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PROSECUTORIAL ANALYTICS

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ABSTRACT

The institution of the prosecutor has more power than any other in the criminal justice system. What is more, prosecutorial power is often unreviewable as a result of limited constitutional regulation and the fact that it is increasingly exercised in private and semi-private settings as the system has become more administrative and less adversarial. Despite this vast, unreviewable power, prosecutors often rely on crude performance measures focused on conviction rates. The focus on conviction rates fails to capture and adequately evaluate the breadth of prosecutorial decision-making. We can do better by fully implementing analytics as a tool to evaluate the prosecutorial function. This tool has revolutionized crime-fighting. Yet, it has been conspicuously absent as a tool to improve other aspects of the criminal justice system. This Article demonstrates the promise of prosecutorial analytics to improve oversight and to promote systemic interests in justice, fairness, and transparency. It offers concrete examples of how analytics can 1) help eliminate race-based jury selection practices; 2) minimize prosecutorial misconduct; 3) uncover whether undesirable arbitrary factors shape prosecutorial discretion; and 4) provide better metrics for the judiciary, practitioners, and the public to evaluate prosecutorial performance.

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INTRODUCTION

The oral argument before the Supreme Court in Tim Foster’s case began with Foster’s counsel asserting, “Mr. Chief Justice, and may it please the Court: The prosecutors in this case came to court on the morning of jury selection determined to strike all the black prospective jurors.”¹ Beginning an argument with such a sweeping assertion is a risky strategy. An unsympathetic jurist might interrupt with a question immediately challenging the factual basis for the assertion. The ensuing back and forth may prevent discussion of the underlying substantive claim. But Foster’s case was different.

Unlike the vast majority of cases involving claims pursuant to *Batson v.*

1. Transcript of Oral Argument at 3, *Foster v. Chatman*, 136 S. Ct. 1737 (2016) (No. 14-8349).

Kentucky,² in which courts must determine whether a prosecutor committed purposeful discrimination in jury selection without access to the most relevant evidence—the prosecutor’s jury selection notes—Foster had the notes and they were before the court.³ Thus, the Court had the opportunity to review the contemporaneous, and un-scrubbed, evidence of the prosecutor’s decisions free of any post-hoc rationalizations.⁴ The notes were damning and consistent with the prosecutor’s actions.⁵ After striking all of the potential black jurors, the prosecutor appealed directly to racialized fears, asking the all-white jury to return a death sentence to “deter other people out there in the projects from doing the same again.”⁶

In the typical *Batson* case, the Court does not have the benefit of such direct evidence. Without it, judges are forced to perform *Batson*’s critical third step, which requires them to be lie detectors, by simply evaluating the prosecutor’s demeanor to determine whether the prosecutor lied to mask purposeful discrimination. Even under the best of conditions, this amounts to guesswork.⁷

There is an alternative approach. Courts could supplement their review with fairly basic statistical analysis and data analytics to diminish the demeanor-based guesswork.⁸ The incorporation of analytics could simultaneously improve judicial decisions and decrease discriminatory jury selection practices.

Analytics can also help evaluate charging practices, identify misconduct, and uncover prosecutorial decisions based on factors that should not be considered.⁹ This Article identifies these examples to demonstrate that analytics is an underused tool. It argues that analytics offers promise as a

2. 476 U.S. 79 (1986) (holding that purposeful racial discrimination in jury selection violates equal protection).

3. *Foster v. Chatman*, 136 S. Ct. 1737, 1743–44 (2016) (describing the contents of the notes). The Author was part of Foster’s defense team during initial state post-conviction proceedings as a staff attorney at the Southern Center for Human Rights.

4. Furthermore, the conclusion that the notes accurately captured the prosecutor’s thoughts during jury selection was bolstered by the evidence demonstrating that the prosecutor believed the notes would never be made public. Petition for Writ of Certiorari at 3–4, *Foster v. Chatman*, 136 S. Ct. 1737 (2016) (No. 14-8349) (explaining that Foster sought the notes at trial but was denied access); Transcript of Oral Argument, *supra* note 1, at 19 (noting that the prosecutor’s decision to testify about the state’s jury selection practices was contingent on him not having to disclose the state’s notes).

5. *See* Transcript of Oral Argument, *supra* note 1, at 38–39, (Justice Kagan questioning whether the state’s jury selection practices amounted to “as clear a *Batson* violation as a court is ever going to see”).

6. Petition for Writ of Certiorari, *supra* note 4, at 22.

7. *See* Hon. Alex Kozinski, *Criminal Law 2.0*, 44 GEO. L. J. ANN. REV. CRIM. PROC. iii (2015) (“Although we pretend otherwise, much of what we do in the law is guesswork.”).

8. *See infra* Part III.A.

9. *See infra* Part III.

tool to: 1) regulate prosecutors' expanding power; 2) more accurately measure prosecutorial performance; and 3) improve constitutional decision-making.

It seeks to bring the institution of the prosecutor in line with one of society's defining characteristics—a seemingly insatiable desire to measure everything, to record as much as possible, to quantify our actions, and to mine the data for trends, patterns, and distortions to solve problems and make better decisions. This Article refers to this process as analytics. Others have offered a similar definition for Big Data.¹⁰ Analytics is a better term here because not all of the applications of this tool to prosecutorial decision-making involve the “three V’s” of Big Data—volume, velocity, and variety.¹¹ Rather, analytics includes the use of small, large, and big data sets.

While the prosecutorial function has largely escaped the wave of analytics, the technique has revolutionized law enforcement's crime fighting efforts and is ubiquitous in modern life. Outside of the criminal justice system, the desire to measure and count things plays out on a grand scale¹² and on the personal level.¹³ Organizations use this data to market products, measure risk, search for cures to disease, rank colleges, identify potential voters, and win sporting events.¹⁴ Within the criminal justice

10. See, e.g., Julie E. Cohen, *What Privacy Is For*, 126 HARV. L. REV. 1904, 1920–21 (2013) (“‘Big Data’ is shorthand for the combination of a technology and a process. . . . Together, the technology and the process comprise a technique for converting data flows into a particular, highly data-intensive type of knowledge.”); Andrew Guthrie Ferguson, *Big Data and Predictive Reasonable Suspicion*, 163 U. PA. L. REV. 327, 352 (2015) (“Big Data refers to the accumulation and analysis of unusually large datasets.”); Paul Ohm, *The Underwhelming Benefits of Big Data*, 161 U. PA. L. REV. ONLINE 339, 340 (2013) (“‘Big Data’ has become nearly synonymous with ‘data analysis’ . . .”).

11. Jules J. Berman, PRINCIPLES OF BIG DATA: PREPARING, SHARING, AND ANALYZING COMPLEX INFORMATION xv, xx (2013).

12. See, e.g., T.W. Crowther et. al., *Mapping Tree Density at a Global Scale*, 525 NATURE 201, 201–205 (Sept. 10, 2015), <http://www.nature.com/nature/journal/v525/n7568/full/nature14967.html> (documenting an effort to count the total number of trees on earth).

13. See, e.g., *The Quantified Self: Counting Every Moment*, ECONOMIST: TECH. Q. (Mar. 3, 2012), <http://www.economist.com/node/21548493> (describing the increased use of data collection and metrics for self-improvement); QUANTIFIED SELF: SELF KNOWLEDGE THROUGH NUMBERS, <http://www.quantifiedself.com> (last visited Feb. 15, 2016).

14. See generally, Lydia Ramsey, *Cancer Treatment Is on the Brink of a Data Revolution*, BUSINESS INSIDER (Sept. 22, 2015), <http://www.businessinsider.com/big-data-and-cancer-2015-9> (describing the efforts of doctors to use extremely large datasets to assist in cancer research and treatment); Press Release, The White House, Fact Sheet: Investing in the National Cancer Moonshot (Feb. 1, 2016), <https://www.whitehouse.gov/the-press-office/2016/02/01/fact-sheet-investing-national-cancer-moonshot>; Press Release, The White House, Fact Sheet: Empowering Students to Choose the College that Is Right for Them (Sept. 12, 2015), <https://www.whitehouse.gov/the-press-office/2015/09/12/fact-sheet-empowering-students-choose-college-right-them> (emphasizing that providing open access to nearly two decades of data collected from colleges and universities will enable researchers and organizations to create additional tools to measure college and university performance); MICHAEL LEWIS, MONEYBALL: THE ART OF WINNING AN UNFAIR GAME (2004); MONEYBALL (Columbia Pictures 2011); MIT Sloan Sports Analytics Conference, <http://www.sloansportsconference.com/about/> (last visited Feb. 15, 2016) (describing the annual conference as an outlet to “discuss the increasing role of

system, actors have been quick to adopt analytics as a crime-fighting tool, promoting so-called smart policing or predictive policing techniques.¹⁵

Yet the rapid adoption of analytics as a crime-fighting tool has been spotty, and, at times, not thoughtful.¹⁶ More importantly, it has been almost entirely prosecution-based in ways that raise serious concerns about fairness to defendants and that makes for a lost opportunity in advancing other worthy prosecutorial ends. Seeing this, several scholars and policymakers have called for more refined reflection about the implications of its use.¹⁷ They worry that reliance on analytics distorts values,¹⁸ risks exacerbating longstanding inequities in the criminal justice system,¹⁹ and masks motives and biases.²⁰ As a result, they have proposed regulations that would limit the use of analytics as a crime-fighting tool.²¹

These calls for analytics speed bumps have great merit. But they miss a

analytics in the global sports industry”).

15. See *infra* Part I.A. See generally Andrew Guthrie Ferguson, *Policing Predictive Policing*, 94 WASH. U. L. REV. (forthcoming 2017); WALTER L. PERRY ET AL., PREDICTIVE POLICING: THE ROLE OF CRIME FORECASTING IN LAW ENFORCEMENT OPERATIONS (2013), http://www.rand.org/pubs/research_reports/RR233.html.

16. See, e.g., Ferguson, *supra* note 15, at *29 (noting that predictive policing has developed with “little public oversight”).

17. See, e.g., Ferguson, *supra* note 10, at 336 (“Using big data may help reduce the negative consequences of traditional policing techniques, but at the same time may create a whole new set of concerns.”).

18. Cecilia Klingele, *The Promises and Perils of Evidence-Based Corrections*, 91 NOTRE DAME L. REV. 537, 579 (2016) (“Labeling values and moral principles like fairness and kindness ‘evidence-based’ is problematic, even if true. While data that support the use of procedural justice to reduce recidivism can reinforce the importance of those principles, the values that underlie procedural justice should be promoted and rewarded on their own terms.”).

19. See, e.g., Eric Holder, Attorney General, Address at the National Association of Criminal Defense Lawyer’s 57th Annual Meeting (Aug. 1, 2014), in JUSTICE NEWS, <http://www.justice.gov/opa/speech/attorney-general-eric-holder-speaks-national-association-criminal-defense-lawyers-57th> (summarizing the impact of analytics on crime-fighting but warning of “unintended consequences,” including, for example, the possibility that analytics in the sentencing context “may exacerbate unwarranted and unjust disparities that are already far too common in our criminal justice system and in our society”).

20. See, e.g., Erin Murphy, *Databases, Doctrine & Constitutional Criminal Procedure*, 37 FORDHAM URB. L.J. 803, 825 (2010) (“Disembodied from the human beings that define, create, realize, and benefit from its parameters, the [law enforcement] database is easily viewed as incapable of bias in the way that human law enforcement agents might be.”).

21. See, e.g., Jennifer Skeem & Christopher T. Lowenkamp, *Risk, Race, & Recidivism: Predictive Bias and Disparate Impact* (forthcoming) (manuscript at 36), <http://ssrn.com/abstract=2687339> (cautioning that “risk assessment instruments should be routinely tested for predictive bias and mean score differences by race”); Sonja B. Starr, *Evidence-Based Sentencing and the Scientific Rationalization of Discrimination*, 66 STAN. L. REV. 803 (2014) (arguing that risk assessment tools for sentencing violate equal protection); Klingele, *supra* note 18, at 540 (cautioning that the careless use of actuarial risk assessment tools and other evidence-based practices has “the potential to thwart long-term efforts to decrease mass incarceration by inadvertently expanding the scope of state control over the lives of justice-involved individuals and their communities”).

crucial step: expanding the use of analytics to even the playing field. This Article seeks to effect a better analytics balance in the criminal justice arena, proposing specific ways of deploying analytics to serve better prosecutorial justice, fairness, and transparency, and to assure that defense-specific interests are part of the data calculus. It argues that analytics can be a powerful justice-enhancing, bias-detecting, and innocence-uncovering tool.²²

The need for defendant- and fairness-sensitive analytics is especially compelling when applied to criminal prosecution. The prosecutor is unique in the criminal justice system because of her near unreviewable power and discretion.²³ Furthermore, the prosecutor's power has grown in absolute and comparative terms over the last several decades.²⁴ Yet, prosecutors and those who observe them still often rely on crude measures of their performance, *i.e.*, crime rates and conviction rates. These measures overlook important questions about how prosecutors exercise their discretion in charging defendants, negotiating plea deals, meeting constitutional and ethical disclosure obligations, and, among other decisions, selecting juries.²⁵ These factors should be considered in addition to crime rates and conviction rates when evaluating whether prosecutors adequately serve broad interests in justice, fairness, and transparency.

The existing regulatory regime for prosecutors is inadequate to protect these systemic interests.²⁶ Many prosecutorial decisions are insulated completely from the reach of constitutional and ethical regulations. And where applicable, the Constitution and ethical regulations only provide minimal guidance. The democratic process fills too little of this regulatory void,²⁷ because the work of the prosecutor increasingly takes place in

22. See *infra* Part III.

23. See Stephanos Bibas, *Prosecutorial Regulation Versus Prosecutorial Accountability*, 157 U. PA. L. REV. 959, 960 (2009) (“No government official in America has as much unreviewable power and discretion as the prosecutor.”).

24. See *infra* Part II.A.

25. See *infra* Part II.B.

26. The consistent drip of *Brady* violations provides evidence that the existing regulatory regime does not adequately incentivize prosecutors to meet their constitutional obligations. See, e.g., *United States v. Olsen*, 737 F.3d 625, 626 (9th Cir. 2013) (Kozinski, C.J., dissenting) (“There is an epidemic of *Brady* violations abroad in the land.”); Daniel S. Medwed, *Brady’s Bunch of Flaws*, 67 WASH. & LEE L. REV. 1533, 1544–47 (2010) (summarizing studies documenting that prosecutors who commit misconduct are rarely punished). See also Jeffrey Bellin & Junichi P. Semitsu, *Widening Batson’s Net to Ensnare More Than the Unapologetic Bigoted or Painfully Unimaginative Attorney*, 96 CORNELL L. REV. 1075, 1077 (2011) (“[V]irtually every commentator (and numerous judges) who have studied [jury selection practices] have concluded that race-based juror strikes continue to plague American trials.”).

27. See *Morrison v. Olson*, 487 U.S. 654, 728 (1988) (Scalia, J., dissenting) (“Under our system of government, the primary check against prosecutorial abuse is a political one.”); Bibas, *supra* note 23, at 983 (“[T]he public suffers from chronic misperceptions about how the criminal justice system actually works.”).

private or semi-private proceedings,²⁸ and prosecutors' broad discretion leaves prosecutorial elections susceptible to manipulation.²⁹

Analytics can help. Analytics can mine historical data to help identify prosecutors who might be more likely to commit misconduct in the future. It can help identify prosecutors or prosecutorial offices that engage in or are more likely to engage in race-based jury selection practices. It can also help identify undesirable trends in charging and plea bargaining. Simultaneously, it can provide the public with better data to evaluate prosecutorial performance. We are unlikely ever to approach the equivalent of open-source prosecuting, but analytics gets us closer. And in doing so, it promises dramatic increases in transparency.

Extending analytics beyond the crime-fighting side of the criminal justice system will require access to the relevant data – data that is often controlled by or in the possession of the prosecutor. Some prosecutors have demonstrated a willingness to share data with outside evaluators to measure justice and fairness.³⁰ In other instances, public interest organizations and researchers have undertaken herculean data collection and data fusion efforts to evaluate prosecutorial decision-making.³¹ These efforts provide proof for the concept that analytics can improve the institution of the prosecutor, and they should be a catalyst to do more.

This Article thus proposes a new regime of mandatory reporting from prosecutorial agencies to ensure that the data is available to evaluate the prosecutorial function in every jurisdiction. The proposal is akin to the

28. See Jocelyn Simonson, *The Criminal Court Audience in a Post-Trial World*, 127 HARV. L. REV. 2173 (2014); Bibas, *supra* note 23 at 961 (“[P]rosecution is a low-visibility process about which the public has poor information and little right to participate.”).

29. See, e.g., Brendan Nyhan & M. Marit Rehavi, *Tipping the Scales?: Testing for Political Influence on Public Corruption Prosecutions* 3 (June 5, 2015), <http://projects.iq.harvard.edu/files/pegroup/files/nyhanrehavi2015.pdf?m=1444765374> (analyzing the timing and results of public corruption prosecutions from 1993 to 2008).

30. See BESIKI LUKA KUTATELADZE & NANCY R. ADNILORO, VERA INSTITUTE OF JUSTICE, PROSECUTION AND RACIAL JUSTICE IN NEW YORK COUNTY – TECHNICAL REPORT (2014), <http://www.vera.org/sites/default/files/resources/downloads/race-and-prosecution-manhattan-technical.pdf> (reporting the results of a partnership between the New York County District Attorney’s Office and the Vera Institute of Justice).

31. See, e.g., AMERICA’S TOP FIVE DEADLIEST PROSECUTORS: HOW OVERZEALOUS PERSONALITIES DRIVE THE DEATH PENALTY, HARV. L. SCH., FAIR PUNISHMENT PROJECT (2016) [hereinafter DEADLIEST PROSECUTORS] (identifying outlier prosecutors with respect to seeking capital convictions), http://fairpunishment.org/wp-content/uploads/2016/06/FPP-Top5Report_FINAL.pdf; Ursula Noye, *Blackstrikes: A Study of the Racially Disparate Use of Peremptory Challenges by the Caddo Parish District Attorney’s Office*, REPRIEVE., Aug. 2015, <https://blackstrikes.com/>; *Arm Yourself With Information*, R3 INVESTIGATIONS, <http://r3investigations.com/sentencing.html> (last visited Feb. 15, 2016) (offering a private database to compare charging decisions and plea offers in Maricopa County, AZ); TRACFED, <http://tracfed.syr.edu/> (last visited Feb. 15, 2016) (compiling data on federal government activity).

certified disclosures corporate executives of public companies must make under the Sarbanes-Oxley Act or the reports law enforcement officials make to the FBI to support the Uniform Crime Reporting Program.³² Mandatory collection and disclosure requirements will ensure that analytics can be used to advance systemic interests in justice, fairness, and transparency, not just as a crime-fighting tool.

The Article proceeds in four parts. Part I summarizes the expansion of analytics as a crime-fighting tool and explains why the tool has not reached other aspects of the criminal justice system. Part II makes the case for using analytics to serve broad interests in justice and the often overlapping, but nonetheless narrower, interests of defendants and potential defendants. It discusses the spike in prosecutorial power and presents analytics as a tool to check that power and to better evaluate prosecutorial performance. Part II concludes by adding that the expanded use of analytics to evaluate the institution of the prosecutor will have the salutary effect of improving decision-making.

Part III shows how this might happen. It cites several specific aspects of prosecutorial decision-making – jury selection, charging decisions, and prosecutorial disclosure obligations – where analytics can improve the relevant decisions. Part IV begins to sketch out a policy for ensuring that the data necessary to review the prosecutorial function will be collected and made available. Finally, it explores some of the risks of the expanded use of analytics in the criminal justice system.

I. THE RISE OF ANALYTICS IN THE CRIMINAL JUSTICE SYSTEM

For decades the law enforcement side of the criminal justice system has recognized the utility of collecting, sorting, and searching large data sets to assist in fighting crime.³³ Not surprisingly, law enforcement eagerly collected and tracked new types of information as advances in technology and storage capacity made doing so possible.³⁴ This advancement has reached a point where it is realistic to imagine a time when it will be “feasible and affordable for the government to record, store, and analyze

32. Sarbanes-Oxley Act of 2002, Pub. L. No. 107-204, §§ 302, 906 (codified at 15 U.S.C. § 7241 and 18 U.S.C. § 1350) (listing certified disclosure requirements); Federal Bureau of Investigation Uniform Crime Reporting, <https://ucr.fbi.gov/> (last visited Jan. 4, 2017) (describing the FBI’s Uniform Crime Reporting Program).

33. *See, e.g.*, *Jurek v. Texas*, 428 U.S. 262, 275 (1976) (“[P]rediction of future criminal conduct is an essential element in many of the decisions rendered throughout our criminal justice system.”); *Murphy*, *supra* note 20, at 805–10 (describing law enforcement databases).

34. *See, e.g.*, *Maryland v. King*, 133 S. Ct. 1958, 1975 (2013) (“Law enforcement agencies routinely have used scientific advancements in their standard procedures for the identification of arrestees.”).

nearly everything people do.”³⁵

In contrast to the eager acceptance and development of analytics as a crime-fighting tool, analytics has rarely been used to promote defense interests and broader systemic interests in justice and fairness. This Part summarizes the expanded use of analytics as a crime-fighting tool. It offers several explanations for the uneven adoption of analytics in the criminal justice system.

A. Analytics as a Crime-Fighting Tool

The influence of analytics as a crime-fighting tool is extensive.³⁶ It reaches jurisdictions of all size³⁷ and a wide range of crimes.³⁸ Furthermore, it influences all stages of crime-fighting. The story is a familiar one: the embrace of analytics is another example of law enforcement’s ability to identify and exploit the crime-fighting capabilities of new technologies.³⁹ The expansion of analytics as a crime-fighting tool has been fueled by partnerships with private industry, government funding, and private foundation support.⁴⁰

On the front end of the criminal justice system, law enforcement collects more data than ever before and mines this data to help prevent and solve crimes.⁴¹ It collects this data using an assortment of tools, including automated license plate readers, facial recognition tools, cell phone tower

35. See Elizabeth E. Joh, *The New Surveillance Discretion: Automated Suspicion, Big Data, and Policing*, 10 HARV. L. & POL’Y REV. 15, 15–16 (2016).

36. See Elizabeth E. Joh, *Policing By Numbers: Big Data and the Fourth Amendment*, 89 WASH. L. REV. 35, 35 (2014) (“The age of ‘big data’ has come to policing.”).

37. See, e.g., Bryce Clayton Newell, *Local Law Enforcement Jumps on the Big Data Bandwagon: Automated License Plate Recognition Systems, Information Privacy, and Access to Government Information*, 66 ME. L. REV. 397 (2014).

38. See, e.g., Frank J. Sensenbrenner & Margaret Ryznar, *The Law and Economics of Insider Trading*, 50 WAKE FOREST L. REV. 1155 (2015) (demonstrating the ability of advanced analytics to help prosecutors identify and prosecute insider trading).

39. See, e.g., Jason Kreag, *Letting Innocence Suffer: The Need for Defense Access to the Law Enforcement DNA Database*, 36 CARDOZO L. REV. 805, 812–13 (2015) (describing law enforcement’s quick adoption of DNA technology to solve crime).

40. See, e.g., OLIVER ROEDER ET AL., BRENNAN CENTER FOR JUSTICE, WHAT CAUSED THE CRIME DECLINE? 4 (2015), https://www.brennancenter.org/sites/default/files/analysis/Crime_rate_report_web.pdf (concluding that CompStat-type policing reduced crime by 5 to 15 percent); POLICE EXECUTIVE RESEARCH FORUM, COMPSTAT: ITS ORIGINS, EVOLUTION, AND FUTURE IN LAW ENFORCEMENT AGENCIES (2013), <https://www.bja.gov/Publications/PERF-Compstat.pdf> (describing the evolution of CompStat); *Criminal Justice: Data-Driven Decision Making*, LAURA AND JOHN ARNOLD FOUNDATION, <http://www.arnoldfoundation.org/initiative/criminal-justice/data-driven-decision-making/> (“LJAF is funding the development of research and data centers that will help criminal justice officials make more objective, evidence-based decisions.”).

41. See, e.g., Joh, *supra* note 36.

simulators, video surveillance cameras, mobile x-ray vans, and gunshot detection sensors.⁴² Law enforcement supplements the information it collects with information it obtains from private data aggregators.⁴³ Once collected, often without implicating Fourth Amendment protections, this data is fused into massive, searchable databases⁴⁴ and used to predict crimes before they occur, to identify bad actors before they act, to identify victims before they are harmed, to identify suspects after a crime occurs, and to allocate scarce policing resources.⁴⁵ For example, the Chicago Police Department uses a proprietary algorithm to collect and mine data to create what it calls the Strategic Subject List, a list of individuals ranked “according to their probability of being involved in a shooting or murder.”⁴⁶ The Chicago Police Department believes the tool has been effective, claiming that 85 percent of Chicagoans shot in the first six months of 2016 were on the Strategic Subject List.⁴⁷

When police develop a suspect and prosecutors initiate charges, analytics is used to influence decisions about pretrial detention.⁴⁸ Prosecutors also use analytics to help determine whether and what type of plea bargain to offer.⁴⁹ And after a conviction, the system uses another version of analytics—risk assessment tools—to help influence sentencing

42. See, e.g., Hon. Brian L. Owsley, *The Fourth Amendment Implications of the Government’s Use of Cell Tower Dumps in Its Electronic Surveillance*, 16 U. PA. J. CONST. L. 1 (2013) (describing the scope of cell tower simulators); Conor Friedersdorf, *The NYPD Is Using Mobile X-ray Vans to Spy on Unknown Targets*, ATLANTIC (Oct. 19, 2015), <http://www.theatlantic.com/politics/archive/2015/10/the-nypd-is-using-mobile-x-rays-to-spy-on-unknown-targets/411181/>; *Gunshot Detectors, Calling the Shots: How Gunshot-Detecting Microphones Help Police Curb Crime*, ECONOMIST (Sept. 13, 2014), <http://www.economist.com/node/21617018/> (describing Washington DC’s police “ShotSpotter” system).

43. See *Smith v. Maryland*, 442 U.S. 735, 744 (1979) (holding that government access of third-party records is not a Fourth Amendment search). See generally Jane Bambauer, *Other People’s Papers*, 94 TEX. L. REV. 205, 212–18 (2015) (describing the reach of the third-party doctrine).

44. See Murphy, *supra* note 20, at 805–10 (describing numerous law enforcement databases).

45. See generally PERRY ET AL., *supra* note 15; *Predictive Policing*, NATIONAL INSTITUTE OF JUSTICE (June 9, 2014), <http://www.nij.gov/topics/law-enforcement/strategies/predictive-policing/Pages/welcome.aspx>.

46. See CHICAGO POLICE DEPARTMENT, Special Order S10-05, (Oct. 6, 2015), <http://directives.chicagopolice.org/directives/data/a7a57bf0-1456faf9-bfa14-570a-a2deebf33c56ae59.html> (describing CPD’s procedures for notifying individuals who appear on the list).

47. Jeremy Gorner, *With Violence Up, Chicago Police Focus on a List of Likeliest to Kill, Be Killed*, CHI. TRIB. (Jul. 22, 2016). But see Jessica Saunders et al., *Predictions Put Into Practice: A Quasi-Experimental Evaluation of Chicago’s Predictive Policing Pilot*, 12 J. EXP. CRIMINOLOGY 347 (2016) (evaluating 2013 data and concluding that individuals on the Strategic Subject List were not more likely to be involved in shootings).

48. See Andrea Roth, *Trial by Machine*, 104 GEO. L.J. 1245, 1268 (2016) (discussing how analytics is changing bail determinations).

49. See Chip Brown, *Cyrus Vance Jr’s ‘Moneyball’ Approach to Crime*, N.Y. TIMES MAG. (Dec. 7, 2014) (describing how better data management has affected plea bargaining), http://www.nytimes.com/2014/12/07/magazine/cyrus-vance-jrs-moneyball-approach-to-crime.html?_r=0.

outcomes.⁵⁰ Similar risk assessment tools are used for parole decisions.⁵¹ And even after formal punishment and supervision ends, crime-fighting analytics trail individuals as records of arrests and convictions remain sprinkled throughout law enforcement and private databases.⁵²

Despite its extensive use as a crime-fighting tool, there are few examples of analytics being used to serve defense interests.⁵³ The remainder of this Part explains the uneven adoption of analytics. It first argues that this is a result of constitutional criminal procedure's small data focus. It then explains that political considerations, logistical challenges, and structural and competency limitations have contributed to the uneven adoption of analytics.

B. Constitutional Criminal Procedure's Small Data Focus

Constitutional criminal procedure has simultaneously cleared the path for law enforcement to adopt analytics and hindered the use of analytics as a tool to promote defense interests and broader interests in justice. On the crime-fighting side, the Supreme Court's Fourth Amendment rulings have largely left analytics to develop outside of constitutional restrictions.⁵⁴ At the same time, the Court's interpretation of the constitutional principles that regulate prosecutorial decisions have insulated prosecutors from the wave of analytics that reaches the rest of society.

The Court's narrow definition of what constitutes a search and thus triggers Fourth Amendment protection insulates law enforcement's collection of massive data sets from constitutional review.⁵⁵ For example,

50. See generally, Dawinder S. Sidhu, *Moneyball Sentencing*, 56 B. C. L. REV. 671 (2015) (analyzing the increased use of data-driven risk assessment tools in sentencing); Starr, *supra* note 21 (same).

51. See generally, Klingele, *supra* note 18 (exploring the use of risk assessment tools for probationers and parolees).

52. See Kevin Lapp, *American Criminal Record Exceptionalism*, 14 OHIO ST. J. CRIM. L. 303, 305–06 (2016); MICHELLE ALEXANDER, *THE NEW JIM CROW: MASS INCARCERATION IN THE AGE OF COLORBLINDNESS* 13 (2010) (“Once released, former prisoners enter a hidden underworld of legalized discrimination and permanent social exclusion.”).

53. See, e.g., Jennifer E. Laurin, *Gideon By the Numbers: The Emergence of Evidence-Based Practice in Indigent Defense*, 12 OHIO ST. J. CRIM. L. 325, 356 (2015) (“To date, the substantive performance standards that guide defense practice are largely the product of professional experience and, ultimately, guesswork about how inputs relate to outputs.”); Pamela Metzger & Andrew Guthrie Ferguson, *Defending Data*, 88 S. CAL. L. REV. 1057 (2015); Ronald F. Wright & Ralph A. Peeples, *Criminal Defense Lawyer Moneyball: A Demonstration Project*, 70 WASH. & LEE L. REV. 1221 (2013).

54. *But cf.* Ric Simmons, *Quantifying Criminal Procedure: How to Unlock the Potential of the Big Data in Our Criminal Justice System*, 2016 MICH. ST. L. REV. 947 (2016).

55. See *Katz v. United States*, 389 U.S. 347, 362 (1967) (Harlan, J., concurring) (limiting the definition of search for Fourth Amendment purposes to government actions that intrude upon reasonable

despite the fact that the Fourth Amendment generally prohibits searches of a suspect's cell phone without a warrant,⁵⁶ the third-party doctrine holds that law enforcement can collect similar information from the suspect's cell phone provider without implicating Fourth Amendment protections.⁵⁷ Furthermore, information knowingly made public is also not subject to Fourth Amendment protections.⁵⁸ Thus, the police are free to use automated license plate readers to identify and track vehicles on our streets.⁵⁹ And they can build DNA databases by collecting abandoned DNA without implicating Fourth Amendment protections.⁶⁰

While the Court's Fourth Amendment jurisprudence has allowed the growth of analytics as a crime-fighting tool, constitutional criminal procedure has simultaneously insulated prosecutorial decision-making from its reach. For example, *McCleskey v. Kemp*⁶¹ and *Batson v. Kentucky*⁶² rely on a decidedly small data approach to constitutional interpretation, focusing the analysis on the prosecutorial decisions made within a case and rejecting the relevance of decisions made in comparable cases. Warren McCleskey challenged his conviction and sentence by claiming that Georgia's administration of the death penalty violated the Eighth Amendment and equal protection because of its racially discriminatory application.⁶³ To support his claim, McCleskey presented a comprehensive, statewide statistical analysis of Georgia's capital punishment system demonstrating that "defendants charged with killing white victims were 4.3 times as likely to receive a death sentence as defendants charged with killing black[]

expectations of privacy). In *Florida v. Jardines*, 133 S. Ct. 1409, 1414 (2013), the Court clarified that *Katz's* reasonable expectation of privacy test is not the only definition of a Fourth Amendment search. Rather, "[w]hen 'the Government obtains information by physically intruding' on persons, houses, papers, or effects, 'a 'search' within the original meaning of the Fourth Amendment' has 'undoubtedly occurred.'" *Jardines*, 133 S. Ct. at 1414 (quoting *United States v. Jones*, 132 S. Ct. 945 n.3 (2012)).

56. See *Riley v. California*, 134 S. Ct. 2473 (2014).

57. See, e.g., *Smith v. Maryland*, 442 U.S. 735, 744 (1979) (holding that the voluntary sharing of information with a third-party nullifies one's expectation of privacy in that information). See generally Bambauer, *supra* note 43 (proposing modernization of the third-party doctrine to account for law enforcement's ability to use modern computing to perform narrow targeted searches of the information it collects).

58. See *California v. Ciraolo*, 476 U.S. 207, 213 (1986) ("The Fourth Amendment protection of the home has never been extended to require law enforcement officers to shield their eyes when passing by a home on public thoroughfares."); *Katz*, 389 U.S. at 351 ("What a person knowingly exposes to the public, even in his own home or office, is not a subject of Fourth Amendment protection.").

59. See Joh, *supra* note 35, at 22–24 (2016) (describing the quick adoption of this crime-fighting tool and its extensive reach as police build large data sets).

60. See Jason Kreag, *Going Local: The Fragmentation of Genetic Surveillance*, 95 B.U. L. REV. 1491, 1546 (2015).

61. 481 U.S. 279 (1987).

62. 476 U.S. 79 (1986).

63. *McCleskey*, 481 U.S. at 286.

[victims].”⁶⁴ While not big data, McCleskey certainly relied on advanced data analytics to prove his constitutional claim.

The Court was not impressed, and it swiftly pushed aside the relevance of the study. It took a small data approach, concluding that McCleskey missed the mark by focusing on statewide trends.⁶⁵ Rather, to prevail he needed to prove the existence of discriminatory purpose in *his* case, something that the statistical analysis was incapable of doing.⁶⁶ The Court dismissed McCleskey’s Eighth Amendment claim with equal swiftness. It characterized the study results as indicating disparate outcomes that merely “correlate[d] with race” and added that such a result was “an inevitable part of our criminal justice system.”⁶⁷ Because the discretion granted to prosecutors and juries was the source of the inevitability, the Court held that there was no Eighth Amendment violation.⁶⁸

Notably, in rejecting McCleskey’s Eighth Amendment claim with a small data approach, the Court reasoned that it was protecting the foundation of the criminal justice system. It feared the future, where similar analytics-based constitutional claims might “throw[] into serious question the principles that underlie our entire criminal justice system.”⁶⁹ The Court reasoned:

64. *Id.* at 287. See DAVID BALDUS ET AL., EQUAL JUSTICE AND THE DEATH PENALTY: A LEGAL AND EMPIRICAL ANALYSIS 392–419 (1990) (describing the study). One of McCleskey’s lawyers described the statistical study as follows:

Suffice it to say that David [Baldus] and his colleagues examined a large sample of Georgia homicide convictions between 1973 and 1979 and collected information about more than five hundred factors pertinent to sentencing in each case. They subjected this information to an extensive array of statistical procedures, including multiple-regression analyses based upon alternative models that controlled for as few as ten or as many as 230 sentencing factors—all of the factors specified by Georgia law for consideration in capital sentencing and virtually every other factor recognized in the legal and criminological literature as likely to affect the choice of life or death.

Anthony G. Amsterdam, *Opening Remarks: Race and the Death Penalty Before and After McCleskey*, 39 COLUM. HUM. RTS. L. REV. 34, 43 (2007) (footnote omitted).

65. *McCleskey*, 481 U.S. at 292–93 (“[T]o prevail under the Equal Protection Clause, McCleskey must prove that the decisionmakers in *his* case acted with discriminatory purpose. He offers no evidence specific to his own case that would support an inference that racial considerations played a part in his sentence. Instead, he relies solely on the Baldus study.”).

66. *Id.* at 293, n.11 (highlighting that the statistical models were just models and unable to establish proof of discriminatory purpose in any individual case). *Cf. Washington v. Davis*, 426 U.S. 229 (1976) (holding that in the employment discrimination context statistical evidence demonstrating a disparate impact is not sufficient to succeed on an equal protection claim without evidence of purposeful discrimination).

67. *McCleskey*, 481 U.S. at 312.

68. *Id.* at 311 (“McCleskey’s argument that the Constitution condemns the discretion allowed decisionmakers in the Georgia capital sentencing system is antithetical to the fundamental role of discretion in our criminal justice system.”).

69. *Id.* at 315.

[S]ince McCleskey's claim relates to the race of his victim, other claims could apply with equally logical force to statistical disparities that correlate with the race or sex of other actors in the criminal justice system, such as defense attorneys or judges. Also, there is no logical reason that such a claim need be limited to racial or sexual basis. If arbitrary and capricious punishment is the touchstone under the Eighth Amendment, such a claim could—at least in theory—be based upon any arbitrary variable, such as the defendant's facial characteristics, or the physical attractiveness of the defendant or the victim, that some statistical study indicates may be influential in jury decisionmaking. As these examples illustrate, there is no limiting principle to the type of challenge brought by McCleskey.⁷⁰

McCleskey's small data approach has had a lasting impact. Professor Anthony Amsterdam described it this way: “[S]o long as *McCleskey v. Kemp* remains the law, no purely statistical showing of racial differentials in the imposition or execution of death sentences will suffice to make out a violation of the federal Constitution.”⁷¹ Other scholars have noted its reach beyond the application of the death penalty.⁷²

In *Batson*, the Court demonstrated a similar commitment to small data constitutional interpretation.⁷³ *Batson* overruled *Swain v. Alabama*, which required that defendants prove a sustained pattern of race-based jury strikes to establish an equal protection violation.⁷⁴ At the time, this made sense, as practical realities made it nearly impossible for defendants (and courts) to collect the aggregate jury strike information necessary to meet *Swain*'s burden.⁷⁵ Of course, the modern reality of high-power computing and automated record keeping make these concerns less powerful.⁷⁶

70. *Id.* at 317–18 (footnotes omitted). *Cf. Washington v. Davis*, 426 U.S. at 248 (“A rule that a statute designed to serve neutral ends is nevertheless invalid, absent compelling justification, if in practice it benefits or burdens one race more than another would be far reaching and would raise serious questions about, and perhaps invalidate, a whole range of tax, welfare, public service, regulatory, and licensing statutes . . .”).

71. Amsterdam, *supra* note 64, at 45.

72. *See, e.g.,* Jeffrey Fagan & Mukul Bakhshi, *New Frameworks for Racial Equality in the Criminal Law*, 39 COLUM. HUM. RTS. L. REV. 1, 9 (2007) (“McCleskey was one of the first decisions in an ongoing historical process that has expanded the discretion of legal decision-makers—from police through corrections officials—and simultaneously insulated them from meaningful constitutional challenges.”).

73. *Batson v. Kentucky*, 476 U.S. 79, 96 (“[A] defendant may establish a prima facie case of purposeful discrimination in selection of the petit jury solely on evidence concerning the prosecutor's exercise of peremptory challenges at the defendant's trial.”).

74. *Swain v. Alabama*, 380 U.S. 202 (1965).

75. *See Batson*, 476 U.S. at 92 (1986) (criticizing *Swain* for demanding a “crippling burden of proof”).

76. *See infra* Part III.A.

Nevertheless, in focusing the equal protection analysis on the prosecutor's actions in a single case,⁷⁷ *Batson* represents an example of small data constitutional analysis, and this small data focus has impeded the reach of analytics in the criminal justice system.

The Court's ineffective assistance of counsel cases also reflect a small data approach to constitutional decision-making. The majority opinion and Justice Marshall's dissent in *Strickland v. Washington*,⁷⁸ demonstrate the point. Justice Marshall emphasized the trade-like aspects of criminal defense. He believed that many aspects of defense work are routine and could be evaluated with checklists.⁷⁹ This approach would be filled with determinable, and for the most part objective, variables that would fit seamlessly with the use of analytics.⁸⁰ But the Court rejected Justice Marshall's approach. Rather, it emphasized the artist-like qualities of criminal defense, arguing that the highly nuanced nature of each case rendered a formalistic approach to ineffective assistance of counsel claims unworkable.⁸¹

Under the Court's case-specific, small data approach, there is less room for analytics to grow as a tool for defense interests.⁸² Small data constitutional interpretation makes it less likely that data will be collected and organized, particularly when defendants are already forced to prioritize issues and maximize scarce resources. If the data is not collected, or is not collected correctly, it cannot be mined for trends and patterns to help decision-making.

C. Factors Contributing to the Analytics Imbalance

In addition to constitutional criminal procedure's small data focus, political realities (and pathologies), structural dynamics, and institutional competency limitations contribute to the uneven adoption of analytics. In

77. Notably, *Batson* did not fully refute *Swain*'s holding. That is, even though *Batson* lowered the *Swain* burden by relieving defendants from the crippling burden of demonstrating a pattern of race-based strikes over time, nothing in *Batson* prevents defendants from relying on systemic evidence of race-based strikes. *Batson*, 476 U.S. at 96–97 (noting that courts must consider “all relevant circumstances”).

78. 466 U.S. 668 (1984).

79. *Id.* at 709 (Marshall, J., dissenting) (arguing for the use of “uniform standards” to evaluate many aspects of criminal defense work).

80. *Id.* (noting that “conferring with one’s client, making timely objections . . . and filing a notice of appeal” are objective measures and could be used to evaluate effectiveness).

81. *Strickland*, 466 U.S. at 688–89 (“No particular set of detailed rules for counsel’s conduct can satisfactorily take account of the variety of circumstances faced by defense counsel or the range of legitimate decisions regarding how best to represent a criminal defendant.”).

82. This is not to say that analytics is not a useful tool for evaluating the provision of criminal defense services. See *supra* note 53.

Trial by Machine, Professor Andrea Roth explores “the rise of mechanized criminal adjudication.”⁸³ She contrasts mechanized criminal adjudication, which she argues has transformed the presentation of evidence at trial,⁸⁴ jury deliberations,⁸⁵ and sentencing,⁸⁶ with what preceded it, a human-driven system of adjudication that relied on human perception, complex judgments about what constitutes a crime, and discretionary sentencing schemes.⁸⁷ Professor Roth’s insightful analysis of the transition to a machine-driven adjudicatory system finds fault with the fact that this transition has not developed uniformly, favoring prosecutors as opposed to defendants.⁸⁸ The same has been true for analytics. This Section explains why the criminal justice system has not used analytics to aid defendants or promote broader systematic goals of fairness and justice.

1. Political Considerations

There are three interrelated political factors that explain why analytics has been more quickly adopted to serve crime-fighting interests as opposed to defense interests or broader interests in justice. First, criminal defendants and potential criminal defendants are politically weak, particularly when compared to law enforcement interests.⁸⁹ Second, extending analytics to defense interests will impose costs on law enforcement and prosecutors, but law enforcement and prosecutors will only receive part of the benefit from this expansion.⁹⁰ For example, requiring prosecutors to collect data on their

83. See Roth, *supra* note 48, at 1252.

84. *Id.* at 1253 (characterizing the changes in the manner in which evidence is presented at trial as a move away from the “importance of the human senses” toward the “silent testimony of instruments” (citing Mirjan R. Damaška, EVIDENCE LAW ADRIFT 143 (1997))).

85. *Id.* at 1264 (documenting how changes in substantive laws have diminished the need for jurors to exercise “complex moral decision making” in rendering verdicts).

86. *Id.* at 1266–69.

87. *Id.* at 1253 (discussing the reduced role for “percipient and human witnesses in proving guilt”); *id.* at 1264 (contrasting the modern criminal justice system with its past form, where the “jury had significant leeway to engage in complex moral decision making when determining guilt”).

88. *Id.* at 1252–53 (arguing that the mechanization of adjudication has been dominated by law enforcement interests seeking to minimize false negatives—“crimes that go undetected”—as opposed to seeking to minimize false positives, which would include wrongful convictions and excessive punishment).

89. See, e.g., WILLIAM J. STUNTZ, THE COLLAPSE OF AMERICAN CRIMINAL JUSTICE 267 (“Potential criminal defendants are not exactly a powerful lobby in legislative hallways, so legislators tend to hear from only one side—the government’s side.”); Erin Murphy, *The Politics of Privacy in the Criminal Justice System: Information Disclosure, the Fourth Amendment, and Statutory Law Enforcement Exemptions*, 111 MICH. L. REV. 485, 504 (2013) (noting that legislative efforts to provide privacy protections often reflect law enforcement’s powerful lobbying efforts); William J. Stuntz, *The Pathological Politics of Criminal Law*, 100 MICH. L. REV. 505, 508 n.5 (2001) [hereinafter *Pathological Politics*] (“[W]ith rare exceptions, legislators listen only to arguments that favor broader [criminal] liability rules.”).

90. Cf. Rachel Harmon, *Why Do We (Still) Lack Data on Policing?*, 96 MARQ. L. REV. 1119, 1131

charging practices⁹¹ will, at a minimum, generate costs related to the collection and storage of the data. And while prosecutors will incur some of the benefits of this data collection, for example by using it to improve internal procedures or to evaluate individual prosecutors,⁹² some of the benefits will not be fully internalized. Third, law enforcement officers are incentivized to focus on crime-fighting capabilities as opposed to justice-promoting qualities. This is true even if a new technique offers potential to fight crime while simultaneously serving defense interests and broader interests in fairness and justice.⁹³

Market interests amplify these political dynamics that have contributed to the analytics imbalance in the criminal justice system. Many of the analytics-based crime-fighting tools have been developed by industry.⁹⁴ Industry interests recognize the pool of stable customers—prosecutor’s offices and law enforcement agencies—and recognize that these customers are driven by crime rates and conviction rates.⁹⁵ In turn, crime rates and convictions rates drive funding. A stable customer base and stable funding streams incentivize industry to develop analytics tools focused on crime fighting. The same political and resource landscape does not exist on the defense side of the criminal justice system.

2. *Structural Limitations*

Important structural factors contribute to the analytics imbalance. The centralized and hierarchical nature of prosecuting agencies and law enforcement organizations allows leaders in these organizations to more quickly bring about sweeping changes by adopting new policies. But there is not an equivalent centralized power source on the defense side, where

(2013) (concluding that the lack of data on policing practices is the result of the fact that “police chiefs and politicians experience much of the cost of increased investment in obtaining information . . . but usually internalize only some of the benefits of improved policy”).

91. See *infra* Part IV.B.

92. See Marc L. Miller & Ronald F. Wright, *The Black Box*, 94 IOWA L. REV. 125, 134 (2008) (documenting the practice in New Orleans of evaluating line prosecutors based on data collected about charging decisions).

93. Rachel A. Harmon, *The Problem of Policing*, 110 MICH. L. REV. 761, 811 (2012) (concluding that law enforcement is “usually better rewarded for maintaining order and reducing crime than protecting civil rights.”).

94. See, e.g., POLICE EXEC. RESEARCH FORUM, COMPSTAT: ITS ORIGINS, EVOLUTION, AND FUTURE IN LAW ENFORCEMENT AGENCIES (2013), <https://www.bja.gov/Publications/PERF-Compstat.pdf> (describing the evolution of CompStat); *Predictive Crime Fighting*, IBM, <http://www-03.ibm.com/ibm/history/ibm100/us/en/icons/crimefighting/> (describing NYPD’s partnership with IBM to create CompStat).

95. Cf. Kreag, *supra* note 54, at 1506–07 (describing how corporate interests have contributed to the expansion of local DNA databases designed to address high-volume property crime).

client-specific outcomes dominate as opposed to broader systemic interests.

The changes instituted by Manhattan District Attorney Cy Vance exemplify how policy changes can happen quickly on the prosecution side. When Vance took office in 2010, he prioritized incorporating analytics into prosecutorial decisions.⁹⁶ Vance created the Crime Strategies Unit to develop “intelligence-driven prosecution” techniques.⁹⁷ The backbone of this unit is an automated database system—the Arrest Alert System—that notifies prosecutors when a “priority defendant”⁹⁸ has a new police encounter. The system delivers immediate access to the full range of information law enforcement has on the priority defendant even if the triggering arrest was for a minor matter. This allows prosecutors to tailor bail recommendations, charging decisions, and plea-bargaining strategies to defendants based not only on the immediate case, but also on the defendant’s complete law enforcement file.⁹⁹ Vance’s Executive Assistant District Attorney described the adoption of analytics succinctly. He explained:

It’s the ‘Moneyball’ approach to crime The tool is data; the benefit, public safety and justice—whom are we going to put in jail? If you have 10 guys dealing drugs, which one do you focus on? The assistant district attorneys know the rap sheets, they have the police statements like before, but now they know if you lift the left sleeve you’ll find a gang tattoo and if you look you’ll see a scar where the defendant was once shot in the ankle. Some of the defendants are often surprised we know so much about them.¹⁰⁰

Outside of New York, other prosecutors have turned to analytics to assist prosecutorial decisions.¹⁰¹ The New Orleans District Attorney’s Office was an early adopter of analytics. Beginning in 1988, the District Attorney “instructed his attorneys to keep an unusually rich computerized record of

96. See Brown, *supra* note 49, at 24.

97. *Id.*; see also, INTELLIGENCE-DRIVEN PROSECUTION / CRIME STRATEGIES UNIT, The New York County District Attorney’s Office, <http://manhattanda.org/intelligence-driven-prosecution-crime-strategies-unit> (describing the Crime Strategies Unit).

98. See INTELLIGENCE-DRIVEN PROSECUTION / CRIME STRATEGIES UNIT, The New York County District Attorney’s Office, <http://manhattanda.org/intelligence-driven-prosecution-crime-strategies-unit>.

99. See Brown, *supra* note 49.

100. *Id.* at 25.

101. The Manhattan District Attorney welcomes invitations to share its techniques about “Intelligence-Driven Prosecution” with other law enforcement agencies. See INTELLIGENCE-DRIVEN PROSECUTION / CRIME STRATEGIES UNIT, The New York County District Attorney’s Office, <http://manhattanda.org/intelligence-driven-prosecution-crime-strategies-unit>, which includes a link for other prosecutors to request information about the program.

their prosecutorial choices and reasoning,”¹⁰² focusing on decisions about whether and when to decline prosecution.¹⁰³ Each time prosecutors declined to prosecute a case, they were required to record the reasons for the declination.¹⁰⁴ Supervisors used the data to evaluate prosecutor performance.¹⁰⁵

In contrast with prosecutorial-led initiatives to incorporate analytics, on the defense side there is no equivalent of the elected prosecutor who has the power, resources, and access to data to develop analytics for defendants to use.¹⁰⁶ The insiders in the system—defendants and defense attorneys—focus on individual cases for the most part.¹⁰⁷ In addition, resource constraints limit the ability of defense insiders to explore analytics as a defense tool.¹⁰⁸ This often leaves public interest organizations and outside researchers to fill the void by demonstrating how analytics can benefit defense interests and serve broader interests in justice and fairness.¹⁰⁹

3. Measurement Challenges

The uneven adoption of analytics is also related to the mechanics of gathering and measuring data. Put simply, some things are easier to measure than others. And there is a natural tendency to focus resources on those things that are easier to measure and quantify. In the aggregate, prosecutors

102. Miller & Wright, *supra* note 92, at 129. *See id.* at 135 (documenting that the database collected information for prosecutorial decisions from 1988 to 1999).

103. *Id.* at 134.

104. *Id.* (“For many years, the office routines in New Orleans called for prosecutors to declare a reason (and only one reason) for any decision to decline prosecution The screening prosecutors chose their reasons from a standardized office list and recorded their reasons in computerized format”).

105. *Id.* (reporting that supervisors “routinely used the data to evaluate the timeliness of an attorney’s work and to make sure that a single prosecutor did not decline charges at an unusually high or low rate”).

106. In some jurisdictions, county or statewide public defender offices might fill some of this void. However, even if we assume that these organizations have sufficient resources to take on this new role, these offices will not often have access to relevant data. *See infra* Part IV.B. (explaining the need for mandatory disclosure rules for prosecutorial agencies to build the necessary data sets).

107. Occasionally, individual casework uncovers systemic injustices and misconduct. For example, public defender Scott Saunders uncovered the widespread misconduct surrounding law enforcement and prosecutorial reliance on informants in Orange County, California in a single case. *See generally* PATRICK DIXON ET AL., ORANGE COUNTY DISTRICT ATTORNEY INFORMANT POLICIES & PRACTICES EVALUATION COMMITTEE REPORT (2015) (outlining proposed reforms responding to the uncovered misconduct).

108. *But see supra* note 53.

109. *See, e.g.*, FAIR PUNISHMENT PROJECT, <http://fairpunishment.org/> (last visited Sept. 22, 2016); QUATRONE CENTER FOR THE FAIR ADMINISTRATION OF JUSTICE, <https://www.law.upenn.edu/institutes/quatronecenter/> (last visited Feb. 15, 2016); VERA INSTITUTE OF JUSTICE, <http://www.vera.org/> (last visited Feb. 15, 2016).

measure success based on conviction rates and crime rates, variables that are easily quantified, tracked, and compared.¹¹⁰ For example, in explaining his decision to expand data-driven decision making in the Manhattan District Attorney's Office, District Attorney Vance pointed to crime rates as the motivating factor.¹¹¹

While prosecutors can easily turn to comprehensive measures of crime rates and conviction rates to guide their adoption of analytics, there is not an equivalent comprehensive measure to guide the adoption of defense-centered analytics.¹¹² It is more challenging to identify and measure proxies and determinable variables for fairness and justice than it is for crime-fighting-driven analytics, which can default to conviction and crime rates. This does not mean that it is not possible.¹¹³ Rather, the measurement challenges simply help explain why analytics as a crime-fighting tool has developed quicker than as a tool to serve defense interests.

4. Competency Limitations

The institutional competency of courts contributes to the analytics imbalance.¹¹⁴ These limitations are of two types. First, there is the question of whether the judiciary possesses the ability to reliably evaluate, analyze, and weigh complex statistical information that is often a part of analytics. Second, courts often point to limitations in judicial competency as a reason to defer to the political process to evaluate prosecutorial discretion.

With respect to the first question, judges are often reluctant to incorporate complex statistical analysis in their judicial reasoning. For example, in *Craig v. Boren*,¹¹⁵ after evaluating and rejecting statistical evidence in an equal protection claim, Justice Brennan asserted, "It is unrealistic to expect either members of the judiciary or state officials to be well versed in the rigors of experimental or statistical technique."¹¹⁶ More

110. See Part II.B.

111. Brown, *supra* note 49, at 24 (quoting Vance explaining his adoption of analytics as follows: "The question I had when I came in was, Do we sit on our hands waiting for crime to tick up, or can we do something to drive crime lower?").

112. Laurin, *supra* note 53, at 356 (explaining that one of the challenges of using analytics to evaluate indigent defense is the lack of agreement about "what good defense practice is aiming to achieve").

113. See *infra* Part III (identifying ways to expand analytics to serve defense interests).

114. While I focus on judicial competency, one cannot dismiss the possibility that judicial capacity—meaning the absolute number of cases the judiciary can process—is also a driver of this analytics imbalance. See Andrew B. Coan, *Judicial Capacity and the Substance of Constitutional Law*, 122 YALE L.J. 422, 457 (2012) (arguing that "capacity constraints are a principal factor preventing courts from dealing competently with many important constitutional questions").

115. 429 U.S. 190 (1976).

116. *Id.* at 204.

recently, the Court cautioned lower courts against intervening in technical controversies beyond their expertise.¹¹⁷ This reluctance is consistent with the Justices' limited experience with technology.¹¹⁸

The Court has also recognized the judiciary's limited competency to evaluate certain aspects of prosecutorial discretion. For example, in *Wayte v. U.S.*,¹¹⁹ the defendant challenged the government's passive enforcement policy for people who failed to register for the military draft.¹²⁰ The Court ultimately upheld the charging policy, emphasizing the broad discretion prosecutors have to bring or decline criminal charges.¹²¹ In doing so, the Court emphasized its limitations. It explained that the Court's deference to prosecutors "rests largely on the recognition that the decision to prosecute is particularly ill-suited to judicial review."¹²² It added that the factors that go into the charging decision "are not readily susceptible to the kind of analysis the courts are competent to undertake."¹²³

This type of analysis, where the Court has asserted its limited competency, sends a strong signal to litigants about the utility of analytics as a litigation strategy. But this signal is not equally felt by law enforcement and prosecutors. Rather, the crime-fighting use of analytics happens largely outside of the reach of the Constitution, and, hence, outside of the reach of the judiciary.¹²⁴ However, as a tool to serve defense interests, analytics would often be filtered through the courts.¹²⁵ To the extent that courts are unwilling or unable to use analytics, the criminal justice system's reliance on "guesswork" is preserved.¹²⁶ In turn, this reluctance or inability to engage

117. See *Glossip v. Gross*, 135 S. Ct. 2726, 2740 ("[F]ederal courts should not 'embroil [themselves] in ongoing scientific controversies beyond their expertise.'" (quoting *Baze v. Rees*, 553 U.S. 35, 51 (2008))). See generally Mary Graw Leary, *The Supreme Digital Divide*, 48 TEX. TECH L. REV. 65, 66 (2015) (arguing that the Court's Fourth Amendment jurisprudence is weakened by the digital "divide between the perspective of the Court and twenty-first century realities").

118. See, e.g., Alan M. Trammell and Derek E. Bambauer, *Personal Jurisdiction and the 'Interwebs'*, 100 CORNELL L. REV. 1129, 1151–52 (2015) (arguing that judges' limited technological experience and understanding caused deficiencies in the jurisprudence of personal jurisdiction); Michelle R. Smith, *Kagan: Court Hasn't Really 'Gotten to' Email*, ASSOCIATED PRESS (Aug. 20, 2013, 9:53 PM), <http://bigstory.ap.org/article/kagan-justices-not-tech-savvy-send-paper-memos> (quoting Justice Kagan saying, "The justices are not necessarily the most technologically sophisticated people . . . The court hasn't really 'gotten to' email.").

119. 470 U.S. 598 (1985).

120. *Id.* at 601 (explaining that the government's passive enforcement policy focused disproportionately on people who wrote the Selective Service to inform it of their decision not to register).

121. *Id.* at 614.

122. *Id.* at 607.

123. *Id.*

124. See *supra* Part I.B.

125. See *infra* Part II.C. (making the case that analytics can improve judicial analysis).

126. See Kozinski, *supra* note 7.

with analytics makes it less likely that defendants and criminal justice reformers will use resources to build the data sets necessary to expand this tool.

II. EXTENDING ANALYTICS TO THE PROSECUTORIAL FUNCTION

This Part explains why part of the response to the uneven adoption of analytics should be to expand the use of analytics to areas that can benefit defendants. It offers more than a simplistic, “everybody’s doing it” argument. Rather, it makes the affirmative case that expanding the use of analytics can improve the prosecutorial function, increase community participation in the justice system, advance constitutional decision-making, and promote the systemic goals of justice and fairness.

It is worth noting that addressing the analytics imbalance by expanding its use beyond crime-fighting interests is not the only option. Several scholars have advocated for restricting (or at least regulating) the state’s use of analytics in the crime-fighting sphere.¹²⁷ Former Attorney General Eric Holder cautioned that predictive policing methods and risk-assessment driven sentencing decisions “should not be based on unchangeable factors that a person cannot control, or on the possibility of a future crime that has not taken place.”¹²⁸ Others have questioned whether analytics shares the same promise as a tool for the defense as it does for law enforcement and prosecutors.

This Article takes a different path. It proposes an expanded role for analytics, focusing on areas where analytics can be used to serve defense interests and help promote broader goals in justice and fairness. This Part explores why this expansion would be a positive development irrespective of the use of analytics to fight crime. It argues that analytics offers promise as a tool to: 1) regulate prosecutors’ expanding power; 2) more accurately measure prosecutorial performance; and 3) improve constitutional decision-making.

A. Checking Prosecutorial Power

127. See, e.g., Sidhu, *supra* note 50, (exploring arguments against using analytics to develop risk-assessment tools for sentencing); Lapp, *supra* note 52, at 7 (discussing the pathology of “dataveillance”). Cf. Sunita Sah et al., *Blinding Prosecutors to Defendants’ Race: A Policy Proposal to Reduce Unconscious Bias in the Criminal Justice System*, 1 BEHAV. SCI. & POL’Y 69, 73 (2015) (warning that one of the potential drawbacks of blinding prosecutors to the race of defendants is that prosecutors may be less likely to express empathy for anonymized defendants).

128. Eric Holder, Attorney General, Address at the National Association of Criminal Defense Lawyer’s 57th Annual Meeting (Aug. 1, 2014) (transcript available at <http://www.justice.gov/opa/speech/attorney-general-eric-holder-speaks-national-association-criminal-defense-lawyers-57th>).

The affirmative case for expanding the use of analytics starts with recognizing the extraordinary power of prosecutors. Society and prosecutors alike have long recognized the power of the institution.¹²⁹ Former Attorney General Robert Jackson acknowledged this over 75 years ago when he concluded, “The prosecutor has more control over life, liberty, and reputation than any other person in America.”¹³⁰ Jackson’s description is even more accurate today; the criminal justice system has evolved in a way that has consolidated more power and discretion in the prosecutor’s hands.¹³¹ Furthermore, the expansion of the prosecutor’s power has coincided with, and contributed to, the dramatic expansion of the criminal justice system in the last four decades.¹³²

Prosecutorial power has increased in absolute and comparative terms. Changes in substantive criminal law and sentencing regimes have provided prosecutors more power during the charging and plea bargaining process. Constitutional rulings have insulated many prosecutorial decisions from judicial review.¹³³ And, simultaneously, other institutions in the criminal justice system have lost power. This Section summarizes these developments, setting the stage for how analytics can serve as a check on prosecutorial power.

Two trends in how society classifies and defines criminal conduct have consolidated power in the prosecutor’s office. First, a dramatic increase in the number of criminal laws has expanded the universe of activity that can be classified as criminal.¹³⁴ The addition of new criminal prohibitions has been so quick and cumbersome that it is difficult simply to count the number of criminal laws.¹³⁵ This has given prosecutors the ability to pick from an

129. See, e.g., Attorney General Robert H. Jackson, *The Federal Prosecutor*, 31 AM. INST. CRIM. L. & CRIMINOLOGY 3, 3 (1940) (recognizing the prosecutor’s “tremendous” discretion in initiating investigations, bringing charges, and recommending sentences).

130. *Id.*

131. Bibas, *supra* note 23, at 960 (“No government official in America has as much unreviewable power and discretion as the prosecutor.”).

132. See WILLIAM J. STUNTZ, *THE COLLAPSE OF AMERICAN CRIMINAL JUSTICE* 47 (2011) (“More inmates live in state and federal penitentiaries than in the past chiefly because prosecutors have charged and convicted more criminal defendants than in the past.”); *id.* at 299 (“In 1974, 17,000 local prosecutors were responsible for some 300,000 felony prosecutions each year. Thirty years later, the number of local prosecutors had grown to 27,000—but the annual number of felony prosecutions had exploded, topping 1 million.”); John F. Pfaff, *The Micro and Macro Causes of Prison Growth*, 28 GA. ST. U. L. REV. 1239 (2012) (providing empirical evidence that modern incarceration rates are the result of prosecutors filing more cases as opposed to longer sentences or other factors).

133. See, e.g., Fagan *supra* note 72.

134. See, e.g., Alex Kozinski & Misha Tseytlin, *You’re (Probably) a Federal Criminal*, IN THE NAME OF JUSTICE: LEADING EXPERTS REEXAMINING THE CLASSICAL ARTICLE “THE AIMS OF THE CRIMINAL LAW” 43 (Timothy Lynch ed., 2009).

135. Gary Fields & John R. Emshwiller, *Many Failed Efforts to Count Nation’s Federal Criminal*

assortment of different crimes with different sentencing ranges on the front end of a case.

Prosecutors have always had to choose which cases to pursue;¹³⁶ however, new and revised statutes have increased prosecutorial power by making it increasingly difficult for any of us to avoid overstepping criminal laws.¹³⁷ In his unsparing critique of the modern criminal justice system, Judge Alex Kozinski demonstrated the long reach of prosecutorial power by describing a game federal prosecutors played in which they challenged each other to identify “plausible” criminal charges for well-known individuals picked at random.¹³⁸ The fact that the challenge was realistic demonstrates the vast reach of our criminal laws.

The sheer number of criminal laws tells only part of the story. Changes in how legislatures define criminal conduct has also expanded the power of prosecutors. For example, while it was once routine to require proof that a defendant acted with a morally blameworthy state of mind, the modern trend is to minimize, or sometimes eliminate altogether,¹³⁹ this requirement.¹⁴⁰ For example, “In today’s courtroom . . . defendants are prosecuted not just for breaking and entering, but for simply possessing burglary tools as well.”¹⁴¹

Changes in sentencing practices have also increased prosecutors’ power.

Laws, WALL ST. J. (Jan. 23, 2011), <http://www.wsj.com/articles/SB10001424052702304319804576389601079728920> (reporting that a 1982 attempt by the Justice Department to count the number of federal crimes was only successful at coming up with an “educated estimate” of about 3,000 federal criminal offenses and a similar effort by the ABA in 1998 concluded that attempting to count the number of federal crimes was “futile” and would nonetheless end up with an inaccurate tally). *See generally* John S. Baker, *Revisiting the Explosive Growth of Federal Crimes*, HERITAGE FOUNDATION, LEGAL MEMORANDUM No. 26, June 2008, <http://www.heritage.org/research/reports/2008/06/revisiting-the-explosive-growth-of-federal-crimes> (finding that between 1980 and 2007 over 50 new federal crimes were added each year); Jeff Welty, *Overcriminalization in North Carolina*, 92 N.C. L. REV. 1935 (2014) (analyzing the expansion of North Carolina’s criminal code).

136. Jackson, *supra* note 129, at 5 (“One of the greatest difficulties of the position of prosecutor is that he must pick his cases, because no prosecutor can even investigate all of the cases in which he receives complaints. If the Department of Justice were to make even a pretense of reaching every provable violation of federal law, ten times its present staff would be inadequate.”).

137. *Pathological Politics*, *supra* note 89, at 509 (“As criminal law expands, both lawmaking and adjudication pass into the hands of police and prosecutors; law enforcers, not the law, determine who goes to prison and for how long.”).

138. Kozinski, *supra* note 7, at xlv (quoting Tim Wu, *American Lawbreaking*, SLATE (Oct. 14, 2007), http://www.slate.com/articles/news_and_politics/jurisprudence/features/2007/american_law_breaking/introduction.html).

139. For an argument that strict liability crimes can lead to unfair results, see Elizabeth Nevins-Saunders, *Incomprehensible Crimes: Defendants With Mental Retardation Charged With Statutory Rape*, 85 N.Y.U. L. REV. 1067 (2010).

140. *See* STUNTZ, *supra* note 132, at 260 (“Traditionally, that body of law required proof that the defendant acted with a state of mind that was worthy of moral blame. . . . But for the most part, the concept of wrongful intent . . . has gone by the boards.”).

141. *See* Roth, *supra* note 48, at 1264.

Increased reliance on mandatory minimums, sentencing guidelines, formalized risk-assessment tools, and so-called evidence-based sentencing schemes have simultaneously expanded the power of the prosecutors and limited the role of the judiciary in sentencing decisions. Prosecutors set the terms of potential sentences with their charging decisions in a variety of ways, such as by stacking charges that result from a single course of conduct.¹⁴² And even after setting the initial charge, they control the process by exercising their power to bargain away charges or to agree to hide factors from the court that would affect sentencing.

The prosecutor has also gained leverage and power as the collateral consequences of arrests and convictions have expanded.¹⁴³ These collateral consequences can include restrictions on individual liberty, including continued confinement, even after a convicted offender serves his entire criminal sentence.¹⁴⁴ Other, less drastic liberty restrictions follow convicted individuals in less obvious ways.¹⁴⁵ When paired with the prosecutor's power to initiate criminal charges and negotiate plea bargains, the expansion of deep collateral consequences gives the prosecutor one more lever of power in a system that had already granted prosecutors immense power.

Finally, the increased power of the prosecutor is closely tied to law enforcement's expanding power as a result of new surveillance techniques that help police identify a larger percentage of ongoing criminal activity.¹⁴⁶ The more cases law enforcement brings to the prosecutor, the more the prosecutor is able exercise her discretion.

While prosecutorial power has increased, prosecutors face comparatively little regulation and oversight.¹⁴⁷ Where applicable,

142. See STUNTZ, *supra* note 89, at 296 (concluding that in the modern criminal justice system “[i]nstead of juries and trial judges deciding whether this or that defendant merits punishing, prosecutors decide who deserves a trip to the nearest penitentiary”).

143. See ALEXANDER, *supra* note 52, at 2 (“Once you’re labeled a felon, the old forms of discrimination—employment discrimination, housing discrimination, denial of the right to vote, denial of educational opportunity, denial of food stamps and other public benefits, and exclusion from jury service—are suddenly legal.”).

144. See NATIONAL DISTRICT ATTORNEYS ASSOCIATION, CIVIL COMMITMENT OF SEX OFFENDERS (2012) <http://www.ndaa.org/pdf/Sex%20Offender%20Civil%20Commitment-April%202012.pdf> (compiling state laws that provide for civil commitment of sex offenders following their criminal sentences).

145. See generally, American Bar Association, *National Inventory of the Collateral Consequences of Conviction*, <http://www.abacollateralconsequences.org/> (compiling collateral consequences by jurisdiction).

146. For example, in prior work, I explored how the growth of local DNA databases has allowed police to more effectively solve high-volume property crimes. See KREAG, *supra* note 60.

147. See BIBAS, *supra* note 23, at 960 (“No government official in America has as much unreviewable power and discretion as the prosecutor.”); *id.* at 962 (“Many, if not most, other government actors enjoy less power yet are subject to far more regulation than prosecutors are. The comparison

constitutional protections provide only floors. This leaves many prosecutorial decisions, including decisions like charging, nearly untouched by constitutional review.¹⁴⁸

Other areas of constitutional criminal procedure also leave prosecutors with a great amount of unregulated power. For example, despite the system's overwhelming reliance on guilty pleas and plea bargaining,¹⁴⁹ the Court has been unwilling to extend key due process protections to plea bargaining. Specifically, while the Due Process Clause requires prosecutors to disclose material exculpatory and impeachment information to the defense in advance of trial,¹⁵⁰ the Court has remained silent about the extent to which this right applies during plea negotiations.¹⁵¹ The Court's silence leaves this important issue¹⁵² to be determined by lower federal courts, state courts, and the ethical rules that guide prosecutors.¹⁵³

In an address at the University of Arizona College of Law, former United States Attorney for the District of Arizona, Paul Charlton, explained how his office applied *Brady* during plea negotiations when he was the United States Attorney.¹⁵⁴ Charlton stated that, while he generally favored expanded pretrial discovery for criminal defendants, prosecutors had the authority to determine when *Brady*'s full due process protections applied in guilty plea cases. For example, he argued that in "fast track" illegal reentry immigration cases it was ethical and constitutional for federal prosecutors to refuse to provide pretrial discovery. Charlton added that if a defendant wanted to receive full discovery, he had to forgo the "fast track" proceedings and go to trial. He recognized that defendants who elected to exercise their

suggests that prosecutors are the outliers and that some new regulatory mechanisms are likely to be worth the cost.").

148. See *Wayte v. United States*, 470 U.S. 598, 607 (1985) ("In our criminal justice system, the Government retains broad discretion as to whom to prosecute. So long as the prosecutor has probable cause to believe that the accused committed an offense defined by statute, the decision whether or not to prosecute, and what charge to file or bring before a grand jury, generally rests entirely in his discretion.") (internal quotation marks and citations omitted).

149. See *Lafler v. Cooper*, 132 S. Ct. 1376, 1388 (2012) (recognizing that "criminal justice today is for the most part a system of pleas, not a system of trials").

150. See *Brady v. Maryland*, 373 U.S. 83, 87 (1963); *Giglio v. United States*, 405 U.S. 150, 154 (1972) (extending *Brady* to impeachment material).

151. See *United States v. Ruiz*, 536 U.S. 622, 633 (2002) (holding that due process does not require the prosecutor to disclose material impeachment evidence during plea negotiations, but remaining silent with respect to other forms of exculpatory evidence).

152. See *Giglio*, 405 U.S. at 154 ("When the 'reliability of a given witness may well be determinative of guilt or innocence,' nondisclosure of evidence affecting credibility falls within [*Brady*'s reach].") (quoting *Napue v. Illinois*, 360 U.S. 264, 269 (1959)).

153. See, e.g., *Buffey v. Ballard*, 782 S.E.2d 204 (W. Va. 2015) (extending *Brady* to plea negotiations).

154. Paul Charlton, Address to the University of Arizona College of Law Program in Criminal Law and Policy: Prosecutorial Ethics (Oct. 22, 2015) (notes on file with author).

right to go to trial and obtain full discovery likely faced more serious punishment upon being found guilty at trial, but he found this bargain permissible and within the prosecutor's discretion.¹⁵⁵

Minimal constitutional regulation of prosecutorial decision-making is paired with equally slight regulation and oversight from political forces. This does not mean that prosecutors are not political actors. They are, and political calculations certainly check their discretion.¹⁵⁶ However, relying on political forces to regulate prosecutorial decision-making is a weak form of regulation.¹⁵⁷

B. Moving Beyond Conviction Rates

The fact that analytics has not been used to evaluate the prosecutorial function cannot be explained by prosecutorial resistance to being measured.¹⁵⁸ Prosecutors are accustomed to having their ultimate results measured. They accept, and sometimes welcome, the fact that conviction rates are used to evaluate performance.¹⁵⁹ However, the focus on conviction rates is insufficient to effectively analyze prosecutorial decision-making and to incorporate defense interests and broader interests in fairness and justice.¹⁶⁰ This traditional metric leaves relevant information unexamined,

155. *Id.*

156. *See, e.g.*, Jackson, *supra* note 129 at 3 (pointing to the requirement of a presidential appointment and the Senate confirmation process as political checks to evaluate the "character" of prosecutors in the federal system); *Morrison v. Olson*, 487 U.S. 654, 728 (1988) (Scalia, J., dissenting) ("Under our system of government, the primary check against prosecutorial abuse is a political one.").

157. The infrequency with which prosecutors face any negative consequences even when they are found to have committed misconduct or abused their offices supports the proposition that relying on political forces to regulate prosecutors is insufficient. *See, e.g.*, Kozinski, *supra* note 7, at xxxii ("In my experience, the U.S. Justice Department's Office of Professional Responsibility (OPR) seems to view its mission as cleaning up the reputation of prosecutors who have gotten themselves into trouble."); Angela J. Davis, *The Legal Profession's Failure to Discipline Unethical Prosecutors*, 36 HOFSTRA L. REV. 275, 276 (2007); Daniel S. Medwed, *Brady's Bunch of Flaws*, 67 WASH. & LEE L. REV. 1533, 1544-47 (2010) (summarizing studies documenting that prosecutors who commit misconduct are rarely punished).

158. Interestingly, the same may not be said for defense attorneys. *See Laurin, supra* note 53, at 360 ("Professional opposition to data collection might also flow simply from what is widely understood to be an autonomous, maverick culture to criminal defense, one in which tracking hours spent and tasks performed is likely to be met with resistance."); *Strickland v. Washington*, 466 U.S. 668, 688-89 (1984) ("No particular set of detailed rules for counsel's conduct can satisfactorily take account of the variety of circumstances faced by defense counsel or the range of legitimate decisions regarding how best to represent a criminal defendant.").

159. *See, e.g.*, Jessica Fender, *DA Chambers Offers Bonuses for Prosecutors Who Hit Conviction Targets*, DENVER POST (Mar. 23, 2011), <http://www.denverpost.com/2011/03/23/da-chambers-offers-bonuses-for-prosecutors-who-hit-conviction-targets/>.

160. *Cf. Kreag, supra* note 60, at 1541 ("Solving and deterring crimes is how law enforcement defines its success, and it is often under considerable pressure to do these two things. In such an

fails to capture the full implications of prosecutorial discretion, is too easily manipulated, and is comparatively less helpful in our modern, plea dominated criminal justice system.

The focus on conviction rates leaves important information uncollected and, therefore, unaccounted for. Conviction rates fail to measure where prosecutors exercise their most discretion—at the charging and plea bargaining stage at the beginning of a case.¹⁶¹ They are nearly useless for evaluating decisions to decline prosecution.¹⁶² They do not distinguish between convictions based on trials as opposed to guilty pleas. They are incapable for evaluating the coercive nature of plea bargains. They say nothing about jury selection or whether prosecutors meet their constitutional disclosure obligations. In short, by focusing on the ultimate result, they miss the process.

In the marketing context, the continued focus on conviction rates is similar to a company tracking only the number of items sold. In the sports world, the focus on conviction rates is similar to focusing on the win-loss record. Such measures are helpful, but incomplete. The company could make better decisions if it also knew what type of consumers purchased its products, what products these consumers simultaneously purchased, and what type of marketing influenced their purchasing decisions. The sports team would benefit from measuring the discrete factors that contributed to the wins and losses.

Conviction rates are also ineffective because they can easily be manipulated.¹⁶³ Prosecutors can elect not to bring tough cases. Or, they can avoid tough cases by offering favorable pleas to defendants in exchange for dismissing certain charges. There are sound strategic reasons to do this in many cases. For example, a prosecutor may offer a generous plea in consultation with victims who do not want to go through the stress and pain of a public trial. But, most of us would agree that making such decisions to artificially maintain high conviction rates is not an appropriate use of discretion.

environment, it is unlikely that law enforcement will identify and internalize all of the costs of a surveillance procedure, particularly when it believes that procedure to be effective at solving crime.”).

161. *See generally* Miller & Wright, *supra* note 92 (exploring the factors that influence declination decisions).

162. *See id.* (documenting how the former New Orleans District Attorney used analytics to evaluate declinations); Bibas, *supra* note 23, at 986–87 (concluding that conviction rates “are mediocre proxies for an office’s performance” and that they “ignore other important outcomes, such as declinations, sentences, and victim satisfaction”).

163. *See* Stephanos Bibas, *Transparency and Participation in Criminal Procedure*, 81 N.Y.U. L. REV. 911, 935 (2006) (“District attorneys can create the misleading impression of toughness by touting 99.5% conviction rates, when in fact most of those convictions come from lenient pleas.”).

The focus on conviction rates also masks the distributional effects of prosecutorial decision-making.¹⁶⁴ Conviction rates provide little information about the extent to which the multitude of discretionary steps that precede a conviction are affected by or correlated with the experience level of the prosecutor and defense attorney, the race and gender of the prosecutor and defendant, or the offense of arrest, for example.¹⁶⁵ Such information is only available with a much finer measure than the blunt focus of conviction rates.

Finally, the continued focus on conviction rates fails to account for the fact that the modern criminal justice system is less dependent on trials as a means to determine guilt.¹⁶⁶ “[C]riminal justice today is for the most part a system of pleas, not a system of trials.”¹⁶⁷ The dependence on pleas modifies the adversarial nature of the criminal justice system, replacing it with administrative-like proceedings.¹⁶⁸ In this administrative system, the conviction is nearly a forgone conclusion once charges are filed. The work is done in the private negotiations that set the terms for the conviction.¹⁶⁹ Evaluating prosecutorial performance by focusing on conviction rates fails to consider this reality.

Part III provides several examples of how analytics can be used to measure prosecutorial decision-making. These examples are akin to moving beyond simply measuring wins and losses—convictions and not-guilty verdicts—and instead analyzing the determinable factors that contribute to the win-loss record. But before moving there, the next Section explains how analytics can also improve constitutional decision-making, which can, in turn, help make prosecutorial decisions more transparent.

164. Similarly, a focus on arrest rates masks the distributional effects of policing. *See* Harmon, *supra* note 93, at 811–812 (“[H]arms of policing are unevenly distributed. . . . African Americans and Latinos are much more often stopped, searched, arrested, and hurt by the police than are others.”); *see also* William J. Stuntz, *The Distribution of Fourth Amendment Privacy*, 67 GEO. WASH. L. REV. 1265 (1999).

165. *See, e.g.*, Kutateladze, *supra* note 30 (exploring disparate racial impacts of discretionary prosecutorial decisions in the Manhattan District Attorney’s Office).

166. *See* Missouri v. Frye, 132 S. Ct. 1399, 1407 (2012) (“Ninety-seven percent of federal convictions and ninety-four percent of state convictions are the result of guilty pleas.”).

167. *See* Lafler v. Cooper, 132 S. Ct. 1376, 1388 (2012).

168. *See generally* STEPHANOS BIBAS, *THE MACHINERY OF CRIMINAL JUSTICE* (2012) (noting insiders – prosecution and defense attorneys – colluding).

169. *See* Richard A. Oppel Jr., *Sentencing Shift Gives New Leverage to Prosecutors*, N.Y. TIMES (Sept. 25, 2011), http://www.nytimes.com/2011/09/26/us/tough-sentences-help-prosecutors-push-for-plea-bargains.html?_r=1 (quoting Federal Judge John J. Kane Jr. as follows: “How many times is a mandatory sentence used as a chip in order to coerce a plea? They don’t keep records That’s what the public doesn’t see”).

C. Improving Constitutional Decision-Making With Analytics

When Judge Kozinski began his stinging critique of the criminal justice system by warning that “much of what we do in the law is guesswork,”¹⁷⁰ he joined a long list of scholars and commentators who have lamented the lack of an empirical foundation for many of the decisions made in the course of a criminal case.¹⁷¹ Kozinski offered a broad indictment of the system. This Section focuses on a part of the criticism, namely the guesswork and lack of empirical foundation that is prevalent in constitutional criminal procedure, particularly where it relates to regulating prosecutorial behavior.¹⁷² It uses the Supreme Court’s equal protection analysis in *McCleskey* and the due process analysis the Supreme Court has used to set the constitutional floor for pre-plea disclosure obligations to demonstrate that analytics can replace the guesswork and improve the Court’s ability to regulate prosecutorial decision-making.

In time, some of the improvement will flow naturally from technological advancements that make it possible to collect and sort large data sets. Simply having the data will address part of the concerns courts have raised as an explanation for resisting the incorporation of analytics in constitutional rulings. Here, it is helpful to consider how courts analyzed the statistical evidence in *McCleskey*. The Eleventh Circuit Court of Appeals and the Supreme Court assumed the validity of the statistical evidence.¹⁷³ However, the district court was extremely critical of the study.¹⁷⁴ It highlighted gaps in the data, critiqued the methodology, and ultimately concluded that it was not sufficiently trustworthy.¹⁷⁵ Much of the district court’s concern was over *McCleskey*’s attempt to make predictions about the whole system by reviewing only a portion of it. Regardless of whether one believes this concern can be adequately overcome using

170. Kozinski, *supra* note 7, at iii.

171. See, e.g., Tracey L. Meares and Bernard E. Harcourt, *Supreme Court Review – Forward: Transparent Adjudication and Social Science Research in Constitutional Criminal Procedure*, 90 J. CRIM. L. & CRIMINOLOGY 733, 735 (2000) (“[U]se of empirical evidence will produce a clearer picture of the existing constitutional landscape and spotlight the normative judgments at the heart of criminal procedure cases.”) (emphasis omitted). *But see* Allison Orr Larsen, *Factual Precedents*, 162 U. PA. L. REV. 59, 77 (2013) (noting that Supreme Court opinions have a “new emphasis on factual claims reinforced by empirical data and secondary authorities”).

172. See, e.g., Opper, *supra* note 169. *Cf.* *Scott v. Harris*, 550 U.S. 372 (2007) (concluding that raw video from the case provided clear evidence that police did not use excessive force despite the lack of empirical evidence to support this assertion); Dan M. Kahan et al., *Whose Eyes Are You Going to Believe? Scott v. Harris and the Perils of Cognitive Illiberalism*, 122 HARV. L. REV. 837 (2009) (demonstrating empirically the limitations of the Court’s assertion of what the video proved).

173. *McCleskey v. Kemp*, 481 U.S. 279, 291 n.7 (1987).

174. *Id.* at 287–89.

175. *Id.* at 288–89 n.6.

statistical sampling methods, the modern reality of ever-growing data collection can minimize, and perhaps erase, this concern.

Prof. Elizabeth E. Joh explored this new reality in discussing how analytics and big data are changing policing:

If conventional scientific research begins with a hypothesis or question that then shapes the collection of the relevant data, the big data phenomenon turns such conventions upside down. Because data is being collected and stored all of the time, research questions do not have to shape or limit data collection at all. Researchers need not limit themselves to data sampling, either. Big data permits the study of a phenomenon where the set is nearly everything that is possible to study (another way of stating that we are approaching $n=all$).¹⁷⁶

The promise of analytics in a world where everything is measured is far from a reality, particularly in the criminal justice system.¹⁷⁷ One of the central goals of this Article is to promote measuring and data collection about prosecutorial decision-making to the same degree that we do in other areas. When we do, it is possible to imagine that concerns about sampling and data gaps will fall away.¹⁷⁸

Notably, the principles of analytics can improve the Court's constitutional analysis of prosecutorial decision-making even before we reach $n=all$, in Joh's terms. In *United States v. Ruiz*,¹⁷⁹ the Court held that the Due Process Clause does not require prosecutors to disclose "material impeachment evidence prior to entering a plea agreement."¹⁸⁰ The Court's analysis of this weighty constitutional issue with far-reaching implications was remarkable for several reasons. But what is most obvious when viewing the opinion with an eye to how analytics can improve constitutional decision-making is the near total lack of empirical foundation for the Court's reasoning. This void is particularly stunning because the Court rested its holding on a traditional due process balancing test, weighing the nature and value of the private interest (here, the defendant's interest in pre-plea disclosure of impeachment evidence) against the burden imposed on

176. See Joh, *supra* note 36, at 40 (citing VIKTOR MAYER-SCHONBERGER & KENNETH CUKIER, *BIG DATA: A REVOLUTION THAT WILL TRANSFORM HOW WE LIVE, WORK, AND THINK* 26 (2013)).

177. See Wright & Peeples, *supra* note 53, at 1224 (2013) (characterizing the criminal justice system as a "data-poor environment").

178. Of course, this only addresses one of the hurdles of *McCleskey*. The Supreme Court assumed the validity of McCleskey's statistical evidence. 481 U.S. at 291 n. 7. Nonetheless, it denied his claim, finding that the evidence, even if true, could not independently establish purposeful discrimination. *Id.* at 291.

179. 536 U.S. 622 (2002).

180. *Id.* at 633.

the government.¹⁸¹ One would expect that by setting up the test this way the Court would at least attempt to identify the actual (or even approximate) private benefits and government burdens. It did not. Rather, the Court offered evidence-free assertions, downplaying the private benefit and overstating the government interest.

With respect to the private benefit, the Court first narrowly defined the interest at stake, focusing only on whether “in the absence of impeachment information, innocent individuals, accused of crimes, will plead guilty.”¹⁸² But the Due Process Clause protects more than innocence.¹⁸³ It also seeks to ensure fair play and fair proceedings,¹⁸⁴ factors the Court neglected to consider. The Court’s evidence-free analysis continued when it concluded that the concern that innocent people would plead guilty if prosecutors did not disclose impeachment evidence was “diminished” by the government’s agreement in Ruiz’s case to disclose “any information establishing . . . factual innocence.”¹⁸⁵ Plainly, this is a logical conclusion. However, the Court did not even attempt to quantify how much the risk is diminished. It simply asserted that the decreased risk is a “comparatively small . . . constitutional benefit.”¹⁸⁶

If the Court was concerned with providing an empirically justified due process analysis it should have, at a minimum, recognized the deficiency in its analysis. What is more, even in 2002, there was ample evidence of false confessions and defendants pleading guilty despite their innocence.¹⁸⁷ Furthermore, the hypothetical innocent defendant that the Court used in its analysis is concerned with more than receiving “any information establishing . . . factual innocence.”¹⁸⁸ This innocent defendant contemplating pleading guilty might elect to go to trial if he knew that the government possessed information that *tended* to support his innocence or even evidence that had the potential to undermine key aspects of the state’s case.¹⁸⁹ Even if we accept the fact that the Court did not possess enough

181. *Id.* at 631.

182. *Id.*

183. *See* Kreag, *supra* note 39, at 832 (discussing the twin aims of due process—protecting innocence and ensuring fair proceedings).

184. *See, e.g.*, *Brady v. Maryland*, 373 U.S. 83, 87 (1963) (“Society wins not only when the guilty are convicted but when criminal trials are fair; our system of the administration of justice suffers when any accused is treated unfairly.”); *Berger v. United States*, 295 U.S. 78, 88 (1935) (“It is as much [the prosecutor’s] duty to refrain from improper methods calculated to produce a wrongful conviction as it is to use every legitimate means to bring about a just one.”).

185. *Ruiz*, 536 U.S. at 631.

186. *Id.* at 632.

187. *See The Cases*, THE INNOCENCE PROJECT, <http://www.innocenceproject.org/cases>.

188. *Ruiz*, 536 U.S. at 631.

189. *See, e.g.*, *Napue v. Illinois*, 360 U.S. 264, 269 (1959) (“The jury’s estimate of the truthfulness and reliability of a given witness may well be determinative of guilt or innocence[.]”).

information to predict at what rate innocent defendants would make this decision, the Court's failure to acknowledge it undermines its holding.

On the government's side of the ledger, the Court did not even attempt to hide the fact that its holding was based on speculation as opposed to empirical measures. It simply listed several *potential* burdens the government might face if it was required to disclose impeachment evidence pre-plea.¹⁹⁰ And it did not even offer a guess about the likelihood that the government would *actually* face these burdens. Instead, it summarily concluded that these *potential* burdens would amount to a "radical . . . change in the criminal justice process."¹⁹¹

Ruiz is more than small-data constitutional analysis. It is no-data constitutional analysis. Its analysis, and perhaps its outcome, would have been different had the Court had access to reliable data. The relevant data would include, among other things, whether guilty plea rates are different in jurisdictions where prosecutors routinely provide full disclosures pre-plea in addition to pre-trial. This data would help to more accurately weigh the private benefit of extending *Brady's* full protections to pre-trial proceedings. The data would also include a more fine-grained assessment of the costs to prosecutors to provide full disclosure in guilty plea cases. Here, again, the Court's analysis would have been bolstered by reviewing the actual costs prosecutors face in jurisdictions with open file policies. The mere fact that some prosecuting agencies elect to open their files in part demonstrates that the costs of extending full due process disclosure protections to plea bargaining is manageable.

Beyond the Supreme Court, the adoption of analytics could change constitutional criminal procedure in other ways. The Court's constitutional decisions often leave important questions for lower courts. Because the lower courts make decisions constrained by the same data-poor environment that the Court faces, these courts often make decisions based on little or no empirical foundation. Not surprisingly, the lack of empirical foundation contributes to lower courts issuing inconsistent constitutional rulings. Undoubtedly, some of the inconsistency would remain even in a world where courts had full information. However, there is reason to believe that empirically-based constitutional analysis would increase uniformity of judgments.

190. *Ruiz*, 536 U.S. at 631–32 (repeatedly identifying burdens that "could" come to pass if the government must disclose impeachment evidence).

191. *Id.* at 632.

III. ANALYTICS BEYOND CRIME-FIGHTING

This Part identifies four applications of analytics that would serve defense interests and broader interests in justice, fairness, and transparency. Remedying the analytics imbalance in the criminal justice system will require work beyond these four areas. Nonetheless, I offer them as a jumping off point from which others will identify additional applications of analytics to evaluate and improve the prosecutorial function.

A. Jury Selection

Analytics is rapidly changing jury selection.¹⁹² Vast databases, predictive tools, and real-time processing have helped litigants predict which jurors will be favorable toward or skeptical of their claims.¹⁹³ However, the Constitution forbids litigants from making these decisions based on race.¹⁹⁴ Despite this prohibition, racial discrimination in jury selection remains a significant stain on the criminal justice system.¹⁹⁵ Analytics can help remove this stain.¹⁹⁶

Batson adopted a three-part test to determine if a prosecutor's peremptory strikes violate equal protection.¹⁹⁷ At step one the defendant must make a prima facie showing of racial discrimination.¹⁹⁸ Step two requires that the prosecutor offer race-neutral reasons for each challenged strike.¹⁹⁹ And at step three the court evaluates the veracity of the

192. See, e.g., Andrew Guthrie Ferguson, *The Big Data Jury*, 91 NOTRE DAME L. REV. 935 (2016); Caren Myers Morrison, *Investigating Jurors on Social Media*, 35 PACE L. REV. 285 (2014).

193. See Ferguson, *supra* note 192.

194. See *Batson v. Kentucky*, 467 U.S. 79 (1986); *J.E.B. v. Alabama ex rel. T.B.*, 511 U.S. 127 (1994) (extending *Batson* to sex).

195. See *Miller-El v. Dretke*, 545 U.S. 231, 238 (2005) (“[T]he very integrity of the courts is jeopardized when a prosecutor’s discrimination ‘invites cynicism respecting the jury’s neutrality’ and undermines public confidence in adjudication.”) (citation omitted); *Id.* at 268 (Breyer, J., concurring) (listing studies documenting the prevalence of race-based jury selection practices).

196. An alternative to analytics is prohibiting peremptory strikes. *Batson*, 467 U.S. at 102–03 (Marshall, J. concurring) (“The decision today will not end the racial discrimination that peremptories inject into the jury-selection process. That goal can be accomplished only by eliminating peremptory challenges entirely.”); Charles J. Ogletree, *Just Say No!: A Proposal to Eliminate Racially Discriminatory Uses of Peremptory Challenges*, 31 AM. CRIM. L. REV. 1099 (1994).

197. Because this Article is focused on using analytics to evaluate prosecutorial decision-making, this Section focuses on prosecutorial efforts to exclude black jurors. *Batson*, however, extends to defense strikes as well. See *Georgia v. McCollum*, 505 U.S. 42 (1992). *Batson* also extends to civil litigants. See *Edmonson v. Leesville Concrete Co.*, 500 U.S. 614 (1991). But the Court has not extended *Batson* to discrimination based on religion. See *Davis v. Minnesota*, 511 U.S. 1115 (1994) (denying certiorari).

198. *Snyder v. La.*, 552 U.S. 472, 476 (2008) (“First, a defendant must make a prima facie showing that a peremptory challenge has been exercised on the basis of race . . .”).

199. *Id.* at 477 (requiring that “the prosecution . . . offer a race-neutral basis for striking the juror in question”).

prosecutor's purported race-neutral reasons.²⁰⁰ In doing so, the court must consider "all of the circumstances that bear upon the issue of racial animosity"²⁰¹ to determine if the defendant proved purposeful discrimination.²⁰² The analysis at step three is the heart of *Batson*. The Court set a low bar for establishing a prima facie case of discrimination at step one.²⁰³ And, in practice, step two is a formality.²⁰⁴

The Court instructs judges to perform the lie-detecting function at *Batson*'s step three by measuring "how reasonable, or how improbable, the [prosecutor's race neutral] explanations are; and by whether the proffered rationale has some basis in accepted trial strategy."²⁰⁵ But the Court provides little guidance about how to measure this, admitting that, in contrast with the record in Tim Foster's case, judges often must evaluate the prosecutor's veracity without access to the direct evidence.²⁰⁶ The Court attempts to fill this void by instructing judges that "the best evidence [of discriminatory intent] often will be the demeanor of the [prosecutor]."²⁰⁷

By focusing on a trial court's evaluation of the prosecutor's demeanor,²⁰⁸ *Batson* rejects a more reliable and objective tool available to help judges

200. *Id.* ("[T]hird, in light of the parties' submissions, the trial court must determine whether the defendant has shown purposeful discrimination."); see also *Miller-El v. Cockrell*, 537 U.S. 322, 339 (2003) ("In the typical peremptory challenge inquiry, the decisive question will be whether counsel's race-neutral explanation for a peremptory challenge should be believed." (quoting *Hernandez v. New York*, 500 U.S. 362, 365 (1991))).

201. 552 U.S. at 478.

202. *Id.* at 477.

203. See, e.g., *Johnson v. California*, 545 U.S. 162, 170 (2005) ("We did not intend the first step to be so onerous that a defendant would have to persuade the judge—on the basis of all the facts, some of which are impossible for the defendant to know with certainty—that the challenge was more likely than not the product of purposeful discrimination. Instead, a defendant satisfies the requirements of *Batson*'s first step by producing evidence sufficient to permit the trial judge to draw an inference that discrimination has occurred.").

204. See, e.g., Jeffrey Bellin & Junichi P. Semitsu, *Widening Batson's Net to Ensnare More Than the Unapologetically Bigoted or Painfully Unimaginative Attorney*, 96 CORNELL L. REV. 1075, 1093 (2011) ("[P]rosecutors regularly respond to a defendant's prima facie case of racially motivated jury selection with tepid, almost laughable 'race-neutral' reasons, as well as purportedly 'race-neutral' reasons that strongly correlate with race. More significantly, . . . courts accept those reasons . . . and almost without exception, those reasons survive subsequent scrutiny . . .").

205. See *Miller-El*, 537 U.S. at 339.

206. Of course, circumstantial evidence can be sufficient to prove a *Batson* claim. See *Batson v. Kentucky*, 472 U.S. 79, 93 (1986) (recognizing that in evaluating whether a defendant has proven purposeful discrimination, a "court must undertake a sensitive inquiry into such circumstantial and direct evidence of intent as may be available") (internal quotation marks omitted); *Miller-El v. Dretke*, 545 U.S. 231, 246 (2005) ("[T]he State's failure to engage in any meaningful voir dire examination on a subject the State alleges it is concerned about is evidence suggesting that the explanation is a sham and a pretext for discrimination." (quoting *Ex parte Travis*, 776 So. 2d 874, 881 (Ala. 2000))).

207. *Hernandez v. New York*, 500 U.S. 352, 365 (1991) (plurality opinion).

208. See *Snyder v. Louisiana*, 552 U.S. 472, 477 (2008) (citing *Hernandez* for the proposition that the court must evaluate "whether the prosecutor's demeanor belies a discriminatory intent.").

evaluate the presence of discriminatory intent.²⁰⁹ Rather than focusing on an imprecise evaluation of the prosecutor's demeanor, courts should use analytics to determine if the prosecution's peremptory strikes are the result of purposeful discrimination. This Section identifies two ways to do this. The first focuses only on the jury selection data within a given case. This is an example of a small data approach to constitutional criminal procedure.²¹⁰ The second requires collecting and analyzing historical jury strike data.

The Court's demeanor-focused step three analysis should be supplemented with statistical analysis. Notably, in many cases, such analysis is possible even when limiting the analysis to the strike patterns within a given case. Here, the relevant statistical question is whether the number of black jurors excluded by the prosecutor in a given case is statistically significantly larger than the number of black jurors that we expect would be excluded if the prosecutor exercised her peremptory challenges randomly.²¹¹ Stated another way, the question is, how likely is it that if the prosecutor exercised her jury strikes randomly the number of black jurors struck would equal or exceed the number of black jurors the prosecutor actually struck? The answer to these questions will not conclusively determine whether a prosecutor's strikes were the result of purposeful discrimination. However, just as a prosecutor's pattern of questions during voir dire is relevant to *Batson's* step three,²¹² this statistical information can help judges identify purposeful discrimination.

Professor and statistician Joseph L. Gastwirth has explored the usefulness of statistical analysis to identify the presence of purposeful discrimination in jury selection in a series of papers.²¹³ Most recently, he

209. Notably, the Court admits that the current *Batson* framework is often not up to the task of curbing racial discrimination. See, e.g., *Dretke*, 545 U.S. at 238 (“The rub has been the practical difficulty of ferreting out discrimination in selections discretionary by nature, and choices subject to myriad legitimate influences, whatever the race of the individuals on the panel from which jurors are selected.”); *id.* at 267 (Breyer, J., concurring) (“The complexity of this process reflects the difficulty of finding a legal test that will objectively measure the inherently subjective reasons that underlie use of a peremptory challenge.”); *id.* at 267–68 (Breyer, J., concurring) (“*Batson* asks judges to engage in the awkward, sometime hopeless, task of second-guessing a prosecutor’s instinctive judgment—the underlying basis for which may be invisible even to the prosecutor exercising the challenge.”).

210. See *supra* Part I.B.

211. Fisher’s exact test is one statistical test that can be used to answer this question. See MICHAEL O. FINKELSTEIN & BRUCE LEVIN, *STATISTICS FOR LAWYERS* 123–25; 154–56 (2001) (describing Fisher’s exact test).

212. See *Miller-El*, 545 U.S. at 246 (“[T]he State’s failure to engage in any meaningful voir dire examination on a subject the State alleges it is concerned about is evidence suggesting that the explanation is a sham and a pretext for discrimination.”) (quoting *Ex parte Travis*, 776 So. 2d 874, 881 (Ala. 2000)).

213. See, e.g., Joseph L. Gastwirth, *Statistical Testing of Peremptory Challenge Data for Possible Discrimination: Application to Foster v. Chatman*, 69 VAND. L. REV. En Banc 51 (2016) [hereinafter “*Statistical Testing*”]; Joseph L. Gastwirth et al., *Case Comment: Appropriate Statistical Methodology*

demonstrated that one statistical tool, the Fisher's exact test, has accurately predicted the outcome in several *Batson* cases that reached the Supreme Court.²¹⁴ Most recently, the test accurately predicted the Court's finding of purposeful discrimination in Tim Foster's case.²¹⁵

Analytics can also be used to uncover purposeful discrimination by incorporating jury strike data from other cases. For example, a prosecutor's or a prosecutorial office's history of peremptory strikes are relevant at *Batson*'s step three, and analytics offers a method to incorporate this data. Indeed, it is not difficult to imagine the *Batson* equivalent of law enforcement's heat lists that are designed to identify potential future offenders.²¹⁶

In the law enforcement context, these so-called heat lists are created by analyzing inputs in addition to past criminal behavior. For example, they incorporate analysis of social networks, based on the theory that if one's associates are engaged in criminal activity or the victims of criminal activity, it is more likely that an individual will be involved in violent crime. Similarly, in the *Batson* context, data wholly outside of the jury selection process might also prove helpful in uncovering purposeful discrimination in jury selection.²¹⁷ For example, a prosecutor's past public comments may demonstrate a lack of sensitivity to racial discrimination or overt bigotry.²¹⁸ Or, a record that other prosecutorial decisions have contributed to racially disparate outcomes might warrant a more careful attention to jury selection patterns in a given case.²¹⁹ Finally, because *Batson*'s step three turns on the prosecutor's veracity, past conduct that demonstrated a willingness to be

Yields Stronger Evidence of Discriminatory Peremptory Challenges in North Carolina: Application to the Randolph County Data in North Carolina v. Rouse and Related Cases, 12 L., PROBABILITY & RISK 155 (2013); Joseph L. Gastwirth et al., *Case Comment: Statistical Tests for the Analysis of Data on Peremptory Challenges: Clarifying the Standard of Proof Needed to Establish a Prima Facie Case of Discrimination in Johnson v. California*, 4 L., PROBABILITY & RISK 179 (2005).

214. See *Statistical Testing*, *supra* note 213, at 93–95 (demonstrating that the Fisher's exact test accurately predicted results in *J.E.B. v. Alabama ex rel T.B.* 511 U.S. 127 (1994); *Snyder v. Louisiana*, 552 U.S. 472 (2008); and *Edmonson v. Leesville Concrete, Inc.*, 500 U.S. 614 (1991)).

215. *Statistical Testing*, *supra* note 213, at 85–88; *Foster v. Chatman*, 136 S. Ct. 1737 (2016).

216. See Jeremy Goner, *Chicago Police Use 'Heat List' as Strategy to Prevent Violence*, CHI. TRIB. (Aug. 21, 2013), http://articles.chicagotribune.com/2013-08-21/news/ct-met-heat-list-20130821_1_chicago-police-commander-andrew-papachristos-heat-list.

217. Cf. *Amersterdam*, *supra* note 64, at 49–51 (describing a similar comprehensive, data-centered approach to overcome “*McCleskey*'s requirement of proof of subjective racial animus”).

218. See, e.g., *Calhoun v. United States*, 133 S. Ct. 1136, 1136 (2013) (Sotomayor, J.) (criticizing the prosecutor's race-based argument: “You've got African-Americans, you've got Hispanics, you've got a bag full of money. Does that tell you—a light bulb doesn't go off in your head and say, This is a drug deal?”).

219. See, e.g., *Kutateladze*, *supra* note 30 (documenting the results of Vera's multi-year study of the New York County District Attorney's Office).

less than candid in court is also relevant and could be incorporated in creating a *Batson*-type heat list.

Notably, there is support in the Court's case law for the use of analytics to identify purposeful discrimination. This support covers both the use of analytics to focus solely within a given case and by incorporating historical patterns. For example, in finding the *Batson* violation in *Miller-El v. Dretke*, the Court concluded that "[h]appenstance [was] unlikely to produce" the racial disparity in the prosecutor's jury strikes.²²⁰ The Court's analysis invites the use of statistical tests like the Fisher's exact test to compare the racial breakdown of the actual jury strikes in a case to the expected outcome if the strikes were performed at random.

Furthermore, when *Miller-El*'s *Batson* claim first reached the Court, the Court made clear that historical jury strike patterns and even the culture of the prosecutor's office are relevant to *Batson*'s step three.²²¹ In addition, past strikes that were close but ultimately not found to be the result of purposeful discrimination are also relevant at step three.²²² Here, using prior *Batson* close calls and the "culture" of a prosecutor's office to help identify purposeful discrimination is the equivalent of using prior arrests that did not result in convictions and social networks to help law enforcement create heat lists composed of likely future offenders. Of course, social networks and past criminal conduct or arrests cannot perfectly predict future criminal activity. Regardless, the failure to use available analytical tools to include this type of information in *Batson*'s step three undoubtedly leaves some instances of purposeful discrimination hidden.

Ironically, the use of analytics in this context is a nod to the pre-*Batson* equal protection standard in *Swain v. Alabama*.²²³ In *Swain*, the prosecutor struck all 6 eligible black jurors.²²⁴ Furthermore, *Swain* demonstrated that for at least the decade before his case reached the Court, 100 percent of the eligible black jurors were excluded from every petit jury, civil or criminal, in Talladega, Alabama.²²⁵ Despite this evidence, the Court rejected *Swain*'s

220. *Miller-El v. Dretke*, 545 U.S. 231, 241 (2005) (quoting *Miller-El v. Cockrell*, 537 U.S. 322, 342 (2003)).

221. *Cockrell*, 537 U.S. at 347 (recognizing that the step three determination about whether the prosecutor's race-neutral reasons are credible can take into account "the culture of the District Attorney's Office"); *Batson v. Kentucky*, 476 U.S. 79, 96 (1986) (requiring courts to consider "all relevant circumstances" at *Batson*'s step three).

222. *See Snyder v. Louisiana*, 552 U.S. 472, 478 ("[I]f there were persisting doubts as to the outcome, a court would be required to consider the strike of Ms. Scott for the bearing it might have upon the strike of Mr. Brooks.").

223. 380 U.S. 202 (1965).

224. *Id.* at 205.

225. *Id.* at 226.

equal protection claim.²²⁶ The Court held that Swain failed to prove that prosecution jury selection practices, not those of defense attorneys, were responsible for the total exclusion of black jurors in Talladega.²²⁷

The rule the Court adopted in *Swain* required defendants to prove systemic discrimination against black jurors “over a period of time.”²²⁸ This was a big data, analytics-based constitutional rule. But because it was adopted in a small data era, it was simply too difficult for defendants to meet.²²⁹ Today, however, in a world of automated collection methods and analytics, the task of amassing the data is a manageable one.

226. *Id.*

227. *Id.* at 224 (“The difficulty with the record before us . . . is that it does not with any acceptable degree of clarity, show when, how often, and under what circumstances the prosecutor alone has been responsible for striking those Negroes who have appeared on petit jury panels in Talladega County. The record is absolutely silent as to those instances in which the prosecution participated in striking Negroes, except for the indication that the prosecutor struck the Negroes in this case and except for those occasions when the defendant himself indicated that he did not want Negroes on the jury.”).

228. *Id.* at 227.

229. See *Batson v. Kentucky*, 476 U.S. 79, 92–93 (1986) (criticizing the “crippling burden of proof” defendants faced under *Swain*, which left the prosecution’s use of peremptory challenges “largely immune from constitutional scrutiny”); *Miller-El v. Dretke*, 545 U.S. 231, 239 (2005) (characterizing the *Swain* standard as “unworkable”). Commentators have been equally critical of the Court’s decision in *Swain*. See, e.g., Charles Nesson, *Peremptory Challenges: Technology Should Kill Them?*, 3 L. PROBABILITY & RISK 1, 1 (2004) (characterizing *Swain* as a “stunningly unjust decision” requiring a “ridiculous burden” that is “impossible to meet”).

*B. Identifying Supposedly Irrelevant Factors*²³⁰

Regardless of the degree to which the criminal justice system embraces analytics, the system will always maintain a degree of uncertainty. Law enforcement officials, prosecutors, judges, and juries will not be replaced with fully-predictable robots.²³¹ Some of the uncertainty is preserved by the Constitution. For example, unless we are willing to concede that the presence of a defense attorney does not affect case outcomes, defendants who exercise their right to self-representation²³² and forgo the assistance of an attorney will likely have a different pattern of results than defendants represented by attorneys. Similarly, the Double Jeopardy Clause insulates seemingly surprising acquittals from retrial.²³³ In other instances, non-constitutional factors will preserve this uncertainty. For example, changes in prosecutorial resources or the sudden unavailability of an important witness can contribute to unpredictable results.

The goal of analytics is not to erase all of this unpredictability. Some of it is welcome. And even if it is not, it would be impossible to reduce the uncertainty to zero. Nonetheless, analytics offers an opportunity to identify and reduce the influence of factors that most people agree should be irrelevant in prosecutorial decision-making. By measuring and collecting data, we can first identify if the system is immune from these factors. Then, once we identify which factors are present, prosecutors and courts can design systems and policies to limit their influence.

This Article borrows the focus on identifying supposedly irrelevant factors from behavioral economists, who revolutionized traditional economic theory by demonstrating the relevance of factors that economists have historically overlooked.²³⁴ Traditional economic theory is based on the premise that decision-makers maximize utility using rational, unbiased methods. Underlying this premise is that factors like availability, sunk costs, and inertia are supposedly irrelevant to rational decision-makers. Despite the simplicity of this model and despite its long-held grasp on economic theory, the model does not accurately describe how people *actually* make

230. See RICHARD H. THALER, *MISBEHAVING: THE MAKING OF BEHAVIORAL ECONOMICS* 9 (2015) (defining “supposedly irrelevant factors” as those that traditional economic theory presumes are not related to rational decision-making but that nonetheless influence how *actual* people make decisions).

231. See Roth, *supra* note 48, at 6–7 (noting that the increase in mechanical adjudication has yet to produce calls for robots to replace juries and judges).

232. *Faretta v. California*, 422 U.S. 806 (1975) (holding that the Sixth Amendment guarantees the right of self-representation).

233. *Otis v. State*, 782 S.E.2d 654 (Ga. 2016) (barring retrial on double jeopardy grounds in a murder case in which the trial court mistakenly granted a mistrial).

234. THALER, *supra* note 230, at 9 (urging economists and policy makers to “start paying attention to those *supposedly irrelevant factors*”).

decisions.²³⁵ Rather, behavioral economists have demonstrated that people often make decisions that lead to less than optimal results and that these non-optimizing decisions—decisions economist Richard H. Thaler cheekily characterizes as instances of “misbehavior”—often happen in predictable ways.²³⁶ Behavioral economists use this information to alter choices so that people are less likely to pursue irrational, i.e., sub-optimal, choices.

The criminal justice system can use analytics to identify when prosecutorial decision-making is influenced by factors that most people agree should be irrelevant. Prosecutors routinely face complex decisions requiring them to consider many factors and competing values. Furthermore, prosecutors possess significant discretion in these decisions.²³⁷ Nonetheless, not all factors are equal. Some factors, like the race and sex of potential jurors, are explicitly prohibited from consideration by the Constitution.²³⁸ For other factors, like political considerations, the system is willing to accept that decision-makers will be influenced by them, but only up to a point, after which they should become irrelevant. Analytics can help identify whether factors that should be irrelevant to the prosecutorial function are, in fact, irrelevant.

The first task is identifying potential supposedly irrelevant factors. Then, one must identify the information necessary to determine if a potential supposedly irrelevant factor is, in fact, irrelevant, or, on the other hand, if it influences the system’s outcomes in an undesirable manner. This Section identifies several potential supposedly irrelevant factors. It is not intended to be an exhaustive list. Rather, this Section is meant to highlight the value of identifying supposedly irrelevant factors in the prosecutorial context and thereby encourage scholars and reformers to identify other factors.

235. *See generally id.* (documenting the slow acceptance of behavioral economic principles).

236. *Id.* at 21–23 (noting that the field of behavioral economics is built on the foundation of psychologists who, for example, demonstrated that *actual* people make decisions based on rules of thumb and that this process causes them to make irrational, suboptimal decisions in predictable ways) (citing Amos Tversky & Daniel Kahneman, *Judgment under Uncertainty: Heuristics and Biases*, 185 *SCI.* 1124 (1974)).

237. *See supra* Part II.A.

238. *See, e.g.*, *Batson v. Kentucky*, 476 U.S. 79 (1986).

1. *Over Politicization*

We accept a certain level of politics in prosecutorial decision-making. After all, in the overwhelming majority of jurisdictions, prosecutors are elected officials.²³⁹ But beyond a certain point, politically-motivated decisions are antithetical to the prosecutorial obligation to seek justice.²⁴⁰ Of course, identifying that point is often difficult. This is where analytics offers promise. Careful collection and analysis of relevant data can help identify whether prosecutors cross the line and become too political.

Recent work by economist Bryan McCannon set out one way to evaluate whether prosecutorial decision-making has become too tied to politics.²⁴¹ Building on his prior research finding that in jurisdictions where prosecutors face reelection the number of felony cases ending in trials increases,²⁴² McCannon sought to determine if this increase in trials in the run-up to an election resulted in less reliable outcomes.²⁴³ In short, it did.²⁴⁴

Similar studies could evaluate whether prosecutors file more cases in the aggregate or file more cases of particular types depending on election cycles. For example, a recent study found that federal prosecutors' decisions to initiate public corruption charges is influenced by the timing of partisan elections.²⁴⁵ The study concluded that public corruption "cases against defendants associated with the opposition party are more likely to be filed *before* elections rather than afterward (relative to members of the president's party)."²⁴⁶ The study also found that in the run-up to an election federal prosecutors filed charges "more rapidly" against defendants from the opposing political party.²⁴⁷ Notably, while McCannon found that

239. See Bryan C. McCannon, *Prosecutor Elections, Mistakes, and Appeals*, 10 J. EMPIRICAL LEG. STUD. 696, 697 n.2 (2013) (documenting that forty-seven states elect state prosecutors and the remaining three states have appointed prosecutors).

240. See *Berger v. United States*, 295 U.S. 78, 88 (1935) (recognizing that the prosecutor's goal is not to win cases, but to see "that justice shall be done").

241. See McCannon, *supra* note 239, at 696.

242. Siddhartha Bandyopadhyay & Bryan C. McCannon, *The Effect of the Election of Prosecutors on Criminal Trials* (Sept. 8, 2011) (unpublished manuscript), http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1641345.

243. McCannon, *supra* note 239, at 697 (using data from criminal appeals from western New York state convictions to evaluate whether trials that immediately preceded elections for incumbent prosecutors resulted in more reversals on appeal).

244. McCannon found that if an "initial felony conviction occurs in the six months prior to a reelection, the probability the appellate court will later uphold the conviction decreases by 5.1 to 7.1 percentage points." *Id.* at 698.

245. Brendan Nyhan & M. Marit Rehavi, *Tipping the Scales? Testing for Political Influence on Public Corruption Prosecutions* 3 (June 5, 2015) (unpublished manuscript), <http://projects.iq.harvard.edu/files/pegroup/files/nyhanrehavi2015.pdf?m=1444765374> (analyzing the timing and results of public corruption prosecutions from 1993 to 2008).

246. *Id.*

247. *Id.*

“hawkish” prosecution decision-making in the run-up to an election corresponded with less reliable verdicts,²⁴⁸ “the[] partisan differences in case timing do not appear to correspond to less favorable outcomes or more punitive treatment of opposition defendants” in public corruption prosecutions.²⁴⁹

2. *Potential Arbitrary Factors*

The Court’s rejection of McCleskey’s challenge to Georgia’s capital punishment system outlined several potential supposedly irrelevant factors that can be explored with analytics.²⁵⁰ For example, the Court cited studies examining how the race and sex of criminal justice insiders—attorneys and judges—correlate with outcomes.²⁵¹ It noted other studies that examined how “facial characteristics” and the attractiveness of the parties influence outcomes.²⁵² The Court was adamant that even if these or similar studies demonstrated statistically significant disparities based on these arbitrary factors it was not prepared to extend its Eighth Amendment jurisprudence to them.²⁵³

However, the Court’s fear of extending Eighth Amendment protections to these or similar arbitrary factors does not mean that we should turn a blind eye to the influence of these potentially irrelevant factors. This is particularly true today, when analytics can easily identify how arbitrary, determinable factors influence outcomes. For example, we could determine 1) whether and how the experience level of the prosecutor, defense attorney, or judge influences outcomes;²⁵⁴ 2) if outcomes differ based on whether the case is resolved in the weeks before a major holiday or at a different time of year; or 3) whether blinding the prosecutor to the race of defendants and

248. See McCannon, *supra* note 239, at 696.

249. See Nyhan & Rehavi, *supra* note 245, at 4.

250. McCleskey v. Kemp, 481 U.S. 279, 317 (1987).

251. *Id.* at 317 nn.41–42.

252. *Id.* at 317–18 nn.43–44.

253. *Id.* at 319 (“The Constitution does not require that a State eliminate any demonstrable disparity that correlates with a potentially irrelevant factor . . .”).

254. See, e.g., Miller & Wright, *supra* note 92, at 164 (documenting that prosecutorial experience affected declination rates among prosecutors); Ronald F. Wright & Kay L. Levine, *The Cure for Young Prosecutors’ Syndrome*, 56 ARIZ. L. REV. 1065 (2014). With respect to the influence of judges on outcomes, studies identifying outlier judges in the administrative context may prove useful as models. See, e.g., Jaya Ramji-Nogales, Andrew I. Schoenholtz, & Phillip G. Schrag, *Refugee Roulette: Disparities in Asylum Adjudication*, 60 STAN. L. REV. 295 (2007) (documenting discrepancies among judges in asylum cases); HAROLD J. KRENT & SCOTT MORRIS, ACHIEVING GREATER CONSISTENCY IN SOCIAL SECURITY DISABILITY ADJUDICATION: AN EMPIRICAL STUDY AND SUGGESTED REFORMS 16–21 (2013) (identifying outlier administrative law judges in disability claims), https://www.acus.gov/sites/default/files/documents/Achieving_Greater_Consistency_Final_Report_4-3-2013_clean.pdf.

victims affects outcomes.²⁵⁵

To some degree, each of these factors should be irrelevant in the administration of justice. Yet, unless we measure them, we can only speculate about their influence.

C. Charging and Bargaining Decisions

In December 2015, a reporter contacted me about what he thought was a potential abuse of prosecutorial power in Santa Cruz County, Arizona. He explained that several people had been charged with kidnapping in cases that did not seem to involve kidnapping. He added that none of these defendants were ever convicted of kidnapping, and this made him suspect that the prosecutor was simply using the kidnapping charge for leverage.²⁵⁶ I gave him a quick explanation about the near total discretion prosecutors possess in charging cases, quickly summarized some of the systemic reasons why plea bargaining is so prevalent, and encouraged him to review the kidnapping statute, which was likely much broader than he suspected. Our conversation ended with him telling me that he planned to contact the prosecutor and court to ask them to provide the number of people charged and convicted of kidnapping in 2015. I wished him luck, noting that obtaining the data was probably going to be a challenge.

When he called again in early 2016, he explained that both the court and the prosecutor told him that they did not maintain that type of information and could not easily retrieve it.²⁵⁷ So, the reporter started digging. He reviewed published court calendars and identified twenty-one defendants charged with kidnapping in 2015.²⁵⁸ Of these, nine were resolved in 2015, and each ended in a conviction.²⁵⁹ But in each instance the prosecutor dropped the kidnapping charges.²⁶⁰ This trend was consistent with the memory of the Chief Criminal Deputy County Attorney. She explained that while there *had* been kidnapping convictions in Santa Cruz, she could not

255. See, e.g., Sah et al., *supra* note 127. See also *Glossip v. Gross*, 135 S. Ct. 2726, 2760 (2015) (Breyer, J., dissenting) (noting studies that “show that circumstances that ought *not* to affect the application of the death penalty, such as race, gender, or geography, often *do*”).

256. Telephone Interview with Murphy Woodhouse, Reporter, Nogales International (Dec. 17, 2015).

257. See Murphy Woodhouse, *Kidnapping Charges Are Common, but Not Convictions*, NOGALES INT’L (Jan. 5, 2016), http://www.nogalesinternational.com/news/kidnapping-charges-are-common-but-not-convictions/article_b0d95aa8-b341-11e5-b5d2-bbdd82482a87.html (discussing the reporter’s attempts to obtain the data).

258. *Id.* The published story indicates that there were more than twenty defendants charged with kidnapping. The reporter confirmed to me that the precise number was twenty-one. Telephone Interview with Murphy Woodhouse, Reporter, Nogales International (Dec. 17, 2015).

259. Woodhouse, *supra* note 257.

260. *Id.*

recall a recent example.²⁶¹

Of course, the charging practice in Santa Cruz County was constitutional.²⁶² Nonetheless, the reporter believed that residents of Santa Cruz would be interested in the prosecutor's practice and should have the opportunity and means to evaluate it.²⁶³ I agree. We should also be able to compare charging practices to other counties and to historical data. Analytics makes this possible.

Several jurisdiction-specific studies have demonstrated the promise of using analytics to evaluate both whether charging and bargaining practices are constitutional and, even when they are, whether they are desirable.²⁶⁴ For example, a partnership between the Manhattan District Attorney and the Vera Institute of Justice enabled researchers to review the prosecution files in over 222,000 cases from 2010–2011.²⁶⁵ The effort confirmed that while “there were no noticeable [racial or ethnic] differences” at the initial decision point, where prosecutors elected to file charges on cases brought to them by the police,²⁶⁶ other trends emerged. For example, misdemeanor drug charges were more likely to be dismissed for minority defendants, and for all drug offenses—misdemeanors and felonies—prosecutors offered more punitive plea offers to minority defendants.²⁶⁷

Other studies have used analytics to examine how charging decisions affect disparate racial outcomes. M. Marit Rehavi and Sonja B. Starr found that prosecutors' charging practices for offenses that imposed mandatory minimum sentences explained a significant amount of the racial disparity in

261. *Id.*

262. *See* *Wayte v. United States*, 470 U.S. 598, 608 (1985) (noting that “although prosecutorial discretion is broad, it is not unfettered. Selectivity in the enforcement of criminal laws is . . . subject to constitutional constraints.”) (internal quotation marks omitted); *Bordenkircher v. Hayes*, 434 U.S. 357, 364 (1978) (charging decisions may not be “deliberately based upon an unjustifiable standard such as race, religion, or other arbitrary classification” (quoting *Oyler v. Boles*, 368 U.S. 448, 456 (1962))). *See also Pathological Politics*, *supra* note 89, at 558 (“The commitment to prosecutorial discretion rules out aggressive equal protection review of charging decisions, the kind of review that would seek out and correct enforcement disparities among different population groups and would bar irregular and sporadic enforcement altogether.”).

263. *Cf.* *Harmon*, *supra* note 93, at 781 (“Constitutional rights are structurally incapable of encouraging law enforcement to impose only necessary, fair, and efficient harms on legitimate individuals interests. They are also unable to require that the means and goals for law enforcement do not undermine the lived experience of individuals and communities. When law enforcement and individual interests collide, constitutional rights alone cannot delineate the appropriate balance between the two.”).

264. *See, e.g.,* BESIKI KUTATELADZE ET AL., VERA INST. OF JUSTICE, DO RACE AND ETHNICITY MATTER IN PROSECUTION? A REVIEW OF EMPIRICAL STUDIES (2012) (summarizing thirty-four peer reviewed empirical studies published between 1990 and 2011).

265. *See* Kutateladze, *supra* note 30.

266. *Id.* at 83.

267. *Id.* at pt. VI–X.

federal sentences for black and white offenders in the federal system.²⁶⁸ For similar offenses and similar offenders federal prosecutors filed charges that required mandatory minimum sentences 65 percent more often against black defendants as compared to white defendants.²⁶⁹

While many studies focus on the racial implications of prosecutorial charging decisions, analytics can deliver relevant information about additional factors, including factors that do not raise constitutional concerns. For example, we could track: 1) how often the crime of arrest corresponds to the charged crime and to the ultimate conviction; 2) which crimes are complements in the sense that they are often charged together; 3) how often a particular crime is charged and how often it is dropped (and at what stage); and 4) whether these actions correlate with a host of variables including, the race and gender of the defendant and victim, whether the defendant is in custody pre-trial, or whether the defendant is represented by a private or public defense attorney. Importantly, this information could be compared among prosecutors, across different prosecutorial offices, and over time.²⁷⁰

This type of analysis would dramatically increase transparency, providing a more accurate account of how prosecutors exercise their charging and bargaining discretion.²⁷¹ Prosecutorial insiders could use this information to regulate practices.²⁷² The public could use this to evaluate prosecutorial performance.²⁷³ And, armed with a more complete picture of how prosecutors exercise their discretion, judges may be less reluctant to conclude that they are “ill-suited”²⁷⁴ to regulate these discretionary decisions.²⁷⁵

268. M. Marit Rehavi & Sonja B. Starr, *Racial Disparity in Federal Criminal Sentences*, 122 J. POL. ECON. 1320 (2014).

269. *Id.* at 1350.

270. A recent report from the Fair Punishment Project at Harvard Law School is one small-scale example of identifying prosecutorial outliers with respect to charging decisions in capital cases. DEADLIEST PROSECUTORS, *supra* note 31 (arguing that the personality-driven capital punishment regime undermines its constitutional legitimacy).

271. *See, e.g.*, Kozinski, *supra* note 7, at xi (noting that a focus on aggregate conviction rates and guilty plea rates “fails to take into account the trend of bringing multiple counts for a single incident . . . as well as the creativity of prosecutors in hatching up criminal cases where no crime exists and the overcriminalization of virtually every aspect of American life.”) (footnote omitted).

272. *See* Miller & Wright, *supra* note 92, at 189 (noting that “[d]ata triggers can also alert agents and supervisors to decisions that fall outside of the norm”); Bibas, *supra* note 23, at 1001–02 (“Computer tracking and frequent statistical reports can reinforce oversight and implementation of district attorneys’ priorities.”).

273. Bibas, *supra* note 23, at 1012 (“Head prosecutors and outsiders are better able to review systemic patterns than individual decisions.”).

274. *Wayte v. United States*, 470 U.S. 598, 607 (1985).

275. *See, e.g.*, *Glossip v. Gross*, 135 S. Ct. 2726, 2760–61 (2015) (Breyer, J., dissenting) (relying on empirical studies to conclude that the death penalty should be unconstitutional, in part, because “the

D. Prosecutorial Disclosure Obligations

Prosecutorial efforts to game the system by failing to disclose favorable evidence to defendants²⁷⁶ have resulted in several notable miscarriages of justice²⁷⁷ and attracted widespread condemnation.²⁷⁸ Scholars and practitioners have proposed reforms to minimize misconduct. In other work, I proposed a low-tech model for encouraging compliance with *Brady*—simply asking prosecutors about their disclosure decisions on-the-record in pretrial proceedings.²⁷⁹ Analytics offers an additional solution. However, unlike using analytics to evaluate: 1) jury selection; 2) the influence of arbitrary factors in prosecutorial decisions; and 3) charging practices, there are no empirical studies demonstrating the ability of analytics to minimize *Brady* violations. Despite this void, there are several reasons to believe that analytics could prove to be an effective tool.

The ultimate goal is to use analytics to identify potential *Brady* violators before they commit misconduct. Scholars have performed some of the theoretical work to make this possible by identifying characteristics that might make it more likely that a prosecutor will violate *Brady*. For example, Miriam Baer applied behavioral economics and psychology to *Brady*, explaining that prosecutors' decisions to comply with *Brady* likely are affected by the timing of when they identify favorable material.²⁸⁰ She concluded that behavioral models predict that a “prosecutor’s . . . incentive[] to cheat increase[s] as a prosecution progresses” and the prosecutor’s “relative preferences [for violating *Brady*] also change.”²⁸¹ This insight has a strong theoretical foundation, and analytics can help confirm or disprove it. If confirmed, this finding could focus efforts to encourage disclosure on the points in a case where prosecutors are more likely to shirk their discovery obligations.

Where Baer's work explores the timing of *Brady* violations, other

decisionmaking authority, the legal discretion, and ultimately the power of the local prosecutor” allow “circumstances that ought *not* to affect application of the death penalty, such as race, gender, or geography” to drive its use).

276. See *Brady v. Maryland*, 373 U.S. 83 (1963).

277. See, e.g., *In re Special Proceedings*, 842 F. Supp. 2d 232 (D.D.C. 2012) (documenting the prosecutorial misconduct in the prosecution of Senator Ted Stevens); MICHAEL MORTON, GETTING LIFE: AN INNOCENT MAN'S 25-YEAR JOURNEY FROM PRISON TO PEACE (2014); *Milke v. Mroz*, 339 P.3d 659 (Ariz. Ct. App. 2015) (barring the prosecutor from retrying Milke based on its misconduct during her initial trial).

278. See, e.g., Kozinski, *supra* note 7; *United States v. Olsen*, 737 F.3d 625, 626 (9th Cir. 2013) (Kozinski, C.J., dissenting) (“There is an epidemic of *Brady* violations abroad in the land.”).

279. See Jason Kreag, *The Brady Colloquy*, 67 STAN. L. REV. ONLINE 47 (2014).

280. Miriam H. Baer, *Timing Brady*, 115 COLUM. L. REV. 1 (2015).

281. *Id.* at 39.

research sheds light on potential characteristics that might make individual prosecutors more likely to commit misconduct. For example, Ronald F. Wright's and Kay L. Levine's research confirms that prosecutors believe that they become less adversarial, less rigid, and more focused on achieving justice as opposed to winning convictions as they gain experience.²⁸² Experienced prosecutors are also more likely to acknowledge and appreciate the important role defense attorneys play in the system, characterizing defense attorneys as essential to achieving justice as opposed to an unnecessary check on the otherwise righteous work of the prosecutor.²⁸³ If these self-reported perceptions are accurate, Wright's and Levine's research demonstrates that inexperienced prosecutors are theoretically more likely to commit *Brady* violations than experienced prosecutors.²⁸⁴ Here again, empirical work powered by analytics can test this theory, thereby helping to focus reforms designed to bolster compliance with *Brady* on prosecutors more likely to commit misconduct.

Furthermore, analytics could help determine if theories of criminal conduct are helpful for identifying prosecutors more likely to commit *Brady* violations. For example, the equivalent of the broken windows theory of policing in the *Brady* context might be that prosecutors who have unusually high rates of having their evidentiary objections overruled or the objections of their adversaries sustained might be more likely to commit *Brady* violations. Or, applying something similar to the social contacts analysis police use to identify potential bad actors, it might be that prosecutors who work on the same prosecutorial team or in the same office with other prosecutors who have been found to have violated *Brady* might be more likely to commit misconduct in the future.

Analytics could also identify what types of cases are more likely to involve *Brady* issues and what type of information—*e.g.*, impeachment evidence, information supporting a defendant's alibi, evidence of third-party guilt—is more likely to be withheld.²⁸⁵ Identifying these trends could aid defendants in tailoring their discovery requests, assist judges inclined to actively police prosecutor's disclosure decisions,²⁸⁶ and aid prosecutors who

282. Wright & Levine, *supra* note 254.

283. *Id.* at 1092–94.

284. The overly competitive and aggressive approach of inexperienced prosecutors is not the only reason they may be more likely to violate *Brady*. *Brady* relies on prosecutors to anticipate how the defense could use the potentially favorable evidence. Inexperienced prosecutors may simply fail to recognize how a piece of evidence could help the defense.

285. Professor Brandon Garrett has attempted a similar task with respect to wrongful convictions. See BRANDON L. GARRETT, *CONVICTING THE INNOCENT: WHERE CRIMINAL PROSECUTIONS GO WRONG* (2011).

286. See *United States v. Olsen*, 737 F.3d 625, 626 (9th Cir. 2013) (Kozinski, C.J., dissenting) (arguing that “[o]nly judges can put a stop to” ongoing *Brady* violations); Krag, *supra* note 279

otherwise want to meet their obligations but sometimes fail despite good intentions.

In this context, the application of analytics is more aspirational than it is for using analytics to evaluate jury selection, charging practices, or in fleshing out the influence of arbitrary factors in prosecutorial decision-making. Much of the data collection needed to apply analytics to these areas is routinely done. However, in the *Brady* context, the focus is more on the first step of analytics— assembling the data. Nonetheless, analytics offers promise and should be included in the reforms designed to minimize *Brady* violations.

IV. THE CHALLENGES OF PROSECUTORIAL ANALYTICS

A. *Risks of Analytics*

Increased reliance on data analytics carries risks. Some of the risks are similar to those associated with using analytics to fight crime. Others are context specific. They include: 1) the opportunity costs of foregoing other potentially worthy efforts to improve the justice system; 2) the possibility of focusing on the wrong data or failing to uncover “bugs” in the analytical tools; 3) the tendency of a data-centric approach to crowd out other important values; and 4) the possibility that we might be uncomfortable with what we learn.

Expanding analytics to the prosecutorial function will incur new costs as the system collects vast amounts of currently uncollected data. These costs will force tradeoffs. For example, if the costs are associated with promoting defense interests, funding them will put additional pressure on the existing strapped budgets of public defense agencies.²⁸⁷ To the extent prosecutorial agencies are asked to incur the costs, they lack the incentive to adopt the optimal amount of data collection and analytics because the benefits of these measures extend beyond the prosecutor’s office.²⁸⁸ However, if the New Orleans District Attorney’s Office is at all representative, there is evidence that prosecuting agencies have the capacity to absorb some of the additional

(proposing that judges conduct a colloquy regarding prosecutorial disclosures pretrial and pre-plea).

287. Jennifer Laurin made this point in the context of calls for public defenders to adopt analytics to improve the provision of indigent defense services. Laurin, *supra* note 53, at 355 (“Time and energy spent leaning on public defenders to gather better data might trade off . . . with funding to alleviate caseloads or hire defense investigators.”).

288. Harmon, *supra* note 90, at 1131 (“[P]olice chiefs and politicians experience much of the cost of increased investment in obtaining information—in the form of delayed decision-making, opportunity costs, and increased accountability—but usually internalize only some of the benefits of improved policy.”).

costs of data collection.²⁸⁹ Furthermore, to the extent that analytics documents that prosecutorial decision-making creates negative externalities, equity considerations point to requiring prosecutors to internalize these costs.

Beyond the resource question, increased reliance on analytics carries the risk of relying on bad inputs. Focusing on the wrong data points, using inaccurate data, and failing to detect “bugs” in the analytical process would severely compromise outputs. This risk is exacerbated by the fact that prosecutorial decisions are often complex and involve competing values that may not be easily mapped with determinable variables.²⁹⁰ To some degree, these problems have plagued the use of analytics on the crime-fighting side of the system.²⁹¹ For example, criminal records often include errors.²⁹² And heat lists, local DNA databases, and other predictive policing techniques are bound to be over-inclusive, sweeping up large numbers of innocent people. Similar errors in the data could plague the use of analytics to evaluate prosecutorial decision-making.

There are other more abstract risks. Several scholars have argued that the focus on data may crowd out important and less easily quantifiable values in the criminal justice system. Kevin Lapp laments the “pathology of ‘dataveillance’ [which] nearly always sees the solution as more data collection and greater dissemination.”²⁹³ Others worry that to the extent that data anonymizes decisions, there is a risk that there is less room for empathy.²⁹⁴ In a twist, Justice Thomas used a related argument to challenge Justice Breyer’s use of analytics in his Eighth Amendment analysis of

289. See Miller & Wright, *supra* note 92, at 189 (“NODA was no better funded than a typical district attorney’s office. Yet Harry Connick and his staff decided that they could better achieve their goals by shifting significant resources—from a very tight budget—into record-keeping, recording, and reviewing.”).

290. Laurin, *supra* note 53, at 356 (noting that using analytical tools to evaluate the provision of indigent defense services is challenging because of the lack of agreement about “what good defense practice is aiming to achieve”); Roth, *supra* note 48, at 1264–65 (noting that changes in substantive law that focus criminality on determinable variables as opposed to complex value judgments have allowed for a more mechanized adjudication process).

291. Roth, *supra* note 48, at 1270 (noting the “hidden subjectivities and errors that often go unrecognized and unchecked”). These errors extend beyond crime-fighting. See, e.g., *Ambrose v. Booker*, 684 F.3d 638, 640–42 (6th Cir. 2012) (documenting that a “computer glitch” in software used to create jury lists caused “the systematic underrepresentation of African-Americans in the jury pools of Kent County, Michigan”).

292. See MADELINE NIEGHLY & MAURICE EMSELLEM, NAT’L EMP’T LAW PROJECT, WANTED: ACCURATE FBI BACKGROUND CHECKS FOR EMPLOYMENT (2013), <http://www.nelp.org/content/uploads/2015/02/Report-Wanted-Accurate-FBI-Background-Checks-Employment-1.pdf>.

293. Lapp, *supra* note 52, at 7 (quoting Roger A. Clarke, *Information Technology and Dataveillance*, 31 COMM. ACM 498, 499, 502–04 (1988)).

294. See, e.g., Sah et al., *supra* note 127, at 73 (cautioning that an attempt to reduce racial biases by blinding prosecutors to the race of defendants risks “other unintended effects, such as reducing empathy, leading to harsher decisions toward anonymous defendants”).

capital punishment in *Glossip*. Justice Thomas warned against making constitutional decisions based on “cold mathematical calculations.”²⁹⁵

Finally, there is the risk that using analytics to evaluate prosecutorial decision-making may reveal too much about the system, including aspects of it that we would rather not acknowledge. This fear animated the Court’s unwillingness to include the robust statistical analysis in evaluating *McCleskey*’s constitutional claims.²⁹⁶ In *McCleskey*, the Court feared analytics because it might produce too much justice. Such a position maintains the status quo, where “lawyers and judges [and the public] are inculcated with the notion that the system works well and there is nothing to worry about.”²⁹⁷ Analytics offers the opportunity to test our faith that the system works well.²⁹⁸

B. Mandatory Prosecutorial Disclosures

Realizing the promise of analytics will require building robust data sets that reflect the myriad decisions prosecutors make in every case and making this data widely available. Much of the necessary data is tucked away in prosecutorial files and currently preserved, if at all, in ways that make aggregating it costly. Consequently, prosecutors will play an essential role in collecting this data. Some believe that prosecutors will, eventually, undertake this responsibility voluntarily.²⁹⁹ But given the benefits prosecutors receive from their current private and discretion-filled system, waiting for them to voluntarily undertake this effort would likely prove futile. Rather, in exchange for the immense power society cedes to prosecutors, we should require that prosecutors collect, certify, and disclose certain data. There are at least four reasons for cautious optimism that a mandatory prosecutorial disclosure regime is possible.

First, there is more openness to the possibility of extensive substantive reform of the criminal justice system in today’s political climate than in the past. Interest groups from across the political spectrum have criticized mass

295. *Glossip v. Gross*, 135 S. Ct. 2726, 2752 (2015) (Thomas, J., concurring).

296. *McCleskey v. Kemp*, 481 U.S. 279, 314–15 (1987) (“*McCleskey*’s claim, taken to its logical conclusion, throws into serious question the principles that underlie our entire criminal justice system.”).

297. Kozinski, *supra* note 7, at xviii.

298. *See, e.g., Kutateladze, supra* note 30, at iv (“The shame is not in finding that we have unconscious biases or that our current policies have a disproportionate racial impact—the shame lies in refusing to ask the questions and correct the problems.”).

299. Miller & Wright, *supra* note 92, at 195 (“Perhaps down the road, prosecutors who gain confidence in the institutional and political viability of detailed internal data collection and analysis will be willing to share portions of that data directly with the public.”).

incarceration and its accompanying costs.³⁰⁰ Scholars have begun to point to the prosecutor's discretionary power as the driver of our incarceration rate.³⁰¹ Simultaneously, several high profile cases crumbled as a result of prosecutorial misconduct or related abuses of power.³⁰² Taken together, these factors provide room for the seeds of reform to grow. Furthermore, requiring data collection is a soft form of oversight. It does not mandate how prosecutors exercise their discretion in any one case. It only collects data about these decisions.

Second, public and private funding streams increasingly promote the use of evidence-based practices and require robust data collection and analysis as a condition of funding. These funding conditions have been common for programs designed to develop analytics as a crime-fighting tool.³⁰³ And they have slowly begun to reach defense interests.³⁰⁴ Furthermore, the jurisdiction-specific studies, often funded by these same public and private organizations, have helped demonstrate the promise of the widespread use of analytics to evaluate prosecutorial decision-making.

Third, there is precedent for requiring prosecutors to collect and disclose data about their discretionary decisions. In the federal system, the Department of Justice mandates that prosecutors collect information related to plea agreements, declinations, and the use of informants. All negotiated plea agreements must be reduced to writing, approved by a supervising attorney, and recorded and filed in court.³⁰⁵ Similarly, when federal prosecutors decline to pursue a case, they are required to communicate their reasons to the investigating agency.³⁰⁶ And when they agree not to press charges in exchange for assistance from a cooperating witness, prosecutors

300. See, e.g., Baker, *supra* note 135 (providing a critique of over-criminalization from the Heritage Foundation); Orin Kerr, *Koch Industries Gives Grant to NACDL "To Address the Nation's Profound Indigent Defense Crisis,"* WASH. POST (Oct. 21, 2014), <https://www.washingtonpost.com/news/volokh-conspiracy/wp/2014/10/21/koch-industries-gives-grant-to-nacdl-to-address-the-nations-profound-indigent-defense-crisis/>.

301. See *supra* note 133.

302. See *supra* note 277.

303. See Laurin, *supra* note 53, at 337 (noting the prominent role of federal grants in promoting and researching evidence-based policing techniques and in improving data collection methods for law enforcement); *Data-Driven Decision Making*, LAURA & JOHN ARNOLD FOUND., <http://www.arnoldfoundation.org/initiative/criminal-justice/data-driven-decision-making/> (outlining the foundation's promotion of data-driven policing policies).

304. Laurin, *supra* note 53, at 337 ("Consistent with the approach of NIJ and BJA to the criminal justice field more broadly, grant funding aimed at the indigent defense field efforts has expressly prioritized the development and promotion of an evidence base, especially in support of cost-efficient programming.")

305. See U.S. DEP'T OF JUSTICE, UNITED STATES ATTORNEYS' MANUAL 9-27.450, <http://www.justice.gov/usam/title-9-criminal>.

306. See *id.* at 9-27.270.

must prepare a written record of the details of the agreement.³⁰⁷ These provisions help ensure consistency across cases and federal districts.³⁰⁸ They also form the ingredients for a rich data set that could be used to identify trends and outliers in prosecuting agencies.

Finally, there are slivers of support for requiring mandatory prosecutorial disclosures in the First and Sixth Amendment rights that ensure public participation in the criminal justice system. Together these constitutional protections are designed to increase transparency and accountability in the system.³⁰⁹ Jocelyn Simonson has argued that in a world with very few trials the regulatory force of the constitutional guarantee of a public trial must extend to pretrial proceedings, including those from which the public is routinely excluded.³¹⁰ Preserving a physical audience to promote transparency and accountability is undoubtedly important to ensuring that the public has the opportunity to evaluate the ultimate results of prosecutorial power. These same constitutional principles support transparency with respect to the prosecutor's decision-making process that brings about the results.

CONCLUSION

Undoubtedly, law enforcement will continue to extract the maximum crime-fighting capabilities of analytics. But there is little reason why this tool should be confined to one part of the criminal justice system. Failing to collect and measure robust data sets about the prosecutorial function risks the institution becoming anachronistic in modern society, which has shown an insatiable appetite for trying to improve decision-making with data. More importantly, it risks preserving individual and institutional biases in the system that could otherwise be identified with analytics. This Article outlines a path forward to replace the data-poor environment surrounding prosecutorial power. This path offers promise for regulating and improving the institution of the prosecutor.

307. *See id.* at 9-27.650.

308. *See, e.g., id.* at 9-27.450B (“Written agreements will facilitate efforts by the Department or the Sentencing Commission to monitor compliance by prosecutors with Department policies and the guidelines.”).

309. *See* Simonson, *supra* note 28, at 2196 (arguing that the First and Sixth Amendment rights to a public trial “concentrate on the function of the local audience as a check on abuses of power and a mechanism of democratic accountability”).

310. *Id.* at 2176 (“[T]he protections of the Sixth and First Amendment rights to a public trial extend with full force into the nontrial criminal courtroom.”).