise of group members can have implications for decision-making performance, particularly in terms of altering the motivations of other group members (Stroebe, Diehl, and Abakoumkin 1996). In other words, "group members' knowledge of who knows what influences decision-making performance because it affects their understanding of the task" at hand (van Ginkel and van Knippenberg 2009, 218). More specifically, these authors have shown that knowledge about group member specialization leads other group members to place greater emphasis on information elaboration; that is, awareness that a particular group member possesses a measure of expertise "changes group members' understanding of the task to an understanding that puts the exchange and integration of information center-stage" (ibid., 219).

Although the psychological and organizational conclusions noted above were not developed with judges specifically in mind, there is reason to believe that such findings are broadly applicable to them. As a general matter, of course, a number of scholars have suggested that many psychological theories are applicable to judicial behavior (e.g., Klein and Mitchell 2010; Baum 2006; Braman 2006). Guthrie, Rachlinski, and Wistrich (2002, 50) put it this way in discussing the susceptibility of judges to the same cognitive processes that ordinary people routinely utilize: "Judges, it seems, are human. They appear to fall prey to the same cognitive illusions that psychologists have identified among lay persons and other professionals." Elsewhere, these authors make the more specific point that judges, like all people, process information through a combination of intuitive (or System 1) and deliberative (or System 2) processes (Guthrie, Rachlinski, and Wistrich 2007). As we see it, such conclusions represent compelling evidence that the processes underlying judicial cognition are not *sui generis* and that theories of small-group behavior have a good deal of applicability to judicial behavior.

In our view, much of this scholarship pertaining to specialization's influence in small-group decision making is also consistent with what Epstein, Landes, and Posner (2013; see also Posner 1993) have termed the *judicial utility function*. In fact, this theory is itself predicated on the notion that the motivations and preferences of judges are not so different from those of laypersons. Simply put, this complementary theoretical perspective holds that judges, like all individuals, exhibit self-interested behavior in a labor-market setting that requires them to balance multiple goals and considerations (Epstein, Landes, and Posner 2013). Treating judges as economic actors, Epstein and her colleagues identify the preference for leisure, or "effort aversion," as an important feature of a rational federal judge's calculus. This notion of effort aversion might be manifested by a judge laboring under a particularly heavy workload who eschews authoring a dissent. Alternatively, two Democratic panel judges could accede to the strong views of their Republican colleague because they prioritize avoiding the effort that would be needed to counter that Republican's dissent ahead of their preferences about the case outcome (ibid.). Bluntly stated, rational judges will generally do whatever possible to minimize their cognitive effort and maximize their leisure (Bainbridge and Gulati 2002; Langevoort 2002).

Such effort aversion might be an alternative or additional reason for the increased influence of specialists. All else being equal, the most straightforward path to minimizing one's effort in the presence of an opinion specialist would be for the specialist judge to take a disproportionate role in resolving those decisions in her area of specialization—and for

her nonspecialist colleagues to ratify that work. On this account, just as avoiding dissent might represent an instance of effort aversion, so too might deference by nonspecialists to the views of specialists on the panel. Such a perspective complements the psychological and organizational findings above by underscoring the relevance of context to the values and considerations that motivate appellate judges (e.g, Lindquist, Martinek, and Hettinger 2007).

Indeed, we suspect that the specialist's presence effectively *changes* the small-group context in which decision making occurs by altering the task representations of nonspecialists—that is, the presence of a specialist changes nonspecialists' understandings of the decision-making task at hand and their respective role in it (van Ginkel and Van Knippenberg 2008). Recalibration of those task representations by other group members is thought to result, in turn, from distribution knowledge, or information about which group members possess what information. Ultimately, this knowledge of group expertise and the changes in task representation it facilitates have been found to elevate the role of informational exchange within the group or panel (van Ginkel and van Knippenberg 2009). As Stasser, Stewart, and Wittenbaum's (1995) experimental study reports, groups in which members were aware of individual expertise were more likely to exchange more unique information—and make better decisions—than groups in which there was no such awareness of member specialization. Such outcomes are particularly likely when groups work together repeatedly as appellate judges do, because that repeated interaction fosters the development of transactive memory or shared memory schemes (Wegner 1987; Wegner, Giuliano, and Hertel 1985).

Earlier, we raised the possibility of nonspecialists offering specialists a side payment for their specialization, conceiving of that side payment as the ceding of additional influence to specialists as a form of compensation for their careful attention to a particular area of law. Farhang and Wawro (2004), Boyd, Epstein, and Martin (2010), and Kastellec (2013) all investigate panel effects (concerning the inclusion of women or minorities on appellate panels) and speculate on the underlying causal mechanisms for the effects they observe. Farhang and Wawro's (2004) examination of employment discrimination cases suggests that there are two potential explanations: (1) suppressed dissent (driven by workload, coercive consensus, or some sort of organizational loyalty); or (2) modification of content (based either on a convincing argument from a colleague or on logrolling across cases). Boyd, Epstein, and Martin (2010) and Kastellec (2013) approach the issue in a similar fashion in considering sex discrimination and affirmative action cases, respectively. Notably, Hinkle (2014) has tested these theories of deliberation and dissent aversion, incorporating the unique role of the opinion author in her analysis in order to distinguish between these potential sources of panel effects. She concludes that panel effects are largely driven by deference to the authoring judge; upon presenting our main results, we consider this idea of author deference by undertaking a supplementary analysis to capture the potential for specialists to remain influential even when they are not assigned to author an opinion. We also note that, in contrast to prior studies that have discerned panel effects stemming from characteristics such as the presence of women on panels in sex discrimination cases (Boyd, Epstein, and Martin 2010) or the inclusion of African Americans on panels weighing affirmative action (Kastellec 2013), specialization's potential to foster panel effects is not specific to a particular legal area.

We cannot precisely delineate the various possible causal explanations because our data is observational. However, we believe that it is unlikely that the effects of specialization on a specialist's copanelists derive from the specialist's mere physical presence, given the nature of the characteristic we are studying. In other words, unlike race or sex, which are descriptive traits and thus often readily observable to all by their mere presence, specialization is an intellectual trait that may be less outwardly visible and therefore is

especially likely to exert its effects in tandem with group-based exchanges of information. Furthermore, we will present robustness checks suggesting that an exchange of information, as opposed to a simple exchange of votes, helps explain why copanelists serving with a specialist gravitate toward the specialist's position. We do this by undertaking a supplementary analysis, one that reestimates our model with a focus on whether the copanelist is the author of the opinion, in an attempt to account for authorship and vote exchange as explanations for our findings.

Before moving to our research design, we reiterate that our overriding objective is to assess the influence that a specialist's inclusion on a panel may exert on her colleagues. However, we begin by testing whether specialists in our data do, in fact, engage in enhanced levels of ideological decision making as compared to nonspecialists. Other studies of panel effects have had the advantage of knowing how, ideologically, the characteristic they seek to investigate will affect decision making.[2] We must establish empirically the behavior we expect to observe from specialists because extant evidence on this score has been quite limited; without doing so, we cannot say a priori that specialists are, in fact, more ideological than their counterparts. The nascent literature on this topic does provide an indication that specialists should be more ideological, meaning that liberal or conservative specialists should be more liberal or conservative, respectively, within their areas of specialization than their nonspecialist counterparts (Curry and Miller 2015; Miller and Curry 2009). Establishing the effects of opinion specialization on specialists themselves is a necessary first step to determining whether—and how—specialists may influence the decisions of fellow panelists.

HYPOTHESES, DATA, AND VARIABLES

With these considerations in mind, we chose to examine the influence of specialization on decision making in antitrust, environmental, search-and-seizure, and securities regulation cases. We selected cases from these areas both to enhance the generalizability of any potential findings as well as to provide a diverse numerical, geographic, and caseload-related cross-section of specialists as identified by Cheng (2008). We began with the categories of specialization created by Cheng and eliminated those legal areas where specialization was limited to judges on one or two circuits (e.g., insurance), where only one or two judges in the nation had such specialization (e.g., tax, ERISA), or both (e.g., state statute constitutionality). We then sought to assemble a database that reflected a degree of variation in terms of caseload pressures and subject matter. After completing this process, we concluded that the four areas we selected provided the greatest possible variation in terms of such factors as geography, subject matter, and caseload pressures. Though any such choice of legal areas is necessarily debatable and may be viewed as a potential limitation to a study such as ours, we are confident that our data offer a sufficiently diverse backdrop against which to assess possible relationships between opinion specialization, ideology, deliberation, and judicial decision making. We use these data to assess the following expectations:

> **Hypothesis 1 (Specialist Judges)**: Specialists will vote in a more ideologically consistent manner than will nonspecialists.
>
> **Hypothesis 2 (Informational Panel Effects)**: Judges serving on a panel with a specialist will tend to vote more closely in accord with the ideological proclivities of that specialist as opposed to the proclivities of nonspecialists.

To assess these hypotheses, we gathered data on each area of law from comprehensive searches in LexisNexis. We began our data collection in 1995 and carried it through 2005

Table 1. Descriptive Statistics

Variable	Mean	Std. Dev.	Min.	Max.
Liberal Vote	0.32	0.47	0	1
Opinion Specialization	0.06	0.24	0	1
Conservatism	0.05	0.36	−0.65	0.67
Opinion Spec. * Conservatism	0.00	0.09	−0.59	0.57
Experience	13.96	8.94	0	45
Judge-Serves-with-Specialist	1.01	0.34	0	2
Panel Conservatism	0.05	0.27	−0.53	0.58
Overall Caseload per Judge	23.80	10.70	6.39	62.29
Memorandum Opinion	0.18	0.39	0	1
Supreme Court Conservatism	0.64	0.42	0.13	1.64
Circuit Percent Democratic	0.45	0.16	0.07	0.83
Lower Court Liberal	0.23	0.42	0	1
Case Factor	0.00	1.00	−2.73	2.53
Complexity Factor	−0.01	0.99	−1.53	6.93
Amicus	0.14	0.34	0	1

to fit with Cheng's (2008) measure of opinion specialization, which we discuss below.[3] Specifically, we collected data on search-and-seizure cases from 1995 through 2006, gathering an additional year of data to ensure that these results were not endogenous to the procedure used by Cheng to measure specialization. For antitrust, environmental, and securities cases, we collected data from 1995 to 2012 to ensure that we had enough cases both to isolate the potential effects of specialization in these issue areas with somewhat smaller caseloads and to estimate post-2005 models in order to exclude the possibility of endogeneity. For the search-and-seizure cases, we randomly sampled the available decisions between 1995 and 2005, collecting 10 percent of the decisions; we also collected all of the opinions from 2006 in order to test our models out of sample. For the remaining issue areas, we selected a random sample of cases from 1995 to 2012. All models presented are robust to the exclusion of any particular year of data. Table 1 includes descriptive statistics for the included variables.

Our dependent variable is whether the judge voted in a liberal direction, where our characterization of a liberal decision is taken from traditional (i.e., Spaeth et al. 2013) thinking about liberal and conservative outcomes. In antitrust cases, we characterize liberal decisions as those in which a judge votes to break a monopoly; for defenses of this characterization, see Curry and Miller (2015) and Landes and Posner (2003). In environmental cases we counted liberal decisions as those that favored more environmental regulation (e.g., Revesz 1990), and in cases where criminal environmental liability was alleged, we counted as liberal those cases in which the court upheld a conviction against those accused of environmental crimes.[4] In the bulk of the securities cases contained in our data set, individual investors (as stand-alone plaintiffs or in class-action suits) or the Securities and Exchange Commission itself are pitted against corporate defendants accused of providing something less than full and complete disclosure. Votes in these cases were considered liberal when a judge voted in favor of greater regulation or oversight (Spaeth et al. 2013). In search-and-seizure cases a liberal decision is one in favor of finding a Fourth Amendment violation, as is consistent with the well-established literature in this area (e.g., Scherer 2005; Segal 1984, 1986).[5]

Three independent variables are of primary theoretical interest. First, as referenced above, we utilize Cheng's (2008) measure of **opinion specialization** in all four areas of law.[6] Although the Appendix contains more information on who is characterized as an opinion

specialist in which area(s) of law, some brief discussion of the measure is warranted. Cheng utilizes a technique known as median polish to determine whether the observed frequency with which a judge writes an opinion differs in a statistically significant way from what we would expect to observe given random opinion assignment.[7] We know from simple observation how frequently a judge writes in a particular area of law, but we need to know how often we would expect them to write in that issue area given random assignment. This is what the median polish measures: expected opinions. From these measures of median polish, Cheng generates a measure of the residual, or the difference in expected versus observed opinions, which is detailed in endnote 8. That residual measure is continuous and can include both positive and negative specialization, where negative specialization indicates that a judge writes significantly fewer opinions than random assignment suggests. Cheng characterizes judges as specialists if they have a standardized residual above 3 or below -3. We take his definition and utilize a dichotomous variable characterizing those judges who have residuals above 3 in a given issue area as specialists in that area.[8] We count negative opinion specialists as being like any other nonspecialist judge, although our results are robust to including them as negative opinion specialists as well (and only search-and-seizure cases have negative specialists).[9]

Our measure of ideology, **conservatism**, uses the method first described by Giles, Hettinger, and Peppers (2001), with higher scores representing a more conservative judicial ideology. Theoretically the scores range between -1 and 1. We interact the conservatism and opinion specialist (**opinion spec. * conservatism**) measures to capture the effect of opinion specialization on the likelihood that an opinion specialist votes in a manner influenced by her ideology as compared to a nonspecialist. We use this interaction to test Hypothesis 1 and expect the effect will be negative and statistically significant (e.g., Brambor, Clark, and Golder 2006).

In addition, we include a measure that we call **judge-serves-with-specialist**, which is measured as follows: if the judge whose vote we measure served with an opinion specialist who is liberal (having a conservatism score below 0), then we set the variable equal to 0. If the judge whose vote we measure did not serve with an opinion specialist, then we set the variable equal to one. If the judge whose vote we measure served with an opinion specialist who is conservative (having a conservatism score above 0), then we set the variable equal to 2. We use this variable to test Hypothesis 2. If nonspecialists serving with a specialist tend to vote with the specialist, then this variable should be negative and statistically significant. Note that to accurately test Hypothesis 2, we exclude opinion specialist votes from the model in which the judge-serves-with-specialist variable is included. We do this because including opinion specialists in the model contaminates what we are seeking to isolate: how the presence of a specialist alters the voting of a nonspecialist on the same panel.

Finally, with respect to individual judges, we include a measure of **experience**, which is simply a count of the number of years the judge has been on the bench when the case is heard. Our assumption is that over time a judge will hear approximately equal numbers of each case type per year, given the norm of random assignment to panels. Previous studies (Miller and Curry 2009) have found that experience has no effect on the consistency of ideological voting in technical cases, and we do not expect it to matter here once ideology is separately controlled for in our models. In addition, we include a control variable that measures the ideology of a judge's copanelists that we term **panel ideology**, which is the average ideology score of the judge's two copanelists.

To account for the potential of workloads to alter the effect of specialization on decision making, we include **overall caseload per judge**, which measures the total number of cases arising per circuit in a given year divided by the number of active judges on a circuit.

Memorandum opinion is coded 1 if the decision is based on a short, unsigned opinion and 0 otherwise. Because memorandum opinions tend to be used in cases where the lower court is affirmed and because most of the cases in each area of law are decided in a conservative direction at the district court level, we expect this variable to have a negative effect on the likelihood of a liberal vote. We include two control variables to capture the potential intersection of hierarchical control and panel decision making (e.g., Collins and Martinek 2015; Hettinger, Lindquist, and Martinek 2006). First, we include a measure of the ideological composition of the circuit, called **circuit percent Democratic**, which is simply the ratio of active Democrats to active Republicans on a circuit in a given year. Second, to account for the (remote) possibility of Supreme Court review of any given decision, we include a measure of the Supreme Court's ideology, which we call **Supreme Court conservatism**. In addition, we include an indicator of the direction of the decision of the lower court (**lower court liberal**), which we expect to be positively signed. We include two factor scores, one to summarize measures of the case facts and one to summarize case complexity. The factor score for **case facts** is structured so that higher values should lead to a higher likelihood of a liberal vote; this is explored more fully in the Appendix. The **complexity factor** is composed of the following elements: (1) whether the case is published (Wasby 2004); (2) the number of pages in the opinion (Maltzman, Spriggs, and Wahlbeck 2000); and (3) the number of legal issues present in the case (ibid.). The complexity factor score is structured so that higher scores reflect more complex decisions (i.e., decisions that are published, have more pages, and include more legal issues). All else being equal, we would expect more complex decisions to be reversed on appeal with greater frequency than less complex ones because, in effect, the more complex a case the likelier the trial court is to have decided it erroneously. Though this expectation is straightforward, our models cannot capture it directly because our dependent variable measures ideological direction as opposed to reversal. Keep in mind, however, that 77 percent of all lower court decisions in our data are decided in a conservative direction (see Table 1). On balance, then, liberal appellate decisions are disproportionately likely to be reversals, and conservative appellate decisions are typically affirmances. This asymmetry should translate indirectly into a positive relationship between case complexity and our dependent variable, liberal decision making.

To control for the salience of a case, we include an indicator variable, **amicus**, which is equal to 1 if at least one amicus brief is present in the case and 0 otherwise.[10] To be sure, amicus curiae participation in the courts of appeals is rare (Martinek 2006). However, as Hettinger, Lindquist, and Martinek (2006, 58; see also Collins and Martinek 2015) have observed, "[t]he very infrequency of amicus curiae participation in the circuit courts... makes it a particularly apt measure of salience."[11]

ANALYSIS

Given the dichotomous nature of our dependent variable, we estimate two logit models. The models in Table 2 fit the data well, with areas under the Receiver Operating Curve (ROC) above 0.70, percent reductions of error of 26 percent and 27 percent, respectively, and statistically significant Wald χ^2 statistics. The models reported below contain fixed effects for each circuit to control for any circuit-level idiosyncrasies as well as a cubic spline to control for change over time. The number of knots is determined by the data (Beck, Katz, and Tucker 1998), though we treat these as nuisance parameters and do not display them. The standard errors are clustered by case,[12] and 2,595 total cases are present

Table 2. Regression Models

DV: Liberal Vote	Model 1	Model 2
Judge characteristics		
Opinion specialization (∼)	−0.27 (.13)*	—
Conservatism (−)	−0.50 (.09)*	−0.50 (.09)*
Opinion spec. * conservatism (−)	−0.84 (.37)*	—
Experience (∼)	−0.00 (.00)	−0.00 (.00)
Panel characteristics		
Judge-serves-with-specialist (−)	—	−0.46 (.13)*
Panel conservatism (−)	−0.49 (.16)*	−0.36 (.17)*
Overall caseload per judge (∼)	−0.01 (.01)	−0.01 (.01)
Controls		
Memorandum opinion (−)	−0.32 (.15)*	−0.33 (.15)*
Supreme Court conservatism (∼)	−1.01 (.64)	−1.03 (.65)
Circuit percent democratic (∼)	0.66 (.72)	0.66 (.73)
Lower court liberal (+)	1.94 (.11)*	1.96 (.11)*
Case factor (+)	0.18 (.05)*	0.17 (.05)*
Complexity factor (+)	0.35 (.05)*	0.34 (.05)*
Amicus (∼)	0.18 (.14)	0.18 (.14)
N	7768	7301
Clusters	2595	2595
Wald χ^2	559.93 ($p = 0.000$)	568.24 ($p = 0.000$)
Area under ROC	0.79	0.80
PRE	0.26	0.27

* coefficients are significant at $p < 0.05$ (two-tailed). Standard errors are clustered by case. Constants, fixed effects, and cubic splines are not displayed.

in the models. Aside from the different variables included in the two models, the number of observations also differs between them.

The variables of theoretical interest in Model 1 are opinion specialization, conservatism, and the interaction of opinion specialization and conservatism. The significant and negatively signed interaction term shown in Table 2 is preliminary evidence for the idea that opinion specialists are more ideological in their decision making.[13] As Table 2 shows, the interaction term is significant and negatively signed. The effect of opinion specialization on the reliance on ideology is substantial. Adjusting the conservatism of a nonspecialist judge from the tenth percentile (a very liberal judge) to the ninetieth percentile (a very conservative judge) decreases the likelihood of a liberal vote by 8 [-8, -8] percentage points (95 percent confidence intervals are represented throughout by brackets). Alternatively, adjusting conservatism in the same manner for a specialist judge decreases the likelihood of a liberal vote by 19 [-19, -18] percentage points, meaning that opinion specialists are about twice as ideological in their decision making as are nonspecialists.[14]

A number of additional variables are also significant in Model 1. First, as we would expect, independent of the effects of opinion specialization and a judge's own ideology, the ideological conservatism of the other judges on the panel (panel conservatism) is a strong predictor of the likelihood of a liberal vote. Across the range of conservatism there is an 8 [-13, -3] percentage point decrease in the probability of a liberal vote. Four additional control variables are significant predictors. First, if the panel used a memorandum opinion to decide the case, then their decision is likely to be conservative; when a memorandum opinion is utilized, the likelihood of a liberal decision decreases by 5 [-10, -1] percentage points. This is largely because most lower court decisions in our data are conservative, and memorandum opinions are more likely to be used to simply affirm the lower court. Similarly, as with most intermediate appellate court data, there is a strong

tendency in our sample to affirm the lower court, meaning that the district court's decision is a strong predictor of the outcome at the appellate level. Here our indicator variable for whether the lower court's decision is liberal, which is positive and statistically significant, is an excellent predictor of the panel's decision. When the lower court's decision is liberal, the likelihood of a liberal vote increases by 32 [32, 35] percentage points.

The two factor scores, the case facts factor and the complexity factor, are both significant and in the predicted direction. Recall that the case facts factor is measured so that each relevant case fact for a specific issue area ought to contribute to the likelihood of a liberal vote. Therefore, it is not surprising that the variable is positive. Although the scale of the case fact factor score is not inherently meaningful, we can get a sense of the aggregate effect of case facts by looking at the score's percentiles, with higher percentiles representing a set of case facts that ought to increase the likelihood of a liberal vote. Moving from the tenth percentile of the case facts factor to the ninetieth percentile increases the likelihood of a liberal vote by 8 [7, 8] percentage points. Similarly, the complexity factor measure is structured so that higher values should indicate that a case is more complex. We anticipated that more complex cases would be more likely to result in liberal decisions—this is tied to the fact that, as mentioned above, the majority of the cases in the data are decided by district courts in a conservative manner. Recall that the constituent parts of our complexity measure include whether the case was published, the number of issues present in a case, and the number of pages in a decision. When the appellate court reverses a lower court, we expect that more explanation is necessary (the number of pages), that the lower court is more likely to have been incorrect as legal complexity increases (the number of issues), and that reversals of lower court decisions are perhaps of greater precedential and explanatory value (and hence are more likely to be selected for publication). Therefore, the more complex the case, the more likely it is that the appellate court will reverse the lower court and thus render a liberal decision. This, in fact, is what we find: increasing complexity from the tenth to the ninetieth percentile increases the probability of a liberal vote by 15 [15, 16] percentage points.

Model 2 allows us to test Hypothesis 2.[15] Knowing that specialists are more ideological in their decision making, in Model 2 we investigate what effect this has on a specialist's copanelists. Since many of the control variables have the same effects in both Model 1 and Model 2, to avoid repetition we will focus only on the variable of theoretical interest from the perspective of Model 2: judge-serves-with-specialist. Figure 1 displays the effects for this categorical variable, which, given that its coefficient is negative and statistically significant, supports Hypothesis 2.[16] Given that we have shown that specialists are significantly more ideological in their decision making, we expect that this type of panel effect will manifest itself by leading nonspecialists serving on a panel with a specialist to vote in a manner more consistent with the specialist's ideological position. Figure 1 provides evidence of this effect—as before, 95 percent confidence intervals are represented by brackets. Service with a liberal specialist (defined as an opinion specialist with a conservatism score below 0) makes copanelists at all levels of ideology *more* likely to vote in a liberal direction than service on a panel with no specialist on it. Similarly, service with a conservative specialist makes copanelists at all levels of conservatism *less* likely to vote in a liberal direction than service on a panel without a conservative specialist on it. To put this in perspective, a judge at the tenth percentile of conservatism (i.e., a very liberal judge) is predicted to vote in a liberal direction with a likelihood of 0.45 [0.40, 0.50] of the time when serving with a liberal specialist, but will only vote liberally with a likelihood of 0.29 [0.24, 0.33] of the time when serving with a conservative specialist. Of course a judge's own

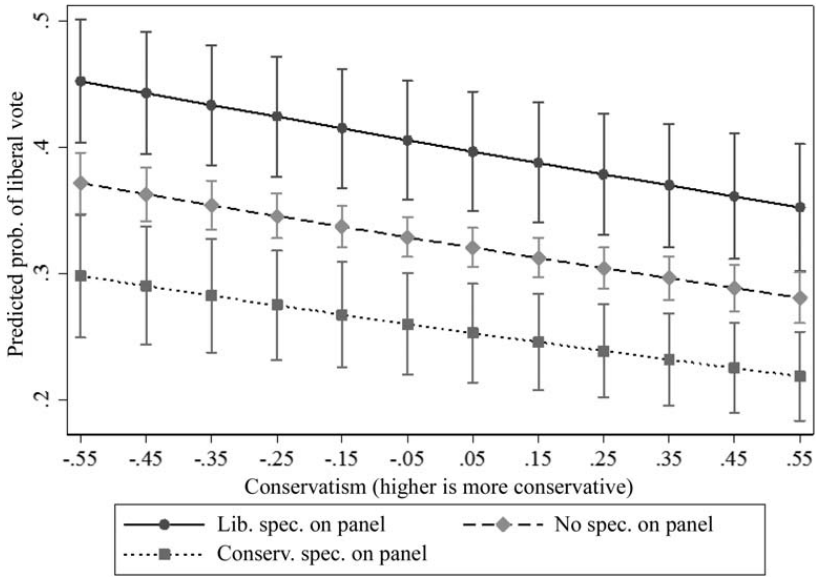

Figure 1. Effects of Service with Specialist on Deliberation.

ideology still matters, as evinced by the downward sloping lines in all three conditions—the effect of the specialist is shown by the shifted intercepts.

How much of the effect of an opinion specialist's presence on a panel is simply the result of adding an ideologically minded judge? In other words, what is the effect of adding a conservative (or liberal) specialist to a panel over and above adding a conservative (or liberal) to a panel who is not a specialist? Conservative panels without any specialist on them have a likelihood of voting liberally of 0.26 [0.23, 0.30]. Adding a liberal specialist in place of one of the conservative judges increases the likelihood of a liberal vote to 0.37 [0.31, 0.42], a 42 percent increase in the probability of a liberal vote. Conversely, liberal panels without any specialists on them have a likelihood of voting liberally of 0.39 [0.35, 0.43]. Adding a conservative specialist in place of one of the liberal judges decreases the likelihood of a liberal vote to 0.28 [0.23, 0.33], a 28 percent decrease in the probability of a liberal vote. Compare the effects of adding a specialist to adding a nonspecialist with the same ideological score. Adding a liberal nonspecialist to a conservative panel increases the likelihood of a liberal vote to 0.33 [0.31, 0.36], a 27 percent increase in the probability of a liberal vote. Effects are similarly sized, but oppositely signed, when a conservative nonspecialist is added to a liberal panel. In short, beyond simply changing the ideology of the panelist, adding a specialist increases the effects of the ideological proclivities of the added judge by approximately one third.

Nevertheless, there is more we can do to probe the nature of the effect uncovered in Figure 1. Recall that one concern of scholars who study panel effects is that such effects could simply be a byproduct of deference to the opinion author (e.g., Hinkle 2014; Farhang and Wawro 2004). To allay these concerns we undertake a supplemental analysis. If judges who specialize in writing opinions in a particular area of law are highly influential, it may simply be a byproduct of the fact that consensus and efficiency concerns tend to compel deference to opinion authors. So we reestimate the model with an additional variable, **opinion author**, which is simply a dichotomous variable that captures whether a judge wrote the opinion in a given case. In addition, because there is no clear opinion author in cases decided via memorandum opinions, we exclude those cases from the analysis. Table 3 and Figure 2 present the results of this analysis. We focus here only on the theoretically important results. We are asking a particularly difficult question about the role of opinion

Table 3. Supplementary Regression Analysis

DV: Liberal vote	**Model 3**
Judge characteristics	
Opinion author (∼)	−0.01 (.02)
Conservatism (−)	−0.53 (.09)**
Experience (∼)	−0.00 (.00)
Panel characteristics	
Judge-serves-with-specialist (−)	−0.40 (.13)**
Panel conservatism (−)	−0.33 (.18)*
Overall caseload per judge (∼)	0.00 (.01)
Controls	
Supreme Court conservatism (∼)	−0.81 (.67)
Circuit percent democratic (∼)	0.05 (.76)
Lower court liberal (+)	1.68 (.12)**
Case factor (+)	0.10 (.05)**
Complexity factor (+)	0.31 (.05)**
Amicus (∼)	0.24 (.14)*
N	5941
Clusters	2119
Wald χ^2	424.96 ($p = 0.000$)
Area under ROC	0.76
PRE	0.24

** coefficients are significant at $p < 0.05$ (two-tailed), * coefficients are significant at $p < 0.10$ (two-tailed). Standard errors are clustered by case. Constants, fixed effects, and cubic splines are not displayed.

specialists on panels: do they remain more influential when the judge they are seeking to influence is writing the opinion for the panel?

Focusing on Figure 2, which is a replication of Figure 1 using only judges who are opinion authors (1,885 observations in Model 3), there is a clear repetition of the pattern of behavior we uncovered in Model 2. Namely, even judges who are tasked with authoring an opinion tend to vote in a manner that is ideologically consistent with the ideology of the opinion specialist with whom they serve. Although there is some overlap in the 95 percent confidence intervals across the range of judicial ideology, which is not surprising

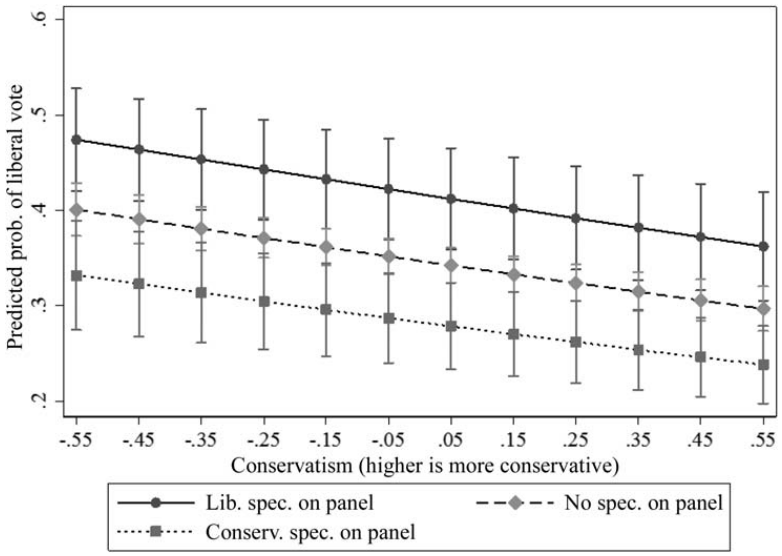

Figure 2. Effect of Opinion Specialist on Copanelist When Copanelist Is Opinion Author.

given the reduced *N*, the pattern is still quite clear. This, then, is strongly suggestive evidence that something other than the effect of simply being the opinion author is at play in the influence of opinion specialists.

DISCUSSION AND CONCLUSION

The goal of this study was to determine the circumstances under which specialization may have implications for judicial decision making. We found that specialization significantly amplified the ideological nature of decision making for judges on the US courts of appeals at the individual level. This in itself is a useful contribution, for it shows that specialization's ability to accentuate ideological decision making at the individual level extends beyond institutionally specialized courts and is not confined to esoteric issue areas. However, the study's more notable contribution stems from what we have shown about specialization's influence on other, nonspecialist judges at the panel level: judges serving with a specialist were especially likely to mimic the voting behavior of the specialist, and this finding held irrespective of the nonspecialist judge's own ideological predispositions.

This result with respect to panel effects for specialization is an important finding for several reasons. First, it serves to amplify the effect of specialization on decision making in the federal appellate courts. In our data, approximately 18 percent of the votes are by opinion specialists or those who are serving on a panel with one. If one fifth of the votes across a diverse set of cases are influenced by the specialization of a member of the panel, then this strikes us as an important and, to date, unexamined fact. Second, to our knowledge it represents the first time that a study of a judicial characteristic has established the existence of panel effects related to that particular characteristic that influence decision making across a number of legal areas. This is important because, while the topic of judicial specialization garners less publicity than more visible characteristics such as race or gender, our results suggest that specialization's effects on decision making in the small-group setting of the three-judge panel are at least as pervasive. We think this possibility underscores the importance of examining the potential relevance of panel effects to other manifestations of specialization beyond the realm of opinion authorship. In other words, it is conceivable that, while highly visible, opinion specialization may represent only one manifestation of specialization or expertise's influence on panel-level decision making in the courts of appeals. One other potential area of investigation is whether subject matter specialization, as opposed to opinion specialization, has similar effects.

The fact that our findings remained robust in our supplementary analysis sheds additional, if not conclusive, light on the causal mechanisms by which specialization may operate to influence panel-level decision making. It is clear that the panel effects we observe are not a mere byproduct of deference to the authoring judge—even in those instances where opinion specialists do not author a panel's opinion, they are still able to draw panelists, including the authoring judge, toward their ideological preferences. Thus, we are probably not observing an exchange of votes between judges (or log-rolling across cases). While this supplementary analysis eliminates one possible explanation for our findings, we believe, for a number of reasons, that additional evidence supports an informational mechanism. First, as noted in our discussion of small-group decision making, important experimental findings suggest that the specialist's effect on the nonspecialists with whom she works is rooted in the specialist's ability to alter nonspecialist task representations through the mechanism of distributional knowledge, which in turn elevates the role of informational exchange (van Ginkel and van Knippenberg 2008, 2009). Though they cannot definitively establish causality, our supplementary results—that even

authoring, nonspecialist judges migrate toward the ideological position of the specialist in their small group—are certainly consistent with the idea that the existence of expertise on these three-judge panels operates in such a manner (van Ginkel and van Knippenberg 2009). Second, unlike the other characteristics investigated by scholars studying panel effects, such as gender or race (e.g., Sommers 2006), opinion specialization is not a background characteristic that is likely to matter by its mere presence. Instead, specialization is more likely to matter in the (to scholars) mostly unobservable exchange that occurs as judges determine the outcome of a case.

Moving forward, it will be important to investigate the factors that may predispose particular judges to serve as opinion specialists in certain areas of law. Gaining leverage on the consequences of specialization is important, but it is also necessary to probe its causes. Part of this explanation may be due to the possession of certain background characteristics (e.g., Hettinger, Lindquist, and Martinek 2003, 2004; Songer, Sheehan, and Haire 1994) or the possession of prior substantive expertise or training in a particular area (Miller and Curry 2009, 2013), and we suspect that circuit court cultures may play some part in this explanation as well (Hettinger, Lindquist, and Martinek 2006; Solimine 2005).

In addition to assessing possible ideological effects, prior research on expertise's influence on decision making in the Court of Appeals for the Federal Circuit (Miller and Curry 2013) has found that specialists were significantly less likely to defer to decisions by the lower authority than were their nonspecialist counterparts—presumably because specialization leads judges to be more confident in their decision making and, thus, more assertive in challenging the conclusions of the lower court (Baum 2011). It strikes us as important to investigate the possibility that specialization might exert similar effects in a more generalist context as well; a corollary question could be whether the level of expertise possessed by a lower court affects the deference afforded by specialists, as opposed to nonspecialists, reviewing its decisions.

Finally, we think the results presented here suggest that small-group theories are likely to be applicable to a host of other politically relevant situations. As Robertson (1980, 164) has put it, "Small groups pervade all elements of the political process" (see also Stern and Sundelius 1994). Small-group theories have already been profitably applied in several areas, including jury (e.g., Devine et al. 2001) and foreign policy (Garrison 2010; Hart 1990) decision making, and they might also pertain to additional small-group situations of political importance (Gastil, Richards, and Knobloch 2014). One can imagine that the repeated interactions between legislative members on committees or subcommittees would constitute an amenable environment within which to apply small-group theoretical approaches. The same could be true for bureaucratic processes such as rule making or for aspects of interest group lobbying (e.g., Grasse and Heidbreder 2011). Given the effects we have uncovered in this article about specialization's role in structuring decision making, we are particularly intrigued by the possibility that scholars of politics and administration might build on our findings by undertaking similar projects in the context of city councils and nonprofit governing boards. Several studies have conceived of these policymaking environments as small groups. Moreover, since both municipal councils (Gabris and Nelson 2013; Nelson, Gabris, and Davis 2011) and nonprofit boards (Brown 2007; Olson 2000) consist of individuals with diverse levels of expertise, it would be valuable to know whether the presence of a subject matter specialist in such a context might affect decision making by nonspecialist council or board members.

NOTES

1. On the one hand, some have plausibly suggested that ideologically motivated cognition might be especially likely to result when individuals face complicated facts or evidence and thus rely

disproportionately on heuristic-based System 1 decision making in order to bring clarity to such difficult situations (Westen et al. 2006). However, a host of recent findings have challenged this perspective by showing that characteristics of System 2 processing tend to yield *more* ideological divisions (e.g., Kahan 2013; Kahan et al. 2013; Hamilton 2011; see also Chen, Duckworth, and Chaiken 1999). Kahan and his colleagues summarize the crux of these conclusions, noting that individuals "who enjoy above-average . . . comprehension will not face any less incentive to form [identity-congruent] beliefs; indeed, they will face pressure to *use* their intelligence and reasoning skills to find evidentiary support for identity-congruent beliefs the comprehension of which would likely exceed the capacity of most of their peers" (2013, 4).

2. Kastellec (2013) undertakes a similar analysis to demonstrate that African American judges are more liberal in their voting proclivities in affirmative action cases than are white judges. Here, the characteristic in which we are interested—opinion specialization—does not lead to a unidirectional expectation of more liberal (or conservative) positions. Instead we expect bidirectional convergence to the position of the specialist, be that liberal or conservative.
3. Cheng's measure represents an especially difficult test of our key hypotheses, given that it does not capture new specialists subsequent to 2005, meaning that a number of subsequent specialists will exist in the data that we do not capture with Cheng's measure.
4. In essence, in these cases we have coded the first dimension of the case. That is, what is the meaning of a conviction for pollution or a securities violation? Most observers would hold that convictions in these instances are actually proregulation and therefore liberal.
5. The following four cases from our data illustrate our dependent variable's coding. Although we coded the vote of each individual judge, in the interests of parsimony we describe unanimous cases here and focus on the nature of the overall case outcome: (1) An oil company filed an antitrust suit alleging a defendant's predatory pricing scheme eliminated competition among gasoline retailers in the Las Vegas market (Rebel Oil Company, Inc., et al. v Atlantic Richfield Company 1998). The Ninth Circuit panel ruled in favor of the defendant, and this was coded a conservative decision; (2) A shareholder sued a corporation and its directors, alleging that the corporation's proxy statement was materially misleading in violation of the Securities Exchange Act of 1934 (Resnik v Swartz et al. 2002). Because the Second Circuit panel ruled against the shareholder, this was coded a conservative decision; (3) An environmental organization sued a gas extraction company for violating the Clean Water Act by discharging a pollutant into a river (Northern Plains Resource Council v Fidelity Exploration and Development Company 2003). The Ninth Circuit panel found in favor of the environmental organization, an ideologically liberal decision; (4) The US government appealed a trial court decision suppressing methamphetamine evidence in drug conspiracy trials of two defendants (United States v Romero 2006). The Sixth Circuit panel reversed the trial court in a conservative decision that allowed the drug evidence to be admitted at trial.
6. This measure, like any other, has certain limitations. For example, it considers an environmental specialist to be equally adept at cases involving the Clean Air Act or the Endangered Species Act. In reality, an individual could specialize in one or more subcategories of environmental law to the exclusion of others. However, because our analysis uncovers significant effects for specialization even as it is conceptualized in this broader way, we are confident that, if they were available, more fine-grained measures would yield similar—indeed, probably more dramatic—effects.
7. See Cheng (2008) for an account of the rules and norms pertaining to random assignment of cases to panels on the US courts of appeals. With respect to the assignment of opinions within panels, though there are slight variations in practice between the circuits (see ibid.), the most senior active judge serving on the panel is typically responsible for assigning opinions within the panel. We acknowledge that opinion assignment within panels is unlikely to be perfectly random. At the same time, restricting the definition of *specialists* to those who fall *beyond* three standard deviations of what such randomness would predict sets the threshold for specialization quite high—and should make this operationalization a particularly tough test of our hypotheses.
8. Residuals here are Pearson standardized residuals, a "statistical measure for standardizing the differential between. . .observed and . . .expected opinions" (Cheng 2008, 533). The residuals are calculated as follows for each judge *i* and subject matter *j*: $r_{ij} = (n_{ij}-e_{ij})/(\sqrt{e_{ij}})$, where n_{ij} is the observed frequency and e_{ij} is the expected frequency determined via the median polish technique, and r_{ij} is the Pearson standardized residual. There is no inherent meaning to the median polish residual measures because there is no known distribution for them. In the absence of a

known distribution to compare against, Cheng uses simulations of the data to generate distributions against which to compare the actual data. According to Cheng (ibid., 571), median polish residuals of three have a mean false positive rate of 0.0057 using 10,000 simulations. This is obviously significantly lower than the standard of 0.05, making median polish residuals a conservative measure of the possibility of specialization.

9. This measure of specialization is issue specific, and we expect any effects of specialization to be confined to the particular legal area of specialization. Our coding of this variable reflects this framework—for instance, a judge who specializes in antitrust but not environmental cases is coded as a specialist when he adjudicates an antitrust case but is coded as a nonspecialist when he hears an environmental case.
10. Readers may wonder whether amicus briefs are significantly more likely to be filed in search-and-seizure cases than in other areas, given that some believe search cases to be generally salient. Across each of the four issue areas, cases with amicus briefs are distributed as follows: antitrust (32 percent), securities (14 percent), environmental (51 percent), and search and seizure (3 percent). Put differently, it is environmental cases that are most salient using amicus briefs as a measure, not search-and-seizure cases.
11. Unfortunately, the absence of significant media coverage of courts of appeals decisions makes it impossible to utilize other widely used measures of salience that scholars have employed to capture case salience before the US Supreme Court (e.g., Unah and Hancock 2006; Epstein and Segal 2000).
12. Our models are robust to the decision to cluster on judge instead of case, as all of the variables of theoretical interest remain statistically significant and their effects are substantively similar, regardless of the decision to cluster on case or on judge.
13. Because our operationalization of specialization is dichotomous, the constituent term for ideology in the model (termed conservatism) is a measure of the effect of ideology on nonspecialists (Brambor et al. 2006). Also of note, as an additional robustness check on our results, we separately estimated regressions for each of the four issue areas. Across issue areas the signs for most variables in the regression remain consistent and vary little with respect to statistical significance. For instance, the effect of judicial ideology is as we would expect (a negatively signed variable) and is statistically significant across all the individual issue models, and in securities the variable is negative but has a p-value of 0.24 (likely because we have the fewest securities observations among the issue areas). More importantly, in all of the issue areas the effect for the theoretically important interaction term is negative (as we would expect). In two of the issues areas (antitrust and securities) the interaction is also statistically significant at conventional levels (i.e., $p < 0.05$). In the other two issue areas the effect is not statistically significant at conventional levels, largely due to inflation of the standard errors due to the reduced N. Lastly, we wish to note the distribution of cases across each issue area. Environmental cases and search and seizure cases each make up 26 percent of the observations, antitrust cases are 28 percent of the observations, and securities cases are 20 percent of the data.
14. Our data do not allow us to assess how the presence of multiple specialists with differing ideological profiles might influence panel decision making. Although there are thirty-one cases in our data with two specialists on a panel, in twenty-four of those instances both specialists are conservative, and in the remaining seven, both are liberal. Surprisingly, there is not a single case in our data where a liberal and a conservative specialist serve together. Thus, the direction of the potential ideological influence on the nonspecialist is just as it would be if only one specialist were serving on the panel.
15. Recall that opinion specialists are excluded from the observations used in Model 2. This allows us to clarify the effects on nonspecialists.
16. It is worth noting that the effects of serving with a specialist are asymmetrical in our data: conservative specialists seem to have a greater pull on copanelists than do liberal specialists. A thorough assessment on why this is so pulls us outside the scope of the present article, but we can briefly note a potential explanation. It has been documented by others taking a cognitive approach to studying judicial behavior that effects are often more pronounced among conservative judges. For instance Collins and Martinek (2015, 269) posit that "the evidence suggests that conservatives tend to engage in less cognitively complex reasoning than liberals, among both the general public and political elites." This less complex cognitive processing of conservatives—though in no way normatively better or worse than more complex processing—tends to lead them to rely on decision making shortcuts. Furthermore, research suggests that these generalizations about the differences between the cognitive approaches of liberals and conservatives apply to judges as well.

Tetlock et al. (1985) have noted that Supreme Court justices who are conservative mirror the general pattern. And Collins and Martinek (2015) find a similar pattern in the reaction of liberal and conservative courts of appeals judges to amicus briefs.

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MEASUREMENT APPENDIX

MEASURING JUDICIAL SPECIALIZATION AND CASE COMPLEXITY

Table A1 lists the opinion specialists uncovered by Cheng's (2008) median polish approach.

Table A1. Opinion Specialists by Court and Issue Area

Name	Court	Area(s) of opinion specialization
Garland, Merrick	DC	Criminal
Randolph, A. Raymond	DC	Criminal
Rogers, Judith Ann Wilson	DC	Criminal
Boudin, Michael	1st	Antitrust
Torruella, Juan	1st	Environmental
Cabranes, Jose	2nd	Securities
Calabresi, Guido	2nd	Criminal
Newman, Jon	2nd	Criminal
Sack, Robert	2nd	Antitrust
Wesley, Richard	2nd	Criminal
Barry, Maryanne	3rd	Criminal
Fisher, D. Michael	3rd	Criminal
Mansmann, Carol Los	3rd	Securities
Rendell, Marjorie	3rd	Criminal
Scirica, Anthony	3rd	Criminal
Smith, D. Brooks	3rd	Securities
Van Antwerpen, Franklin	3rd	Criminal
Michael, M. Blaine	4th	Criminal
Wilkins, William	4th	Criminal
Wilkinson III, J. Harvie	4th	Criminal
Jolly, E. Grady	5th	Criminal
Reavley, Thomas	5th	Criminal
Brown, Bailey	6th	Criminal
Contie Jr., Leroy	6th	Criminal
Jones, Nathaniel	6th	Criminal
Kennedy, Cornelia	6th	Criminal
Moore, Karen	6th	Criminal
Norris, Alan	6th	Criminal; Environmental
Ryan, James	6th	Criminal
Bauer, William	7th	Criminal
Coffey, John	7th	Criminal
Easterbrook, Frank	7th	Antitrust; Criminal; Securities
Flaum, Joel	7th	Criminal
Kanne, Michael	7th	Criminal
Posner, Richard	7th	Antitrust; Criminal
Rovner, Ilana	7th	Criminal
Lay, Donald	8th	Antitrust
Loken, James	8th	Criminal
Magill, Frank	8th	Criminal
Murphy, Diana	8th	Criminal
Smith, Lavenski	8th	Criminal
Alarcon, Arthur	9th	Criminal
Beezer, Robert	9th	Antitrust
Clifton, Richard	9th	Environmental
Gould, Ronald	9th	Environmental
Hug, Procter	9th	Environmental
Kozinski, Alex	9th	Criminal
Noonan, John	9th	Criminal
Norris, William	9th	Antitrust
Reinhardt, Stephen	9th	Criminal
Sneed, Joseph	9th	Securities
Trott, Stephen	9th	Criminal
Wardlaw, Kim	9th	Criminal
Anderson, Stephen	10th	Criminal
Barrett, James	10th	Criminal

Table A1. *Continued*

Name	Court	Area(s) of opinion specialization
Ebel, David	10th	Criminal
Lucero, Carlos	10th	Criminal
McKay, Monroe	10th	Criminal
Birch, Stanley	11th	Criminal

Table A2. Complexity Factor Score Creation

Variable	Factor loadings
Published	0.70
Page numbers	0.92
Issues	0.91
Variable	**Scoring coefficients**
Published	0.32
Page numbers	0.43
Issues	0.42

As noted in the text, we created a factor score that combines the three elements we use to determine case complexity. Briefly, the three elements under consideration are the number of pages in an opinion, the number of issues in an opinion, and whether the opinion was published. We take our cue for these elements primarily from Maltzman et al. (2000) as well as from considerations raised in Hettinger et al. (2006). Details of the factor analysis are in Table A2.

These scores reflect our intuition with respect to complexity, as each contributes positively to the complexity of a case. Overall, the retained factor had an eigenvalue of 2.2 and explained 79 percent of the variance across the factors.

CREATION OF CASE FACTS FACTOR SCORES

Similar to our approach with respect to complexity, within each issue area we created a factor score based on principal components analysis in order to determine how much the presence of each case fact in that area of law contributes to the likelihood of a liberal decision. Our approach is to briefly justify the inclusion of a specific set of facts and then to present our summary measures. For each set of case facts' principal component scores, we retained the factor with the highest eigenvalue (all at least above one) and then used regression scoring to create a single index. The tables below (Tables A3 through A6) present the factor loadings and regression scoring coefficients for each issue area. In any case, it is worth noting that the substantive results remain almost exactly the same as those presented in the article if we exclude the summary case facts measure from the regressions. More specifically, both of the interaction terms of interest are statistically significant, have negative coefficients, and are substantively important.

For the search-and-seizure cases, we include the set of case facts that Segal (1984) originally determined as being important in Fourth Amendment cases. We use the coding scheme for these facts elucidated by Scherer (2005). The model includes indicators of whether the search is of a **home**, with searches of **cars**, **luggage**, and at the **border** expected

Table A3. Search and Seizure Case Facts Factor Score

Search variables	**Factor loadings**
Home	−0.91
Auto	0.56
Luggage	0.07
Person	0.44
Limited search	0.48
Border	0.20
Warrant	−0.77
Search variables	**Scoring coefficients**
Home	−0.41
Auto	0.25
Luggage	0.03
Person	0.20
Limited search	0.21
Border	0.09
Warrant	−0.34

to result in affirmance of the search (as compared to the search of a house). Similarly we expect that a search pursuant to a **warrant** or one that is **limited** in nature will be more likely to be upheld. Note that though it may seem odd that searches of homes should be significantly less likely to result in a liberal decision, in our data there is a strong correlation ($r = 0.56$) between searches of a home and obtaining a warrant prior to the search, something that is virtually never true of searches of cars.

In environmental cases, we include a number of controls meant to capture the nature of the underlying issue by using the laws under which the court determines the outcome. We include the following variables, all coded dichotomously, for relevant laws, and we have no a priori expectations about their effects. **Clean Air** is coded one if there is a claimed

Table A4. Environmental Case Facts Factor Score

Environmental variables	**Factor loadings**
Clean Air	0.75
Clean Water	−0.24
Endangered Species	−0.31
Superfund	0.81
EPA litigant	−0.24
US named party	0.58
Criminal	0.03
Environmental variables	**Scoring coefficients**
Clean Air	0.42
Clean Water	−0.13
Endangered Species	−0.18
Superfund	0.45
EPA litigant	−0.13
US named party	0.33
Criminal	0.02

Table A5. Antitrust Case Facts Factor Score

Antitrust variables	**Factor loadings**
US named party	−0.73
Class action	0.73
Antitrust Variables	**Scoring coefficients**
US named party	−0.69
Class action	0.69

violation of the Clean Air Act; **Clean Water** is coded one if there is a claimed violation of the Clean Water Act; **Endangered Species** is coded one if there is a claimed violation of the Endangered Species Act; and **Superfund** is coded one if there is a claimed violation of the Comprehensive Environmental Response, Compensation, and Liability Act. In addition, we include controls for the involvement of the federal government in a case. When the EPA was a named party in the case, including when the EPA was a litigant as an agency, the **EPA litigant** is coded one. If the case involves criminal charges, then **criminal** is coded one. Furthermore, we coded as liberal votes for culpability in cases that involved criminal violations of environmental regulations.

For antitrust cases, we include variables that measure whether the US federal government is a named party (**US named party**) in the lawsuit to prevent a merger or breakup a monopoly. We also include an indicator of whether the lawsuit is a **class action** or not. For reasons we explore in Curry and Miller (2015), we expect both of these variables to positively influence the likelihood of a liberal decision.

In the securities cases we also include indicators of whether the United States is a named party in the lawsuit and whether the litigation is a class action. And, as above, we expect that these two variables ought to make a liberal decision more likely. In addition, we include an indicator variable equal to one if the Securities and Exchange Commission is a litigant (**SEC**)—we have no a priori expectation about the sign of this variable. Lastly, we include an indicator of whether or not the litigation involves criminal charges involving securities (**criminal**). As in the environmental cases, we code as liberal those votes that uphold criminal liability in securities regulation cases, since this is usually a finding against someone who has withheld information from investors.

Table A6. Securities Case Facts Factor Score

Securities Variables	**Factor loadings**
US named party	0.95
Class action	−0.62
SEC	0.79
Criminal	0.40
Securities variables	**Scoring coefficients**
US named party	0.45
Class action	−0.29
SEC	0.38
Criminal	0.19