

Modeling the Effects of Peremptory Challenges on Jury Selection and Jury Verdicts

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Although proponents argue that peremptory challenges make juries more impartial by eliminating “extreme” jurors, studies testing this theory are rare and inconclusive. For this article, two formal models of jury selection are constructed, and various selection procedures are tested, assuming that attorneys act rationally rather than discriminate based on animus. The models demonstrate that even when used rationally, peremptory challenges can distort jury decision making and undermine verdict reliability.

Peremptory challenges systematically shift jurors toward the majority view of the population by favoring median jurors over extreme jurors. If the population of potential jurors is skewed in favor of conviction—as empirical evidence suggests is usually the case—then peremptory challenges have the unexpected result of making convictions more likely, rather than promoting reasoned deliberation without prejudice to the result. This is troublesome when jurisdictions almost universally award more peremptory challenges in trials involving the most serious crimes. And this effect is magnified when attorneys have more complete information about jurors, suggesting the problem may become worse in the future.

Moreover, juries selected with more peremptory challenges become more ideologically and demographically homogenous, even when attorneys do not engage in discrimination, reducing the accuracy of jury verdicts. Although this second effect has been seen empirically, the results of the models suggest that it is an inevitable result of the peremptory challenge process rather than an effect of discrimination by attorneys.

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MODELING THE EFFECTS OF PEREMPTORY CHALLENGES ON JURY SELECTION AND JURY VERDICTS

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INTRODUCTION

Attorneys try to shape jury selection by exercising peremptory challenges (sometimes called peremptory strikes), which allow them to eliminate potential jurors without justification or explanation.¹ Peremptory challenges have long been controversial, and for decades the terms of the debate have largely been fixed. Proponents claim that peremptory challenges help ensure an impartial jury by permitting attorneys to remove jurors who might be biased or predisposed against their side—jurors at the extremes of the pool, who will not be able to evaluate the facts fairly and render an impartial verdict. The result, proponents say, is a jury composed of jurors in the moderate middle, open to both sides and able to come to a fair decision. As Justice Scalia wrote for the Supreme Court in *Holland v. Illinois*²:

Peremptory challenges, by enabling each side to exclude those jurors it believes will be most partial toward the other side, are a means of “eliminat[ing] extremes of partiality on both sides,” thereby “assuring the selection of a qualified *and unbiased* jury.”³

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¹ BLACK’S LAW DICTIONARY 261-62 (9th ed. 2009).

² 493 U.S. 474 (1990).

³ *Id.* at 484 (quoting *Batson v. Kentucky*, 476 U.S. 79, 91 (1986)) (citations omitted). This is, of course, not the only justification given for peremptory challenges. William Blackstone argued that they give the defendant confidence in the impartiality of the jurors deciding his fate, and that by permitting attorneys to challenge jurors without stating a reason, they help avoid offending and potentially biasing jurors. See 4 WILLIAM BLACKSTONE, COMMENTARIES *346-47. Barbara Allan Babcock advanced a form of the second argument, arguing that peremptory challenges help to “avoid[] trafficking in the core of truth in most common stereotypes” by “allow[ing] the covert expression of what we dare not say but know is true more often than not.” Barbara Allen Babcock, *Voir Dire: Preserving “Its Wonderful Power”*, 27 STAN. L. REV. 545, 553-54 (1975).

The usual response by opponents is that peremptory challenges permit attorneys—particularly but not exclusively prosecutors—to discriminate based on race, age, gender, employment, or other group characteristics. Given the limited information that is typically available about potential jurors, a rational attorney must rely on these characteristics and on stereotypes about jurors with those characteristics.⁴ This may be entirely rational, if these characteristics do have predictive power and attorneys lack better information.⁵ An attorney who is biased against a group, however, might target members of that group for elimination, consciously or unconsciously, even when it is irrational to do so.⁶ In either case, because attorneys typically have little information about potential jurors as individuals, they are forced to make decisions based on group characteristics instead.⁷ The natural result is discrimination—both animus-based and statistical—and underrepresentation of certain groups on juries.⁸ And the problem may be large enough to outweigh any benefits from peremptory challenges; as Justice Breyer recognized in 2005, “the use of race- and gender-based stereotypes in the jury-selection process seems better organized and more systematized than ever before.”⁹

These two arguments largely talk past each other. Proponents argue that peremptory challenges are beneficial when used properly—that is, when based on factors that legitimately may affect or indicate a juror’s view of the evidence or willingness to vote for one side or the other—because they help ensure an impartial jury, a right protected by the Sixth Amend-

⁴ See, e.g., Paul V. Olczak, Martin F. Kaplan & Steven Penrod, *Attorneys’ Lay Psychology and Its Effectiveness in Selecting Jurors: Three Empirical Studies*, 6 J. SOC. BEHAV. & PERSONALITY 431, 440 (1991) (finding that most attorneys rely on two or three stereotypical characteristics when exercising peremptory challenges).

⁵ Which is not to say that it would be legal; the exercise of peremptory challenges based on gender or race violates the Constitution. See *J.E.B. v. Alabama ex rel. T.B.*, 511 U.S. 127, 129 (1994) (gender); *Batson*, 476 U.S. at 89 (race).

⁶ For instance, in the trial at issue in *Mata v. Johnson*, 99 F.3d 1261, 1264 (5th Cir. 1996), vacated in part on reh’g, 105 F.3d 209 (5th Cir. 1997), prosecutors and defense attorneys conspired to exclude all black jurors.

⁷ See Reid Hastie, *Is Attorney-Conducted Voir Dire an Effective Procedure for the Selection of Impartial Juries?*, 40 AM. U. L. REV. 703, 724 (1991). Lack of individualized information is not the only reason attorneys might rely on group characteristics, of course; relying on a small number of heuristics is also simply *easier* and faster than obtaining individualized data and processing that data to reach individualized decisions. See *id.* at 720.

⁸ The academic discussions of this argument include, for example, Albert W. Alschuler, *The Supreme Court and the Jury: Voir Dire, Peremptory Challenges, and the Review of Jury Verdicts*, 56 U. CHI. L. REV. 153, 170 (1989), Raymond J. Broderick, *Why the Peremptory Challenge Should Be Abolished*, 65 TEMP. L. REV. 369, 410-13 (1992), and Eric L. Muller, *Solving the Batson Paradox: Harmless Error, Jury Representation, and the Sixth Amendment*, 106 YALE L.J. 93, 97-107 (1996). On statistical discrimination and animus-based discrimination, see Lior Jacob Strahilevitz, *Privacy Versus Anti-discrimination*, 75 U. CHI. L. REV. 363, 365 (2008).

⁹ *Miller-El v. Dretke*, 545 U.S. 231, 270 (2005) (Breyer, J., concurring).

ment. The opponents mostly do not dispute this, but instead focus on *improper* use of peremptory challenges, arguing that animus-based discrimination taints peremptory challenges in practice and, perhaps, inherently.

The remarkable thing about this debate is that there is almost no evidence that peremptory challenges have the positive effects that proponents describe and opponents concede. There are several important assumptions packed into the argument for peremptory challenges: that a core middle group of impartial jurors actually exists; that each side is able to identify the “extreme” jurors; and that the number of such “extreme” jurors is approximately the same as the number of challenges, for example. Some of these assumptions are implausible; some are flatly inconsistent with the available evidence. And there is essentially no evidence that peremptory challenges lead to more impartial juries, even when exercised rationally.

Complicating efforts to analyze the benefits of peremptory challenges are studies showing that attorneys are remarkably bad at exercising them. Yet we should expect attorneys to improve in the coming years, benefiting from specialized software and the widespread availability of consumer information and public records about potential jurors. The long-term question, then, is whether peremptory challenges can *ever* result in more impartial juries, and if so how. Simple assertions aside, remarkably little attention has been paid to this question.

This Article aims to mount a new challenge to peremptory challenges that looks beyond animus-based discrimination and group characteristics. It confronts the argument that peremptory challenges help ensure the selection of impartial juries. In fact, even when used rationally, peremptory challenges cause systematic and idiosyncratic changes to jury composition, potentially leading to biased juries. They can also create juries that are unrepresentative of the community. These effects can be both systematic, for example when juries become more likely on average to vote to convict; they can also be idiosyncratic, meaning individual juries can differ wildly from other juries selected at the same time from the same population. The magnitudes of these effects are highly dependent on the specific procedures employed in jury selection, including the number of peremptory challenges available to each side, the size of the venire, the amount of information available to attorneys, and the process by which eliminated jurors are replaced. They are also dependent on community characteristics. In many circumstances, peremptory challenges can have a surprisingly large effect on jury composition.

Perhaps most importantly, these systematic and idiosyncratic effects are independent of any reliance on group characteristics: even if prosecutors and defense attorneys have perfect information about each juror and rely solely on that individual information, peremptory challenges are likely to result in a more biased jury if they have any effect. In short, even setting aside discrimination concerns, peremptory challenges fail to live up to the

arguments in their favor; even when used exactly as intended, they likely do more harm than good.

This Article proceeds as follows. Part I summarizes the use of peremptory challenges in the United States and the existing literature on their effectiveness. It describes how peremptory challenges work in practice and how states' practices vary. It next looks at the (rather limited) empirical and theoretical literature on how attorneys use challenges. It then examines some of the reasons to expect that attorneys will become better at exercising peremptory challenges, which means that the theoretical question—what would happen if attorneys *did* know how to exercise challenges effectively?—may be more important in the long term than the empirical question of how well they now do so.

Part II constructs two models to test the effects of peremptory challenges on jury composition. Peremptory challenges systematically favor jurors close to the median of the pool of potential jurors. This has two effects. First, peremptory challenges can shift the likelihood that the average empaneled juror will vote to convict. Second, they can affect the ideological and demographic diversity of juries, reducing diversity on individual juries but increasing second-order diversity among juries. The likely result is that verdicts from juries selected with peremptory challenges will be less reliable than verdicts of juries selected randomly.

Part III discusses some policy implications of these findings for courts and legislatures, and then the Article concludes.

I. THE USE OF PEREMPTORY CHALLENGES IN JURY TRIALS

A. *How Peremptory Challenges Work*

Though peremptory challenges have a long history¹⁰ in criminal cases,¹¹ there has been little consensus about how, precisely, they should be implemented. Courts today use a wide variety of challenge procedures, varying from jurisdiction to jurisdiction, court to court, and judge to judge.

¹⁰ Peremptory challenges date to the 1100s and the dawn of the jury trial in England. Among the excellent histories of peremptory challenges in the English and American systems are JON M. VAN DYKE, *JURY SELECTION PROCEDURES: OUR UNCERTAIN COMMITMENT TO REPRESENTATIVE PANELS* 1-9 (1977), Broderick, *supra* note 8, at 371-99, and Roger D. Moore, *Voir Dire Examination of Jurors: I. The English Practice*, 16 *GEO. L.J.* 438 *passim* (1928). Additionally, Blackstone detailed the eighteenth-century English practice and gave several justifications for the practice. See 4 BLACKSTONE, *supra* note 3, at *346-49.

¹¹ Peremptory challenges are commonly available in both civil and criminal trials in the United States. This Article focuses on their use in criminal cases, both because most of the controversy about peremptory challenges concerns their use in criminal cases and because the asymmetric relationship between prosecutors and defendants presents some interesting issues. Many of the conclusions are equally applicable to peremptory challenges in civil cases.

These differences affect even the most basic decisions concerning peremptory challenges: while trial juries have been standardized at twelve people since the early days of jury trials,¹² the number of peremptory challenges allocated to each side has never been consistent across jurisdictions or stable over time. And while the effects of other procedural variations are less obvious than the effects of granting more or fewer peremptory challenges, these procedural differences nevertheless can greatly affect jury composition.

1. Number of Challenges

The first major variable affecting a party's exercise of peremptory challenges, of course, is how many challenges are available. States are all over the map: some defendants are entitled to as few as one peremptory challenge, while others receive as many as twenty-five.¹³ These numbers are typically minimums; frequently courts grant additional challenges for use in selecting alternate jurors, to correct an error, or for other discretionary reasons.¹⁴

Though states vary in how many peremptory challenges they grant defendants, several norms are clear. First, almost every state allocates more peremptory challenges for more serious crimes.¹⁵ Though New York and New Jersey (and in a few cases California) grant each side ten peremptory challenges in misdemeanor cases,¹⁶ nearly all states give each side two to six challenges in misdemeanor trials.¹⁷ In felony cases, however, each side is rarely allocated fewer than six peremptory challenges; ten or more is common.¹⁸ And while Virginia gives each side in a death penalty trial just four peremptory challenges, and Ohio six,¹⁹ the vast majority of death-

¹² See, e.g., AUSTIN WAKEMAN SCOTT, *FUNDAMENTALS OF PROCEDURE IN ACTIONS AT LAW* 76 (1922) (“[B]y the middle of the fourteenth century the requirement of twelve [jurors] had probably become definitely fixed. Indeed this number finally came to be regarded with something like superstitious reverence.”). There has, however, been movement away from this standard. Six-person criminal juries were declared constitutional in *Williams v. Florida*, 399 U.S. 78, 86 (1970). Thirty-four states use juries with fewer than twelve jurors in at least some criminal trials. DAVID B. ROTTMAN & SHAUNA M. STRICKLAND, U.S. DEP’T OF JUSTICE, *STATE COURT ORGANIZATION 2004*, at 233-37 tbl.42 (2006), available at <http://www.ojp.usdoj.gov/bjs/pub/pdf/sco04.pdf>.

¹³ ROTTMAN & STRICKLAND, *supra* note 12, at 228 tbl.41.

¹⁴ See *infra* notes 25-26.

¹⁵ ROTTMAN & STRICKLAND, *supra* note 12, at 228 tbl.41. The exceptions are Vermont, which gives each side six peremptory challenges in all criminal trials (and, for that matter, all civil trials), *id.* at 231 tbl.41, and West Virginia, which gives each side four challenges in misdemeanor cases, but, oddly, in felony cases gives the defendant six and the prosecution two, *id.*

¹⁶ *Id.*

¹⁷ *Id.*

¹⁸ *Id.*

¹⁹ *Id.*

penalty states allocate ten, twelve, or more peremptory challenges to each side in capital cases.²⁰ Connecticut gives each side twenty-five challenges in death penalty cases, while California, Indiana, New York, Pennsylvania, and South Dakota give each side twenty, and Delaware, Georgia, Maryland, New Hampshire, and New Jersey give the defense twenty and the prosecution fewer.²¹

Second, the usual practice is to allocate the same number of peremptory challenges to the prosecution as to the defense. Forty states always do so, while nine sometimes give the defendant more challenges and Minnesota always gives the defendant more.²² None give the defendant fewer peremptory challenges.²³ States that sometimes give the defendant more challenges always give the extra challenges in more serious crimes: for example, in felony trials but not misdemeanors (Arkansas, Maryland, New Jersey, South Carolina, and West Virginia) or only in capital cases (Delaware and New Hampshire).²⁴

Third, while state law always allocates a certain number of peremptory challenges to each side, the actual number of peremptory challenges frequently varies from this allocation. Trial judges often have discretion to award extra challenges. Sometimes this discretion is specifically authorized by state statute, such as when multiple defendants are tried together or when the statute only sets a minimum number of challenges;²⁵ sometimes the discretion is conferred by precedent or is a product of harmless error analysis.²⁶ Trial judges also sometimes award fewer challenges, either by accidentally giving each side fewer challenges than provided by law or by erroneously denying a valid challenge for cause (and thus effectively forcing one side to use a peremptory challenge instead).²⁷ Awarding extra challenges, however, is far more common than not awarding enough, because it is sometimes permitted by law and because even when not permitted, attor-

²⁰ *Id.*

²¹ ROTTMAN & STRICKLAND, *supra* note 12, at 228 tbl.41.

²² *Id.*

²³ *Id.*

²⁴ *Id.*

²⁵ *See, e.g.*, ALA. R. CRIM. P. 18.4(f)(1) (requiring the trial court to assemble a strike list of “not less than” 18, 24, or 36 potential jurors, depending on the severity of the offense charged); FLA. R. CRIM. P. 3.350 (giving judges discretion to award additional challenges when the defendant is charged with multiple counts or when the defendant demonstrates possible prejudice).

²⁶ *See, e.g.*, *United States v. Patterson*, 215 F.3d 776, 781 (7th Cir. 2000), *vacated in part*, 531 U.S. 1033 (2000); *People v. Robinson*, 606 N.E.2d 122, 127 (Ill. App. Ct. 1992); *Johnson v. State*, 43 S.W.3d 1, 8-9 (Tex. Crim. App. 2001) (Keller, P.J., concurring).

²⁷ *See Ross v. Oklahoma*, 487 U.S. 81, 88 (1988) (finding no constitutional violation when a judge erroneously deprived a defendant of challenges he was entitled to by statute, because there was no constitutional right to peremptory challenges in the first place).

neys do not usually object to receiving extra opportunities to shape the jury.²⁸

A significant effect of these factors, taken together, is that cases abound in which defendants are accused of serious crimes such as murder or rape and in which attorneys exercise dozens and dozens of peremptory challenges.²⁹

2. Challenge Procedures

As important as the number of peremptory challenges is how they are exercised. There are two systems frequently used in the United States: the sequential-selection method (also called the strike-and-replace method or the jury-box method) and the struck-jury system.³⁰

The sequential-selection method is the predominant selection procedure in the United States.³¹ Under that system, enough potential jurors are moved into the jury box (from the courtroom gallery, for example) to fill the jury (plus, sometimes, slots for alternates).³² The lawyers proceed with voir dire; maybe some of the jurors are dismissed for cause or excused for personal hardship or other statutory excuses; and then lawyers exercise peremptory challenges.³³ Then new potential jurors take the now-empty places in the jury box; the lawyers re-run voir dire, excuses, and challenges for those jurors; and the cycle continues until a full jury is empaneled.³⁴

²⁸ See JAMES J. GOBERT & WALTER E. JORDAN, *JURY SELECTION: THE LAW, ART, AND SCIENCE OF SELECTING A JURY* § 8.01 (2d ed. 1990).

²⁹ See, e.g., *United States v. Tipton*, 90 F.3d 861, 872 (4th Cir. 1996) (defense exercised fifty-two challenges); *Burks v. Borg*, 27 F.3d 1424, 1426 (9th Cir. 1994) (prosecution exercised seventy-three challenges and defense seventy-two); *Capers v. Singletary*, 989 F.2d 442, 444 (11th Cir. 1993) (prosecution permitted forty peremptory challenges); *Denard v. Dir., Dep't of Corr.*, 967 F. Supp. 387, 394 & n.8 (C.D. Cal. 1997) (prosecution exercised forty-one or forty-two challenges); *Echlin v. LeCureux*, 800 F. Supp. 515, 519 (E.D. Mich. 1992) (prosecution allotted twenty-four), *rev'd*, 995 F.2d 1344 (6th Cir. 1993); *Wilson v. State*, 690 So. 2d 449, 458 (Ala. Crim. App. 1995) (prosecution exercised forty-one challenges), *aff'd in part, quashed in part sub nom. Ex parte Wilson*, 690 So. 2d 477 (Ala. 1997); *People v. Hardy*, 825 P.2d 781, 801-02 (Cal. 1992) (prosecution and defense each exercised forty-one challenges). And this is not a recent development. See, e.g., *People v. Spies*, 12 N.E. 865, 910 (Ill. 1887) (defendants exercised 160 challenges), *error dismissed sub nom. Ex parte Spies*, 123 U.S. 131 (1887); *Alfred v. State*, 32 Tenn. 581, 582 (1853) (defendants exercised seventy challenges).

³⁰ See, e.g., VAN DYKE, *supra* note 10, at 146-47; Richard J. Link, Annotation, *Number of and Procedure for Exercising Peremptory Challenges Allowed in Federal Criminal Trial for Selection of Regular Jurors—Modern Cases*, 110 A.L.R. FED. 626, 652-56 (1992).

³¹ See *Patterson*, 215 F.3d at 780 (noting that the rules of procedure “assume[] that jurors will be selected either by the jury-box system or by a struck-jury method”); VAN DYKE, *supra* note 10, at 146 (stating that two systems of peremptory challenges exist and that the jury box method is the “usual” system).

³² See Link, *supra* note 30, at 663.

³³ See *id.*

³⁴ See *id.*

The struck-jury system is used less frequently in the United States.³⁵ Under that system, voir dire, excuses, and challenges for cause are performed once on the entire panel of potential jurors rather than repeatedly on smaller subsets.³⁶ At that point, enough potential jurors are left for each side to exercise their peremptory challenges and still leave a full jury—and, ideally, no more.³⁷ (So, for example, if each side gets ten challenges, and the jury is twelve people, at least thirty-two potential jurors are needed.) Then, considering the panel as a whole, the parties exercise their challenges.³⁸ If more than twelve jurors remain, the jury can be selected randomly,³⁹ the first twelve jurors can be empaneled,⁴⁰ or the parties can be given additional peremptory challenges.⁴¹

A key difference between the two methods, then, is how much information an attorney exercising a challenge has about a replacement juror. Under the struck-jury system, the attorney will have already seen and examined the entire panel and so can compare a potential juror to the rest of that panel; under the sequential-selection system, the replacement is unknown. (Of course, if the panel is seated in the courtroom, the attorney may be able to draw inferences from the replacement's appearance, reading material, and so forth. But such appearances provide relatively limited information compared to the questions asked during voir dire.)

Another difference between the two methods is that the struck-jury system can result in larger effective panels, since all potential jurors are examined before any are eliminated. In contrast, under the sequential-selection method, only those who are needed are examined. So, for example, if eighty potential jurors are called for a trial and each side is allowed ten peremptory challenges, then only thirty-two of the eighty potential jurors are needed under the sequential-selection method. This makes peremptory challenges potentially much more powerful in the sequential-selection method, since peremptory challenges can eliminate a greater fraction of potential jurors.

A third difference concerns the calculation an attorney exercising peremptory challenges must make when deciding whether to challenge a potential juror. Under the struck-jury system, the decision whether to use a peremptory challenge on a juror is conceptually easy: with j challenges, a

³⁵ See VAN DYKE, *supra* note 10, at 146.

³⁶ Kathleen M. McKenna, *Jury Trial Issues*, in CURRENT DEVELOPMENTS IN FEDERAL CIVIL PRACTICE 2009, at 527-28 (PLI Litig. & Admin. Practice, Course Handbook Series No. H-795, 2009).

³⁷ McKenna, *supra* note 36, at 527-28; VAN DYKE, *supra* note 10, at 146-47.

³⁸ McKenna, *supra* note 36, at 527-28; VAN DYKE, *supra* note 10, at 147.

³⁹ See, e.g., *United States v. Patterson*, 215 F.3d 776, 778-79 (7th Cir. 2000) (describing the trial court's random selection after peremptory challenges were complete), *vacated in part*, 531 U.S. 1033 (2000).

⁴⁰ See, e.g., TEX. R. CIV. P. 234 (empanelling the first twelve names on the list who have not been struck).

⁴¹ See, e.g., FLA. R. CRIM. P. 3.350(e) (allowing for additional peremptory challenges).

lawyer should strike the j least-preferred members of the jury pool. Setting aside questions of how much attorneys can really learn about potential jurors, the comparison in the struck-jury method is between known quantities: an individual potential juror versus the (known) rest of the pool. The choice is risk-free.

Things are more complicated under the sequential-selection system, both because the replacement for an eliminated juror is unknown and because there is an order to the jurors (even if only implicit) that is not present in the struck-jury system. Since no direct comparison is possible, attorneys exercising challenges must compare a potential juror to the population of all potential jurors.

Because the number of peremptory challenges and the size of the jury are fixed, the total size of the sequential-selection jury pool is fixed: if each side gets ten challenges, for example, and the jury includes twelve people, then a maximum of thirty-two potential jurors need be considered (ignoring alternates). This is $2j + x$, where x is the number of jurors who will be empaneled. (The initial pool will need to be larger if jurors are excused or dismissed for cause. But because peremptory challenges are typically exercised after the court handles other dismissals, those potential jurors should not affect attorneys' decision making.)

An attorney deciding whether to challenge a potential juror in the first set of jurors called up, then, must decide whether that juror is likely to be one of the j worst of those $2j + x$ potential jurors. Without other information, a risk-neutral attorney looking at the first group would challenge a potential juror only if that juror is in the bottom $\frac{j}{(2j+x)}$ of the total potential juror *population*.⁴² After a few rounds of challenges, however, the numbers change: if both sides have accepted ten jurors out of twelve slots and each side has two peremptory challenges remaining, for example, then the court will fill the last two slots from six possible jurors. An attorney should therefore strike a potential juror if that juror is in the least preferred third of the population. (This is the same $\frac{j}{(2j+x)}$ calculation, except that the number of open jury slots (x) and remaining peremptory challenges for each side (j) change as jurors are chosen.)

Compared to the relative certainty of the struck-jury system, the uncertainty of the sequential-selection method has two distinct effects: first, challenging a juror is risky, in that the replacement may be even worse;⁴³ and

⁴² A complicating factor is that x of those $2j + x$ potential jurors are known: the jurors that have already been seated and subjected to voir dire. The real question an attorney should ask, then, is how likely a potential juror is to be in the bottom j of x known jurors and $2j$ unknown jurors, given some population distribution for the pool of possible unknown jurors—a rather complicated calculation for an attorney in the middle of jury selection.

⁴³ The risk of the sequential-selection procedure was described in *North Carolina Lawyers Weekly*:

second, the balance changes of how bad a potential juror must be to merit striking. For example, a juror who would have been challenged had she appeared early in the draw might make the jury if she comes later and a lawyer is running out of challenges; the reverse is equally plausible.

One final complication in evaluating the effects of challenge procedures is that both the sequential system and the struck-jury system give the trial judge or court considerable leeway to vary the precise procedures employed. Even when using the more certain struck-jury system, potential variables include how many jurors are in the pool; whether excess jurors will be eliminated randomly or by extra peremptory challenges; whether the potential jurors will be ordered (thus permitting attorneys to concentrate their challenges on those most likely to get selected⁴⁴) or not; and how alternates, if any, are selected.⁴⁵ For the sequential-selection method, add to

The gambling problem of the current system was the subject that came up during my most recent monthly lunch with my good friend Boxer Haynes, Esq., North Carolina's most grizzled trial attorney. Grumbling even more than usual into his beard, he sat to join me.

"Now what?" I asked. He'd just come from voir diring a med[ical] mal[practice] case against a cardiologist.

"I got rid of a nurse. Her replacement? A physician's husband. I struck the physician's husband. Replacement? A cardiology student. I'm out of strikes. I want the nurse back."

Susan O'Malley, *Tips & Strategies—The "Struck System" of Jury Selection*, N.C. LAW. WKLY., Feb. 3, 1997.

⁴⁴ See, e.g., *Spencer v. State*, 314 A.2d 727, 730-31 (Md. Ct. Spec. App. 1974). With one juror left to be chosen, the defendant had three peremptory challenges remaining, and the prosecution had none. *Id.* at 731. To that point, potential jurors had been accepted or rejected in the order they were listed on the court's jury list. *Id.* at 730-31. Thirteen names remained on the list, and the defendant concluded that the fourth juror on the list was preferable to the first three. *Id.* at 731. So the defense challenged the first three jurors listed, at which point the clerk skipped past three names and called the seventh person on the list, who was seated. *Id.*

⁴⁵ See, e.g., *United States v. Patterson*, 215 F.3d 776, 778-79, 784 (7th Cir. 2000), *vacated in part*, 531 U.S. 1033 (2000). The appeal came after a five-month-long, fifteen-defendant drug conspiracy trial. *Id.* at 778, 784. The trial court used the struck-jury system. With a twelve-person jury, eight alternates, twenty-two peremptory challenges distributed among the various defendants, and fourteen for the prosecution, a pool of fifty-six potential jurors was required after excuses and challenges for cause. Sixty-three potential jurors remained at that point, however, all of whom the trial court left in the jury pool without establishing any order or priority. After the parties exercised their allotted peremptory challenges, and then additional challenges to make up for duplicates, thirty-one potential jurors remained. The clerk randomly selected twelve of those thirty-one to sit as the jury; alternates were selected randomly from the remaining nineteen after another round of challenges. *Id.* at 778-79.

The defendants argued on appeal that this procedure contained numerous errors: (1) The pool contained sixty-three potential jurors instead of the fifty-six required, reducing the strength of their peremptory challenges; (2) the pool was unordered, preventing the defendants from targeting potential jurors who were most likely to serve; (3) the court empaneled eight alternates instead of the six permitted by procedural rule, reducing the effectiveness of the defendants' peremptory challenges in selecting alternates; and (4) the court gave each side only two peremptory challenges for use in selecting alternates, instead of the three permitted by the rules. *Id.* at 779.

The defendants had case law or statutory support for each claim of error: the first two had been held previously to be reversible error, and the latter two were contrary to the rules. Yet the appellate court found no reversible error, because there was no indication the jury was not impartial. *Id.*

this list what (if anything) attorneys know about replacement jurors: if, for example, replacements are drawn from the gallery in seating order, then attorneys might have limited information about potential jurors (sex, race, approximate age, perhaps information from jurors' style of dress or reading material) even before those jurors have answered voir dire.

One of these frequently discretionary decisions judges make turns out to be quite important to jury selection outcomes: whether or not the jury pool is placed in a specific order before the attorneys exercise their challenges. Consider a struck-jury selection in which each side has twelve peremptory challenges and the total pool consists of sixty potential jurors. If the potential jurors are ordered, then only the first thirty-six jurors have any chance of being selected⁴⁶ (ignoring excuses and challenges for cause, which usually are handled before peremptory challenges). Each side, then, will use its peremptory challenges on the twelve least-preferable members of that set of thirty-six potential jurors—in other words, the bottom third of a thirty-six-member jury pool. If the potential jurors are not ordered, however, then all sixty potential jurors have a chance of being selected; the parties will still use their challenges on the twelve least-preferable members of the pool, but each side will only be able to eliminate a fifth of the full sixty-member pool. When the potential jurors are ordered, the lawyers can focus on a smaller jury pool, and have a correspondingly larger ability to shape the jury with the same number of challenges.

B. *The Existing Evidence on the Effectiveness of Peremptory Challenges*

Given the various purported benefits of peremptory challenges, the inconsistent ways they are implemented, and the difficulty of studying actual jurors, it is not surprising that little empirical work exists concerning the effects of peremptory challenges.⁴⁷ Hans Zeisel and Shari Seidman Di-

⁴⁶ This “effective venire size” will be a key variable in Part II, *infra*.

⁴⁷ Nor, for that matter, has there been much theoretical work on their benefits. Instead, the vast majority of writing about peremptory challenges falls into two categories: (1) discussion of the relationship between peremptory challenges and discrimination, *see, e.g.*, Alschuler, *supra* note 8, at 156-57, 163; Broderick, *supra* note 8, at 370-71; Morris B. Hoffman, *Peremptory Challenges: Lawyers Are From Mars, Judges Are from Venus*, 3 GREEN BAG 2D 135, 138-39 (2000); Nancy S. Marder, *Beyond Gender: Peremptory Challenges and the Roles of the Jury*, 73 TEX. L. REV. 1041, 1077-83 (1995); Muller, *supra* note 8, at 96-97; Deborah Ramirez, *Affirmative Jury Selection: A Proposal to Advance Both the Deliberative Ideal and Jury Diversity*, 1998 U. CHI. LEGAL F. 161, 162; *cf.* Babcock, *supra* note 3, at 553 (“The peremptory [challenge], made without giving any reason, avoids trafficking in the core of truth in most common stereotypes.”); and (2) practical advice for trial lawyers on how to exercise challenges effectively, based mostly on experience, anecdote, and stereotype, *see, e.g.*, Solomon M. Fulero & Steven D. Penrod, *The Myths and Realities of Attorney Jury Selection Folklore and Scientific Jury Selection: What Works?*, 17 OHIO N.U. L. REV. 229 *passim* (1990) (reviewing the “folklore” of jury selection techniques); VALERIE P. HANS & NEIL VIDMAR, *JUDGING THE JURY* 72-78 (1986).

among performed the most influential empirical study of peremptory challenges.⁴⁸ They assembled mock juries for twelve actual criminal trials in Chicago.⁴⁹ Half of the mock jurors were potential jurors attorneys had peremptorily challenged, while the other half were selected at random from potential jurors who did not go through voir dire.⁵⁰ Those mock juries then sat through the trials and deliberated; their initial votes and eventual verdicts were compared to the actual juries'.⁵¹

The study concluded that attorneys are surprisingly ineffective at exercising peremptory challenges.⁵² On a scale of -100 to +100, where -100 represents the worst possible exercise of peremptory challenges (challenging those jurors most likely to vote for the challenger's side) and +100 represents the best possible exercise, prosecutors averaged -0.5, meaning they had essentially no effect overall.⁵³ Defense attorneys did better, averaging +17.0, but nevertheless fell well short of good performance.⁵⁴ Even the defense attorneys' relatively stronger performance was not statistically significant at the 5% level, meaning that there is a greater than 5% chance that their performance was coincidental.⁵⁵

While the average effect was small, attorneys' performance was sufficiently erratic that large swings were produced in individual cases.⁵⁶ Prosecutors' performance in individual cases varied between -61 and +62; defense attorneys' varied between -62 and +48.⁵⁷ And these shifts did change the probability that the empaneled jury would vote to convict, compared to the control juries: with large swings by one side or the other, prosecutors and defense attorneys could accidentally combine to wildly swing the jury composition in any individual case.⁵⁸ Indeed, this happened in two of the twelve cases Zeisel and Diamond studied.⁵⁹ In those cases, the combination of the prosecutors' and defense attorneys' challenges produced changes in

⁴⁸ Hans Zeisel & Shari Seidman Diamond, *The Effect of Peremptory Challenges on Jury and Verdict: An Experiment in a Federal District Court*, 30 STAN. L. REV. 491 (1978).

⁴⁹ *Id.* at 492-93.

⁵⁰ *Id.* at 498-99.

⁵¹ *Id.* at 506-08.

⁵² *Id.* at 516-17.

⁵³ *Id.* at 515-17.

⁵⁴ Zeisel & Diamond, *supra* note 48, at 516-17.

⁵⁵ Zeisel and Diamond did not calculate the statistical significance of their results, but they provided all the data in their article, permitting a one-sample *t* test to be performed. *See id.* at 516 tbl.9. With a hypothetical mean of 0, that test gives a two-tailed *p*-value of 0.0997. This means that the null hypothesis, that the average score of defense attorneys in the population is 0, cannot be rejected at the 5% confidence level, but can be (barely) rejected at the 10% confidence level. *See generally* ALAN AGRETI & BARBARA FINLAY, *STATISTICAL METHODS FOR THE SOCIAL SCIENCES* 143-47 (4th ed., Prentice Hall 2009) (describing tests for statistical significance).

⁵⁶ Zeisel & Diamond, *supra* note 48, at 516-17.

⁵⁷ *Id.*

⁵⁸ *Id.* at 517.

⁵⁹ *Id.* at 507 tbl.4, 509 tbl.5, 517.

the probability of a guilty verdict of -30% and -72% .⁶⁰ In both cases, the outcome was a not-guilty verdict, which the judge called “without merit.”⁶¹ In one case, the jury selected without challenges would have had eight votes to convict and four votes to acquit; with challenges that proportion was reversed.⁶²

Studies of how attorneys exercise peremptory challenges shed some light on this poor performance. Michael O. Finkelstein and Bruce Levin studied sixteen federal criminal trials in New York in which prosecutors and defense attorneys submitted their peremptory challenges simultaneously.⁶³ By studying how often potential jurors were challenged by both sides (a surprisingly common occurrence, especially considering it should rarely happen if attorneys know what they are doing), the authors were able to construct two models dividing the population of potential jurors into those who were “clear choices” to challenge—jurors most attorneys would agree are likely to be biased against a specific side—and those who were mere “guesses,” about whom attorneys would disagree.⁶⁴ The authors concluded that almost all challenges are guesses, indicating that attorneys have very little sense of who is worth challenging.⁶⁵

Studies also show that attorneys rely on a small number of stereotypes or heuristics in exercising their challenges—and, interestingly, that these characteristics differ across cultures.⁶⁶ One study found, for example, that the stereotypes attorneys relied on in Australia bore little resemblance to those used in the United States.⁶⁷ For instance, Australian defense attorneys used peremptory challenges to strike younger, casually dressed potential jurors, contrary to the usual advice in the United States.⁶⁸ While this may be rational, if casually dressed younger Americans tend to favor the defense while those in Australia tend to favor the prosecution, the other possible explanation is more troubling: that attorneys in the United States and Australia have just adopted different, opposing stereotypes without any real basis.

There are at least three possible explanations for attorneys’ reliance on broad stereotypes rather than individualized information. One explanation, of course, would be (conscious or unconscious) animus-based discrimina-

⁶⁰ These shifts occurred in Cases Four and Twelve. *Id.*

⁶¹ *Id.* at 509 tbl.5.

⁶² This occurred in Case Twelve. Zeisel & Diamond, *supra* note 48, at 507 tbl.4.

⁶³ Michael O. Finkelstein & Bruce Levin, *Clear Choices and Guesswork in Peremptory Challenges in Federal Criminal Trials*, 160 J. ROYAL STAT. SOC’Y A 275, 277-79 (1997).

⁶⁴ *Id.* at 276-77, 279-84.

⁶⁵ *Id.* at 281, 284.

⁶⁶ See, e.g., Fulero & Penrod, *supra* note 47, at 230-37; Hastie, *supra* note 7, at 706-10; Olczak, Kaplan & Penrod, *supra* note 4, at 431-40.

⁶⁷ See Glenn F. Ross, *The Selection of Jurors in the Higher Courts of Queensland*, 15 AUSTL. PSYCHOLOGIST 351, 357 (1980).

⁶⁸ *Id.* at 355.

tion. A second possible explanation, however, is that jurors' votes may vary predictably with race, sex, socioeconomic status, and other demographic variables. Indeed, studies have confirmed that likelihood of convicting does correlate with demographic variables.⁶⁹ But even attorneys who take scientific approaches in using these variables have had limited success.⁷⁰

The third possible explanation is that even in cases where demographics have little or no predictive power, there may be little else to go on.⁷¹ Voir dire is typically limited to a questionnaire or brief questioning in court, and there is only so much an attorney can find out about a potential juror in even several hours of questioning—let alone about dozens of potential jurors.⁷² As one study concluded: “*Voir dire* was grossly ineffective not only in weeding out ‘unfavorable’ jurors but even in eliciting the data which would have shown particular jurors as very likely to prove ‘unfavorable.’”⁷³ With little else to go on, attorneys rely on stereotypes.

One final statistical finding is worth noting. Johnson and Haney found that in the usual case, voir dire and peremptory challenges tend to “homogenize the composition of the jury that results”: at least with respect to the demographic characteristics that the attorneys considered relevant, challenges tended to be exercised on potential jurors who were at the extremes of those demographic dimensions.⁷⁴ Juries, then, were less representative of the population as a whole, and more homogenous, than were the venires they were drawn from.⁷⁵

C. *The Future of Peremptory Challenges*

Zeisel and Diamond determined that in some criminal trials, peremptory challenges do matter: when one side made significantly more effective use of its challenges than the other side, the resulting shift in the views of

⁶⁹ See, e.g., William J. Bowers, Benjamin D. Steiner & Marla Sandys, *Death Sentencing in Black and White: An Empirical Analysis of the Role of Jurors' Race and Jury Racial Composition*, 3 U. PA. J. CONST. L. 171, 190-203 (2001); Hubert S. Feild, *Juror Background Characteristics and Attitudes Toward Rape: Correlates of Jurors' Decisions in Rape Trials*, 2 LAW & HUM. BEHAV. 73, 82-91 (1978) (discussing the predictability of jurors' votes in rape cases).

⁷⁰ See, e.g., Shari Seidman Diamond, *Scientific Jury Selection: What Social Scientists Know and Do Not Know*, 73 JUDICATURE 178, 183 (1990).

⁷¹ See, e.g., Charles J. Ogletree, *Just Say No!: A Proposal to Eliminate Racially Discriminatory Uses of Peremptory Challenges*, 31 AM. CRIM. L. REV. 1099, 1126 (1994); Marvin Zalman & Olga Tsoudis, *Plucking Weeds from the Garden: Lawyers Speak About Voir Dire*, 51 WAYNE L. REV. 163, 292-98 (2005).

⁷² See HANS & VIDMAR, *supra* note 47, at 67-76.

⁷³ Dale W. Broeder, *Voir Dire Examinations: An Empirical Study*, 38 S. CAL. L. REV. 503, 505 (1965).

⁷⁴ Cathy Johnson & Craig Haney, *Felony Voir Dire: An Exploratory Study of Its Content and Effect*, 18 LAW & HUM. BEHAV. 487, 499-500 (1994).

⁷⁵ *Id.* at 500.

the jury could affect the outcome of the trial.⁷⁶ This result leads to some obvious follow-ups: Do peremptory challenges affect trial outcomes when both sides are equally effective in exercising those challenges? What are the effects on jury composition when both sides make good use of their challenges? And are these effects good or bad?

Though attorneys are bad at exercising peremptory challenges, there are reasons to think they may improve in the future. There is always the possibility that developments in the psychological literature will give lawyers better insights to use in exercising peremptory challenges. But additionally, two recent technological developments make it easier for attorneys to exercise peremptory challenges effectively.

The first technological development that may help attorneys exercise peremptory challenges more effectively is computer software that makes scientific jury selection methods available at a much lower cost. Traditional scientific jury selection, as practiced in high-profile trials since the 1970s, compares potential jurors' demographic characteristics to the results of local opinion surveys and mock trial exercises.⁷⁷ For example, if opinion surveys determine that older men are more likely than younger women to sympathize with a defendant, the defense attorney facing an older man and a younger woman would challenge the woman. (This is basically using stereotypes, except the stereotypes are tested for statistical validity before use.) There are significant doubts about the effectiveness of scientific jury selection methods,⁷⁸ and jury consultants today focus more on making attorneys' presentations persuasive rather than helping select juries.⁷⁹ Nevertheless, to the extent traditional scientific jury selection methods are effective—and there is some evidence that they have a limited effect⁸⁰—their primary disadvantage is cost. Surveys and mock trials are often practical only in important or high profile cases. And these methods have not given generalizable results that could apply to many cases.⁸¹

New software may help change that. The most prominent example is JuryQuest, a software package that became available in 2005.⁸² Instead of comparing potential jurors' demographic characteristics to the results of

⁷⁶ See Zeisel & Diamond, *supra* note 48, at 518-19.

⁷⁷ See HANS & VIDMAR, *supra* note 47, at 79-94.

⁷⁸ See, e.g., M. Juliet Bonazzoli, Note, *Jury Selection and Bias: Debunking Invidious Stereotypes Through Science*, 18 QUINNIAC L. REV. 247, 296-305 (1998) (finding that the scientific process for jury selection is more effective than the conventional method); Diamond, *supra* note 70, at 178-83; Fulero & Penrod, *supra* note 47, at 244-51; HANS & VIDMAR, *supra* note 47, at 89-92.

⁷⁹ Diamond, *supra* note 70, at 182-83.

⁸⁰ See, e.g., Bonazzoli, *supra* note 78, at 297-99; Diamond, *supra* note 70, at 180; Fulero & Penrod, *supra* note 47, at 243-53.

⁸¹ See Diamond, *supra* note 70, at 180.

⁸² Jeff Horwitz, *Jury-Rigging: Can a Computer Pick a Better Jury Than a High-Priced Consultant?*, SLATE, Aug. 10, 2006, <http://www.slate.com/id/2147351>; JuryQuest Home Page, <http://juryquest.com> (last visited Sept. 19, 2009).

local surveys, the software compares seven demographic variables—age, sex, race, education, occupation, marital status, and prior jury service—to a massive database of survey questionnaires and prior jury outcomes.⁸³ The idea is that juror attitudes are predictable in mine-run cases; case-specific surveys and mock-trial exercises may not be needed.⁸⁴ This significantly reduces costs, to a few hundred or thousand dollars per trial, compared to tens of thousands of dollars for traditional jury consulting.⁸⁵ Public defender offices in California, Florida, Oklahoma, and Texas use JuryQuest.⁸⁶ Its maker claims impressive results in cases where the package is used, including an acquittal rate of 50% in criminal trials, though no independent studies have evaluated the company's claims.⁸⁷

The second technological development that may help attorneys exercise challenges more effectively is the growing availability of large databases of consumer and public information. This information comes in a variety of forms: public records such as property tax and vehicle registration records; membership lists from churches, college alumni groups, and various clubs; magazine and catalog subscription lists; travel records such as frequent flier account statements; and supermarket discount card records, for example. Some of these data sources are less accessible than others—credit reports are generally protected and federal privacy laws protect health records—while other sources of information are commercially available.⁸⁸ Consumer information has been used extensively in politics: candidates and parties use it to identify likely supporters.⁸⁹ Similarly, marketers rely on

⁸³ See Augustina Guerrero, *Attorneys: Jury Still Out on Computer-Aided Process*, ORLANDO BUS. J., Sept. 11, 2006, <http://orlando.bizjournals.com/orlando/stories/2006/09/11/story11.html>; see also JuryQuest Home Page, *supra* note 82. The *Batson* implications of this technology are unclear. JuryQuest's scores are based in part on race and gender, but the software perfectly separates statistical discrimination from animus-based discrimination, undercutting *Batson*'s rationale, since demographics affect scores only when they have predictive power. See James R. Gadwood, Note, *The Framework Comes Crumbling Down: JuryQuest In A Batson World*, 88 B.U. L. REV. 291, 292, 306-09 (2008).

⁸⁴ See Gadwood, *supra* note 83, at 291-94.

⁸⁵ See *id.* at 306.

⁸⁶ See JuryQuest Testimonials Page, http://juryquest.com/index.php?option=com_content&task=view&id=37&Itemid=69 (last visited Sept. 19, 2009).

⁸⁷ See About JuryQuest Software Page, http://juryquest.com/index.php?option=com_content&task=view&id=58&Itemid=84 (last visited Sept. 19, 2009).

⁸⁸ See, e.g., Yochi J. Dreazen, *Democrats, Playing Catch-Up, Tap Database to Target Potential Voters*, WALL ST. J., Oct. 31, 2006, at A1; Jon Gertner, *The Very, Very Personal Is the Political*, N.Y. TIMES, Feb. 15, 2004, § 6, at 43.

⁸⁹ See, e.g., DOUGLAS B. SOSNICK, MATTHEW J. DOWD & RON FOURNIER, *APPLEBEE'S AMERICA: HOW SUCCESSFUL POLITICAL, BUSINESS, AND RELIGIOUS LEADERS CONNECT WITH THE NEW AMERICAN COMMUNITY* 33-51 (2006); Dreazen, *supra* note 88; Michael D. Shear, *Va. Gubernatorial Hopefuls Use Data to Zero In on Voters*, WASH. POST, Aug. 28, 2005, at C1; David Von Drehle, *No Stone Is Left Unturned for Turnout; Tight Contest Fires Up Faithful in Record Push for Votes*, WASH. POST, Nov. 7, 2000, at A1.

consumer data to identify targets.⁹⁰

No comprehensive database of consumer information has yet been marketed for use in jury selection; nor have the correlation studies necessary to make use of such data in jury selection been performed. Politicians and political parties *have* done similar work,⁹¹ though there has not been independent verification of their effectiveness. But there is little reason to think these methods will not eventually come to jury selection as well.

The combination of these two advances could significantly change how jury selection is performed. The biggest limitation of a program like JuryQuest is the set of variables the software considers. Though those variables may have some predictive power, they are inevitably limited; more information can only help. While JuryQuest might be able to say that, on average, a thirty-five-year-old Korean-American engineer will vote to convict a certain percent of the time, knowing that she reads *The Nation*, drives a hybrid car, and shops at Whole Foods might refine that prediction. Traditionally, some of these variables could be revealed through voir dire or through private investigation of potential jurors, but judges usually do not allow protracted voir dire examination and investigations are far too expensive for most trials. Consumer databases could make this information available to attorneys in all sorts of cases.

The enduring question, then, is what effect peremptory challenges *can* have—that is, what effect they would have if attorneys exercised them rationally, effectively, and with full information. This paper aims to help answer that question.

II. MODELING PEREMPTORY CHALLENGES

A. *Introduction to the Models*

1. Procedures Tested

There are three possible jury selection procedures to test: a sequential-selection method, an ordered struck-jury system, and an unordered struck-jury system. The first two procedures, however, are basically the same: in each case the venire is effectively limited to the first $2j + x$ potential jurors.⁹² The difference is that the sequential-selection method involves a degree of risk that is absent from the ordered struck-jury system, since the replacement for a challenged juror is unknown. That risk makes the optimal

⁹⁰ See, e.g., John D. McKinnon, *Political Device Goes Corporate*, WALL ST. J., May 21, 2007, at A6.

⁹¹ See, e.g., Dreazen, *supra* note 88; Gertner, *supra* note 88; Shear, *supra* note 89.

⁹² See *supra* note 42 and accompanying text.

strategy much more complicated, since the threshold at which a potential juror should be challenged changes during the course of the selection.⁹³ Litigants are also unlikely to be risk-neutral, which increases the complexity.⁹⁴ The ideal jury outcome from each system, however, given a particular ordered venire, should be the same. Because of the uncertainty and complexity in modeling the sequential-selection method and its basic equivalence to the ordered struck-jury method, this Article will test the two varieties of struck juries.

2. Effects Evaluated

This Article evaluates two ways peremptory challenges could affect jury composition.

First, what are the effects of peremptory challenges on the probability that empaneled jurors and juries will vote to convict or acquit? If peremptory challenges change the average juror's likelihood of voting to convict, then trial outcomes will likewise change with the jury selection method employed. This would cast doubt on the legitimacy of jury verdicts: if verdicts can be changed simply by varying the number of peremptory challenges or how they are exercised, then how confident can one be that a jury's verdict is correct?

Second, what are the effects of peremptory challenges on the distribution (both ideological and demographic) of jurors empaneled on any particular jury and on different juries? Two juries may have the same average probability of voting to convict but nevertheless behave differently as groups if one group has jurors who have similar probabilities of voting to convict and the other has a wide range of jurors. Similarly, demographics can affect jury deliberations.⁹⁵ All else being equal, then, we should prefer selection methods that preserve the distribution of the pool of potential jurors.

A related question concerns the predictability of jury selection. Can a selection procedure, drawing from the same population, produce two wildly

⁹³ See, e.g., Steven J. Brams & Morton D. Davis, *Optimal Jury Selection: A Game-Theoretic Model for the Exercise of Peremptory Challenges*, 26 OPERATIONS RES. 966, 989 (1978) (discussing an algorithm for exercising peremptory challenges).

⁹⁴ For example, faced with the choice in jury selection between a known potential juror who is, say, 40% likely to vote to convict, or an unknown replacement juror drawn from the population of potential jurors, a risk-neutral attorney will challenge the known potential juror if the unknown potential jurors are, on average, more favorable to the attorney's side than the known potential juror—even if only slightly more favorable. If the attorney is risk-averse, however, then she will be reluctant to gamble that the unknown alternative will be better than the known potential juror. A risk-averse defense attorney, then, might not take the risk unless the replacement jurors average less than 35% or 30% likely to vote to convict.

⁹⁵ See *infra* Part III.B.

divergent juries? In other words, how great is the *second-order diversity* of juries?⁹⁶ Unpredictability makes jury trials riskier and could make trial outcomes less reliable, since it increases the effects of random variation in jury composition.

3. Attorneys' Knowledge

A variety of assumptions can be made about what knowledge attorneys have when exercising peremptory challenges. Different assumptions can lead to different behavior by attorneys and thus produce different outcomes. To test these different assumptions, this Article employs two models of jury selection.

In the first model, attorneys know how likely an individual potential juror is to vote to convict in criminal cases *generally*, but do not know how likely that potential juror is to vote to convict in any *particular* case. This is essentially the JuryQuest approach, taken to extremes: by comparing an individual potential juror to a comprehensive database of votes in a large number of trials, an attorney could predict how often that potential juror would vote to convict. Accordingly, in this model, each juror is represented by the probability that he or she will vote to convict in a random criminal trial. The model assumes that each attorney knows this probability for each potential juror and acts rationally, striking potential jurors who are less likely to vote for the attorney's preferred outcome.

The second model assumes that attorneys also have case-specific knowledge. Attorneys will sometimes be able to tell not only how often a potential juror would vote to convict, but also in which kinds of cases that juror would vote to convict. A potential juror who would vote to convict in 60% of cases might be predictably more sympathetic to defendants in drug cases and less sympathetic in rape cases. This sort of information might be available through a JuryQuest-type database that contained breakdowns based on type of case. When this information is available, attorneys can predict not just the probability that a potential juror will vote to convict, but (with greater or lesser degrees of accuracy) what that potential juror's vote will be in a particular case. The second model thus assumes that every potential juror's vote can be predicted accurately and precisely in any given case. Potential jurors are divided into those who will vote to convict and those who will vote to acquit. The model assumes that each attorney knows which group each potential juror is in and exercises peremptory challenges, when possible, to strike potential jurors who will vote against the attorney's preferred outcome.

⁹⁶ I borrow the term from Heather K. Gerken, *Second-Order Diversity*, 118 HARV. L. REV. 1099, 1102-03 (2005) (discussing the advantages of diversity among decision-making bodies such as juries).

B. *A Probability Model of Jurors and Jury Selection*

1. Motivating the Model

Imagine a random potential juror in an armed robbery trial. Several factors might affect that juror's willingness to vote to convict. Obviously, details of the specific case should matter: How good is the evidence? Is there surveillance camera footage, or an eyewitness? Were fingerprints found? Was the defendant caught with stolen goods, or at the scene? Is there an alibi, or a motive?

There are also factors that can affect a juror's willingness to convict that are unrelated to any specific case. Maybe a juror has been a crime victim and is unsympathetic to criminal defendants. Maybe a juror has been falsely accused and is suspicious of police. Maybe a juror has law-and-order political beliefs. Maybe a juror watches television crime dramas and expects perfect forensic evidence in every case.⁹⁷ Maybe a juror is less sympathetic to defendants of one race.

Each juror's vote to convict or acquit in an individual case thus depends on a great variety of case-specific and case-independent factors. A potential juror's votes across all possible cases determine the probability that she would vote to convict after hearing the evidence in a random case. And since such a probability exists for each potential juror, a probability distribution can be constructed for all potential jurors in the population. Using that distribution, the effects of various jury selection schemes can be modeled.

The model approximates the probability distribution of potential jurors with a beta distribution, with the shape parameters $\alpha = 5$ and $\beta = 4$. (The beta distribution used in the model, with $\alpha = 5$ and $\beta = 4$, is shown in Figure 1.) The distribution is given by the equation

$$f(x; \alpha, \beta) = \frac{1}{B(\alpha, \beta)} x^{\alpha-1} (1-x)^{\beta-1},$$

in which the independent variable x represents an individual potential juror's likelihood of voting to convict in a random criminal trial; the function

⁹⁷ The "CSI effect" has become a problem for prosecutors as juries demand more and more forensic evidence even in simple cases. *See, e.g.*, Kit R. Roane, *The CSI Effect*, U.S. NEWS & WORLD REP., Apr. 17, 2005; Richard Willing, "CSI Effect" Has Juries Wanting More Evidence, USA TODAY, Aug. 5, 2004. The effect may have been responsible for the acquittal of actor Robert Blake of murder: jurors noted that Blake had "not one particle" of gunshot residue on his clothes after the shooting. Roane, *supra*. Some prosecutors have responded by calling "negative evidence witnesses," who "try to assure jurors that it is not unusual for real crime-scene investigators to fail to find DNA, fingerprints and other evidence at crime scenes." Willing, *supra*.

f describes the proportion of potential jurors who fall near x ; and the normalization constant B is given by

$$B(\alpha, \beta) = \int_0^1 t^{\alpha-1} (1-t)^{\beta-1} dt = \frac{(\alpha-1)!(\beta-1)!}{(\alpha+\beta-1)!}.$$

Although there is no source of empirical information that would approximate the real-world distribution of potential jurors,⁹⁸ this beta distribution has two features that make it particularly suitable for testing the effects of peremptory challenges. First, the vast majority of jurors are somewhere in the middle—possibly convicting, possibly not, depending on case-specific factors. There may be people who would almost always convict or almost always acquit, but they probably make up a relatively small portion of the population. There are nevertheless differences between jurors: a juror who is 40% likely to convict in a random trial and one 60% likely to convict may both be weighing the evidence carefully and with equal attention to their responsibilities as jurors, but the 40% juror is somewhat more skeptical of the government's case.

Second, the distribution is not centered at 50%. This is realistic: there is little reason to expect a real population to be perfectly neutral between the prosecution and defense. This factor will vary from community to community: urban jurors may be less willing to convict, for example, than suburban jurors.⁹⁹ And asymmetry enables testing whether peremptory challenges result in systematic distortions: if, for example, the average potential juror is 60% likely to vote to convict, but the average *empaneled* juror is 70% likely to vote to convict, then the selection procedure is biasing juries.

⁹⁸ One obvious approach would be to compare conviction rates with jury demographics and construct an approximation based on demographics of the population. There are two problems with this approach: (1) juries are made up of members of a population who actually show up and make it through jury selection (including excuses, challenges for cause, and peremptory challenges) rather than a random sample of the population, which, as the model shows, *see infra* Part II.B.3, makes a significant difference in the distribution of jurors empaneled; and (2) jury verdicts are a product not only of the individual jurors' initial votes, but of group deliberations, *see infra* Part III.2.

⁹⁹ *See, e.g.*, SHAWN M. FLOWER, ABELL FOUND., DISPARITIES IN JURY OUTCOMES: BALTIMORE CITY VS. THREE SURROUNDING JURISDICTIONS—AN EMPIRICAL INVESTIGATION 1, 2 (2008), available at <http://www.abell.org/pubsitems/Disparities-cj.908.pdf>.

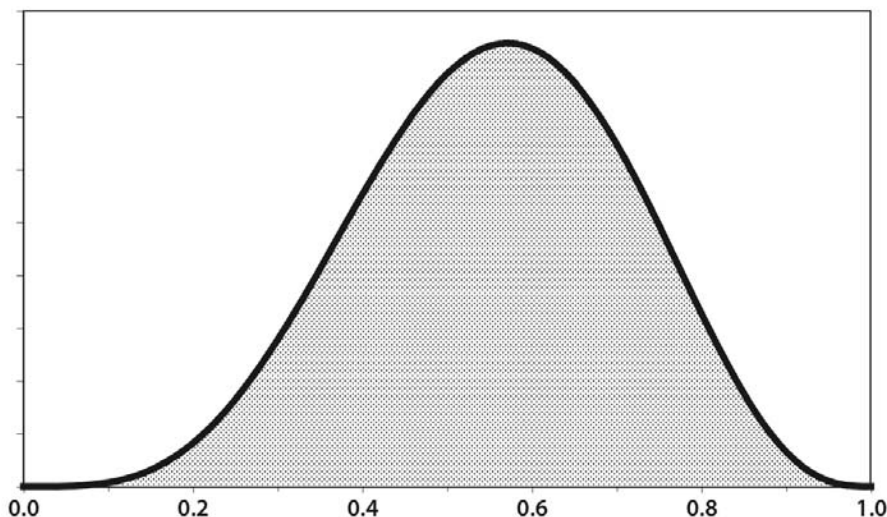


Figure 1. *The beta distribution.* A sample beta distribution is shown with the shape parameters $a = 5$ and $b = 4$. The figure is normalized so the shaded area equals 1. The mean is at $x = 0.556$, with the peak at $x = 0.571$ and the median at $x = 0.559$. For a population modeled by this curve, then, the average person is 55.6% likely to convict. Additionally, 36.3% of people are less than 50% likely to vote to convict; 63.7% of people are more than 50% likely to vote to convict. Very few people are truly partial: just 2.1% of people are more than 85% likely to vote to convict, for example, and 0.3% are less than 15% likely to convict.

2. Constructing and Applying the Model

The model assumes that during jury selection, each side eliminates those jurors who are most likely to vote against that side; prosecutors will challenge those potential jurors with the smallest probabilities of voting to convict, while defense attorneys will challenge those with the largest probabilities.¹⁰⁰ Each side will also limit challenges to those jurors who actually have a chance of being selected. If the venire is not ordered before challenges are exercised, this is the entire venire. If the venire is ordered, however, only the first $2j + x$ potential jurors (where j represents the number of peremptory challenges allocated to each side and x represents the size of the jury) actually have a chance of being selected. (To simplify matters, I will assume that $x = 12$ and that both sides have the same number of peremptory challenges.) Alternate jurors would complicate this analysis, since alternates are typically selected in a second round, with each side given additional challenges, but the conclusions would be the same.

¹⁰⁰ As discussed in Part II.A.3, a potential juror might be less likely to vote to convict as averaged across all cases, but *more* likely to vote to convict in a certain case or a certain class of cases. The probability model does not account for such case-specific factors. This is a key limitation of the model, and it is addressed in the binary model. *See infra* Part II.C.

For the unordered-venire selection method, the distribution of *empaneled* jurors can be calculated as follows. Let $f(x)$ be the distribution of all potential jurors. (In the model, $f(x)$ is the beta distribution with $\alpha = 5$ and $\beta = 4$, as discussed above.) The probabilities of potential jurors voting to convict from any individual venire of size s can be sorted into order from smallest to largest and represented as $X_{(1)}, X_{(2)}, \dots, X_{(s)}$, where $X_{(k)}$ represents the k th-smallest probability and is called the k th order statistic of the venire. With an unordered venire, each juror has an equal probability of being selected (before challenges), so each side will eliminate the j least-favorable members of the entire venire. The eliminated jurors are the jurors at each end of the sorted venire; those who remain are the middle jurors. Accordingly, jurors $X_{(1)}, X_{(2)}, \dots, X_{(j)}$ and $X_{(s-j+1)}, X_{(s-j+2)}, \dots, X_{(s)}$ will be struck. The remaining jurors—the jurors who might be selected—are $X_{(j+1)}, X_{(j+2)}, \dots, X_{(s-j)}$.

The probability distributions of these remaining potential jurors' likelihoods of voting to convict are the distributions of order statistics of the distribution $f(x)$. The probability distribution of an order statistic $X_{(k)}$ is given by

$$f_{X_{(k)}}(x) = \frac{n!}{(k-1)!(n-k)!} (F(x))^{k-1} (1-F(x))^{n-k} f(x),$$

where n is the total number of values of X (in this case, s) and $F(x)$ is the cumulative distribution function for $f(x)$. (For a probability distribution defined over $[0,1]$, $F(x) = \int_0^x f(z) dz$, defined for x in $[0,1]$.) The distribution of empaneled jurors is the average of the distributions of $X_{(j+1)}, X_{(j+2)}, \dots, X_{(s-j)}$, which is given by

$$f_{\text{empaneled}}^{\text{unordered}}(x; s, j) = \frac{1}{s-2j} \sum_{k=j+1}^{s-j} \frac{(s-2j)!}{(k-1)!(s-2j-k)!} (F(x))^{k-1} (1-F(x))^{s-2j-k} f(x).$$

Figure 2 shows an example of the distributions of order statistics for the remaining jurors. Figure 3 shows the resulting distribution of all empaneled jurors. As expected for a selection mechanism in which the potential jurors who are most and least likely to convict are eliminated, the distribution is substantially narrower than the distribution of all potential jurors. "Extreme" jurors are much less likely to serve than they would be if juries were selected randomly.

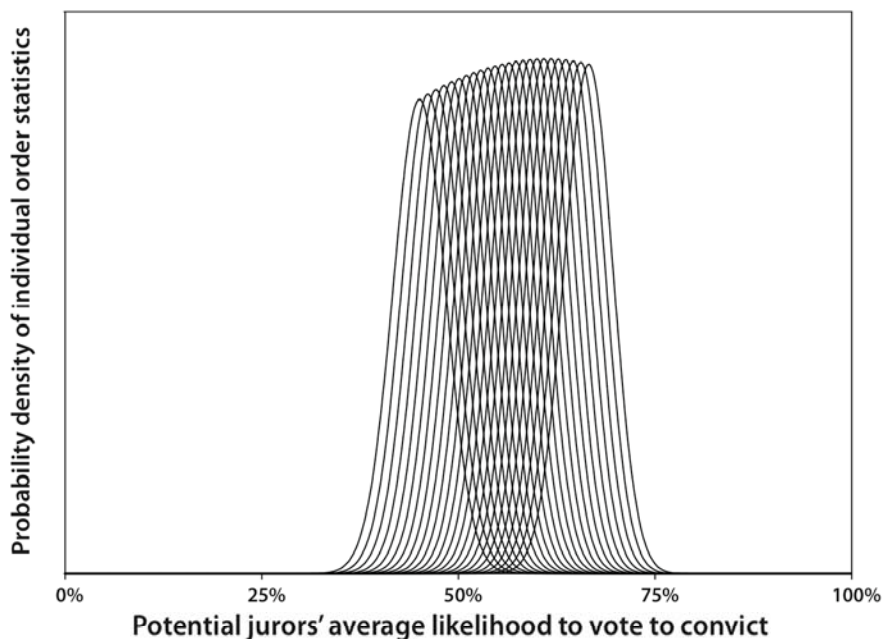


Figure 2. *Juror order statistics.* The probability distributions of potential jurors who are not challenged are shown for a specific selection mechanism. The distribution of all potential jurors is the beta distribution with shape parameters $a = 5$ and $b = 4$; this is the distribution shown in Figure 1, *supra*. The venire size is forty-eight, and each side is allocated twelve peremptory challenges, leaving the middle twenty-four potential jurors after peremptory challenges. Each of those potential jurors is represented by a probability distribution. The average of these twenty-four distributions, which is the distribution of all empaneled jurors, is shown in Figure 3, *infra*.

The calculation of the distribution of jurors selected according to the ordered-venire method is similar. The differences are (1) the number of members of the effective venire varies with the number of peremptory challenges each side is allowed; and (2) the number of potential jurors who are not eliminated is fixed at twelve. With each side getting j peremptory challenges, the empaneled jurors will be the middle twelve jurors out of $2j + 12$ potential jurors. Accordingly, $X_{(1)}, X_{(2)}, \dots, X_{(j)}$ and $X_{(j+13)}, X_{(j+14)}, \dots, X_{(2j+12)}$ will be struck, and $X_{(j+1)}, X_{(j+2)}, \dots, X_{(j+12)}$ will be selected. This gives a distribution of empaneled jurors of

$$f_{\text{empaneled}}^{\text{ordered}}(x; j) = \frac{1}{12} \sum_{k=1}^{12} \frac{(12+2j)!}{(j+k-1)!(12+j-k)!} (F(x))^{j+k-1} (1-F(x))^{12+j-k} f(x).$$

For both distributions of empaneled jurors, the standard deviation of the distribution can be calculated from the standard formula

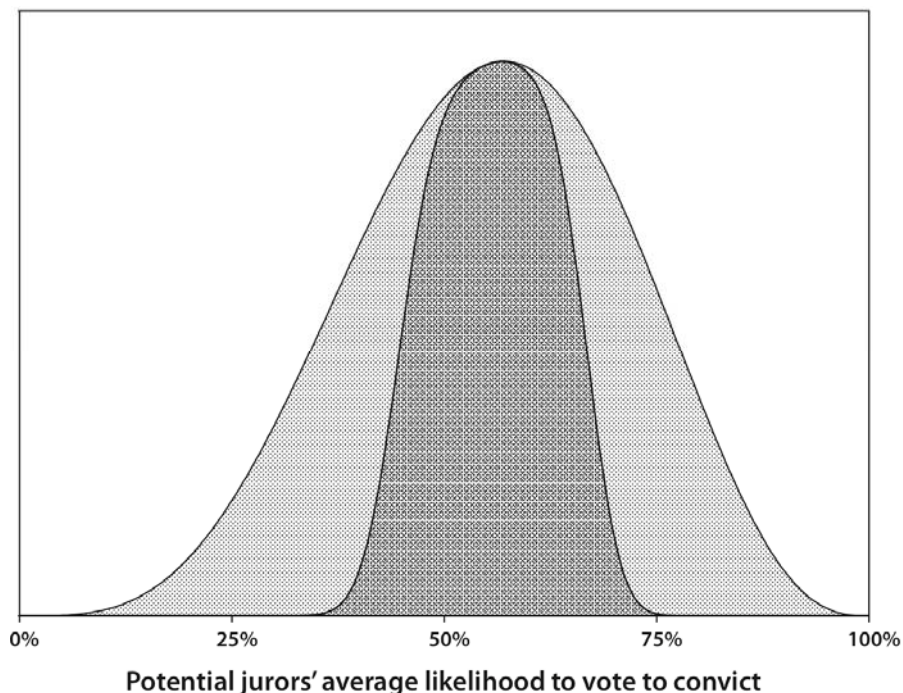


Figure 3. *Probability distribution of empaneled jurors.* Two distributions are shown. The broad (lighter) probability distribution shows all potential jurors, while the narrow (darker) probability distribution shows only those jurors who are not challenged. The selection method is the same as in Figure 2. Peremptory challenges result in a substantial narrowing of the jury pool, eliminating jurors at the extremes. The two distributions are not normalized; they are shown in different height scales to make comparison easier.

$\sigma^2 = E(X^2) - (E(X))^2$, to provide a measure of the ideological diversity of empaneled jurors.¹⁰¹

3. Results of the Model

The results of the model for several selection methods and numbers of peremptory challenges are summarized in Table 1.

The first effect of peremptory challenges is that the asymmetry in the population of potential jurors is magnified as the proportion of peremptory challenges increases. According to this model, jurors selected by methods with more peremptory challenges are more likely to vote to convict than those selected with fewer peremptory challenges. (Of course, if the distribution of all potential jurors were flipped, juries selected with more peremptory challenges would become less likely to vote to convict.) The average juror selected randomly has a 55.56% probability of voting to convict in a

¹⁰¹ For lack of a better term, I use ideology to refer to jurors' willingness to convict or acquit, rather than to any underlying views.

<i>Selection method</i>	<i>Total peremptory challenges</i>	<i>Effective venire size</i>	<i>Ratio of challenges to effective venire size</i>	<i>Average likelihood to vote to convict</i>	<i>Standard deviation of distribution of empaneled jurors</i>
Random selection	0	n/a	0.00	0.5556	0.1571
3 per side, no set order	6	60	0.10	0.5569	0.1313
6 per side, no set order	12	60	0.20	0.5577	0.1125
12 per side, no set order	24	60	0.40	0.5587	0.0822
18 per side, no set order	36	60	0.60	0.5593	0.0571
3 per side, set order	6	18	0.33	0.5582	0.0897
6 per side, set order	12	24	0.50	0.5589	0.0761
12 per side, set order	24	36	0.67	0.5594	0.0542
18 per side, set order	36	48	0.71	0.5595	0.0434
Fully-struck jury from 60	48	60	0.80	0.5596	0.0368

Table 1. *Results of the probability model.* The average likelihood that a juror will vote to convict and standard deviation of jurors is shown for several selection methods. As the ratio of peremptory challenges to effective venire size increases, the average juror's likelihood of voting to convict likewise increases, and the standard deviation of empaneled jurors decreases. These relationships are shown graphically in Figures 4 and 5.

random case; the average juror selected according to the fully-struck-jury method from a venire of sixty has a 55.96% probability of voting to convict. As the ratio of peremptory challenges to effective venire size increases, the average empaneled juror's probability of voting to convict increases. (This relationship is shown in Figure 4.) All else being equal, a jury selected from this population using a method with no peremptory challenges should be less likely to convict than a jury selected using a method with many peremptory challenges.

This result would be rather troubling, except that the difference in probabilities is so small, spanning less than half a percentage point in the model. This difference would affect the verdict only in the most borderline case. The magnitude of the change, however, is a function of the shape of the probability distribution, and since there is no reason to believe the actual population of potential jurors is best modeled by a beta distribution, the magnitude of this effect might be greater.

This effect has a simple cause. A selection method with many peremptory challenges eliminates potential jurors on either end of the spectrum and favors those jurors near the median of the population. Because the beta distribution is skewed to the right, its median is greater than its mean, so the average likelihood of voting to convict increases as jurors near the median are favored. (Indeed, for the beta distribution for $\alpha = 5$ and $\beta = 4$, the mean is 0.5556 and the median is 0.5598.) The magnitude of the effect depends on the ratio of peremptory challenges to effective venire size because that is the fraction of potential jurors who are eliminated through peremptory challenges. The size of the change depends on how close the median and mean

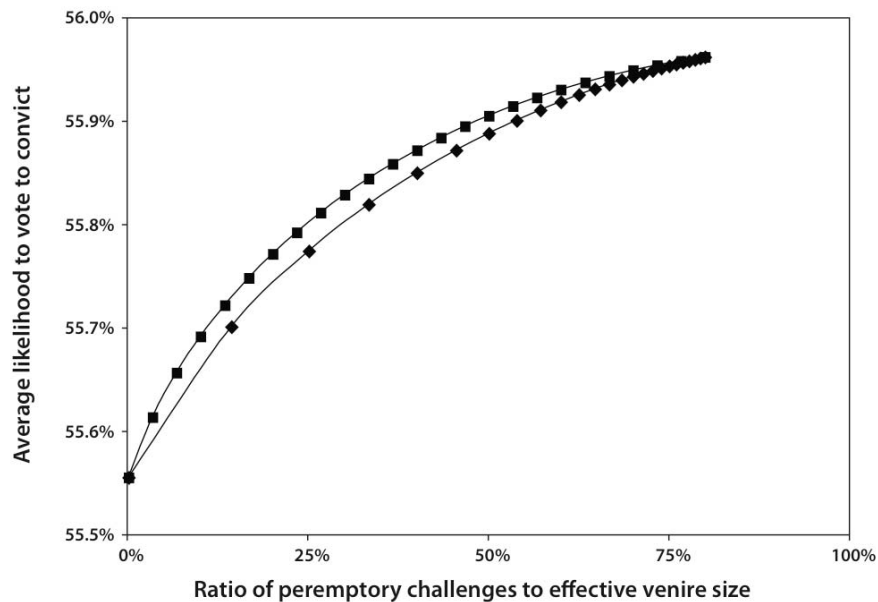


Figure 4. *Likelihood to convict as a function of peremptory challenges.* As the number of peremptory challenges for a given selection mechanism rises, the average juror selected becomes more likely to vote to convict. Each point represents a jury selection mechanism with a specific number of peremptory challenges. Square points represent selection from an unordered venire of size sixty; diamond points represent selection from an ordered venire with up to twenty-four peremptory challenges per side. Although the two lines are not precisely the same, the trend is largely dependent on the ratio of peremptory challenges to effective venire size, not on the raw number of challenges. However, the magnitude of the effect is quite small, accounting for less than 0.5% of the probability that a random juror will vote to convict.

are for the population distribution; they are fairly close in the beta distribution used in the model, and so the shift in jury outcomes is small. For a more skewed population, the difference would be more significant¹⁰²—and

¹⁰² This can be easily shown by comparing the results for the beta distribution used in the model to other possible distributions of potential jurors. The following table, for example, compares the change due to peremptory challenges in probability that an empaneled juror will vote to convict with the skewness of the underlying distribution of all potential jurors, assuming that each side is allocated twenty-four peremptory challenges and an ordered selection procedure is used:

<i>Beta distribution</i>	<i>Skewness of population distribution</i>	<i>Potential jurors' probability of voting to convict</i>	<i>Empaneled jurors' probability of voting to convict</i>	<i>Change in probability of voting to convict</i>
$\alpha = 5, \beta = 4$	-0.129	0.5556	0.5596	+0.0041
$\alpha = 5, \beta = 3$	-0.310	0.6250	0.6353	+0.0103
$\alpha = 5, \beta = 2$	-0.596	0.7143	0.7344	+0.0201
$\alpha = 5, \beta = 1$	-1.183	0.8333	0.8685	+0.0351

As the populations of potential jurors become more skewed, the probability shift caused by the peremptory challenges increases from less than half a percentage point to more than 3.5%. This is a much more significant shift, enough to affect approximately one in twenty-eight juror votes—or one vote every two or three trials.

the population of potential jurors in the United States may be strongly skewed toward conviction: 84% of juries in federal criminal jury trials convict.¹⁰³

The second effect of peremptory challenges in the model is that the standard deviation of the individual jurors' likelihood of voting to convict on any particular jury declines as the proportion of peremptory challenges increases. In other words, peremptory challenges make individual juries much more homogenous and much less ideologically diverse than juries selected randomly. Figure 5 illustrates the trend.

This phenomenon has the same cause as the shift in average likelihood to convict: as prosecutors and defendants are allowed more peremptory challenges, they use them to eliminate more and more jurors at each end of the spectrum, leaving only those jurors at the median. Unlike the shift in average likelihood to convict, this effect is anything but minor, as Figure 6 makes clear: juries selected according to methods with many peremptory challenges are uniformly concentrated in the middle of the population. Indeed, a Monte Carlo simulation makes clear how large the effect is: the average jury selected with no peremptory challenges has members with probabilities of voting to convict ranging from 29.8% to 80.0%, while the average jury selected according to the fully-struck-jury method with twenty-four peremptory challenges per side varies only between 52.0% and 59.9%. Among 5,000 such simulated fully struck juries, *no single juror* was chosen with a probability of less than 41.8% or greater than 69.4%. When the parties are allocated many peremptory challenges, whole swaths of potential jurors—those who are not in the very middle of the jury pool—are essentially eliminated from *ever* serving. This effect does not depend on the shape of the population or of the model chosen; for all distributions, potential jurors near the median are much more likely to serve than those farther away. This is a fundamental shift away from the idea that juries are to be chosen from a “fair cross-section of the community.”¹⁰⁴

¹⁰³ See Andrew D. Leipold, *Why Are Federal Judges So Acquittal Prone?*, 83 WASH. U. L.Q. 151, 152 (2005). This shift, of course, is not necessarily problematic. Prosecutors should only bring cases in which they believe the defendant is guilty beyond a reasonable doubt. But since defendants plead guilty in most cases, it is very difficult to know whether most defendants who *go to trial* are guilty or not. These considerations are discussed in Part III.A.

¹⁰⁴ *Taylor v. Louisiana*, 419 U.S. 522, 526 (1975) (holding that a jury-selection procedure that made women much less likely to be selected unconstitutionally deprived Taylor of his right to trial by a jury selected from a fair cross section of the community). The Court limited the fair-cross-section requirement in *Holland v. Illinois*, 493 U.S. 474, 480 (1990), holding that although a jury must be selected from a venire drawn from a fair cross section of the community, an individual jury need not be representative. There is a significant difference, though, between saying the Constitution does not guarantee a representative jury in an individual case, and saying the Constitution permits procedures that effectively exclude large swaths of potential jurors from ever serving and make representative juries vanishingly unlikely to be selected.

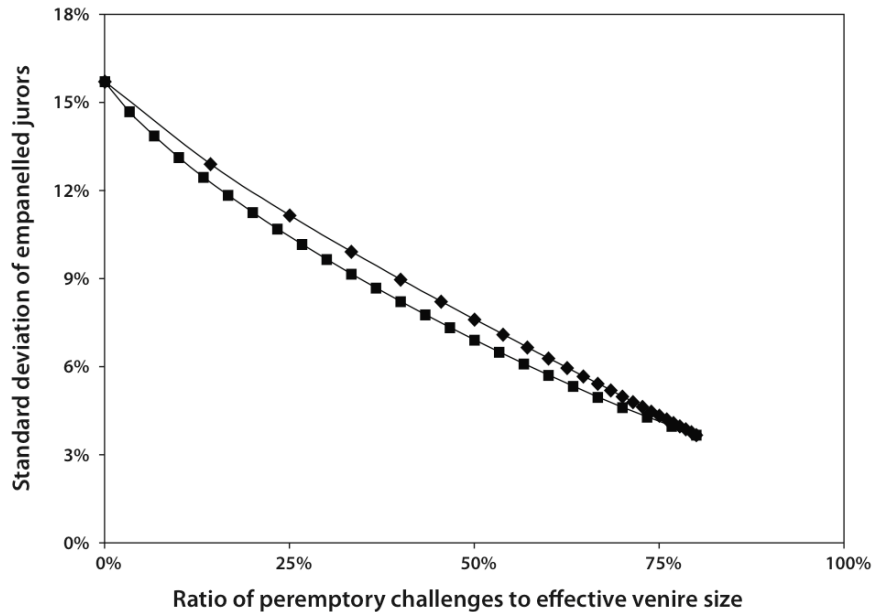


Figure 5. *Ideological diversity as a function of peremptory challenges.* As the number of peremptory challenges for a given selection mechanism rises, the standard deviation of the distribution of empaneled jurors falls. Square points represent examples of selection from an unordered venire of size sixty; diamond points represent selection from an ordered venire with up to twenty-four peremptory challenges per side.

In summary, two effects of peremptory challenges can be shown using the probability model. Peremptory challenges cause the average empaneled juror's likelihood of voting to convict to shift from the mean to the median of the population. For many populations this shift will be minor, though without information about the population's distribution it is impossible to know how large the effect will be. Peremptory challenges also cause juries to be much less ideologically diverse, as individual jurors far from the population's median are much less likely to be selected. This effect is extremely large: the standard deviation in the model of jurors selected with twenty-four peremptory challenges per side (out of a venire of sixty potential jurors) is less than one quarter the standard deviation of randomly selected jurors. Moreover, this effect should be large for most or all distributions of potential jurors. The result is that jurors are exposed to a much lesser variety of viewpoints and experiences, likely reducing the accuracy of jury verdicts.¹⁰⁵

¹⁰⁵ See *infra* Part III.B.

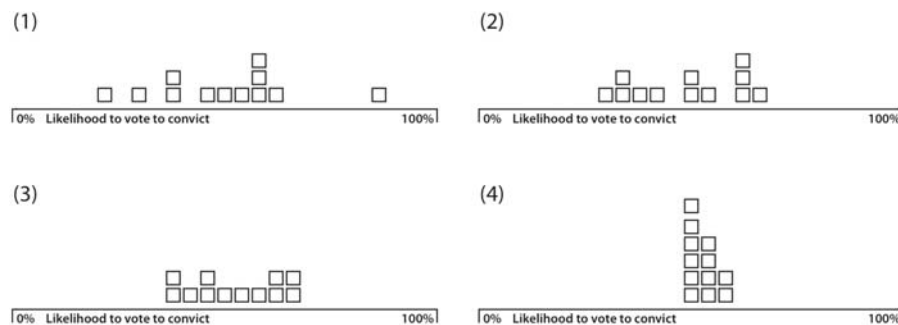


Figure 6. *Decreasing diversity in juries selected with more peremptory challenges.* Histograms of four juries are shown. These juries were selected using the unordered-venire method from the same venire of sixty potential jurors, generated from the beta distribution used in the model. Four juries were chosen, using increasing numbers of peremptory challenges: (1) random selection; and (2)-(4) six, twelve, and twenty-four peremptory challenges per side, respectively.

C. *A Binary Model of Jurors and Jury Selection*

1. *Motivating the Model*

The probability model has a significant limitation: it cannot account for case-specific factors that determine an individual juror's likelihood to vote to convict. Ignoring these factors may be reasonable in some cases, but often attorneys will have information (whether individual or demographic) about a potential juror that sheds light on that juror's likely vote in a specific case. In the extreme, an attorney would have enough information about every potential juror to predict his or her vote. The binary model assumes that this is the case, so we can investigate what happens as attorneys become increasingly good at predicting potential jurors' votes.

The model divides the population of potential jurors into two groups of indeterminate size: those who would vote to convict and those who would vote to acquit. This is the only characteristic distinguishing potential jurors. Prosecutors will, when possible, use peremptory challenges on potential jurors who would vote to acquit (and vice versa for defense attorneys); attorneys are indifferent, however, between potential jurors who would vote the same way.

As a consequence of this indifference, the composition of the empaneled jury is fully determined by two variables: the composition of the effective venire (i.e., how many potential jurors would vote to convict and acquit) and the selection method. For example, if each side is allowed twelve peremptory challenges and the venire is ordered, then only the first thirty-six potential jurors might get selected; if that group has twenty jurors who would vote to convict and sixteen who would vote to acquit, then each side will strike twelve opposing jurors, and the jury will be divided, before deliberations, 8-4 in favor of conviction. If the venire is divided 27-9, how-

ever, one side will be able to challenge all nine opposing potential jurors; the jury will be aligned 12-0. (For unordered selection methods with extra potential jurors, there is a degree of randomness after challenges have been exercised.) The distribution of *jury* compositions thus follows from the distribution of *venire* compositions, which can be calculated according to the binomial theorem.

2. Constructing and Applying the Model

The model divides the population of potential jurors into those who would vote to convict and acquit. Call those groups *A* and *B*, with group *A* representing those who would vote to convict. (This terminology will come in handy in Part II.C.4, *infra*, which expands the model.) Let *s* represent the size of the effective venire (i.e., the number of potential jurors who might get selected) and *p* represent the probability that an individual potential juror is a member of group *A* (i.e., the proportion of the population in group *A*). Applying the binomial theorem, the probability that the venire will contain *k* members of group *A* is given by

$$f(k; s, p) = \frac{s!}{k!(s-k)!} p^k (1-p)^{s-k}.$$

Determining the probability distribution of *juries*' compositions is more complicated, because there are several ways to get a jury split 12-0 in one direction or the other. A jury will have zero members from group *A* if the venire has anywhere from zero to *j* members, where *j* is the number of peremptory challenges allocated to each side. Similarly, if there are *j* or fewer members of group *B* on the venire, the jury will have twelve members of group *A*. For an *ordered* venire, then, the probability that the jury will have *k* members from group *A* is

$$f_{\text{jury}}^{\text{ordered}}(k; j, p) = \begin{cases} \sum_{n=0}^j \frac{(12+2j)!}{n!(12+2j-n)!} p^n (1-p)^{12+2j-n}, & \text{for } k=0 \\ \frac{(12+2j)!}{(j+k)!(12+j-k)!} p^{j+k} (1-p)^{12+j-k}, & \text{for } 1 \leq k \leq 11 \\ \sum_{n=0}^j \frac{(12+2j)!}{(12+j+n)!(j-n)!} p^{12+j+n} (1-p)^{j-n}, & \text{for } k=12. \end{cases}$$

Calculating the probability distribution of juries selected from *unordered* venires is yet more complicated. The breakdown between groups *A*

and B of potential jurors left after challenges have been exercised is determined by the composition of the venire and the number of peremptory challenges. The *jury* is chosen randomly from those remaining jurors, however, and this random choice adds a second binomial step to the calculation. The result is a set of thirteen summations, some of them summations of summations. Some sample calculations not reproduced here confirm that, as in the first model, by far the dominant factor is the ratio of peremptory challenges to effective venire size. Since the added complexity introduced by the unordered selection process does not yield any additional insights, to simplify the analysis, this model will use only the ordered selection method.

In addition to the average number of members of group A on a jury, two more statistics are calculated. First, the probability that a jury will be badly lopsided in favor of the majority, with at least ten members drawn from group A , is given by

$$f_{10-12}^{\text{ordered}}(j, p) = \sum_{n=10}^{11} \frac{(12+2j)!}{(j+n)!(12+j-n)!} p^{j+n} (1-p)^{12+j-n} + \sum_{n=0}^j \frac{(12+2j)!}{(12+j+n)!(j-n)!} p^{12+j+n} (1-p)^{j-n}.$$

This gives another measure of the degree to which peremptory challenges change jury composition. Second, the probability that a jury will be badly lopsided in favor of the *minority*—with at least 10 members drawn from group B —is given by

$$f_{0-2}^{\text{ordered}}(j, p) = \sum_{n=0}^j \frac{(12+2j)!}{n!(12+2j-n)!} p^n (1-p)^{12+2j-n} + \sum_{n=1}^2 \frac{(12+2j)!}{(j+n)!(12+j-n)!} p^{j+n} (1-p)^{12+j-n}.$$

Considered together, these two measures give a sense of how ideologically diverse individual juries are.

3. Results of the Model

The results of the binary model largely mirror the results of the probability model. As in the probability model, peremptory challenges magnify asymmetries in the population. These results are shown in Table 2 for several sample selection methods and breakdowns of the population.

Selection method	Total peremptory challenges	Ratio of challenges to effective venire size	Average number of jurors from group <i>A</i> (<i>p</i> = percent of population in group <i>A</i>)			
			<i>p</i> = 51%	<i>p</i> = 55%	<i>p</i> = 65%	<i>p</i> = 75%
Random selection	0	0.00	6.12	6.60	7.80	9.00
3 per side, set order	6	0.33	6.18	6.90	8.67	10.32
6 per side, set order	12	0.50	6.24	7.18	9.44	11.17
12 per side, set order	24	0.67	6.35	7.70	10.55	11.83
18 per side, set order	36	0.75	6.44	8.15	11.20	11.97
24 per side, set order	48	0.80	6.53	8.54	11.56	11.99
36 per side, set order	72	0.86	6.68	9.17	11.87	12.00

Table 2. *Results of the binary model.* The average breakdown of juries is shown for several selection methods and populations of potential jurors. As the ratio of peremptory challenges to effective venire size increase, the average number of jurors selected from the majority likewise increases. This relationship is shown in Figure 7.

The effect is much larger in the binary model than in the beta distribution model. For instance, when 55% of the population belongs to group *A*, then the average jury selected randomly (i.e., with no peremptory challenges) contains 6.6 members of group *A* and 5.4 members of group *B*. If each side exercises twenty-four peremptory challenges and the jury is selected from an ordered venire, however, an average of 8.5 members come from group *A*. And the effect is even more extreme when the population is split 65-35: randomly selected juries average 7.8 members of group *A*, while juries selected with each side exercising twenty-four peremptory challenges average 11.6 members from group *A*. Peremptory challenges can turn a dominant majority into an overwhelming majority and nearly eliminate members of the minority. If a majority of potential jurors will convict, then in cases with the most peremptory challenges—which tend to be cases involving the most serious crimes—peremptory challenges may cause the jury to have *no* members who are skeptical of the government's case. The rather extreme nature of the effect is shown in Figure 7.

It is not surprising that the effect is more dramatic in this model than in the probability model: attorneys in this model have much greater information about potential jurors, because the probability model assumes that attorneys rely only on factors unrelated to the specific case that attorney is trying. This added information should allow for more tailored use of challenges, magnifying their effects. Just as before, peremptory challenges shift the jury toward the median juror; here the median juror's vote is known, and likely to be guilty. (And as before, if the population distribution were reversed such that the majority of potential jurors would vote to acquit, empaneled jurors would likewise become more likely to vote to acquit as the number of peremptory challenges is increased.)

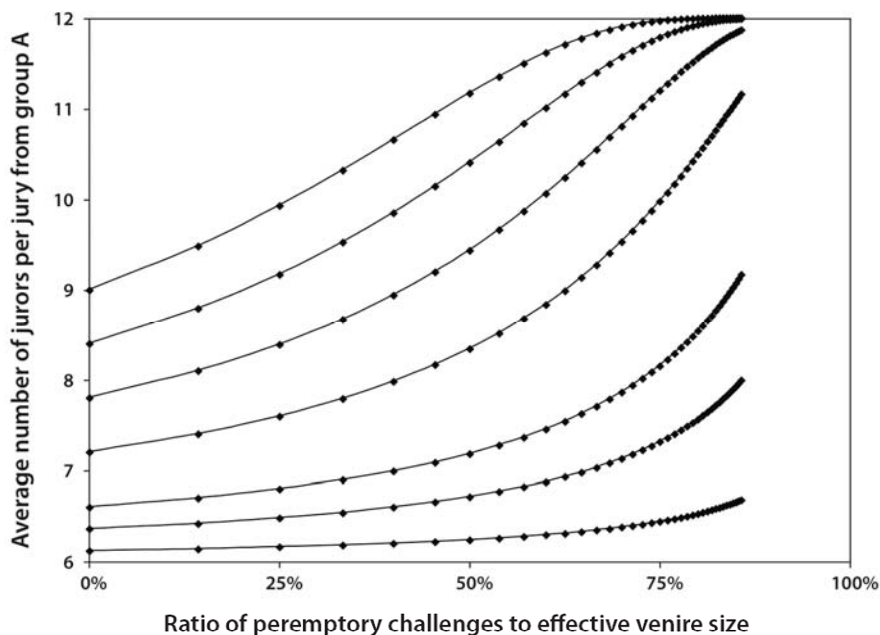


Figure 7. *Dominance of the majority as a function of peremptory challenges.* As the ratio of peremptory challenges to effective venire size increases, the average number of members of the majority group (group *A*) increases. Data are shown for seven divisions of the population: the proportions in the majority (i.e., p) from bottom to top are 51%, 53%, 55%, 60%, 65%, 70%, and 75%.

Figure 8 shows another way of seeing this effect: as the ratio of peremptory challenges to effective venire size increases, many more juries become badly lopsided and dominated by members of group *A*. This is true even when the population is relatively evenly divided. For example, when the population is split 60-40 and each side gets thirty-six peremptory challenges (a large but not unheard-of number),¹⁰⁶ 86% of juries have *at least ten* members from group *A*. Indeed, even when the population is split exactly evenly, peremptory challenges cause badly lopsided juries, as can be seen in Figure 9. When the population is split 50-50 and each side gets thirty-six peremptory challenges, 22% of juries have two or fewer members of group *A* and 22% have ten or more. Nearly half of all such juries, then, are badly divided in one direction or the other, even though the population of potential jurors is evenly divided.

¹⁰⁶ See *supra* note 29.

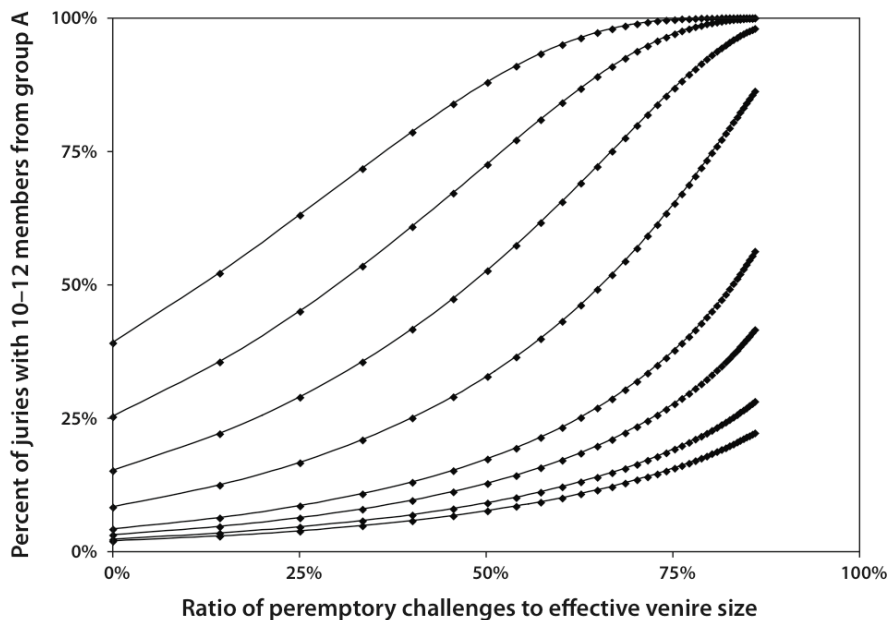


Figure 8. *Dominance of the majority as a function of peremptory challenges: another view.* As the ratio of peremptory challenges to effective venire size increases, the proportion of juries dominated by members of group A increases. Data are shown for eight divisions of the population: the proportions in the majority (i.e., p) from bottom to top are 50%, 51%, 53%, 55%, 60%, 65%, 70%, and 75%. Even when the population is split exactly 50–50, peremptory challenges cause many more juries to be dominated by one group or the other.

The net result of these effects is that peremptory challenges reduce diversity on juries, but *increase* second-order diversity, since a single selection method becomes much more likely to produce wildly different juries as the number of peremptory challenges increases.

In summary, two effects of peremptory challenges can be shown using the binary model. First, as in the previous model, peremptory challenges cause juries to be increasingly dominated by jurors near the median of the population. This means that if a majority of the population would vote to convict, juries will be even more dominated by jurors who would vote to convict than would occur by chance. This is a large effect that applies to all populations. Second, also as in the first model, peremptory challenges cause juries to be less ideologically diverse: juries are much more likely to be dominated by one kind of juror. When a substantial majority of the population would vote to convict, juries are much more likely to be dominated by that group. When the population is evenly divided or nearly so, however, the dominant majority can be for conviction *or* acquittal. And second-order jury diversity is also increased as the number of peremptory challenges increases. These latter two effects make juries less predictable and increase the risks of trial.

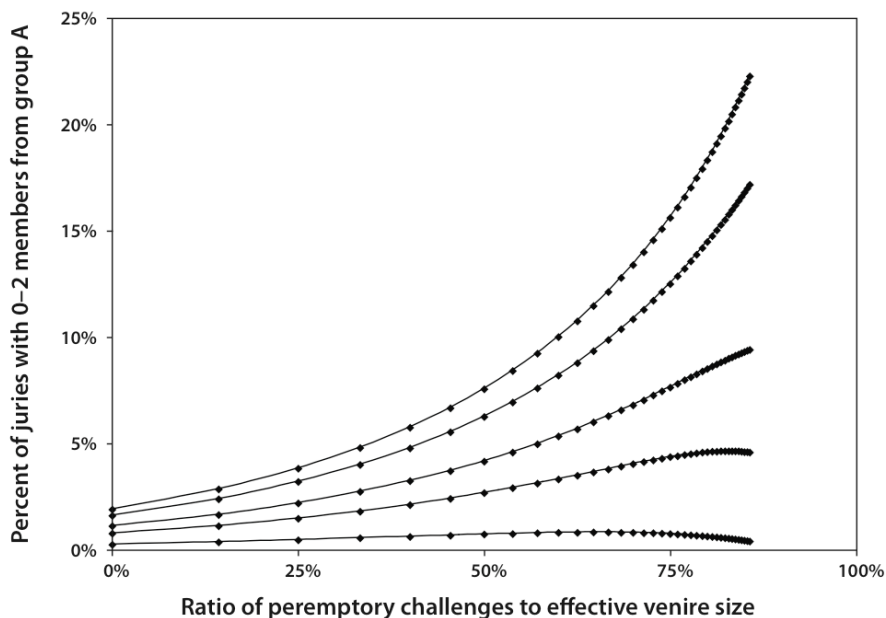


Figure 9. *Dominance of the minority as a function of peremptory challenges.* As the ratio of peremptory challenges to effective venire size increases, the proportion of juries dominated by members of group *B* increases—but only for relatively evenly divided populations. Data are shown for five divisions of the population: the proportions in the majority (i.e., *p*) from bottom to top are 60%, 55%, 53%, 51%, and 50%.

4. Demographic Diversity

The probability model discussed in Part II.B, *supra*, has another shortcoming: it makes no assumptions about the demographic makeup of the population and so cannot predict what effect peremptory challenges have on jury demographics. While it may be the case that peremptory challenges reduce demographic diversity just as they reduce ideological diversity, testing this with the probability model requires a theory of how demographics relate to likelihood of voting to convict.

The binary model can be adapted to investigate demographic diversity by treating groups *A* and *B* as potential jurors from different demographic groups instead of potential jurors with different votes. This version of the model makes two assumptions. First, it assumes that the population can be divided into two groups, with every potential juror belonging to one group or the other. These groups can represent any binary characteristics: white versus minority, male versus female, rich versus poor, liberal versus conservative. Second, the model assumes that in a particular jury trial one side wants to eliminate members of one group, while the other side wants to eliminate members of the other group. (So in a rape trial, for example, the prosecution might want to eliminate male jurors while the defense might want to eliminate female jurors; in a racial discrimination lawsuit, the plain-

tiff may want to eliminate white jurors while the defendant wants to eliminate minority jurors.)¹⁰⁷

The results of this version of the model are the same as in Part II.C.3, *supra*: peremptory challenges increase the representation of median jurors (i.e., jurors from the majority group) at the expense of jurors from the minority group. This decreases the diversity of individual juries, this time with respect to demographics rather than votes. The effect remains strong. For example, if the two demographic groups are white jurors and minority jurors, and one side wants to eliminate all minority jurors (for instance, if race is a major issue in the case), then the effect is likely to be an all-white jury if white potential jurors are a majority.¹⁰⁸

This is not surprising—indeed, *Batson* and its successors are premised on the idea that peremptory challenges can decrease the representation of demographic groups, especially minority groups, on juries.¹⁰⁹ But as in Part II.C.3, *supra*, the result holds even when the population is split evenly or nearly so, as with gender. Peremptory challenges make lopsided juries much more likely than if juries were selected randomly. In a trial in which gender could matter (a sex discrimination case, say, or a rape trial), peremptory challenges make both all-female *and* all-male juries more likely, and thus make trials much more unpredictable.

D. *Summary of Results*

The results described for both models grow out of two effects inherent in the peremptory challenge process. First, peremptory challenges make potential jurors near the median much more likely to be selected, and outliers much less likely. And second, peremptory challenges magnify the effects of random variations in the venire. Both of these effects increase as the proportion of potential jurors eliminated through peremptory challenges (i.e., the ratio of peremptory challenges to effective venire size) increases.

¹⁰⁷ These assumptions are rather simplistic compared to the real world, of course. Race, for instance, is not an either-or choice; age and politics are still more slippery, since they represent continuums rather than discrete characteristics. Likewise, an attorney will probably not want to eliminate *every* member of one gender or race or age group; individualistic consideration is inevitable (and probably worth encouraging). But empirical studies suggest that demographics can have predictive power—sometimes strikingly so. See, e.g., Bowers, Steiner & Sandys, *supra* note 69, at 264-66; Feild, *supra* note 69, at 73, 75-77; Lucy Fowler, *Gender and Jury Deliberations: The Contributions of Social Science*, 12 WM. & MARY J. WOMEN & L. 1, 22-23 (2005); Fulero & Penrod, *supra* note 47, at 244-48; Michael J. Saks, *What Do Jury Experiments Tell Us About How Juries (Should) Make Decisions?*, 6 S. CAL. INTERDISC. L.J. 1, 9-14 (1997).

¹⁰⁸ Of course, such targeting of potential jurors based solely on race is unconstitutional under *Batson v. Kentucky*, 476 U.S. 79, 84 (1986).

¹⁰⁹ The model does suggest that this may be a natural result of peremptory challenges when demographics can help predict votes, rather than simple racism or sexism by attorneys.

Considering these effects and the results of the models, two conclusions can be drawn.

First, peremptory challenges can cause systematic shifts in the average likelihood an empaneled juror will vote to convict—and thus, potentially, in jury verdicts. The most dramatic shifts require attorneys to have excellent information about the potential jurors and require substantial asymmetries in the population of potential jurors; otherwise, only relatively minor shifts have been shown. Nevertheless, when those conditions are met, giving each side a relatively large number of peremptory challenges can essentially determine the outcome of a trial. And because potential jurors in the United States seem to be strongly skewed in favor of conviction,¹¹⁰ this shift almost certainly favors conviction.

Second, peremptory challenges can reduce ideological and demographic diversity within individual juries. This makes juries less representative of a cross section of the community and more representative of the median juror. Because attorneys will always care about jurors' votes, this effect should apply in all cases to ideological diversity, and to demographic diversity in all cases in which demographics have predictive power. Unlike the first conclusion, this effect is strong regardless of the model used or the shape of the population distribution. But while individual juries become less diverse as peremptory challenges increase, juries show *greater* second-order diversity, with greater variations between juries.

III. IMPLICATIONS

These findings have a number of policy implications for both courts and legislators as they implement systems of jury selection.

A. *Changing Votes*

The most obviously troubling implication follows from changes, caused by peremptory challenges, to the likelihood that a juror will vote to convict. Consider a defendant who would not be convicted by a jury selected randomly but is convicted by a jury selected with peremptory challenges. The defendant might be guilty: perhaps most defendants are guilty, and more jurors are overly skeptical than overly credulous of prosecutors. Then peremptory challenges would merely be favoring more accurate outcomes. But the converse is also possible. Without data about how many defendants who go to trial are actually guilty and about how likely potential

¹¹⁰ See Leipold, *supra* note 103, at 151-52.

jurors are to vote to convict, neither of which exist, it is impossible to know which is the case.¹¹¹

Accordingly, when a jury convicts in a case where many potential jurors would not convict, and that conviction comes because the selection procedure systematically excluded those potential jurors, it is difficult to know which outcome is “correct”: the guilty verdict from the jury selected after peremptory challenges, or the not-guilty verdict that might have been delivered without peremptory challenges. The legitimacy of a verdict rendered after peremptory challenges is thus dubious for several reasons.

First, the burden of justifying peremptory challenges is on proponents. The Supreme Court has made clear there is no constitutional right to peremptory challenges,¹¹² and though they have a long history in American and British courts, the fact that they have been around so long without anyone mounting a convincing argument in their favor suggests there is no persuasive justification.

Second, the systematic shift toward conviction that peremptory challenges can cause is inconsistent with the rights of trial by an impartial jury and trial by a jury drawn from a fair cross section of the community, both of which (unlike peremptory challenges) *are* guaranteed by the Constitution.¹¹³ Though the Constitution is not specific about what an “impartial” jury is, systematically selecting for jurors more likely to convict is at odds with most conceptions of impartiality. Moreover, it casts doubt on the verdict when a conviction is due, in part, to the jury selection procedure used.

Third, though the data are far from conclusive, there are limited indications that suggest randomly selected juries might be correct more often than juries selected after peremptory challenges—and thus that peremptory challenges may cause wrongful convictions. The vast majority of criminal defendants plead guilty: between October 2003 and September 2004, 72,152 defendants pleaded guilty in federal courts, while only 3,346 went to trial and only 2,630 were convicted after trial.¹¹⁴ Though a number of factors influence a defendant’s decision to go to trial, the Sentencing Guidelines provide a substantial reduction in recommended sentence for a defendant who pleads guilty, confesses guilt, and cooperates with the prosecu-

¹¹¹ Data about how many juries convict do exist, from which one could make limited inferences about the population of potential jurors. *See id.* at 151-53. But there is no good source of data about how many defendants are actually guilty; conclusions based on trial outcomes would be circular, since the goal would be to figure out if trial outcomes are correct.

¹¹² *United States v. Martinez-Salazar*, 528 U.S. 304, 311 (2000).

¹¹³ *See* U.S. CONST. amend VI (“In all criminal prosecutions, the accused shall enjoy the right to a speedy and public trial, by an impartial jury of the State and district wherein the crime shall have been committed . . .”).

¹¹⁴ *See* U.S. DEP’T OF JUSTICE, COMPENDIUM OF FEDERAL JUSTICE STATISTICS, 2004, at 59, 75 tbl.5.3 (2006), available at <http://www.ojp.usdoj.gov/bjs/pub/pdf/cfjs04.pdf>.

tion.¹¹⁵ Defendants who go to trial are therefore likely to believe their odds of being acquitted are large enough to justify forfeiting the benefits of pleading guilty—because they are not guilty, or because the evidence of guilt is weak, or because they cannot rationally evaluate the strength of the government’s case. Some innocent defendants make it through to trial—no prosecutor’s office is perfect—and because most defendants plead guilty, innocent defendants could make up a significant fraction of those who go to trial even if they make up a small portion of charged defendants.

Moreover, at the federal level at least, trial judges are significantly less likely than trial juries to convict: from 1989 to 2002, the jury trial conviction rate was 84%, while judges convicted in just 55% of bench trials.¹¹⁶ As repeat players who are able to evaluate the strength of the evidence comparatively in multiple cases and are presumably experts at weighing evidence and drawing factual inferences, trial judges may be more likely than juries to be correct. And since it is likely that these juries are convicting more often than randomly selected juries would (because the pool of potential jurors seems skewed toward conviction), randomly selected juries (which would convict less often) might be more often correct.

It is worth emphasizing that cases in which peremptory challenges affect the outcome are almost certainly not the norm. Prosecutors presumably do not bring cases unless they feel the evidence for guilt is convincing beyond a reasonable doubt; borderline cases—the kind most likely to be affected by peremptory challenges—may be rare. Still, we should care about their effects. Peremptory challenges are most important when they are used in the greatest numbers. And states typically award more peremptory challenges in the most severe cases, so it is precisely the cases where the most is at stake, and where society has the greatest reasons to avoid incorrect verdicts, in which peremptory challenges have their greatest influence.¹¹⁷

B. *Jury Diversity*

The other significant finding of this Article is the degree to which peremptory challenges can reduce diversity on juries. Modern jury selection procedures were designed to empanel a broad cross section of the community and avoid the homogeneity that resulted from earlier “blue ribbon”

¹¹⁵ U.S. SENTENCING COMM’N, GUIDELINES MANUAL § 3E1.1, at 351 (2006), *available at* <http://www.ussc.gov/2006guid/CHAP3.pdf>.

¹¹⁶ See Leipold, *supra* note 103, at 152.

¹¹⁷ Of course, the difference could be caused by substantive differences between cases in which the parties agree to a bench trial and those that go to a jury.

selection procedures.¹¹⁸ This reform does limited good, however, if peremptory challenges permit homogeneity to creep back onto juries. Empirical evidence backs up this concern.¹¹⁹ The models developed in this Article confirm that this result is not merely a function of attorneys' reliance on stereotypes of potential jurors, but may instead be an inevitable result of the peremptory challenge procedure.

Why does internal diversity of juries matter? First, jury deliberation would be useless if jurors did not influence each other. Ideally that influence would be in the realm of fact finding rather than bargaining: jurors should point out problems and inconsistencies in testimony, employ their real-world experiences, and generally apply their different backgrounds and thought processes to the facts of the case, so that the likelihood of settling on the "right" outcome is maximized. Jurors' biases and viewpoints will of course play a role in this deliberation: a juror who is 20% likely to vote to convict will inevitably have a different view of the evidence than one who is 80% likely to convict. Differences in demographics are potentially as relevant as ideological differences: studies suggest, for example, that men and women employ qualitatively different types of logical reasoning in deciding moral dilemmas.¹²⁰

Obviously, the outcome of any deliberative process depends substantially on the views of the participants at the outset. There is increasing evidence, though, that group deliberations have a large effect as well: for example, the views of a non-diverse group—that is, a group whose members largely share the same outlook—tend to become *more* extreme than they were at the beginning of the deliberation.¹²¹ That is to say, a group whose members were predisposed to convict will, when put together, convict even *more* often than the numbers would indicate *ex ante*. Just as peremptory challenges can systematically shift a jury's average likelihood of voting to convict, homogeneity can shift a jury even further. Diversity protects against this sort of distortion.

While peremptory challenges decrease the diversity within individual juries, they increase the second-order diversity of juries, leading to lopsided juries and other unusually composed juries. That this can happen even when the population of potential jurors is equally balanced or nearly so (as, for

¹¹⁸ See, e.g., 5 WAYNE R. LAFAVE ET AL., *CRIMINAL PROCEDURE* § 22.2(b) (2d ed. Supp. 1999); VAN DYKE, *supra* note 10, at 14-18.

¹¹⁹ See, e.g., Johnson & Haney, *supra* note 74, at 499-500 (observing that the jury selection process in California state courts reduced jury diversity, compared to the pool of potential jurors).

¹²⁰ See Fowler, *supra* note 107, at 16-20.

¹²¹ See Cass R. Sunstein, *Deliberative Trouble? Why Groups Go to Extremes*, 110 *YALE L.J.* 71, 118-19 (2000). Studies have come to similar conclusions about the size of damage awards by civil juries, see David Schkade, Cass R. Sunstein & Daniel Kahneman, *Deliberating About Dollars: The Severity Shift*, 100 *COLUM. L. REV.* 1139, 1172-73 (2000), and votes by federal appellate judges, see Cass R. Sunstein, David Schkade & Lisa Michelle Ellman, *Ideological Voting on Federal Courts of Appeals: A Preliminary Investigation*, 90 *VA. L. REV.* 301, 352-53 (2004).

example, with gender) is particularly troubling. Numerous studies have documented differences in male jurors' and female jurors' willingness to convict in certain types of cases.¹²² One study, for example, found that women were much more willing than men to vote to convict in rape cases.¹²³ This increased willingness to convict showed up in the ultimate verdicts, though, only when women made up "an overwhelming majority" of the jury—ten or more out of twelve jurors.¹²⁴ And unanimity rules and holdouts notwithstanding, a jury that is divided 11-1 or 10-2 is much more likely than one divided 6-6 or 7-5 to reach the verdict favored by the majority.¹²⁵ Giving each side a large number of peremptory challenges makes such lopsided juries—in either direction—much more likely than if juries were selected randomly, and so renders jury verdicts more unpredictable and less trustworthy.

There may nevertheless be good reasons to favor this bargain between first-order and second-order diversity. Heather Gerken suggests that increased second-order diversity reflects juries' institutional role—that "each individual jury is best understood as one part of a larger institution that establishes what the law is."¹²⁶ But while this account would help explain why juries are selected according to a randomized procedure rather than engineered to be diverse in the individual case,¹²⁷ it only works if those selection procedures nonetheless ensure that the population is fairly represented in the aggregate pool of empaneled juries.¹²⁸ This Article suggests, however, that peremptory challenges are making such equal representation less likely, not more. Any benefits of increasing the second-order diversity of juries by increasing the number of peremptory challenges is thus likely outweighed by the costs.

There is another reason diversity matters. The models discussed in Part II are vastly simplified: they assume a single dimension along which all jurors are arranged. Jurors, though, differ in many ways: every juror has his or her own set of knowledge and life experience, and these inform that juror's perspective on the evidence. Those perspectives are critically important parts of jurors' decision-making processes. As Mark Cammack has written:

¹²² See Fowler, *supra* note 107, at 21-22 (describing studies).

¹²³ *Id.*

¹²⁴ *Id.* at 22.

¹²⁵ See Gerken, *supra* note 96, at 1125.

¹²⁶ *Id.* at 1186.

¹²⁷ *Cf. Holland v. Illinois*, 493 U.S. 474, 478 (1990) (holding that a defendant has no constitutional right to a diverse jury in an individual case); Gerken, *supra* note 96, at 1185-87.

¹²⁸ *Cf. Holland*, 493 U.S. at 480 ("The Sixth Amendment requirement of a fair cross section on the venire is a means of assuring, not a *representative* jury (which the Constitution does not demand), but an *impartial* one (which it does)."); Gerken, *supra* note 96, at 1186.

[Jurors] actively construct representations of the trial evidence based on their prior expectations about what constitutes an adequate explanation of the litigated event. Furthermore, these representations, rather than the original “raw” evidence, form the basis of the jurors’ final decision. Thus, the jurors’ prior assumptions about the nature of the social world are an important ingredient of the jury’s verdict. Because jurors’ beliefs about the world inescapably influence the way they perform their function, those beliefs cannot be ignored in the process of formulating rules for jury selection.¹²⁹

Cammack goes on to describe two studies that concluded that the credibility a listener assigns to a story is essentially unrelated to the evidence for the story.¹³⁰ Instead, individuals base their credibility assessments mostly on the plausibility of the narrative’s structure, given listeners’ backgrounds: “the credibility of a story depends largely on its structural plausibility.”¹³¹

The plausibility of a story, though, depends on one’s perspective and one’s experience with the subject matter of the story.¹³² Consider a high-school student charged with burglary during school hours who has a truthful alibi. If the defendant was absent from school the day of the burglary, a corporate executive may take that to mean that *something* illicit was going on and thus disregard the defendant’s alibi. A juror whose background and experience is similar to the defendant’s might consider the alibi more plausible and assign more credibility to the story. Similarly, jurors who lack experience in the corporate world may be wholly unequipped to evaluate evidence of accounting fraud. Diversity of experiences increases the accuracy of jury fact finding by increasing the range of experiences that jurors will be able to use to evaluate the plausibility of the evidence.

C. Recommendations

For the greatest confidence in jury verdicts, states should reduce the influence peremptory challenges have on jury composition. This means reducing the ratio of peremptory challenges to effective venire size.

This is especially important in situations where attorneys have access to considerable information about potential jurors. Though the binary and beta distribution models give consistent results, the magnitudes are quite different. In the beta distribution model, the average empaneled juror’s probability of voting to convict is increased, but not by much; in the binary model, it can change substantially. The difference is that only attorneys in

¹²⁹ Mark Cammack, *In Search of the Post-Positivist Jury*, 70 IND. L.J. 405, 462-63 (1995).

¹³⁰ *See id.* at 467-73.

¹³¹ *Id.* at 469.

¹³² Phoebe Ellsworth identified three parts of the deliberative process that can be influenced by juror beliefs, attitudes, and experiences: the evaluation of witnesses, inferences drawn from evidence, and the nature of the juror’s “personal standard-of-proof” for conviction. *See* Phoebe C. Ellsworth, *Some Steps Between Attitudes and Verdicts*, in INSIDE THE JUROR: THE PSYCHOLOGY OF JUROR DECISION MAKING 42, 58 (Reid Hastie ed., 1993).

the binary model have access to full information, including case-specific information, about potential jurors.¹³³

There are different ways to reduce the influence of peremptory challenges. The number of peremptory challenges allocated to each side could be reduced. There may be a good reason for variance between states, but there is no justification for Connecticut giving each side twenty-five peremptory challenges in death-penalty cases¹³⁴ while Virginia finds four per side sufficient.¹³⁵ Alternatively or additionally, the effective venire size could be increased, either by directly increasing the venire size or by switching from an ordered selection procedure to an unordered procedure. If eighty potential jurors are called for a trial and each side is allotted ten challenges, then peremptory challenges eliminate 25% of the potential jurors who have any chance of being empaneled (twenty of eighty) in an unordered selection system, as compared with 62.5% (twenty of thirty-two) in an ordered selection system. The same number of peremptory challenges accounts for a much greater percentage of the effective pool in an ordered system.

The different results of the models make clear that reducing the amount of information attorneys have would also reduce the influence of peremptory challenges. It would likely have other negative consequences, however, such as increasing attorneys' reliance on discrimination and on demographic variables.¹³⁶

One difficulty in reducing the influence of peremptory challenges is that they are frequently easier to add than to subtract. Though it is clear that there is no constitutional right to peremptory challenges, there usually *is* a statutory right to a specific number of challenges. Allowing more challenges usually does not violate such a right, while allowing fewer does. And lawyers are much more likely to complain about being deprived of challenges than about being given extra opportunities to shape the jury, even if it means extra opportunities for the other side. These factors can act as a one-way ratchet, increasing the influence of peremptory challenges.

An alternative approach could be to encourage widespread adoption of rules giving defendants more peremptory challenges than prosecutors receive. Some jurisdictions have embraced this approach: this is the standard in non-capital felonies in federal courts,¹³⁷ for example, though most states do not award defendants extra peremptory challenges.¹³⁸ The approach

¹³³ See *supra* Part II.A.3.

¹³² ROTTMAN & STRICKLAND, *supra* note 12, at 228 tbl.41.

¹³⁵ *Id.*

¹³⁶ See Lior Jacob Strahilevitz, *Reputation Nation: Law in an Era of Ubiquitous Personal Information*, 102 NW. U. L. REV. 1667, 1688-94 (2008).

¹³⁷ See FED. R. CRIM. P. 24(b)(2) (allocating six peremptory challenges to prosecutors, and ten to defendants, in non-capital felony trials).

¹³⁸ See *supra* notes 22-24 and accompanying text.

would embrace the feeling of control that can make peremptory challenges attractive to attorneys, but it has little else to recommend it, since it would merely offset one bias with a different kind of bias. Accordingly, it would be hard to calibrate to ensure that it does not introduce other problems.

Some of the proposed changes would be easy to implement; others would be quite difficult. Different decision makers control different steps of the jury selection process. The number of challenges is usually set by statute, while trial judges often have discretion to vary the specifics of the selection procedure. Venire size may be up to the judge or may be controlled by the clerk. And some changes are more transparent than others. If there is political opposition to reducing the number of peremptory challenges, for example because lawyers like exercising them or think they help protect defendants' rights,¹³⁹ much of the same result can be accomplished through a seemingly innocuous procedural change to an unordered selection system.

There may be good reasons to keep *some* peremptory challenges. They can help exclude the occasional nutty juror, and they may help make defendants believe trials are fair. The same result can often be accomplished through challenges for cause, but peremptory challenges can provide a useful backup if a judge erroneously denies a challenge for cause and one side strongly believes the potential juror is biased or unable to evaluate the evidence impartially. (Though judges might take challenges for cause more seriously without that backup.) But that just requires a *few* peremptory challenges—not the 10 or 20 or more per side that are common today.

CONCLUSION

This Article has aimed to determine what happens when attorneys exercise peremptory challenges effectively: rationally, with relevant information about potential jurors, and without discriminating based on animus. The models demonstrate that peremptory challenges systematically increase the representation of jurors near the median of the jury pool. This means that the average empaneled juror's likelihood of voting to convict can be systematically changed, likely in favor of conviction. The models also show that internal ideological and demographic diversity of individual juries can be systematically reduced, while second-order diversity of juries is increased. Each jury has more in common than before, but different juries may be very dissimilar. The magnitudes of these effects increase as the number of peremptory challenges increases, as ordered selection procedures are employed, and as attorneys have access to more complete information about potential jurors.

¹³⁹ See, e.g., Brief of National Ass'n of Criminal Defense Lawyers as Amicus Curiae in Support of Petitioner at 4-7, *Rivera v. Illinois*, 129 S. Ct. 1446 (2009) (No. 07-9995), 2008 U.S. S. Ct. Briefs LEXIS 1064.

These findings cast significant doubt on the argument that peremptory challenges help create juries that are more impartial than randomly selected juries. Using unordered selection procedures and reducing the amount of information available about potential jurors would reduce, but not eliminate, the problem. Accordingly, courts and legislatures should consider limiting or eliminating peremptory challenges.