The Incompatibility of Due Process and Naked Statistical Evidence

I. INTRODUCTION

Qualitative evidence is a cornerstone of the modern trial system. Parties often invoke eyewitness testimony, character witnesses, or other forms of direct and circumstantial evidence when seeking to advance their case in the courtroom, enabling jurors to reach a verdict after weighing two competing narratives.[1] But what if testimonial, experience-based evidence were removed from trials? In a legal system that draws its legitimacy from centuries of tradition—emphasizing

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1.   *See* Jane B. Baron & Julia Epstein, *Is Law Narrative?*, 45 BUFF. L. REV. 141, 148 (1997) (recognizing this phenomenon).

notions of fairness even above absolute accuracy[2]—would a jury, not to mention the public at large, reject a verdict that imposes liability or guilt on a defendant in the complete absence of qualitative evidence? More specifically, does a judgment that rests solely on probabilities or other quantitative evidence offend deep-rooted notions of fairness, especially when that quantitative evidence fails to establish a coherent narrative for the plaintiff's case as a whole? In at least one situation, the answer appears to be yes.

L. Jonathan Cohen's notorious Gatecrasher's Paradox presents a novel problem that spawns from solely using probabilistic evidence (or "naked statistical evidence") to impose liability.[3] Cohen presents his hypothetical as follows:

> Consider, for example, a case in which it is common ground that 499 people paid for admission to a rodeo, and that 1,000 are counted on the seats, of whom A is one. Suppose no tickets were issued and there can be no testimony as to whether A paid for admission or climbed over the fence. So by any plausible criterion of mathematical probability there is a .501 probability, on the admitted facts, that he did not pay. The mathematicist theory would apparently imply that in such circumstances the rodeo organizers are entitled to judgement against A for the admission-money, since the balance of probability (and also the difference between prior and posterior probabilities) would lie in their favour. But it seems manifestly unjust that A should lose his case when there is an agreed mathematical probability of as high as .499 that he in fact paid for admission.

> Indeed, if the organizers were really entitled to judgement against A, they would presumably be equally entitled to judgement against each person in the same situation as A. So they might conceivably be entitled to recover 1,000 admission-moneys, when it was admitted that 499 had actually been paid. The absurd injustice of this suffices to show that there is something wrong somewhere. But where?[4]

Since its proposal, numerous articles and commentaries have grappled with the Gatecrasher's Paradox, seeking to remedy an undeniable feeling of injustice that comes from wrestling with the problem.[5] While,

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2.   *E.g.*, Mirjan Damaska, *Truth in Adjudication*, 49 HASTINGS L.J. 289, 301 (1998) ("Quite obviously, however, truth-conducive values cannot be an overriding consideration in legal proceedings: it is generally recognized that several social needs and values exercise a constraining effect on attempts to achieve fact-finding precision.").

3.   L. JONATHAN COHEN, THE PROBABLE AND THE PROVABLE 74–75 (1977).

4.   *Id.*

5.   *See, e.g.*, Edward K. Cheng, *Reconceptualizing the Burden of Proof*, 122 YALE L.J. 1254, 1269–71 (2013) (evaluating the Gatecrasher's Paradox under a reconceptualized burden of proof); Richard Eggleston, *The Probability Debate*, 1980 CRIM. L. REV. 678, 678 (1980) (defending the plaintiff in the Gatecrasher's Paradox); Stephen E. Fienberg, *Gatecrashers, Blue Buses, and the Bayesian Representation of Legal Evidence*, 66 B.U. L. REV. 693, 693–98 (1986) (discussing the Gatecrasher's Paradox in conjunction with the Blue Bus problem); David Kaye, *The Laws of Probability and the Law of the Land*, 47 U. CHI. L. REV. 34, 36–39 (1979) (discounting the statistical evidence at play in the Gatecrasher's Paradox); Glanville Williams, *The Mathematics of Proof-I*, 1979 CRIM. L. REV. 297, 297–301 (resolving the paradox by proposing an additional legal rule which would require that evidence be tailored to a single defendant, rather than allowing evidence to remain applicable to an entire population of possible defendants).

from a purely quantitative standpoint, the weight of the evidence supports the imposition of liability on each rodeo attendee, the sole use of probabilities to assess this liability seems innately unfair. This tension has spawned a great debate, a debate that does not merely seek to solve Cohen's academic puzzle, but more deeply questions the role of naked statistical evidence in today's legal system.[6]

Contributing to this discourse, this Note argues that in certain circumstances—such as the situation presented in the Gatecrasher's Paradox—the use of naked statistical evidence constitutes a due process violation. United States circuit courts have held that the use of "inherently factually contradictory theories violates the principles of due process."[7] In other words, a due process violation occurs when a prosecutor advances irreconcilable theories for a case against multiple defendants in an attempt to simultaneously secure mutually exclusive verdicts for a single, "lone gunman" crime.[8] The absolute certainty that the prosecutor has presented a false impression in at least one of these trials renders each trial fundamentally unfair.[9]

These due process concerns are equally in play in the Gatecrasher's Paradox. Once the 502nd defendant has been found liable for trespass, there is a certainty that at least one innocent rodeo attendee has been found liable.[10] Thus, the Gatecrasher plaintiff must have advanced a false impression in at least one trial: the plaintiff presented naked statistical evidence to argue that 502 defendants were more-likely-than-not gatecrashers despite knowing that the evidence did not back his claim at least once. The plaintiff's continued ability to advance this theory in the face of factual impossibility renders each

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6.   *See, e.g.*, Richard D. Friedman, *Generalized Inferences, Individual Merits, and Jury Discretion*, 66 B.U. L. REV. 509, 509 (1986) ("Much of the debate in current evidence scholarship concerns the appropriateness of using standard probability theory in modeling adjudicative factfinding. In that debate, the question of whether a verdict can be supported by 'naked statistical evidence' has been accorded great importance.").

7.   *See* Smith v. Groose, 205 F.3d 1045, 1052 (8th Cir. 2000) (finding a due process violation where a prosecutor uses a factually impossible theory for the case to secure mutually exclusive verdicts); 5 WHITE COLLAR CRIME § 38:34 (2d ed.) ("Some courts have held that the Fourteenth Amendment's due process clause prevents prosecutors from using different theories of the same facts in order to convict multiple defendants allegedly involved in the same crime. However, the Supreme Court has not yet ruled on this issue."). *But see* Bradshaw v. Stumpf, 545 U.S. 175, 187–88 (2005) (noting that factually inconsistent theories for immaterial issues do not raise due process concerns, but remanding to determine whether a factual inconsistency at the core of a prosecutor's theory violates the Due Process Clause); Stumpf v. Robinson, 722 F.3d 739, 754 (6th Cir. 2013) (en banc) (finding no due process violation when prosecutors are merely drawing two separate inferences from the same evidentiary record).

8.   *See, e.g.*, *Smith*, 205 F.3d at 1052.

9.   Anne Bowen Poulin, *Prosecutorial Inconsistency, Estoppel, and Due Process: Making the Prosecution Get Its Story Straight*, 89 CALIF. L. REV. 1423, 1460 (2001).

10.   COHEN, *supra* note 3, at 74–75.

subsequent trial fundamentally unfair and in violation of the Due Process Clause.[11]

But does this response provide a complete answer? Should the first 501 defendants merely bemoan their luck as members of the class sued within the realm of the factually possible while the 502nd defendant and his subsequent companions cheer the availability of their newly acquired due process defense? The answer must be no, especially considering that the evidence advanced against the first 501 defendants—the 50.1% chance that each of them is indeed a trespasser—is identical to the evidence that would be presented against the remaining rodeo attendees. Thus, this Note argues that due process violations take a second form, a form unique to naked statistical evidence: if the same naked statistical evidence could be used to impose liability on any randomly selected member of a population, and the subsequent imposition of liability on the entire population would constitute a due process violation because of factual impossibility, then imposing liability on *even one* defendant constitutes a due process violation. Such a rule directly targets the mechanics of the Gatecrasher's Paradox, and prevents the Gatecrasher plaintiff from recovering against any of the defendants in the absence of additional evidence.

This Note proceeds in six parts. Part II of this Note examines historical responses to Cohen's paradox, detailing the various approaches and legal doctrines that commentators have grappled with when seeking to resolve the time-honored problem. Additionally, Part II presents the current state of the discussion surrounding the Gatecrasher's Paradox and the persisting interest in the open question.

Part III delves into constitutional analysis, detailing the due process concerns that arise when factually inconsistent theories are advanced to secure mutually exclusive verdicts. Moreover, Part III argues that this analysis, which has historically been used in the criminal context, is equally applicable to civil proceedings and the Gatecrasher's Paradox.

Part IV offers a novel solution to the Gatecrasher's Paradox: the plaintiff's sole employment of naked statistical evidence violates due process; the hypothetical's potential for mutually exclusive, factually impossible verdicts renders even one trial fundamentally unfair.

Part V then examines the contours and scope of the due process defense. Using Charles Nesson's Prison Riot hypothetical, this Note

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11. The Due Process clause requires that every trial be fundamentally fair. Neb. Press Ass'n v. Stuart, 427 U.S. 539, 586 (1976) (Brennan, J., concurring); *Cf. Smith*, 205 F.3d at 1052 ("[T]he use of inherently factually contradictory theories violates the principles of due process.").

highlights the limit of this defense, noting that as a defendant's likelihood of guilt rises, the viability of the due process defense diminishes in step. Additionally, Part V examines the Blue Bus Problem to delineate the type of naked statistical evidence susceptible to the due process defense espoused by this Note.

Finally, Part VI concludes.

II. RESOLVING THE GATECRASHER'S PARADOX: AN OPEN QUESTION

Since Cohen's proposal of the Gatecrasher's Paradox in 1977, numerous commentators have attempted to define and resolve the uncomfortable feeling of injustice fostered by the hypothetical.[12] Despite the Gatecrasher plaintiff's apparent ability to satisfy his burden of proof and thus hold any of the potential defendants liable, the sole use of statistics to accomplish this task leaves a bitter taste for many readers.[13] This Part details some of the most common and persuasive responses to the Gatecrasher's Paradox. While each of the rebuttals below has merit, none has yet been universally accepted.[14] In addition, and more importantly, no response has analyzed the constitutional concerns that underlie the hypothetical. As such, the Gatecrasher's Paradox remains an open question, for which this Note offers a new perspective.[15]

A. Discounting Naked Statistical Evidence

Many responses to the Gatecrasher's Paradox attack the heart of the problem, questioning the accuracy of the plaintiff's naked statistical evidence and discounting the probative value of the same.[16]

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12.   *See, e.g.*, Cheng, *supra* note 5, at 1269–71 (evaluating the Gatecrasher's Paradox under a reconceptualized burden of proof); Eggleston, *supra* note 5, at 678 (defending the plaintiff in the Gatecrasher's Paradox); Fienberg, *supra* note 5, at 693–98 (discussing the Gatecrasher's Paradox in conjunction with the Blue Bus problem); Kaye, *supra* note 5, at 36–39 (discounting the statistical evidence at play in the Gatecrasher's Paradox); Williams, *supra* note 5, at 297–301 (resolving the paradox by proposing an additional legal rule which would require that evidence be tailored to a single defendant, rather than allowing evidence to remain applicable to an entire population of possible defendants).

13.   *See, e.g.*, Lea Brilmayer, *Second-Order Evidence and Bayesian Logic*, 66 B.U. L. REV. 673, 674–77 (1986) (testing the compatibility of the Gatecrasher's Paradox with Bayesian logic).

14.   Neil B. Cohen, *Confidence in Probability: Burdens of Persuasion in a World of Imperfect Knowledge*, 60 N.Y.U. L. REV. 385, 395 (1985) ("Scholarly debate has [ultimately] failed to produce any satisfactory responses.").

15.   *See infra* Part IV (solving the Gatecrasher's Paradox using the Due Process Clause).

16.   *See* David Kaye, *The Paradox of the Gatecrasher and Other Stories*, 1979 ARIZ. ST. L.J. 101, 102–07 (1979) (questioning the "subjective" value of the probabilities in play in the Gatecrasher's Paradox).

Professor David Kaye's response to the Gatecrasher's Paradox is one of the most prominent articles on naked statistical evidence and Cohen's hypothetical.[17] In general, Kaye seems to approach the Gatecrasher's Paradox with a distinct goal: to decrease errors and improve accuracy at trial.[18] His analysis not only delves into the statistical underpinnings of the problem, but also emphasizes the interplay between administrability and justice.[19]

Kaye begins his critical analysis of the naked statistical evidence in the Gatecrasher's Paradox by highlighting a discrepancy between "objective probability" and "subjective probability."[20] While, objectively, each rodeo attendee has a 50.1% likelihood of membership in the class of trespassers, strict reliance on this quantitative evidence threatens to oversimplify trials by replacing a trial's traditional narrative format with mere background statistics. In this exchange, accuracy decreases as the probative force of corresponding qualitative evidence is lost. Thus, it may be appropriate to instead focus on what Kaye deems *subjective* probability. As the label suggests, subjective probabilities blend quantitative evidence with a desire for corresponding qualitative support. A court calculating subjective probabilities might use objective probabilities as a starting point, but later discount the same "simply to create an incentive for plaintiffs to do more than establish the background statistics."[21] Thus, in the Gatecrasher's Paradox, the 50.1% objective probability that any given defendant is a trespasser might be unilaterally discounted by a court seeking corresponding qualitative evidence. If this rationale and technique holds, the injustice evoked by the hypothetical is waylaid as the plaintiff would need more than mere statistics to overcome the preponderance standard.[22]

Kaye's second, related response is more functional in nature.[23] Put simply, the 50.1% chance that any one of the thousand rodeo attendees is actually a gatecrasher is an overstatement.[24] Importantly,

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    17.   *See, e.g.*, Ronald J. Allen, *A Reconceptualization of Civil Trials*, 66 B.U. L. Rev. 401, 411–14 (1986) (detailing the discourse between professors Kaye and Cohen over the Gatecrasher's Paradox); David Kaye, *Paradoxes, Gedanken Experiments and the Burden of Proof: A Response to Dr. Cohen's Reply*, 1981 ARIZ. ST. L.J. 635, 645 (1981) (responding to Jonathan Cohen's critique of Kaye's earlier solution to the Gatecrasher's Paradox); Kaye, *supra* note 16, at 101–05.

    18.   Kaye, *supra* note 16, at 102–08; *see also* Allen, *supra* note 17, at 412.

    19.   Kaye, *supra* note 16, at 102–08; *see also* Allen, *supra* note 17, at 411–12.

    20.   Kaye, *supra* note 16, at 105–08; *see also* Allen, *supra* note 17, at 411–12.

    21.   Kaye, *supra* note 16, at 106 (internal quotation marks omitted); *see also* Allen, *supra* note 17, at 411–12.

    22.   Kaye, *supra* note 16, at 102–08.

    23.   *Id.* at 107–08; *see also* Allen, *supra* note 17, at 412–13.

    24.   Kaye, *supra* note 16, at 106–08; *see also* Brilmayer, *supra* note 13, at 675 ("The problem is that the evidence in question does not deal with each defendant's guilt individually.").

the probability fails to account for the possibility that other applicable evidence signaling a particular defendant's innocence exists but has been withheld.[25] "Hence, if it is even slightly more likely that the rodeo organizers would have been able to come forward with more evidence about how the defendant A came onto the premises without paying if he had actually done so," the 50.1% chance that defendant A is a gatecrasher is an inflated mischaracterization.[26] Thus, Kaye argues that a rational juror could reasonably believe the possibility that, despite the naked statistical evidence against the Gatecrasher defendants, external factors—such as withheld evidence of a particular defendant's innocence—decrease the probability of that defendant's guilt to a figure below one-half.[27] In such a situation, "[a]ccuracy is increased . . . because the true probability is less than one-half, and recovery is properly denied."[28]

Taken together, Kaye's responses ultimately propose an overarching solution: naked statistical evidence should be discounted.[29] Both elements of the proposed solution seek to adjust the objective probability that a given defendant is a gatecrasher by either highlighting the need to create beneficial incentives or by arguing that the probability is overstated given the possibility of other absent evidence.

B. Creating a New Rule of Evidence

Departing from the statistical approach to the Gatecrasher's Paradox, other commentators have sought to resolve Cohen's conundrum through more normative proposals.[30] For example, Glanville Williams approaches the Gatecrasher's Paradox in a manner wholly independent of probabilistic reasoning by primarily focusing on an individual's sense of justice.[31] Williams argues that a plaintiff should not prevail without first tying evidence to a specific defendant.[32] His

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25. Kaye, *supra* note 16, at 106–08; *see also* Brilmayer, *supra* note 13, at 679–80.

26. Kaye, *supra* note 16, at 108.

27. *Id.*

28. Brilmayer, *supra* note 13, at 679–80.

29. *See* Kaye, *supra* note 5, at 45–56 (detailing different avenues whereby the apparent 50.1% chance of guilt can be seen as inaccurate).

30. *See* Williams, *supra* note 5, at 300 (solving the Gatecrasher's Paradox by proposing a new rule of evidence).

31. *Id.*

32. Williams, *supra* note 5, at 297; *see also* Cohen, *supra* note 14, at 396 ("Glanville Williams has suggested that the defendant must win in the rodeo example because, in addition to the probabilistic burden, our sense of justice dictates that the plaintiff should not win if he does not present some evidence specifically tying this particular defendant to the act in question."). Other

proposed rule prevents a plaintiff from choosing a random individual out of a population of potential defendants—as is the case in Cohen's Gatecrasher's Paradox—and instead requires evidence tailored specifically to the defendant on the stand.[33] Stated differently, the use of naked statistical evidence should be unallowable as a sword for plaintiffs, instead forcing a plaintiff to work with a population size of one: the defendant in the instant case.[34]

In the absence of his proposed rule, Williams also argues that the injustice created by Cohen's hypothetical could be eliminated through an apportionment system whereby damages are awarded not solely based on the defendant's proportionate fault, but instead in proportion to that defendant's "fault-plus-probability."[35] Such a system of damage apportionment would reflect the disconcerting link between the defendant and the naked statistical evidence used against him at trial. Additionally, it would diminish the award to a plaintiff who relied solely on naked statistical evidence, incentivizing the production of additional evidence.[36]

Conversely, Sir Richard Eggleston took exception to this latter proposition.[37] Eggleston, who also analyzed the Gatecrasher's Paradox under a justice-based lens, instead argues that "any injustice involved in giving judgment against the defendant in the rodeo case does not outweigh the injustice of refusing a remedy to the plaintiff who has the odds in his favor."[38] Rather than focusing on waylaying potential injustice for defendants by decreasing judgments against them, Eggleston focuses on the countervailing justice concern. Any apportionment scheme in favor of the defendants will necessarily detract from the recovery of the plaintiff, whose case has a higher probability of accuracy.[39] Contrary to Williams's view, Eggleston finds no injustice in the Gatecrasher's Paradox and claims that naked statistical evidence is sufficient for a plaintiff to recover.

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commentators have showed support for this sort of individualized tailoring of statistical evidence. *See* Brilmayer, *supra* note 13, at 675 ("The problem is that the evidence in question does not deal with each defendant's guilt individually.").

33.   Williams, *supra* note 5, at 300–07.

34.   *Id.*

35.   *See id.*; *see also* LOGIC, PROBABILITY, AND PRESUMPTIONS IN LEGAL REASONING 628 (Scott Brewer ed., 2011) (providing Jonathan Cohen's opinion on many of the responses to his Gatecrasher's Paradox).

36.   LOGIC, PROBABILITY, AND PRESUMPTIONS IN LEGAL REASONING, *supra* note 35, at 628; Williams, *supra* note 5, at 300–07.

37.   *See* Eggleston, *supra* note 5, at 679–83 (defending the Gatecrasher plaintiff, as the odds are in the plaintiff's favor).

38.   LOGIC, PROBABILITY, AND PRESUMPTIONS IN LEGAL REASONING, *supra* note 35, at 628.

39.   *See* Eggleston, *supra* note 5, at 680–83.

Ultimately, Williams and Eggleston both seek to resolve the Gatecrasher's Paradox by appealing to one's innate sense of justice.[40] For Williams, the Gatecrasher's Paradox produces an unjust result when naked statistical evidence is insufficiently tied to an individual defendant.[41] Additionally, injustice exists in the absence of a damage-apportionment scheme whereby a recovery reflects the plaintiff's noticeably strained evidence.[42] Alternatively, Eggleston finds no injustice in the Gatecrasher's Paradox, instead emphasizing that a just result occurs when judgment is awarded to a plaintiff with the odds in his favor.[43]

C. Addressing the Burden of Proof

Another[44] approach to the Gatecrasher's Paradox does not seek to provide an alternate perspective or analysis of its facts, but instead reexamines the plaintiff's burden of proof and questions whether the sole use of naked statistical evidence is adequate for the rodeo owner to recover.[45] Departing from the abstract, normative resolutions proposed by Williams and Eggleston, Professor Edward Cheng recently addressed the Gatecrasher's Paradox through a reconceptualization of the burden of proof.[46]

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40.   *See id.* (arguing that the Gatecrasher's Paradox contains no offense to justice, as the plaintiff has the odds in his favor); Williams, *supra* note 5, at 297 (discussing, ultimately, how justice demands a new rule of evidence to waylay the concerns of naked statistical evidence); *see also* LOGIC, PROBABILITY, AND PRESUMPTIONS IN LEGAL REASONING, *supra* note 35, at 628–31 (recounting both Williams's and Eggleston's arguments, noting their normative undercurrents).

41.   Williams, *supra* note 5, at 297.

42.   *Id.*

43.   LOGIC, PROBABILITY, AND PRESUMPTIONS IN LEGAL REASONING, *supra* note 35, at 628–31; Eggleston, *supra* note 5*,* at 680–83.

44.   While this approach to the Gatecrasher's Paradox is the final response analyzed in this Note, there have been many more responses to the Gatecrasher's Paradox than the three detailed here. *See, e.g.*, Brilmayer, *supra* note 13, at 679–80; Cohen, *supra* note 14, at 396–98; David Enoch, Levi Spectre & Talia Fisher, *Statistical Evidence, Sensitivity, and the Legal Value of Knowledge*, 30 PHIL. & PUB. AFF. 197, 200–02 (2012); Mike Redmayne, *Exploring the Proof Paradoxes*, 14 LEGAL THEORY 281, 285–300 (2008); Richard W. Wright, *Causation, Responsibility, Risk, Probability, Naked Statistics, and Proof: Pruning the Bramble Bush by Clarifying the Concepts*, 73 IOWA L. REV. 1001, 1054 (1988). However, most of these responses fit roughly into the three categories outlined above and, for the sake of efficiency, have not been fully discussed in the text.

45.   *See* Cheng, *supra* note 5, at 1269–71 (approaching the Gatecrasher's Paradox using his reconceptualized burden of proof).

46.   *Id.*; *see* LOGIC, PROBABILITY, AND PRESUMPTIONS IN LEGAL REASONING, *supra* note 35, at 628–31 (recounting the normative approaches to naked statistical evidence advanced by Williams and Eggleston); Eggleston, *supra* note 5*,* at 680–83 (finding no affront to justice in the Gatecrasher's Paradox); Williams, *supra* note 5, at 297 (using a normative rationale to advance a new rule of evidence, one that would waylay the justice concerns in the Gatecrasher's Paradox).

Cheng proposes an alternate way to view different burden-of-proof standards, one that better reflects the mechanics of the trial system.[47] Specifically, Cheng asserts that, at their core, each of the proof standards requires jurors to weigh competing narratives. Contrary to traditional perceptions, the "legal system does not ask decisionmakers to determine whether litigants have established their cases to a particular level of certainty. Instead, decisionmakers compare the stories or theories put forward by the parties, and determine which story is more compelling in light of the evidence."[48] This view of the preponderance standard rejects the notion that preponderance constitutes a probability threshold and instead presents it as a ratio test that compares the probability of both the defendant's and plaintiff's narrative.[49]

Employing a Bayesian lens, a resolution to the Gatecrasher's Paradox may be achieved by applying Cheng's reconceptualized preponderance standard:

> Assuming that payment was in cash and no receipt was given, can the rodeo organizers recover against a randomly selected audience member? Again, the raw probabilities under the traditional preponderance standard suggest yes, since there is a 0.501 probability that any randomly selected audience member is a gatecrasher. However, the reconceptualized preponderance standard suggests otherwise . . . . [W]hether the audience member is a lawful patron or a gatecrasher does not change the probability of observing the evidence presented . . . and plaintiff fails to satisfy his burden of proof.[50]

The likelihood of observing the naked statistical evidence—the 50.1% chance that any randomly selected rodeo attendee is a trespasser—is exactly the same regardless of whether a particular defendant is indeed innocent or liable. Stated differently, jurors could equally expect to see this probabilistic data in every Gatecrasher trial. Given this broad applicability, the naked statistical evidence fails to make the plaintiff's narrative more likely than the defendant's claims of innocence; without more, the plaintiff fails to meet his burden. In this way, the Gatecrasher's Paradox could reach a resolution by reworking the problem with an insightful look at the preponderance standard.[51]

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47.   Cheng, *supra* note 5, at 1258.

48.   *Id.*

49.   *Id.*

50.   *Id.* at 1270–71.

51.   *See id.* at 1258; Kaye, *supra* note 5, at 45–48 (detailing different avenues whereby the apparent 50.1% chance of guilt can be seen as inaccurate); Williams, *supra* note 5, at 297 (discussing, ultimately, how justice demands a new rule of evidence to waylay the concerns of naked statistical evidence).

D. The New Perspective

Although the Gatecrasher's Paradox is approaching its fortieth birthday, Cohen's question remains open.[52] While the three approaches discussed above hardly represent a comprehensive encyclopedia of the vast literature on Cohen's hypothetical, they aptly reflect the predominate state of the debate surrounding the problem.[53]

Kaye's response to the Gatecrasher's Paradox discounts the value of naked statistical evidence and emphasizes an administrable system whereby courts align incentives with judgments.[54] Alternatively, Williams appeals to justice and proposes an entirely new rule, one that requires a plaintiff to tailor probabilistic evidence specifically to the defendant in question.[55] Cheng attacks the Gatecrasher's Paradox, not by questioning the mechanics of the problem, but by reconceptualizing the evidentiary standard that the plaintiff must meet to receive a favorable judgment.[56] There is merit in all of these responses, but ultimately, an underlying issue that pervades the Gatecrasher's Paradox remains untouched.[57]

As the scholarly conversation continues, this Note seeks to provide a new perspective on the problem, a solution that may be extrapolated to the use of naked statistical evidence in general. This Note looks to the Constitution to resolve the Gatecrasher's Paradox.[58] "The absurd injustice of [the Gatecrasher's Paradox] suffices to show that there is something wrong somewhere. But where?"[59] The answer may lie in due process.

III. FACTUAL IMPOSSIBILITY AND DUE PROCESS

The Due Process Clause commands fundamental fairness in the conduct of both civil and criminal trials.[60] While such a broad notion

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52. COHEN, *supra* note 3, at 74–75.
53. While there have been many more responses to the Gatecrasher's Paradox than the three detailed here, all of them roughly fit into the approaches outlined in the text. *See, e.g.*, Brilmayer, *supra* note 13, at 679–80; Cohen, *supra* note 14, at 396–98; Enoch et al., *supra* note 44; Redmayne, *supra* note 44; Wright, *supra* note 44.
54. Allen, *supra* note 17, at 411–12; Kaye, *supra* note 5, at 45–48.
55. Williams, *supra* note 5, at 297.
56. Cheng, *supra* note 5, at 1270–71.
57. Cohen, *supra* note 14, at 395 ("Scholarly debate has [ultimately] failed to produce any satisfactory responses [to Cohen's paradox].").
58. *See* Cheng, *supra* note 5, at 1270–71; Kaye, *supra* note 16, at 106; Williams, *supra* note 5, at 297.
59. COHEN, *supra* note 3, at 74–75.
60. *See, e.g.*, United States *ex rel.* Bros. v. Rundle, 302 F. Supp. 402, 403 (E.D. Pa. 1968) ("Due process commands fundamental fairness in the conduct of a trial.").

naturally manifests itself in a multitude of practices—from prosecutorial rules to courtroom procedure—it has recently been broadened by certain appellate courts to target a new form of fundamental impropriety: factually impossible, mutually exclusive verdicts.[61] This expansion of due process protection provides a new lens under which the Gatecrasher's Paradox may be examined.

A. Mutually Exclusive Verdicts

Convicting two or more defendants of a single, "lone gunman" crime constitutes a violation of due process.[62] Stated more generally, the use of "inherently factually contradictory theories violates the principles of due process."[63]

To illustrate this concept, consider *Smith v. Groose*, in which the Eighth Circuit reversed a felony murder conviction against the defendant Jon Smith.[64] In *Smith*, the defendant and a group of friends set out into a neighborhood on the evening of November 27, 1983, looking for vacant houses to vandalize.[65] Eventually, the group came upon the house of Pauline and Earl Chambers.[66] They noticed that the door to the Chambers' house was ajar and there were footprints leading inside.[67] As Smith and his friends neared the house, they crossed paths with Michael Cunningham, an individual already in the process of looting the Chambers' house.[68] Cunningham agreed to allow Smith and his group to continue the burglary with him.[69]

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61.   *See* Smith v. Groose, 205 F.3d 1045, 1052 (8th Cir. 2000).

62.   *See id.* (finding a due process violation where a prosecutor uses a factually impossible theory for the case to secure mutually exclusive verdicts); 5 WHITE COLLAR CRIME § 38:34 (2d ed.) ("Some courts have held that the Fourteenth Amendment's Due Process Clause prevents prosecutors from using different theories of the same facts in order to convict multiple defendants allegedly involved in the same crime. However, the Supreme Court has not yet ruled on this issue."). *But see* Bradshaw v. Stumpf, 545 U.S. 175, 187–88 (2005) (noting that factually inconsistent theories for immaterial issues do not raise due process concerns, but remanding to determine whether a factual inconsistency at the core of a prosecutor's theory violates the Due Process Clause); Stumpf v. Robinson, 722 F.3d 739, 754 (6th Cir. 2013) (en banc) (finding no due process violation when prosecutors are merely drawing two separate inferences from the same evidentiary record).

63.   *Smith*, 205 F.3d at 1052.

64.   *Id.* at 1054.

65.   *Id.* at 1047–48.

66.   *Id.*

67.   *Id.*

68.   *Id.*

69.   *Id.*

At this point, two opposing theories for the events of that night emerge.[70] Anthony Lytle, a member of Smith's group and the government's key witness in the subsequent trials, provided both versions of the story. Lytle first told police that Smith and the rest of his group entered the Chambers' house before the Chambers were murdered.[71] After hearing "sounds of pain" from the interior of the house, Lytle entered the Chambers' residence to find a third member of their group, James Bowman, stabbing the victims with a knife while Smith stood by.[72]

This first account from Lytle contradicts a subsequent police report and his later testimony at the *Smith* felony murder trial.[73] In these instances, Lytle reported that he confronted Cunningham before Smith and Bowman entered the house.[74] During this altercation, Cunningham allegedly told Lytle that he "took care of" the Chambers, implying that Cunningham (not Bowman) was the murderer.[75] Thus, if this second account were true, the murder would have occurred well before Smith and Bowman arrived at the crime scene.[76]

While either of Lytle's statements is independently plausible, they are mutually exclusive accounts of the night—the Chambers were murdered either before or after Bowman entered the house.[77] At the *Smith* trial, the government used Lytle's first statement as the foundation for its prosecutorial theory.[78] Consistent with Lytle's first account, the government argued that Bowman was the killer and Smith was therefore guilty of felony murder.[79] The jury agreed.[80]

Just months later, however, the State indicted Cunningham on the countervailing theory. Relying instead on Lytle's later statements, the government alternatively argued that Cunningham murdered the victims before Smith and Bowman even entered the house.[81] Despite

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70.   Of key importance, the mutually exclusive nature of these two theories led to the finding of a due process violation. *See id.*

71.   *Id.*

72.   *Id.*

73.   *Id.*

74.   *Id.* at 1047.

75.   *Id.*

76.   To clarify, according to this second theory for the case, Cunningham essentially told Lytle that he murdered the Chambers before he began to loot their house. As such, it would be impossible for Bowman to have murdered the couple—Cunningham already committed the crime before Bowman arrived at the scene. *See id.*

77.   *Id.* at 1052 ("As the State asserts, either Smith arrived before the murder or he arrived after . . . .").

78.   *Id.* at 1050–52.

79.   *Id.* at 1048.

80.   *Id.*

81.   *Id.*

the apparent mutual exclusivity of the government's theories for the two cases, a separate jury also found Cunningham guilty.[82]

On appeal, the Eighth Circuit assessed "whether the Due Process Clause forbids a state from using inconsistent, irreconcilable theories to secure convictions against two or more defendants in prosecutions for the same offenses arising out of the same event."[83] Smith contended that the state's use of inconsistent theories to secure mutually exclusive verdicts—that the Chambers were murdered both before and after Smith entered the house—violated the Due Process Clause as it rendered his trial fundamentally unfair.[84] Specifically, fundamental unfairness permeated the trials when the government presented mutually exclusive theories as truth in both, despite knowing that one of the accounts must necessarily be false.[85] Agreeing with this argument, the court noted that "[t]he State's use of factually contradictory theories in this case constituted 'foul blows,' error that fatally infected Smith's conviction."[86] In reversing the verdict of the trial court, the Eighth Circuit held that a defendant's due process rights are violated when a factual inconsistency exists at the "core" of a prosecutor's case.[87]

The *Smith* case thus provides a touchstone example of how convictions based on factually irreconcilable theories raise substantial due process concerns.[88] While the Supreme Court has found no due process violation where this factual inconsistency solely impacts an immaterial element of the case, it has not directly addressed *Smith*'s holding that factual inconsistency at the "core" of a prosecutor's case violates the Due Process Clause.[89] Thus, for a complete understanding

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82. *Id.*

83. *Id.* at 1049.

84. *Id.* at 1051.

85. *Id.* This aspect of the decision—finding that a certainty of factual impossibility equates to the presentation of false testimony despite no actual knowledge of which particular testimony is false—will be of key importance to the analysis of the Gatecrasher's Paradox. *See infra* Part IV (finding a due process violation where the Gatecrasher plaintiff achieves factually impossible recovery in his favor).

86. *Smith*, 205 F.3d at 1051.

87. *Id.* at 1052.

88. *See id.* at 1051–52 (finding that the existence of factual impossibility constitutes material, "foul blows" to a trial, rendering it fundamentally unfair and in violation of the Due Process Clause).

89. The holding in *Smith* remains good law, as the Court has only addressed issues tangentially related to "core" factual impossibility. *See* Bradshaw v. Stumpf, 545 U.S. 175, 187–88 (2005) (finding that factually inconsistent theories for immaterial issues do not raise due process concerns). *But see* Stumpf v. Robinson, 722 F.3d 739, 754 (6th Cir. 2013) (en banc) (finding no due process violation when prosecutors simply draw separate inferences from an evidentiary record).

of how this rationale applies to the Gatecrasher's Paradox and naked statistical evidence in general, the actual due process concerns underlying *Smith* warrant close examination.

B. Constitutional Concerns

The Gatecrasher's Paradox presents a situation wherein a plaintiff may be awarded comprehensive relief despite the existence of factually inconsistent, mutually exclusive verdicts.[90] Per *Smith*, such inconsistency raises constitutional concerns in the equivalent criminal context because it renders trials invoking the irreconcilable theories fundamentally unfair.[91] This fundamental unfairness equates to a due process violation.[92]

Fully grasping fundamental fairness is no simple task, however, as the due process requirement often takes on an ethereal form, varying from case to case. Yet, courts generally agree that fundamental unfairness occurs when "there is a reasonable probability that the verdict might have been different had the trial been properly conducted."[93] Stated differently, a trial is rendered fundamentally unfair if there is any reasonable likelihood that the outcome might have been affected by a tainting element. [94]

Professor Anne Poulin has applied this standard to prosecutorial inconsistency, detailing why the simultaneous use of irreconcilable theories is fundamentally unfair.[95] Poulin argues that advancing mutually exclusive theories in separate trials is largely analogous to presenting false testimony.[96] She notes:

> When the prosecution takes inconsistent positions in separate proceedings, absent an explanation, only one of them can be correct. In one of the cases, then, the prosecution has advanced a false impression. In some cases, the prosecution rests its position on such inconsistent testimony that the case may fit conventional false testimony analysis. In other cases, false testimony is not involved. Rather, the inconsistency flows from changes in testimony or from the spin placed on the facts by the prosecutors. Nevertheless, the prosecution's creation of a false impression should entitle the defendant to due process relief.[97]

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90.   COHEN, *supra* note 3, at 74–75.

91.   *Smith*, 205 F.3d at 1052.

92.   In re Murchison, 349 U.S. 133, 136 (1955) ("A fair trial in a fair tribunal is a basic requirement of due process.").

93.   Kirkpatrick v. Blackburn, 777 F.2d 272, 278–79 (5th Cir. 1985).

94.   Poulin, *supra* note 9, at 1465.

95.   *Id.* at 1460.

96.   *Id.* at 1461.

97.   *Id.* at 1464–65.

Thus, a prosecutor's ability to take irreconcilable positions in separate proceedings closely parallels the presentation of false testimony: there exists a certainty that, in at least one of the trials, the prosecution advanced a false impression. As illustrated by *Smith*, these false impressions are very likely to have a material impact on jury deliberations. When they do, a trial is rendered fundamentally unfair, thereby violating the Due Process Clause.

But while scholars have recognized that prosecutorial inconsistency raises material due process concerns, few have expounded on the constitutional concerns associated with equivalent inconsistency in civil trials. Does the same underlying logic that establishes a due process violation in a criminal trial carry equal force in a civil trial? One might argue that while due process may help shield criminal defendants from conviction, it does not equally extend to a civil defendant who merely faces monetary or equitable remedies.[98]

Ultimately, though, the due process concerns are equally applicable in civil proceedings.[99] As detailed above, prosecutorial inconsistency renders a criminal trial *fundamentally unfair*, thus running afoul of the Due Process Clause.[100] However, the Due Process Clause requires fundamental fairness in both criminal and civil proceedings.[101] Justice Brennan echoed this notion by noting, "So basic to our jurisprudence is the right to a fair trial that it has been called 'the most fundamental of all freedoms.' "[102] In this way, the Fourteenth Amendment clearly denotes—impartial to either criminal or civil proceedings—that neither a defendant's life, liberty, nor property may be deprived without the due process of law.[103] As such, the right to a

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98. Niki Kuckes, *Civil Due Process, Criminal Due Process*, 25 YALE L. & POL'Y REV. 1, 2–3 (2006) (drawing a distinction between civil and criminal due process).

99. *See* Neb. Press Ass'n v. Stuart, 427 U.S. 539, 586 (1976) (Brennan, J., concurring) (noting the civil defendant's fundamental right to a fair trial).

100. *See, e.g.*, *Smith*, 205 F.3d at 1051; Poulin, *supra* note 9, at 1461–65.

101. Latiolais v. Whitley, 93 F.3d 205, 207 (5th Cir. 1996); *see* Lemons v. Skidmore, 985 F.2d 354, 357 (7th Cir. 1993) ("There is a constitutional right to a fair trial in a civil case."); *see also* Eric D. Blumenson & Eva S. Nilsen, *Contesting Government's Financial Interest in Drug Cases*, 13 CRIM. JUST. 4, 4–5 (1999) (citing Tumey v. Ohio, 273 U.S. 510, 523, 532 (1927)) ("The constitutional due process guarantee includes the right to an impartial tribunal in both civil and criminal cases."); George Clemon Freeman, Jr. & Kyle E. McSlarrow, *RICO and the Due Process "Void for Vagueness" Test*, 45 BUS. LAW. 1003, 1007 n.25 (1990) ("The language of the due process clause of the fifth amendment does not distinguish between civil and criminal contexts, stating that no person shall 'be deprived of life, liberty, or property, without due process of law.' U.S. Const. amend. V., Section 1 of the fourteenth amendment likewise makes no such distinction: 'nor shall any State deprive any person of life, liberty, or property, without due process of law.' "); Dana Walsh, *The Dangers of Eyewitness Identification: A Call for Greater State Involvement to Ensure Fundamental Fairness*, 54 B.C. L. REV. 1415, 1453 (2013).

102. *Stuart*, 427 U.S. at 586 (Brennan, J., concurring).

103. U.S. CONST. amend. XIV, § 1.

fundamentally fair trial is equally applicable in a civil trial as it is in a criminal context.[104] "[F]airness in a jury trial, whether criminal or civil in nature, is a vital constitutional right."[105]

Taken as a whole, then, a plaintiff who simultaneously advances irreconcilable theories in multiple cases is certain to present a false impression in at least one of the trials. This false impression is highly analogous to the presentation of false testimony, and when material, renders the trials fundamentally unfair. As with criminal trials, civil trials demand fundamental fairness. Thus, the plaintiff will be unable to recover, as the false impressions and subsequent fundamental unfairness result in a due process violation.

IV. THE GATECRASHER'S PARADOX UNDER THE LENS OF DUE PROCESS

The discomfort surrounding the Gatecrasher's Paradox is not difficult to define.[106] In Cohen's problem, the plaintiff solely employs naked statistical evidence—by which every defendant has a 50.1% chance of being a gatecrasher—to theoretically secure a verdict against any of the would-be defendants.[107] However, as Cohen himself notes, this simply cannot be.[108] In fact, only 501 of the rodeo attendees failed to purchase a ticket.[109] Nonetheless, the plaintiff, armed solely with naked statistical evidence, "might conceivably be entitled, to recover 1,000 admission-moneys, when it was admitted that 499 had actually been paid."[110] In this inconsistency one finds injustice, but in this inconsistency one also discovers a solution.

Given its potential for mutually exclusive verdicts, the Gatecrasher's Paradox is ripe for examination under the lens of due process. While commentators have sought to resolve the problem from numerous angles,[111] the constitutional concerns raised by the plaintiff's would-be lawsuits have been left untouched. However, given the coexistence of the plaintiff's factually irreconcilable theories of the case and the potential for mutually exclusive judgments, an analysis of the due process concerns raised by the problem is warranted.

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104. *See Latiolais*, 93 F.3d at 207 (reaffirming a civil defendant's constitutional right to a fundamentally fair trial).

105. Bailey v. Sys. Innovation, Inc., 852 F.2d 93, 98 (3d Cir. 1988).

106. COHEN, *supra* note 3, at 74–75. (admitting that the plaintiff's ability to recover from all 1,000 rodeo attendees equates to "absurd injustice").

107. *Id.*

108. *Id.*

109. *Id.*

110. *Id.*

111. *See supra* Part II.

A. A New Perspective on an Old Problem

If the Gatecrasher plaintiff brought suit against and recovered from 502 rodeo attendees, there would surely be a due process violation because the plaintiff knew that at least one of those defendants legally purchased a ticket to the rodeo.[112] Viewed in the aggregate, the plaintiff has presented a factual impossibility as truth: he advanced naked statistical evidence to argue that 502 defendants were more-likely-than-not gatecrashers despite knowing with certainty the evidence did not back that claim in at least one trial.[113] The plaintiff's continued ability to proffer this false impression, despite the aggregate certainty of factual impossibility, renders the trials fundamentally unfair, thus violating the defendants' due process rights.[114]

Once the 502nd defendant has been found liable, the underlying mechanics of the Gatecrasher's Paradox are analogous to the rationale in *Smith*.[115] There, the simultaneous conviction of both Bowman and Cunningham constituted a factual impossibility rising to the level of a due process violation.[116] Similarly, holding 502 defendants liable as gatecrashers would constitute an equivalent factual impossibility, and should equally raise due process concerns given the eventual certainty of a false impression that contributes to the trials' fundamental unfairness.

Such a response, however, hardly provides a complete answer to Cohen's problem. Should the first 501 defendants merely bemoan their luck as members of the unfortunate majority who were tried within the realm of factual possibility, while the 502nd defendant and his subsequent companions cheer the availability of their newly available due process defense? The response is clearly no—all 1,000 defendants are faced with the same naked statistical evidence, and as such, all 1,000 defendants should be equally punished or exonerated. When then should due process concerns be addressed?

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112. *See* Latiolais v. Whitley, 93 F.3d 205, 207 (5th Cir. 1996) (reaffirming a civil defendant's constitutional right to a fundamentally fair trial); *cf.* Smith v. Groose, 205 F.3d 1045, 1051–52 (8th Cir. 2000) (finding, in the equivalent criminal context, that factual impossibility renders a trial fundamentally unfair and afoul of the Due Process Clause).

113. This notion relies on the "aggregation" theory discussed above. *See* Poulin, *supra* note 9, at 1465; *supra* text accompanying note 9.

114. *See Smith*, 205 F.3d at 1051–52 (noting the ability to present evidence tainted by factual impossibility constitutes "foul blows," rendering a trial fundamentally unfair).

115. *See id.*

116. *Id.* at 1051–52 ("As the State asserts, either Smith arrived before the murder or he arrived after . . . .").

B. Improbability and Impossibility

One first might propose an analysis of each individual lawsuit. Beyond the absolute assurance of a due process violation that occurs when a judgment is rendered against the 502nd defendant, there is a strong possibility that an innocent rodeo attendee will be found liable much earlier in the litigation process. As indicated by the problem, there is a 49.9% chance that a given defendant is innocent and indeed purchased a ticket to the venue.[117] Thus p represents the probability that in a given trial, an innocent defendant will nonetheless be found liable as a gatecrasher. If this is true, the probability of holding no innocent defendants liable at N number of independent trials is $(1-p)^N$. Arriving at our desired equation, the probability of holding *at least one* innocent defendant liable in N number of independent trials is $1-(1-p)^N$. Given a certainty level of .99, the application of this formula shows that *at least one* innocent defendant is likely to be found liable by only the seventh trial. Figure 1 below details these results:

Figure 1

Number of Independent Trials	Chance of Holding an Innocent Defendant Liable
1	49.00%
2	73.99%
3	86.73%
4	93.23%
5	96.55%
6	98.24%
7	99.10%
8	99.54%

Thus, by merely the seventh independent trial wherein the Gatecrasher plaintiff solely uses naked statistical evidence to secure a judgment against the defendant, there is a near certainty that one of the seven defendants was an innocent, paying rodeo attendee. Intuitively, this result is unsurprising. The statistics derived from the Gatecrasher's Paradox provide a near-even likelihood that any randomly selected rodeo attendee is either innocent or liable. Thus, asserting that no innocent rodeo attendee will be found liable by the 501st trial is practically equivalent to arguing that a coin will land heads up 501 flips

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117. COHEN, *supra* note 3, at 74–75.

in a row: essentially impossible. Indeed, by about the seventh flip, it is nearly certain that the coin will have landed tails up at least once. Likewise, by about the seventh trial, it is nearly certain that an innocent rodeo attendee will have been found liable. Given these high probabilities of error, the due process defense might apply much earlier in the progression of trials.[118]

      This rationale, however, suffers from two distinct disadvantages. First, until the 502nd defendant is found liable, there is only a strong factual *improbability*—not an absolute *impossibility*—that an innocent rodeo attendee has not been found liable.[119] As such, the applicability of the *Smith* rationale and its propensity to find due process violations where mutually exclusive verdicts occur rests on the level of deference that courts afford to a given certainty level.[120] While some judges may find factual improbability equivalent to factual impossibility at a certain threshold (seven trials or otherwise), others may require certainty of factual impossibility (through 502 defendants being found liable). A second disadvantage revisits an earlier complaint: while the above analysis brings potential justice to defendants seven through 501, are not the first six defendants equally entitled to protection under the Due Process Clause?

C. Core Inconsistencies

      An alternative approach better handles the issue. Recall that in the Gatecrasher's Paradox, the same naked statistical evidence could be used to convict each defendant.[121] In other words, each defendant has a 50.1% chance of being a "gatecrasher," which is sufficient to impose liability on any defendant under a traditional view of the preponderance standard.[122] Therefore, the evidence that would be used to hold the 502nd defendant liable would be *identical to* the evidence used to impose liability on the first, second, and "*n*th" defendants.

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    118. *Cf. Smith*, 205 F.3d at 1051–52 (finding a due process violation where a *certainty* of factual impossibility exists).

    119. Returning to Figure 1, as the number of independent trials increases, so too does the probability that an innocent, paying rodeo attendee has errantly been found liable. Indeed, while Figure 1 shows this statistic through the first eight trials, the probability of the existence of an errant trial continues to approach $p=1.0$. After the 501st trial, the probability that the Gatecrasher plaintiff has randomly selected only liable parties to bring suit against is minuscule—$p = 4.15624$ x 10^{-151}. However, from an excessively technical standpoint, there is not an *absolute* certainty of error until the 502nd trial.

    120. *Smith*, 205 F.3d at 1051–52.

    121. COHEN, *supra* note 3, at 74–75.

    122. *See* Cheng, *supra* note 5, at 1259 ("Conventional legal thinking equates the preponderance standard in civil litigation with a requirement that the plaintiff prove her case to a probability greater than 0.5.").

Given the above, this Note argues that due process violations take a second form: if the same naked statistical evidence could be used to convict any randomly selected member of a population, and the simultaneous conviction of the entire population would constitute a due process violation[123] (due to the mutually exclusive nature of the crime), then the conviction of *even one* of those individuals constitutes a due process violation.

Applying this rule to the Gatecrasher's Paradox, the conviction of even one defendant would violate due process. The Gatecrasher plaintiff is armed with the same naked probabilities in every trial. But as detailed above, the potential for 1,000 mutually exclusive verdicts renders each trial fundamentally unfair.[124] When the defendant in the first trial is found liable based on evidence that could equally and arbitrarily apply to any of the 999 other rodeo attendees, the plaintiff has violated the defendant's due process rights.[125] While the 50.1% chance that a particular defendant is a gatecrasher is not inherently dishonest or inaccurate, its extrapolated effect is. On a larger scale, the naked statistical evidence used by the plaintiff suggests that *each* defendant is liable for failing to purchase a ticket, which is certainly false. This perspective mirrors the mechanics of *Smith*, where the prosecutor suggested that *each* defendant was guilty of murder, despite the apparent factual impossibility of that claim.[126]

The due process concerns highlighted by this Note, however, reach beyond the rationale presented in *Smith*. In *Smith*, there would have been no due process violation if the prosecutor solely chose one theory for the case.[127] The prosecutor only violated the defendants' due process rights when he simultaneously advanced mutually exclusive theories.[128] In contrast, this Note argues that the plaintiff in the Gatecrasher's Paradox violates the first defendant's due process rights. This distinction, however, is not difficult to reconcile. In *Smith*, there was no factual impossibility in the first trial.[129] The prosecutor's original theory—that Bowman killed the Chambers as Smith and

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123. Mirroring the logic found in *Smith*, 205 F.3d at 1045–52.

124. *Cf. Smith*, 205 F.3d at 1051–52 (finding a due process violation in the equivalent criminal context).

125. *See id*. at 1052 (holding that presentation of factually impossible theories to secure mutually exclusive verdicts constitutes a violation of due process); Poulin, *supra* note 9, at 1461–65 (suggesting that, even if a prosecutor does not specifically know when he is advancing false evidence, the existence of factual impossibility in the aggregate transforms the presentation of mutually exclusive theories into the presentation of false testimony).

126. *Smith*, 205 F.3d at 1050–51.

127. *Id*. at 1048–51.

128. *Id*. at 1050–52.

129. *See id*. at 1048–51.

Cunningham stood by—is a perfectly plausible description of the crime.[130] The prosecutor only created factual impossibility at the second trial, Cunningham's trial, during which he claimed the Chambers were instead murdered before Bowman even entered the house.[131]

Alternatively, the first trial in the Gatecrasher's Paradox is premised on factual impossibility. The plaintiff's sole use of naked statistical evidence does not provide a coherent, factually plausible theory of the case. Unlike *Smith,* where the application of the prosecutor's original theory to each potential defendant provides a perfectly reasonable narrative,[132] the application of the Gatecrasher plaintiff's original theory would result in 1,000 mutually exclusive verdicts in the plaintiff's favor.[133] Given this immediate potential for factual impossibility, due process is violated in the very first trial in the Gatecrasher's Paradox.

V. THE RANGE OF THE DUE PROCESS DEFENSE

A. The Prison Guard Hypothetical: Where to Draw the Line?

While examining the Gatecrasher's Paradox under the lens of due process provides a new perspective on Cohen's time-honored problem, this Note's proposal is not without its limitations. For instance, opponents may question whether the same due process concerns espoused earlier should remain viable if only one of the rodeo attendees purchased a ticket to the venue, leaving 999 gatecrashers.[134] Pursuant to the naked statistical evidence produced by such a set of facts, each individual would have a 99.9% chance of being a gatecrasher. Should the above analysis deny the plaintiff relief, despite the overwhelming possibility that any randomly selected member of the population is a gatecrasher? As Neil Cohen notes, "[I]t is unlikely that our sense of justice would require us to deny judgment to the proprietor because there were no facts other than those overwhelming numbers that tended to show that an individual defendant was one of the 999, and not the one honest customer."[135]

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130. *See id.*

131. *See id.*

132. In this instance, Bowman would likely be charged with murder, while Cunningham and Smith would face felony murder charges. *See id.*

133. COHEN, *supra* note 3, at 74–75.

134. *See* Cohen, *supra* note 14, at 396 (questioning the limits of a justice-based approach to the Gatecrasher's Paradox).

135. *Id.*

The answer to this conundrum lies in where one draws a line of demarcation, a line that transforms probabilistic evidence from quantities that carry the blemish of injustice to statistics that no longer raise material concerns. Such an inquiry into the precise line best suited for our judicial system is beyond the scope of this Note, as the literature itself regarding when naked statistical evidence undergoes this "phase change" is only in its infancy.[136] However, to help visualize this abstract discussion, consider Professor Charles Nesson's prison guard hypothetical:

> In an enclosed yard are twenty-five identically dressed prisoners and a prison guard. The sole witness is too far away to distinguish individual features. He sees the guard, recognizable by his uniform, trip and fall, apparently knocking himself out. The prisoners huddle and argue. One breaks away from the others and goes to a shed in the corner of the yard to hide. The other twenty-four set upon the fallen guard and kill him. After the killing, the hidden prisoner emerges from the shed and mixes with the other prisoners. When the authorities later enter the yard, they find the dead guard and the twenty-five prisoners. Given these facts, twenty-four of the twenty-five are guilty of murder.[137]

From a purely statistical standpoint, Professor Nesson's hypothetical largely emulates the Gatecrasher's Paradox—although here, there is a 96% chance that any randomly selected prisoner participated in the murder.[138] The only significant differences between Nesson's and Cohen's illustrations of naked statistical evidence are the nature of the trial (the prison riot problem necessarily invokes a criminal proceeding) and the statistical chance of guilt.[139] To this latter point, Nesson's hypothetical likely used a 96% chance of guilt because this probability lies just beyond the traditional perception of the reasonable doubt standard ($p > .95$).[140] Thus, in totality, Nesson's Prison Riot problem is the criminal counterpart to the civil dispute in Cohen's Gatecrasher's Paradox.

If a prosecutor, relying solely on naked statistical evidence, brings murder charges against the prisoners, this Note suggests that each defendant could raise a due process defense. The same statistical evidence used against the very first defendant (the 96% chance that the defendant was involved in the assault) could equally apply to any of the

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136. *See* Edward K. Cheng & G. Alexander Nunn, DNA, Blue Bus, and Phase Changes 3–6 (August 4, 2015) (unpublished manuscript) (on file with author) (providing a statistical formula to determine when DNA evidence—a form of naked statistical evidence—may be validly considered an independent support for a verdict).

137. Charles R. Nesson, *Reasonable Doubt and Permissive Inferences: The Value of Complexity*, 92 HARV. L. REV. 1187, 1192–93 (1979).

138. *Id.*

139. *Id.*; *cf.* COHEN, *supra* note 3, at 74–75.

140. *See, e.g.*, United States v. Fatico, 458 F. Supp. 388, 406 (E.D.N.Y. 1978) ("If quantified, the beyond a reasonable doubt standard might be in the range of 95% probable.").

other twenty-four prisoners. However, the simultaneous conviction of all twenty-five prisoners would constitute a factual impossibility because one of those prisoners was hiding in the shed during the attack. As such, the use of naked statistical evidence against even one of the prisoners should constitute a due process violation. At the very "core" of the prosecutor's case is the potential for factual impossibility; as per the analysis above, allowing a prosecutor to advance this evidence despite the certainty of a false impression renders each trial fundamentally unfair.[141]

Thus, from a technical standpoint, the increased probability of guilt does not negate the existence of a due process violation. But from the normative angle discussed above, should the higher chance of guilt diminish potential due process concerns? Such an inquiry requires a fact-specific response, as a number of factors impact this determination. For example, the nature of the underlying crime and the potential penalties may affect whether the sense of injustice derived from the Gatecrasher's Paradox transfers to a different setting. However, in areas of criminal law analogous to the Prison Riot hypothetical, convictions with similar potential-of-innocence percentages have sparked outrage, suggesting that a mere 4% chance of innocence does not diminish the applicability of the due process defense.[142] Perhaps, in some circumstances, naked statistical evidence could produce a percentage of guilt so high that these concerns dissipate.[143] But for the vast majority of naked statistical evidence—even bare probabilities that infer a 96% chance of guilt—due process concerns retain their significance.

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141. Smith v. Groose, 205 F.3d 1045, 1052 (8th Cir. 2000).

142. A recent study suggests that at least 4.1% of defendants sentenced to death in the modern era are innocent. Samuel R. Gross et al., *Rate of False Conviction of Criminal Defendants Who Are Sentenced to Death*, 111 PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES 7230, 7234 (2014). When confronted with this statistic, a large portion of the general public, including University of Michigan law professor Samuel Gross, found the figure "disturbing." Ed Pilkington, *US death row study: 4% of defendants sentenced to die are innocent*, GUARDIAN (Apr. 28, 2014), http://www.theguardian.com/world/2014/apr/28/death-penalty-study-4-percent-defendants-innocent [http://perma.cc/N9DY-5FRH]. While false convictions in death penalty cases obviously invoke much stronger emotions than responses to cases where defendants are improperly found liable of trespassing, the reaction provides insight for Nesson's Prison Riot hypothetical, where the twenty-four murders may face severe penalties (including death). Thus, there exists some support for the notion that Due Process violations associated with naked statistical evidence should remain viable even in the face of higher guilt probabilities.

143. For example, as Neil Cohen suggests, perhaps a 99.9% chance of guilt would dissipate any inherent injustice within the Gatecrasher's Paradox. *See* Cohen, *supra* note 14, at 396. Again, however, pinpointing the precise limit of the due process defense is beyond the scope of this Note, and is instead left as an open question.

B. The Blue Bus Problem: Highlighting the Contours of the Due Process Defense

The Gatecrasher's Paradox is often discussed in conjunction with other hypotheticals that contemplate the proper place of naked statistical evidence in our legal system. Along with Nesson's Prison Riot hypothetical, Cohen's paradox runs parallel to a third legal puzzle: the Blue Bus problem.[144] A variation of *Smith v. Rapid Transit, Inc.*,[145] the Blue Bus problem highlights the contours of this Note's solution. The problem proceeds as follows:

> While driving late at night on a dark, two-lane road, a person confronts an oncoming bus speeding down the center line of the road in the opposite direction. In the glare of the headlights, the person sees that the vehicle is a bus, but he cannot otherwise identify it. He swerves to avoid a collision, and his car hits a tree. The bus speeds past without stopping. The injured person later sues the Blue Bus Company. He proves, in addition to the facts stated above, that the Blue Bus Company owns and operates 80% of the buses that run on the road where the accident occurred. Can he win?[146]

The Blue Bus problem presents naked statistical evidence in a manner divergent from the probabilities presented in the Gatecrasher's Paradox, a manner that will highlight the scope and reach of the due process defense to bare probabilities. On the surface, the Gatecrasher's Paradox and the Blue Bus problem seem similar—Cohen's problem presents defendants with a 50.1% chance of liability while the Blue Bus problem provides a defendant with an 80% chance of liability.[147] Both of these probabilities are presumably sufficient to satisfy the preponderance standard.[148]

Yet, despite these apparent similarities, the due process analysis proposed by this Note is incompatible with the Blue Bus problem. Recall that the due process violation in the Gatecrasher's Paradox was driven by the factual impossibility at the core of the plaintiff's theory for the case; the extrapolated effect of his sole use of naked statistical evidence results in 1,000 rodeo attendees being found liable for a crime committed by only 501 gatecrashers.[149]

In the Blue Bus problem, however, this factual impossibility is missing. The naked statistical evidence derived from the Blue Bus

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144. *See, e.g.*, Fienberg, *supra* note 5, at 697.

145. 58 N.E.2d 754 (Mass. 1945).

146. Charles Nesson, *The Evidence or the Event? On Judicial Proof and the Acceptability of Verdicts*, 98 HARV. L. REV. 1357, 1378–79 (1985).

147. *Id.*; *cf.* COHEN, *supra* note 3, at 74–75.

148. *See* Cheng, *supra* note 5, at 1259 ("Conventional legal thinking equates the preponderance standard in civil litigation with a requirement that the plaintiff prove her case to a probability greater than 0.5.").

149. *See supra* Part IV.

problem is based on the frequency of buses traveling on the road, not the probability of guilt based on a set population.[150] Even if there were multiple Blue Bus trials, there would always remain a (perhaps minute) possibility that no error has occurred. Stated differently, if there were a second, third, or 1,000th trial, the probability of the Blue Bus Company's guilt remains a constant 80% throughout each—there is no point where an erroneous verdict is certain.[151]

In contrast, such certainty is inevitable in the Gatecrasher's Paradox.[152] Given the set population of 1,000 rodeo attendees, factual impossibility can be found at the core of the plaintiff's theory for the case, and is assured with a verdict against the 502nd defendant. Indeed, assessing a 50.1% chance of liability on each of the defendants would presumably result in 1,000 mutually exclusive verdicts in favor the plaintiff, 499 of which are necessarily erroneous.[153] As noted above, however, assessing liability on the Blue Bus Company for 1,000 accidents would lack the same element of mutual exclusivity. Given that the Blue Bus Company operated 80% of the buses on the road, it is *possible* that the company was indeed the liable party in each of the trials. The due process defense would therefore be unavailable absent a court willing to equate a high degree of improbability with absolute impossibility.

In this way, the Blue Bus problem highlights the contours of the due process defense to naked statistical evidence. For naked statistical evidence to render a trial fundamentally unfair, there must be an element of factual impossibility at the core of a plaintiff's or prosecutor's theory for the case.[154] In the Gatecrasher's Paradox, this element is readily seen.[155] However, the Blue Bus problem invokes naked statistical evidence of a different kind: evidence based on an unchanging probability of liability derived from the frequency of busses on the road.[156] As such, there is no set population by which factual impossibility can be ensured, and the due process defense that defeats the Gatecrasher plaintiff is unavailable to the Blue Bus Company.

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150. That is, there is not a set population by which factual impossibility can be ensured. *See* Nesson, *supra* note 146, at 1378–79.

151. To be sure, as the number of independent trials solely invoking this naked statistical evidence increases, the probability that the Blue Bus Company has been wrongfully found liable increases to a material figure, but there will never exist an absolute certainty that a mistake has been made. Such a move would be equivalent to the potential solution to the Gatecrasher's Paradox dismissed above. *See supra* Section IV.A.

152. COHEN, *supra* note 3, at 74–75.

153. *Id.*

154. *Cf.* Smith v. Groose, 205 F.3d 1045, 1052 (8th Cir. 2000).

155. COHEN, *supra* note 3, at 74–75.

156. Nesson, *supra* note 146, at 1378–79.

Thus, a set population is essential to the viability of the due process defense.[157]

VI. Conclusion

After four decades of discussion, the scholarly debate surrounding the Gatecrasher's Paradox is as strong as ever. Scholars have resolved Cohen's problem from a number of different angles: by discounting the objective probabilities and emphasizing the need to incentivize plaintiffs or prosecutors to provide the best evidence available; by requiring a plaintiff or prosecutor to tailor the available evidence to the defendant on the stand; and by reconceptualizing a plaintiff's or prosecutor's burden of proof. Despite these meritorious responses, the conversation continues—and one key issue that pervades the Gatecrasher's Paradox has been left untouched.

Analyzing the Gatecrasher's Paradox under the lens of due process gives a new perspective on the problem. The constitutional analysis of Cohen's problem changes materially once one recognizes that a plaintiff's or prosecutor's ability to proffer factually irreconcilable theories leading to mutually exclusive verdicts constitutes a due process violation.

Once the 502nd defendant is found liable as a gatecrasher, a due process violation is certain—at least one innocent rodeo attendee has been found liable. But, if the same naked statistical evidence could be used to convict any randomly selected member of a population, and the conviction of the entire population would constitute a due process violation, then there is no concrete barrier between recovery within the realm of the plausible and the realm of the impossible. Given this assertion, holding *even one* defendant liable with such evidence should equally constitute a due process violation.

*G. Alexander Nunn**