



ARTICLE

Stereotypes as Character Evidence

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Abstract. Base rate evidence often connects a defendant to an act through the defendant's membership in a certain population. It includes evidence arising from forensic analysis, criminal profiling, statistical analysis, artificial intelligence, and many other common and emerging scientific methods. But while this evidence is prevalent in civil and criminal trials, it is poorly understood, and there is little predictability in how a court will decide its admissibility or even what standard the court will apply.

In this Article, I show that although some forms of base rate evidence are desirable and even critical to achieving an accurate case outcome, a common form of base rate evidence called profile evidence often constitutes unrecognized *character evidence*—evidence that a defendant acted in accordance with a certain character trait—which is prohibited by federal and state evidentiary rules. To show this, and to describe precisely the relationship between base rate evidence and ordinary character evidence, I draw on a statistical tool called Bayesian inference to define a concept that I call *predictive character evidence*. Predictive character evidence describes a behavioral propensity of a population to suggest that an individual member of the population acted in accordance with this propensity. I show that this evidence—a form of base rate evidence that involves behavioral stereotyping—relies on character reasoning and is therefore impermissible under the rule against character evidence.

Finally, I discuss critical implications of my analysis. First, I show how an understanding of predictive character evidence helps resolve longstanding confusion and inconsistency surrounding base rate evidence and profile evidence in particular. I then demonstrate that applying the rule against character evidence to determine the admissibility of profile evidence is essential to achieving correct and predictable evidentiary decisions, to minimizing the influence of implicit biases based on race and other personal characteristics of a defendant, and to reaching accurate verdicts.

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Introduction

Criminal profiling aims to connect a specific defendant to a crime or act by describing the probable features or conduct of a type of criminal offender or actor.¹ Its use is common (although controversial) in police investigations—for example, to detect securities fraud or investigate a murder.² However, when a court admits profiling *as evidence*, it takes on a particularly pernicious character.

Consider, for example, the case of *People v. Masters*, in which the police relied on the guidance of a profiling expert (a forensic psychologist) to identify probable features of the perpetrator of a murder and thereby arrest a suspect.³ At trial, the same expert testified regarding the probable features of the perpetrator—for example, the likely existence of a triggering event in the perpetrator’s life, prior fantasies about committing the murder, preference for a surprise attack, and a link to the perpetrator’s past.⁴ He then connected these features to the defendant.⁵ The trial court admitted this evidence, and the prosecutor relied heavily on it to prove the government’s case and obtain a conviction.⁶ The court of appeals and the state supreme court later upheld the admission.⁷ Approximately nine years after the defendant’s conviction and imprisonment, exculpatory DNA evidence came to light, leading to the defendant’s exoneration.⁸ The case was built on profile evidence, and it resulted in a false conviction.

Profile evidence is not limited to murder cases. It is common in cases involving drug trafficking, domestic abuse, fraud, and many other offenses.⁹ For example, a drug-trafficking case may involve testimony that the defendant fits the profile of a drug courier because he arrived in the United States from

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1. See, e.g., *Reid v. Georgia*, 448 U.S. 438, 440 (1980) (per curiam) (defining a drug courier profile as “a somewhat informal compilation of characteristics believed to be typical of persons unlawfully carrying narcotics”); see also *infra* notes 52-59 and accompanying text (describing profile evidence and its treatment in court).
 2. See *infra* notes 57-78 and accompanying text; see also, e.g., *United States v. Sokolow*, 490 U.S. 1, 10 (1989) (“[T]he fact that these factors [providing the officer’s basis for reasonable suspicion] may be set forth in a ‘profile’ does not somehow detract from their evidentiary significance as seen by a trained agent.”).
 3. 33 P.3d 1191, 1195 (Colo. App. 2001).
 4. See *Masters v. People*, 58 P.3d 979, 985-87 (Colo. 2002).
 5. See *id.*
 6. See *id.* at 985-88.
 7. See *id.* at 988-94, 1002-03.
 8. See Maurice Possley, *Timothy Masters*, NAT’L REGISTRY OF EXONERATIONS, <https://perma.cc/S5E5-A444> (last updated May 2, 2022).
 9. See *infra* notes 59-78 and accompanying text.

Colombia and paid for his ticket in cash.¹⁰ A domestic violence case may involve evidence of a defendant’s behaviors to suggest that, based on data from a broader population, the defendant was an abuser who was more likely to become a murderer.¹¹

Indeed, the United States Supreme Court recently highlighted the significance of profile evidence in *Diaz v. United States*, a drug-trafficking case in which the prosecutor sought to prove the defendant knowingly possessed narcotics by introducing profile evidence indicating that it is rare for drug couriers to be unknowing participants in their trafficking activities.¹² Notwithstanding the defendant’s objections, the Ninth Circuit upheld the district court’s admission of this evidence and affirmed the defendant’s conviction.¹³ The Supreme Court granted certiorari but ultimately affirmed the judgment of the Ninth Circuit.¹⁴

Profile evidence is a type of “base rate evidence”—a broad category of evidence that has become increasingly common in civil and criminal cases.¹⁵ In statistics, a base rate indicates the prevalence of a feature in a population.¹⁶ For example, assume that a thirty-year-old patient who has not recently traveled abroad enters a New York hospital with a fever, headache, chills, and fatigue. A doctor is likely to be influenced by the base rates of diseases involving these symptoms in the relevant “reference population”—a comparison population, such as New York’s population of thirty-year-olds. These base rates are likely to lead the doctor to conclude that the patient has a cold, the flu, or COVID-19 rather than malaria, which has a very low base rate, or prevalence, in the reference population.¹⁷ Therefore, base rates may lead the doctor to test for certain diseases and not for others.

10. See, e.g., *United States v. Gomez-Norena*, 908 F.2d 497, 498-99 (9th Cir. 1990).

11. See *infra* notes 76-77 and accompanying text.

12. 144 S. Ct. 1727, 1730-32 (2024).

13. See *United States v. Diaz*, No. 21-50238, 2023 WL 314309, at *2-3 (9th Cir. Jan. 19, 2023).

14. *Diaz*, 144 S. Ct. at 1735.

15. See *infra* Parts I.A, III.A; see also Jonathan J. Koehler, *When Do Courts Think Base Rate Statistics Are Relevant?*, 42 JURIMETRICS 373, 385-400 (2002) (discussing applications of base rates); David Enoch & Talia Fisher, *Sense and “Sensitivity”: Epistemic and Instrumental Approaches to Statistical Evidence*, 67 STAN. L. REV. 557, 558-59 (2015) (“Questions regarding the admissibility and sufficiency of statistical evidence arise in court with ever-growing frequency . . .”).

16. See Koehler, *supra* note 15, at 374 (“The social science literature defines a base rate as a proportion—the relative frequency with which an event occurs or an attribute is present in some reference population.”); PETER D. HOFF, A FIRST COURSE IN BAYESIAN STATISTICAL METHODS 3-4 (2009) (discussing concepts of prevalence and probability).

17. Compare *New York*, CDC, <https://perma.cc/8KYY-PLVU> (archived Oct. 6, 2024) (listing COVID-19 and influenza among the top ten leading causes of death in New York State), with Ashwin Vasani, New York City Dep’t Health & Mental Hygiene Comm’r, *footnote continued on next page*

Base rates are relevant to legal cases for the same reason they are fundamental in statistics and medicine: They suggest the probability of an occurrence, feature, or act based on its prevalence in a broader population. They appear in various forms and can be crucial to achieving an accurate verdict. For example, base rate evidence may appear in the form of DNA evidence offered to connect a defendant to a crime based on the prevalence of a DNA profile in a population, or it may appear as evidence that 80% of a certain population committed a particular act (such as trespass) to suggest that a specific defendant who is member of the population committed the same act.¹⁸ But while base rate evidence has the potential to be highly impactful on the outcome of a case,¹⁹ admissibility decisions surrounding this evidence are at best unprincipled and unpredictable.²⁰ Arguably, many of these decisions are altogether incorrect.

The courts' treatment of profile evidence is particularly problematic. There is little predictability in how a court will decide the admissibility of this evidence—or even which rule it will apply in the first instance.²¹ While forensic evidence and many other forms of base rate evidence are commonplace and often beneficial, profile evidence is different, and although courts seem to recognize its problematic nature, they seem confused as to how to analyze it or why it should be excluded—as though courts are missing an important factor in their analysis.

In this Article, I argue that courts are in fact missing a central component of the analysis. I trace the unpredictability and incoherence surrounding the admissibility of profile evidence to a misunderstanding about the nature of this evidence and what separates helpful from harmful forms of base rate evidence. Specifically, I show that although some forms of base rate evidence are

2023 Health Advisory #21: CDC Advisory: Locally Acquired Malaria Cases Identified in Florida, Texas, and Maryland (Sept. 25, 2023), <https://perma.cc/6CQ2-UPL8> (noting that an average of only 292 malaria cases are diagnosed annually in New York, with 44% of cases occurring in individuals between the ages of eighteen and forty-four, and that locally acquired malaria is very rare in the United States).

18. “Associational evidence” can appear as another form of base rate evidence that indicates the defendant’s association with others for purposes of linking the defendant to a crime or act—just on a more individual level. *See, e.g., Dawson v. Delaware*, 503 U.S. 159, 166 (1992) (noting that associational evidence can be used to show a defendant poses a future threat to society). For example, it may involve evidence that a defendant associates with individuals who have been convicted of drug offenses to prove that the defendant is more likely to have committed the drug offense in question. *See United States v. Romo*, 669 F.2d 285, 288-89 (5th Cir. 1982) (finding that introducing drug convictions of defendant’s acquaintances constituted impermissible “guilt by association”); *see also infra* notes 48-51 and accompanying text.
19. *See infra* note 53 and accompanying text.
20. *See Enoch & Fisher, supra* note 15, at 558-62.
21. *See infra* Part I.A.

desirable and even critical to achieving an accurate case outcome, profile evidence often constitutes unrecognized *character evidence*, a type of evidence that is highly prejudicial and prohibited by federal and state evidentiary rules.

In criminal and civil trials, Federal Rule of Evidence (FRE) 404 and analogous state rules prohibit character evidence.²² Character evidence is evidence of a person's propensities or other acts (acts not at issue in a case) offered to suggest that the person acted in conformity with their propensities or prior acts on the occasion in question.²³ For example, a prosecutor generally may not introduce evidence that a defendant committed two prior robberies to prove that the defendant acted in accordance with a propensity to commit robbery on the occasion in question.²⁴ Although this evidence can be quite probative (and, as such, is sometimes admitted under an expanding set of exceptions²⁵), the general ban on character evidence is based on the profound prejudicial impact that such evidence has on the outcome of a case.²⁶ As one court has stated, "an obvious truth is that once prior convictions are introduced the trial is, for all practical purposes, completed and the guilty outcome follows as a mere formality."²⁷

To demonstrate that a significant subset of base rate evidence—and profile evidence in particular—constitutes prohibited character evidence, and to describe the relationship between base rate evidence and character evidence, I begin by clarifying the meaning, properties, and effects of character evidence. I then draw on an area of statistics called Bayesian inference to define a concept that I call *predictive character evidence*. Predictive character evidence is base rate evidence that fulfills four criteria summarized by the acronym PBIC: predictive, behavioral, individualized, and characterizing. It describes evidence

22. See FED. R. EVID. 404.

23. See *id.*

24. For clarity, I frequently refer to a criminal defendant as the individual about whom evidence is offered. However, the discussion herein applies to civil and criminal cases and to any individual about whom such evidence is offered.

25. See Dora W. Klein, "Rule of Inclusion" Confusion, 58 SAN DIEGO L. REV. 379, 383-403 (2021); Daniel J. Capra & Liesa L. Richter, *Character Assassination: Amending Federal Rule of Evidence 404(b) to Protect Criminal Defendants*, 118 COLUM. L. REV. 769, 771-76 (2018) (describing how federal courts regularly admit character evidence); Dora W. Klein, *The (Mis)application of Rule 404(b) Heuristics*, 72 U. MIA. L. REV. 706, 713-21 (2018) (observing the growth of "exceptions" to FRE 404 in the federal circuit courts); see also Paul S. Milich, *The Degrading Character Rule in American Criminal Trials*, 47 GA. L. REV. 775, 776-79 (2013) ("[T]he character rule has become porous with exceptions and unpredictable in application."); Steven Goode, *It's Time to Put Character Back into the Character-Evidence Rule*, 104 MARQ. L. REV. 709, 711-16, 723-24 (2021) (describing the "mess" surrounding FRE 404 and its exceptions).

26. See Capra & Richter, *supra* note 25, at 772 ("Proof of a criminal defendant's past crimes has a dramatic effect on a jury, almost guaranteeing conviction.").

27. *United States v. Burkhardt*, 458 F.2d 201, 204 (10th Cir. 1972).

regarding a behavioral propensity of a population to suggest that an individual member of the population acted in accordance with this propensity. Predictive character evidence is a form of base rate evidence that involves behavioral stereotyping, and it is surprisingly common in civil and criminal trials. As I show below, however, it relies on impermissible character reasoning. This is because inferring a defendant's behavior from a population's propensity requires an inference that the defendant acted in accordance with a character or propensity on the occasion in question.²⁸ As such, *predictive* character evidence is the unrecognized link between base rate evidence and ordinary impermissible character evidence: Predictive character evidence involves character reasoning and is therefore character evidence; however, it is a special type of character evidence that involves base rate evidence that satisfies the PBIC criteria. That is, when base rate evidence fulfills the PBIC criteria, it constitutes predictive character evidence and is impermissible under FRE 404 and analogous state rules.²⁹

Finally, after carefully defining predictive character evidence and applying the PBIC criteria to delineate precisely when base rate evidence constitutes impermissible character evidence, I show that this relationship resolves significant problems in evidence law. Specifically, my analysis answers two important questions—one descriptive and one prescriptive.

The first question is: What explains the inconsistency and incoherence surrounding the admissibility of profile evidence? Further, given the suspicion with which courts treat profile evidence, what distinguishes this evidence from common forms of admissible base rate evidence, such as forensic evidence and various forms of statistical evidence? I argue that the nature of most profile evidence as predictive character evidence is at the root of the confusion and unpredictability. Specifically, although courts seem to realize the problematic nature of profile evidence, they fail to recognize the relationship between base rate evidence and character evidence and the role of character reasoning in

28. The character inference that a defendant is more likely to have committed the assault in question because the defendant has committed assaults in the past is based on the generalization that people act consistently with their character. Inferences based on a population propensity depend on the generalization that people act consistently not only with their own character but also with the character of others—i.e., that there are meaningful patterns in how people act from person to person within a reference population.

29. A note regarding terminology: Throughout the Article, I use the term “predictive character evidence” to refer specifically to base rate evidence that fulfills the PBIC criteria and the term “character evidence” to refer generically to evidence whose chain of inferences involves character reasoning (pursuant to FRE 404). In addition, I sometimes use the term “ordinary character evidence” to emphasize my focus on character evidence that does not necessarily constitute predictive character evidence or to put predictive character evidence in conversation with character evidence more broadly.

profile evidence. Therefore, courts turn to basic evidentiary principles of relevance (including a balancing of probative value and unfair prejudice) and reliability to determine the admissibility of this evidence.³⁰ While profile evidence is relevant and often is reliable, courts rely on these principles by default to intuit the admissibility of profile evidence. This leads to unpredictability, incorrect evidentiary determinations, and poor precedent.³¹

Indeed, in *Diaz*, the Ninth Circuit considered arguments grounded in relevance, reliability, and unfair prejudice.³² But the court ultimately affirmed the district court's admission of profile evidence regarding the unlikelihood that a drug courier would be an unknowing participant in the trafficking of narcotics.³³ Relying on basic principles of relevance and reliability, neither the district court nor the Ninth Circuit considered FRE 404's ban on character evidence.³⁴ The Supreme Court reviewed the Ninth Circuit's judgment under FRE 704(b), which prevents an expert in a criminal case from opining on "whether the defendant did or did not have a mental state or condition that constitutes an element of the crime charged or of a defense."³⁵ The Court affirmed the Ninth Circuit's judgment, finding that "[a]n expert's conclusion that 'most people' in a group have a particular mental state is not an opinion about 'the defendant' and thus does not violate Rule 704(b)."³⁶

The second question is: When should courts admit or exclude base rate evidence, and profile evidence in particular? I argue that whether base rate evidence fulfills the PBIC criteria (and therefore constitutes predictive character evidence) should be a central determinant of admissibility. I demonstrate that applying the rule against character evidence to determine the admissibility of base rate evidence—and profile evidence in particular—is essential to achieving correct and predictable evidentiary decisions. This has important implications for defense attorneys, prosecutors, and courts. Specifically, I show that by resorting to rudimentary principles of relevance and reliability, courts and advocates promote unpredictability and incorrect verdicts that are premised not on the act at issue in a given case but on a

30. See *infra* Part I.A.

31. See *infra* Part I.

32. See *United States v. Diaz*, No. 21-50238, 2023 WL 314309, at *2 (9th Cir. Jan. 19, 2023).

33. See *id.* at *2-3.

34. See *id.*; Transcript of Motion in Limine Hearing at 18-20, *United States v. Diaz*, No. 20-cr-02546 (S.D. Cal. Jan. 8, 2021), ECF No. 43; see also *United States v. Campos*, 217 F.3d 707, 712 (9th Cir. 2000) (considering FRE 704(b)'s bar on opinion evidence regarding whether a defendant had a mental state that is an element of the charge or defense, but not FRE 404, in a case involving testimony indicating that "marijuana trafficking organizations do not use 'unknowing couriers'").

35. FED. R. EVID. 704(b).

36. *Diaz v. United States*, 144 S. Ct. 1727, 1735 (2024).

defendant's purported character and the acts of others.³⁷ Applying the rule against character evidence (in addition to rules regarding relevance, reliability, and unfair prejudice) would address these concerns and serve the law's aims of fairness and accuracy.

In addition, I demonstrate implications for legal outcomes based on race, gender, appearance, and other personal characteristics of a defendant. I show how inferences from predictive character evidence involve a perfect storm that combines character reasoning with behavioral stereotyping to create biased legal outcomes. I then argue that the rule against character evidence is critical as a mechanism for excluding these inferences and the evidence that permits them.³⁸

Lastly, I highlight the close connection between base rate evidence and artificial intelligence and other technologies that extrapolate from population-level data. I argue that evidence based on these technologies may often constitute predictive character evidence and, as such, should be analyzed under the rule against character evidence.³⁹

This Article proceeds as follows: Part I discusses the courts' unprincipled and inconsistent treatment of base rate evidence in general and profile evidence in particular. Part II begins by clarifying the meaning of ordinary character evidence. It then introduces and develops the concept of predictive character evidence and uses this concept to describe the relationship between base rate evidence and character evidence. Part III discusses critical implications of my analysis for profile evidence, and base rate evidence more broadly.

I. The Courts' Unprincipled Treatment of Profile Evidence

Evidence must be relevant to be admissible. Under FRE 401, "[e]vidence is relevant if: (a) it has any tendency to make a fact more or less probable than it would be without the evidence; and (b) the fact is of consequence in determining the action."⁴⁰ The relevance of base rate evidence relies on the generalization that there is some consistency among members of a population. For example, if a certain type of light bulb lasts one hundred hours on average, then a particular bulb of that type is likely to last closer to one hundred hours than eighty hours. Similarly, if 95% of people in a certain population drive above the speed limit on a certain road, there is a high likelihood that an

37. See *infra* Parts I.B.1, III.B.

38. See *infra* Part III.C.

39. See *infra* Part III.D.

40. FED. R. EVID. 401.

individual member of the population will drive over the speed limit on that road and a low likelihood that she will not.

We rely on such generalizations regularly in everyday life,⁴¹ and we rely on them implicitly in many evidentiary inferences. For example, in a murder trial, evidence that the defendant planned to kill the victim is relevant because “[o]n the basis of an acceptable generalization we are able . . . to place [the defendant] in a class of persons in which the incidence of murder is greater than among the general public,” thus altering the probability of guilt based on the defendant’s membership in a reference population.⁴² That is, the defendant is more likely to have killed the victim because the defendant is a member of a population that has planned to kill, and these people have a greater likelihood than the general public of murdering their intended victim.

Base rate evidence involves explicit information about the prevalence of a feature in a population, often to suggest the existence of the feature in an individual member of the population in line with its population prevalence.⁴³ In some legal contexts, base rate evidence is commonplace and sometimes critical to achieving an accurate verdict. For example, forensic evidence often involves statistical base rate evidence.⁴⁴ DNA evidence, for instance, may provide information about the improbability of a random individual in a reference population having DNA features that match the features in a sample found at a crime scene.⁴⁵ Similarly, statistical evidence involving base rates often serves as the gold standard to prove causation in toxic-tort cases and disparate treatment or impact in discrimination cases.⁴⁶

41. See FREDERICK F. SCHAUER, PROFILES, PROBABILITIES, AND STEREOTYPES 1-25 (2003).

42. George F. James, *Relevancy, Probability and the Law*, 29 CALIF. L. REV. 689, 699 (1941).

43. See *supra* notes 15-20 and accompanying text.

44. See Koehler, *supra* note 15, at 388-89.

45. See *id.* Note that DNA evidence and other forms of base rate evidence frequently involve a risk of misinterpretation by jurors. For example, jurors may commit a transpositional error, or more specifically, the prosecutor’s fallacy, which involves misinterpreting a base rate—e.g., a very low prevalence of certain features or a DNA profile—as the probability of a defendant’s innocence or guilt. See William C. Thompson, *How Should Forensic Scientists Present Source Conclusions?*, 48 SETON HALL L. REV. 773, 805-06 (2018). More precisely, this error involves misinterpreting the probability of the features or profile conditional on the defendant’s innocence or guilt for the probability of the defendant’s innocence or guilt conditional on the features or profile.

46. See, e.g., *Norris v. Baxter Healthcare Corp.*, 397 F.3d 878, 882 (10th Cir. 2005) (“[E]pidemiology is the best evidence of general causation in a toxic tort case.”); *Brock v. Merrell Dow Pharms., Inc.*, 874 F.2d 307, 311 (5th Cir. 1989) (“Undoubtedly, the most useful and conclusive type of evidence in a case such as this is epidemiological studies.”); *Palmer v. Shultz*, 815 F.2d 84, 90-97 (D.C. Cir. 1987) (“Title VII . . . provides that if the disparity between selection rates for men and women is sufficiently large so that the probability that the disparities resulted from chance is sufficiently small, then a court will infer from the numbers alone that, more likely than not, the disparity was a
footnote continued on next page

However, notwithstanding the acceptability, prevalence, and recognized value of certain types of base rate evidence, courts struggle to determine the admissibility of a particular form of this evidence: profile evidence. As described below, to evaluate the admissibility of profile evidence, courts apply a mix of basic evidentiary principles of relevance and reliability that leave the admissibility determination largely in the discretion of the court. And while courts seem to recognize the problematic nature of profile evidence, they seem confused as to how to analyze it or why it should be excluded. Consequently, courts are as unpredictable in their analysis as they are in their evidentiary determinations surrounding this evidence.

A. Profile Evidence

Profile evidence connects a defendant to a crime or act by describing the probable features or conduct of a type of criminal offender or actor.⁴⁷ Effectively, a prosecutor offers evidence regarding the acts or propensities of individuals *other* than the defendant to suggest circumstantially that the defendant acted in accordance with these acts or propensities. Consider the following hypothetical based on the post-apocalyptic television series *The Walking Dead*: A group of five visitors wanders into an established settlement seeking refuge from the zombie-ridden world outside the walls of the settlement.⁴⁸ The citizens of the settlement do not know anything about the group. They are wary of outsiders but willing to consider granting them temporary refuge or even permanent residence. Suppose that on the first night of the visitors' stay, three of the five are involved in perpetrating violent acts against members of the settlement. The following morning, the citizens of the settlement hold a hearing and decide to expel the group—including Mo and Jo, two visitors who were known to be uninvolved in the violent acts of their associates. The acts of the other three visitors provide information about the propensity of the group of visitors as a whole to suggest that Mo and Jo are likely to act in accordance with this propensity in the future.

product of unlawful discrimination—unless the defendant can introduce evidence of a nondiscriminatory explanation for the disparity or can rebut the inference of discrimination in some other way.”).

47. See, e.g., *Reid v. Georgia*, 448 U.S. 438, 440 (1980) (per curiam) (defining a drug courier profile as “a somewhat informal compilation of characteristics believed to be typical of persons unlawfully carrying narcotics”); *People v. Lasenby*, No. 273753, 2007 WL 3170137, at *2 (Mich. App. Oct. 30, 2007) (per curiam) (“Drug profile evidence is ‘an informal compilation of characteristics often displayed by those trafficking in drugs.’” (quoting *People v. Murray*, 593 N.W.2d 690, 693 (Mich. App. 1999))); *United States v. Slocum*, 464 F.2d 1180, 1181-82 (3d Cir. 1972) (explaining that the FAA’s “pre-boarding screening program” involves a profile comprised of “approximately twenty-five characteristics which studies have shown to be held in common by past hijackers”).

48. See *The Walking Dead: Out of the Ashes* (AMC television broadcast Sept. 19, 2021).

I refer to this type of evidence, wherein the individual acts of others are offered to prove a defendant's propensity, as associational evidence. Courts frequently exclude associational evidence when it is offered to prove a defendant's guilt. For example, in a drug case, a court is likely to exclude evidence that the defendant associates with individuals who have been convicted of drug offenses if it is offered to prove that the defendant is more likely to have committed the drug offense in question.⁴⁹ Courts typically exclude this evidence on grounds of relevance or unfair prejudice, concluding either that the acts of others are not probative of whether the defendant committed the crime in question (as required by FRE 401)⁵⁰ or that any probative value of the evidence is substantially outweighed by its unfair prejudice (pursuant to FRE 403).⁵¹

Profile evidence is a close variant of associational evidence. It similarly relies on an inference that the defendant acted in accordance with the acts of others in a reference population, but it reframes the evidence as probable features or conduct of a type of criminal offender or actor.⁵² It arises frequently in criminal cases, and it has the potential to be highly impactful on a case's outcome.⁵³ Nevertheless, courts have rendered unprincipled and inconsistent

49. See *United States v. Romo*, 669 F.2d 285, 288-89 (5th Cir. 1982) (finding that introducing drug convictions of defendant's acquaintances constituted impermissible "guilt by association"); see also *United States v. Polasek*, 162 F.3d 878, 884 n.2 (5th Cir. 1998) ("We have not yet explicitly determined what statute or rule of evidence guilt by association evidence violates. Many of our sister circuits, however, have concluded that such evidence is irrelevant under Federal Rules of Evidence 401 and 402 or unduly prejudicial under Rule 403." (citing cases in the First, Second, Sixth, Seventh, Eighth, and D.C. Circuits)).

50. FED. R. EVID. 401; see also *id.* r. 402 ("Irrelevant evidence is not admissible.").

51. *Id.* r. 403 ("The court may exclude relevant evidence if its probative value is substantially outweighed by a danger of . . . unfair prejudice . . ."); see *Polasek*, 162 F.3d at 884-85 n.2 ("[T]here are two arguments against guilt by association evidence: first, that it is not relevant as that term is defined in Rule 401 and hence is inadmissible under Rule 402, and second, that even if it is relevant, it is unduly prejudicial and excludible under Rule 403.").

52. See *United States v. Doe*, 149 F.3d 634, 638 (7th Cir. 1998) ("If the only purpose of profile evidence is to support an inference of guilt by association, then an objection to the evidence would be well-founded. . . . [H]owever, this was not the thrust of [the DEA agent's] testimony about the *modus operandi* of Nigerian drug traffickers, which delved into specifics about the typical routing of the drug, methods of delivery, and efforts to avoid detection by police."); see also *infra* notes 66-67.

53. See *People v. Martinez*, 10 Cal. App. 4th 1001, 1005-07 (Ct. App. 1992) (highlighting the potential effect of profile evidence and recognizing a prior court's view that such evidence may invoke principles of due process); see also Mark J. Kadish, *The Drug Courier Profile: In Planes, Trains, and Automobiles; and Now in the Jury Box*, 46 AM. U. L. REV. 747, 782-90 (1997).

decisions as to the admissibility of this evidence.⁵⁴ They generally apply a hodgepodge of precedent and basic evidentiary principles of relevance (including unfair prejudice) and reliability to intuit these decisions.

Specifically, many courts have held that profile evidence “should not be admitted as substantive evidence of a defendant’s guilt.”⁵⁵ Others have held that if such evidence “is relevant to the defendant’s guilt or innocence, then it is potentially admissible at trial.”⁵⁶ Indeed, even courts that generally exclude profile evidence have simultaneously carved out a broad set of exceptions that arguably negate the general rule or at least leave the admissibility decision wide open to a court’s discretion.⁵⁷ For example, courts generally admit profile evidence to provide background, show *modus operandi* (MO), or rebut an allegation or defense.⁵⁸ Moreover, as described below, when a court excludes profile evidence, the exclusion is frequently based on either the legal fiction that the evidence is not relevant under FRE 401 or the conclusion that, although relevant, the evidence is unduly prejudicial under FRE 403.

Consider, for example, the use of profile evidence in the drug-trafficking context. In a case in which the defendant was convicted of drug trafficking, the defendant appealed, arguing that the district court incorrectly admitted profile evidence—testimony by a special agent—that “tied his behavior to that of a drug courier” through factors such as the use of a hard-sided suitcase, the use of a pager, the use of an itinerary that involved multiple stops that were short in duration, and stated plans that involved doing business or visiting a relative.⁵⁹ The Ninth Circuit rejected the government’s argument that the evidence was

54. See *People v. Masters*, 33 P.3d 1191, 1203-04 (Colo. App. 2001) (highlighting that “[t]he use of psychological theories, syndromes, profiles, and comparative expert testimony in criminal cases has been significantly debated”; and that “[c]ourts have likewise reached differing conclusions” regarding “when and how such evidence should be used” (citing cases)).

55. *People v. Lasenby*, No. 273753, 2007 WL 3170137, at *2 (Mich. App. Oct. 30, 2007); see also *Kadish*, *supra* note 53, at 760-61 (“The majority rule is that drug courier profile evidence may not be admitted as ‘substantive’ evidence of guilt at trial The Seventh Circuit, taking a minority position, admits profile evidence to prove guilt directly.” (footnote omitted)).

56. *E.g.*, *United States v. Foster*, 939 F.2d 445, 451 (7th Cir. 1991).

57. See, *e.g.*, *Kadish*, *supra* note 53, at 760-61 (listing “liberal exceptions that virtually have subsumed the purported rule”).

58. See, *e.g.*, *Lasenby*, 2007 WL 3170137, at *2; *United States v. Beltran-Rios*, 878 F.2d 1208, 1212-13 (9th Cir. 1989).

59. *United States v. Lui*, 941 F.2d 844, 846 (9th Cir. 1991). Note that this common form of profile evidence constitutes base rate evidence because although it does not explicitly supply a *quantitative* prevalence value—such as a fraction representing the proportion of drug trafficking in the defined subpopulation to that in the general public—the evidence indeed suggests a *higher* prevalence in the subpopulation relative to the general population.

admissible as MO evidence and determined that “[t]here was . . . little, if any, probative value to offset the potential prejudice caused by [the special agent’s] testimony regarding drug courier profiles.”⁶⁰ It concluded that the district court abused its discretion in admitting the evidence, finding that “[b]y providing such testimony and tying it to [the defendant], [the special agent] took items that were perfectly innocent—use of a hard-sided suitcase, traveling for the stated purpose of visiting a relative—and turned them into evidence of guilt.”⁶¹

But in another case, *United States v. Gomez-Norena*, the Ninth Circuit found that similar drug-courier profile evidence—evidence that the defendant arrived from Colombia, paid for his ticket with cash, and was in the United States only in transit to Australia—was admitted by the district court “not to prove that [the defendant] was guilty, but to provide the jury with a full and accurate portrayal of the events as they unfolded.”⁶² The Ninth Circuit highlighted that the “district judge twice cautioned the jury that it could consider [the witness’s] testimony only as background material” and held that “admitting drug courier profile testimony for this limited purpose greatly reduces the potential for unfair prejudice and thus cannot amount to plain error.”⁶³ Similarly, the Seventh Circuit upheld the admission of the defendant’s possession of pager numbers and expert testimony regarding the role of pagers in drug-trafficking activities as evidence to establish the defendant’s intent to distribute cocaine.⁶⁴ Over the defendant’s objections on the bases of relevance and unfair prejudice, the Seventh Circuit found that the lower court “did not err in admitting the testimony.”⁶⁵

Further, in *United States v. Doe*, the Seventh Circuit upheld the admission of expert testimony by a DEA agent indicating “that white heroin from Southeast Asia is commonly smuggled into the U.S. through Nigerian traffickers” and describing “practices of Nigerian drug smugglers,” such as using mailing addresses in smaller cities for drug shipments and using false identities.⁶⁶ The court found that the testimony was relevant to proving “intent to possess and distribute heroin” and that it “explained the common practices and *modus*

60. *Id.* at 847-48.

61. *Id.* The Ninth Circuit also highlighted the district court’s failure to provide a limiting instruction. *Id.* at 848. However, the Ninth Circuit ultimately determined that the trial court’s error was harmless in light of the other evidence in the case. *Id.*

62. 908 F.2d 497, 498, 501 (9th Cir. 1990).

63. *Id.* at 501.

64. *United States v. Solis*, 923 F.2d 548, 549-51 (7th Cir. 1991).

65. *Id.* at 550-51.

66. 149 F.3d 634, 636-37 (7th Cir. 1998).

operandi of Nigerian drug traffickers,” thus allowing the jury to “compare that information to the facts of th[e] case and [the defendant’s] own behavior.”⁶⁷

Similar patterns of admissibility appear in many other substantive contexts. For example, in *People v. Masters*, discussed in the Introduction, the Colorado Court of Appeals and Colorado Supreme Court upheld the admission of expert testimony regarding the characteristics of perpetrators of sexual homicides and how they related to the defendant and the murder at issue.⁶⁸ The appellate court upheld the evidence as “framework evidence,”⁶⁹ and the Colorado Supreme Court upheld it under principles of reliability, relevance, and unfair prejudice.⁷⁰

In the context of sexual assault and abuse cases, courts have acknowledged that profile evidence is “highly undesirable as substantive evidence because it is of low probativity and inherently prejudicial.”⁷¹ As one court explained:

A criminal trial is by its very nature an individualized adjudication of a defendant’s guilt or legal innocence. Testimony regarding a criminal profile is nothing more than an expert’s opinion as to certain characteristics which are common to some or most of the individuals who commit particular crimes. Evidence of a “child battering profile” does not meet the relevancy test, because the mere fact that a defendant fits the profile does not tend to prove that a particular defendant physically abused the victim.⁷²

But courts have regularly admitted profile evidence as background, as “an investigative tool to establish reasonable suspicion,” and as rebuttal evidence.⁷³ For example, in a murder and rape case, to rebut the defendant’s testimony that sexual intercourse with the victim was consensual, the trial court admitted evidence by a psychiatrist “who had made a study of the psychology of rapists” and “characterized [the] defendant as of the class of aggressive, antisocial or

67. *Id.* at 637.

68. See *People v. Masters*, 33 P.3d 1191, 1204-05 (Colo. App. 2001); *Masters v. People*, 58 P.3d 979, 985-87, 992, 994, 1004-05 (Colo. 2002). For instance, the Colorado Supreme Court upheld the admission of testimony connecting these characteristics to drawings produced by the defendant and incidents in the defendant’s life—such as the death of his mother and a triggering incident for the crime in question. See *Masters*, 58 P.3d at 985-88, 992-93, 994, 1004.

69. *Masters*, 33 P.3d at 1204. See generally David L. Faigman, John Monahan & Christopher Slobogin, *Group to Individual (G2i) Inference in Scientific Expert Testimony*, 81 U. CHI. L. REV. 417 (2014) (discussing framework evidence and “group to individual” inference); Laurens Walker & John Monahan, *Social Frameworks: A New Use of Social Science in Law*, 73 VA. L. REV. 559 (1987) (discussing the use of “social frameworks” in court).

70. *Masters*, 58 P.3d at 988-94.

71. *United States v. Gillespie*, 852 F.2d 475, 480 (9th Cir. 1988).

72. *Commonwealth v. Day*, 569 N.E.2d 397, 399 (Mass. 1991) (citing cases).

73. *United States v. Banks*, 36 M.J. 150, 162 (C.M.A. 1992).

sociopathic, hatred rapists.”⁷⁴ The Iowa Supreme Court upheld the admission, finding that “this testimony was admissible as rebutting [the] defendant’s claim of consensual intercourse.”⁷⁵

In the domestic violence context, an Arkansas trial court admitted expert testimony indicating that the defendant, based on certain population-level factors, strongly fit the profile of an abusive partner who was likely to become a murderer.⁷⁶ The Arkansas Supreme Court held that “the profiling of batterers likely to become killers and then placing [the defendant] within that category was unduly prejudicial to his case and, thus, violated Rule 403.”⁷⁷ On the other hand, in a case involving the murder of an infant by shaking, the United States Court of Appeals for the Armed Forces upheld the admission of evidence that a high proportion “of all shaken baby cases are perpetrated by male caregivers” to rebut the allegation that it was the defendant’s wife rather than the defendant himself who committed the killing.⁷⁸

Finally, some courts have addressed the rule against character evidence in considering the admissibility of profile evidence. However, this occurs primarily in cases in which character reasoning is more apparent, and even in these cases, courts tend to either reject the applicability of FRE 404 or acknowledge its potential applicability but then analyze the evidence under non-character principles of, for instance, relevance, reliability, and unfair prejudice.⁷⁹

First, courts occasionally assess profile evidence under the rule against character evidence. This usually occurs when a party offers profile evidence explicitly to suggest a character trait that is indicative of prohibited character reasoning. For example, in the murder case *Ryan v. State*, the Wyoming Supreme Court determined that, under principles of relevance, unfair prejudice, and character evidence, the trial court incorrectly admitted expert testimony regarding the controlling and isolating tendencies of batterers.⁸⁰

74. *State v. Hickman*, 337 N.W.2d 512, 516 (Iowa 1983).

75. *Id.*

76. *Brunson v. State*, 79 S.W.3d 304, 308, 311 (Ark. 2002).

77. *Id.* at 313; *see also* ARK. R. EVID. 403 (“Although relevant, evidence may be excluded if its probative value is substantially outweighed by the danger of unfair prejudice, confusion of the issues, or misleading the jury, or by considerations of undue delay, waste of time, or needless presentation of cumulative evidence.”).

78. *United States v. Bresnahan*, 62 M.J. 137, 146-47 (C.A.A.F. 2005).

79. *See, e.g., United States v. Wells*, 879 F.3d 900, 919-24 (9th Cir. 2018) (involving expert testimony that the perpetrator would likely be “pathologically narcissistic,” with a “strong sense of entitlement” and a “very inflated view of themselves,” combined with statements in closing arguments that “testimony about predatory violence ‘fits [the defendant] to a T’”).

80. 988 P.2d 46, 53-56 (Wyo. 1999).

Specifically, the expert offered testimony regarding a domestic abuse and homicide study showing that subjects “tended to commit homicide when faced with the prospect of separation,” which “impliedly invited the jury to group [the defendant] among those subjects and by this method determine conduct.”⁸¹ Similarly, in the murder case *State v. Loebach*, the Minnesota Supreme Court found, under principles of character evidence, that the trial court erred in admitting expert evidence regarding the “characteristics of a ‘battering parent.’”⁸² There, the prosecutor introduced expert testimony to show that the defendant “fit within the ‘battering parent’ profile,” including “characteristics such as low empathy, a short fuse, low temper, short temper, low boiling point, high blood pressure, strict authoritarianism, uncommunicativeness, low self-esteem, isolation and lack of trust.”⁸³

Notwithstanding the above cases, however, exclusions of profile evidence as character evidence—and even the courts’ acknowledgement that profile evidence raises concerns under the rule against character evidence—are quite rare. Even in cases in which profile evidence relies on relatively clear character reasoning, courts frequently do not address the rule against character evidence in determining admissibility. Instead, they often reject character-based objections through spurious labels of MO or background evidence or by incorrectly analyzing such objections under non-character principles.

For example, although the evidence in *People v. Masters* was offered explicitly for the suggestion that the defendant had characteristics indicative of a sexual murderer,⁸⁴ and was therefore more likely to have committed the murder in question, the Colorado Supreme Court rejected the defendant’s character-based objection—and did so through reasoning that had little to do with character evidence.⁸⁵ Specifically, the court addressed the defendant’s character-based objection by analyzing whether the expert evidence was (1) scientifically reliable; (2) helpful to the jury; (3) not unduly prejudicial (under Colorado’s version of FRE 403⁸⁶); and (4) not excludable under a then-

81. *Id.* at 55.

82. 310 N.W.2d 58, 62-64 (Minn. 1981) (concluding, ultimately, that the evidence did not prejudice the defendant); see also David McCord, *Syndromes, Profiles and Other Mental Exotica: A New Approach to the Admissibility of Nontraditional Psychological Evidence in Criminal Cases*, 66 OR. L. REV. 19, 53-54 (1987).

83. *Loebach*, 310 N.W.2d at 62-63.

84. Although the trial court did not permit the expert to opine on the ultimate issue of whether the defendant fit the profile of a sexual murderer, it permitted him to explicitly connect characteristics of a sexual murderer with features of the defendant and the case (such as connections to the defendant’s drawings and the death of the defendant’s mother). See *Masters v. People*, 58 P.3d 979, 986-87 (Colo. 2002).

85. See *id.* at 985, 988-94.

86. See COLO. R. EVID. 403.

recent Colorado case that analyzed drug-courier profile evidence under principles of relevance, reliability, and unfair prejudice—ultimately concluding that the expert evidence was appropriate.⁸⁷

Aside from ignoring or glossing over the rule against character evidence, a few courts have used constructs such as “group character evidence” to consider the rule’s application to situations the courts view as distinct from the setting the rule was designed to address. But courts referring to the idea of group character evidence tend to mention it only in dicta or in passing, and they have not treated it as actual character evidence.⁸⁸

For example, in *United States v. Doe*, although profile evidence was offered to suggest that the defendant acted in accordance with “Nigerian drug trafficking patterns,” which the defendant argued constituted inadmissible “group character evidence,” the Seventh Circuit distinguished the profile evidence from evidence about the defendant’s “character traits” or “propensity,” instead viewing it simply as “illuminat[ing] the *modus operandi* of Nigerian importers of Southeast Asian heroin.”⁸⁹ The court found that the defendant’s “concerns are adequately addressed under Rule 403” and was unconvinced by “the attempt to recast these concerns through the vehicle of Rule 404.”⁹⁰ The Seventh Circuit gave similar reasoning in *United States v. Williams*, in which it rejected the defendant’s “group character” objection, explaining that “[t]he government used [expert] testimony about the acts of sex traffickers to illustrate their *modus operandi*, not their character; it suggested that because Williams employed similar techniques, his behavior was evidence that he too was engaged in a sex-trafficking operation.”⁹¹

In *State v. McMillan*, after the defendant was convicted of rape and gross sexual imposition, the Ohio Court of Appeals reviewed the lower court’s admission of expert testimony that “[n]ormally, in 85 to 90 percent of the cases,

87. *Masters*, 58 P.3d at 988-94.

88. See, e.g., *United States v. Williams*, 900 F.3d 486, 490-91 (7th Cir. 2018) (finding that the prosecution used evidence of a “group character trait” to illustrate MO); *United States v. Doe*, 149 F.3d 634, 637-38 (7th Cir. 1998) (similar); *State v. McMillan*, 590 N.E.2d 23, 32-33 (Ohio Ct. App. 1990) (addressing “group character evidence” based primarily on principles of reliability and unfair prejudice).

89. 149 F.3d at 637-38.

90. *Id.* at 638. Courts have used the term “group character evidence” particularly in the profile-evidence context, and they have applied this concept inconsistently and in a way that confuses its relationship to ordinary character evidence. Accordingly, in this Article, I develop the distinct concept of “predictive character evidence” rather than attempt to reconstruct the concept of “group character evidence” as the courts have applied it. See *infra* note 134 and accompanying text.

91. 900 F.3d at 490-91; see also *McMillan*, 590 N.E.2d at 31-33 (addressing “group character evidence” based primarily on principles of reliability and unfair prejudice).

an offender was also a victim earlier in his or her life.”⁹² This evidence was offered in combination with testimony by the defendant on cross-examination that he had been the victim of sexual abuse when he was younger.⁹³ Although the Ohio Court of Appeals reversed the conviction, regarded the evidence as “group character evidence,” and acknowledged the risk of prejudicial character inferences, the court’s primary objection to the evidence appeared to be on the basis of caselaw and principles regarding relevance, unfair prejudice, and the reliability of expert testimony—not character evidence.⁹⁴ For instance, despite suggesting that “‘group’ character evidence is objectionable for the same reason as is traditional character evidence,” the court based its reasoning on the *unreliability* of the evidence—specifically, the lack of “scientific studies or authoritative treatises” to support the “[expert] evidence based on percentages.”⁹⁵ However, the inadmissibility of character evidence is not dependent on the reliability of the evidence or the ability of “the scientific community [to] develop[] a precise schema of a sexual abuse offender that is sufficiently reliable.”⁹⁶ Rather, it is inadmissible simply because it relies on character reasoning.⁹⁷

Similarly, while various authors have astutely highlighted the applicability of the rule against character evidence to profile evidence, their treatment of this issue has been insufficient. As in the courts, such applications of the rule tend to be rare and limited to narrow areas of profile evidence, and they generally do not address the precise relationship between profile evidence and character evidence or how the rule against character evidence applies as a framework for determining—through the critical issue of propensity reasoning—the admissibility of profile evidence in a particular case.⁹⁸

92. 590 N.E.2d at 31-33.

93. *Id.* at 31.

94. *See id.* at 32-33.

95. *Id.*

96. *Id.* at 33 (“Until the scientific community develops a precise schema of a sexual abuse offender that is sufficiently reliable, if that is possible, profile evidence must be excluded. It fails to assist the trier of fact and suggests highly prejudicial character inferences that confuse the jurors and dissuade them from their truth-seeking function.”); *see also* Michael D. Claus, Note, *Profiles, Syndromes, and the Rule 405 Problem: Addressing a Form of Disguised Character Under the Federal Rules of Evidence*, 88 NOTRE DAME L. REV. 973, 994-97 (2012) (discussing the courts’ treatment of “group character evidence” in *McMillan and Doe*).

97. *See* FED. R. EVID. 404(a)(1), (b)(1).

98. *See* Claus, *supra* note 96, at 973-77 (arguing “that the prohibition against character evidence should be promoted from the background of the trial court’s analysis of profiles and syndromes to the forefront”); Kadish, *supra* note 53, at 752, 782-90 (arguing that profile evidence is permitted in all circuits, that it should not be permitted except as rebuttal evidence, and that it violates the rule against character evidence); Laura Etlinger, Comment, *Social Science Research in Domestic Violence Law: A Proposal to Focus*
footnote continued on next page

B. The Courts' Analysis of Profile Evidence: Problems Beyond
Unpredictability

As suggested above, the courts' treatment of profile evidence is unprincipled and unpredictable. The courts leave crucial evidentiary decisions wide open to discretion by relying on principles of basic relevance, reliability, and unfair prejudice. Further, courts that apply a general rule against profile evidence have carved out exceptions that negate its exclusionary force. And when courts actually apply the rule against character evidence—a relatively uncommon occurrence—they do so only superficially.

In addition to the confusion and unpredictability suggested by the body of case law described above, there are other serious harms that result from the courts' misguided treatment of profile evidence. I introduce some of these harms here and reserve a more detailed discussion for Part III.

1. The influence of bias based on a defendant's personal
characteristics

First, the courts' current analysis causes verdicts to be heavily influenced by race, sex, appearance, and other background characteristics of a defendant because a defendant's background characteristics often form the centerpiece of profile evidence.⁹⁹ For example, *United States v. Doe* involves the "practices of Nigerian drug smugglers,"¹⁰⁰ and *United States v. Gomez-Norena* involves profiling based on the defendant's arrival in the United States from Colombia.¹⁰¹ Similarly, *United States v. Bresnahan* involves profiling based on sex,¹⁰² and *State v. McMillan* involves profiling based on the defendant's status as a victim of sexual abuse.¹⁰³

As I argue below, profile evidence often involves character reasoning. Indeed, it can often involve a particularly pernicious form of character reasoning that draws on inferences based on race, sex, and other background characteristics. Further, as I discuss in Part III, there is reason to believe that

on Evidentiary Use, 58 ALB. L. REV. 1259, 1261-63, 1273-74, 1300-05 (1995) (examining "the major social science models used in domestic violence law in an effort to discern the common factors that underlie admissibility determinations," and discussing character-evidence considerations); McCord, *supra* note 82, at 21-27, 59, 107 ("provid[ing] guidelines for lawyers and courts dealing with nontraditional psychological evidence" and discussing the applicability of the rule against character evidence to profile (and syndrome) evidence).

99. See *supra* notes 52-98 and accompanying text.

100. 149 F.3d 634, 636 (7th Cir. 1998).

101. 908 F.2d 497, 498 (9th Cir. 1990).

102. 62 M.J. 137, 146-47 (C.A.A.F. 2005).

103. 590 N.E.2d 23, 31-32 (Ohio Ct. App. 1990).

any character reasoning—let alone character reasoning based on stereotyping from an individual’s features—heightens the influence of biases based on a defendant’s personal characteristics.¹⁰⁴ While the rule against character evidence reflects the perniciousness of such reasoning and aims to exclude it, the courts’ current case-by-case treatment of profile evidence does not.

2. Incorrect findings of harmless error

Second, because appellate courts review the admissibility of profile evidence primarily through the lenses of relevance, unfair prejudice, and a hodgepodge of common law rules and exceptions, they are more likely to conclude that a lower court’s erroneous admission of profile evidence constitutes harmless error. This may occur for various reasons. For example, if a court of appeals determines that irrelevant evidence was incorrectly admitted as relevant, the court may conclude that the incorrect admission was harmless precisely because it was not relevant. Similarly, even if a court determines that the evidence was unfairly prejudicial, it may be more likely to conclude that the error was harmless relative to the other evidence in the case as compared to an erroneous admission of character evidence, which is widely accepted to be highly prejudicial and a common and justified cause of reversals.¹⁰⁵ In addition, there is already a very high bar for an appellate court to find error in a lower court’s balancing of probative value and unfair prejudice: The appellate court would generally need to find that the lower court *abused its discretion* in finding that the probative value of the evidence was not *substantially outweighed* by the unfair prejudice associated with the evidence.¹⁰⁶ Overturning a lower court judgment based on an incorrect admission of character evidence is arguably far easier because the admission violates a relatively clear evidentiary rule—and

104. See *infra* Part III.C.

105. See *infra* notes 260-62 and accompanying text. Compare, e.g., *United States v. Lim*, 984 F.2d 331, 334-35 (9th Cir. 1993) (concluding that the lower court’s admission of drug courier profile evidence was “harmless” even though “the prejudicial effect of applying the profile far outweighed its probative value” because “there was more than sufficient evidence in the record to establish [the defendant’s] guilt”), with *United States v. Davis*, 726 F.3d 434, 440-45 (3d Cir. 2013) (discussing the significant requirements of FRE 404, emphasizing that “[n]o [jury] instruction could have eliminated the infirmity at the heart of th[e] case”—the inappropriate admission of the defendant’s prior convictions for possessing cocaine), and *United States v. Jenkins*, 593 F.3d 480, 482, 484-86 (6th Cir. 2010) (concluding that the lower court committed reversible error in admitting “prejudicial” other-acts evidence in light of the government’s “ample” evidence against the defendant, noting that “[e]ven when properly instructed to consider the evidence only for some legitimate purpose—as the jury was instructed here—the danger is obvious that the jury will treat it as propensity evidence instead”).

106. See GEORGE FISHER, EVIDENCE 51 (4th ed. 2023).

one that is well-recognized as preventing a high degree of unfair prejudice—rather than involving an arguable misjudgment under a balancing of values.¹⁰⁷

3. Illogical rules under the common law

Third, aside from being unpredictable, current standards surrounding the admissibility of profile evidence are not grounded in good policy or strong logic. For example, in a jurisdiction that excludes profiling as substantive evidence of guilt, it is unclear why courts should carve out exceptions for profile evidence when it is offered to prove MO or to show background. The policy reasons for excluding it to prove guilt seem to apply equivalently to proving MO.¹⁰⁸ Moreover, it is difficult to identify a line between proving guilt and proving, for example, MO or background. It leaves the issue to the intuition of the court. It would be different if, for instance, the courts carved out a narrow exception with detailed criteria or if the courts admitted base rate evidence only for *non-propensity* purposes—for example, to rebut a defendant’s argument that a certain feature is prevalent in a population. However, this is not the case. The case law above makes clear that courts admit profile evidence for a broad array of purposes, such as proving MO or background, even when such purposes rely on character inferences.¹⁰⁹

II. Predictive Character Evidence

In this Part, I introduce a concept that I call predictive character evidence to identify the precise relationship between base rate evidence and character evidence. Predictive character evidence is base rate evidence that fulfills four criteria summarized by the acronym PBIC: predictive, behavioral, individualized, and characterizing. I begin by discussing a few fundamental concepts, such as accuracy, bias, and unpredictability. I then clarify the meaning and properties of character evidence. Next, I apply principles from an area of statistics called Bayesian inference to examine predictive character evidence’s relevance, risks, and effects on the accuracy of a judgment, and I describe its unique nature and central properties. Most importantly, I show

107. See *infra* notes 263-64 and accompanying text. This distinction can be analogized to the distinction between legal rules and standards. See Louis Kaplow, *Rules Versus Standards: An Economic Analysis*, 42 DUKE L.J. 557, 559-63 (1992) (“Rules are more costly to promulgate than standards because rules involve advance determinations of the law’s content, whereas standards are more costly for legal advisors to predict or enforcement authorities to apply because they require later determinations of the law’s content.”). See generally *Davis*, 726 F.3d at 441 (“Rule 404(b) has become the most cited evidentiary rule on appeal.”).

108. See *infra* Part III.B.

109. See *supra* notes 55-97 and accompanying text.

how predictive character evidence links base rate evidence—and therefore, profile evidence—to ordinary impermissible character evidence. In particular, I examine predictive character evidence’s relationship to ordinary character evidence and its reliance on character reasoning. I then show that when base rate evidence fulfills the PBIC criteria—and therefore constitutes predictive character evidence—it involves prohibited character reasoning.

A. Accuracy and the Bias-Variance Tradeoff

Define a correct judgment regarding a fact or verdict as the judgment that would result from perfect information about the facts and law surrounding a case.¹¹⁰ Because a court does not have perfect information, however, it must ask a factfinder to use evidence to arrive at an estimate, or a judgment. Define accuracy and error in terms of the proximity and distance between the factfinder’s judgment and the *correct* judgment.¹¹¹ For example, if a jury finds a defendant guilty when she is in fact innocent, the difference between the guilty verdict and the defendant’s factual innocence represents error. Similarly, if a jury in a torts case finds that the defendant’s negligence caused economic harm in the amount of \$100,000 when the true economic harm was \$300,000, the difference of \$200,000 represents error.

Applying standard definitions of accuracy and error in the sciences, error can be deconstructed into two components: variance and bias. Variance measures the unpredictability, randomness, or dispersion around a mean or expected value, whereas bias measures the difference between the correct value and the expected value, or expectation—“the mean that would result from repeated sampl[es].”¹¹² Precision is the inverse of variance: As variance increases, precision decreases, and vice versa.

For example, if a correct damages award reflects the total amount of harm that the plaintiff sustained in an accident caused by the defendant, the difference between an actual damages award of \$100,000 and a correct damages award of \$300,000 may result both from systematic biases that jurors have and from unpredictability based on which jurors serve in the case, which judge presides over the case, how the evidence is presented, and other factors. Similarly, a verdict of guilty or not guilty in a robbery case may differ from the correct verdict based on both bias and variance—reflecting both systematic differences and differences based on randomness or unpredictability.¹¹³

110. Hillel J. Bavli, *An Aggregation Theory of Character Evidence*, 51 J. LEGAL STUDS. 39, 46 (2022).

111. *Id.*

112. *Id.*

113. *See id.*

It is desirable to have an unbiased estimation process—one whose expectation is equal to the correct outcome.¹¹⁴ However, error results from both bias and variance, and unbiasedness is not necessarily of principal importance: A slightly biased but relatively predictable estimate may be significantly better than an unbiased but highly unpredictable estimate.¹¹⁵ Indeed, sometimes a certain amount of bias is necessary to reduce the variance of an estimation process. This is known as a bias-variance tradeoff.¹¹⁶

For example, jurors receive little guidance in determining damage awards for pain and suffering. There is no established method for computing such awards. Therefore, they are unpredictable: For the same case, one jury may award \$100,000 and another jury may award \$2 million.¹¹⁷ However, adding a small amount of bias by providing jurors with information regarding awards in factually similar cases may improve accuracy.¹¹⁸ Although this process adds some error in the form of bias, it arguably avoids far more error in the form of variance, rendering the estimation process more predictable and thus more accurate.¹¹⁹

More specifically, in the context of legal judgments, variance measures “judgment variability,” which refers to the variability from randomness in the judgment-making process.¹²⁰ Judgment variability includes randomness in the selection of jurors, the selection of a judge, and intricacies in the presentation of evidence.¹²¹ Introducing awards in comparable cases—a method that I have called “comparable-case guidance”—may simultaneously add bias and reduce variance depending on the uniformity or disuniformity of the comparison cases relative to the case in question.¹²² Uniformity reflects the concept of “event variability”—how variable or different the comparison units are relative to one another and the event in question.¹²³ The accuracy benefits of comparable-case guidance depend on the degree to which the evidence reduces

114. *Id.*

115. *Id.*

116. *Id.*

117. See Hillel J. Bavli & Reagan Mozer, *The Effects of Comparable-Case Guidance on Awards for Pain and Suffering and Punitive Damages: Evidence from a Randomized Controlled Trial*, 37 YALE L. & POL’Y REV. 405, 409 & n.8 (2019).

118. See *id.* at 419, 437-38.

119. See *id.* at 419, 437-38, 455-57 (finding that informing jurors of prior award amounts reduces error and improves accuracy); Hillel J. Bavli, *The Logic of Comparable-Case Guidance in the Determination of Awards for Pain and Suffering and Punitive Damages*, 85 U. CIN. L. REV. 1, 15-24 (2017).

120. Bavli, *supra* note 110, at 47.

121. *Id.*

122. Bavli, *supra* note 119, at 4-5, 19.

123. See Bavli, *supra* note 110, at 48.

error in the form of variance more than it introduces error in the form of bias. Such benefits, in turn, are based on both judgment variability and event variability.¹²⁴ For example, the method will entail greater benefits if judgment variability is high (i.e., the judgment is highly unpredictable without the evidence) and event variability is low (i.e., the events are highly uniform, permitting guidance from highly comparable cases) than if judgment variability is low or event variability is high.¹²⁵

B. The Meaning and Properties of Ordinary Character Evidence

1. The rule against character evidence

FRE 404 prohibits evidence of a person's other acts or propensities to suggest that they acted in accordance with a certain character trait on the occasion in question.¹²⁶ Character inferences are common and often central in real-world reasoning. For example, we request references before hiring an employee, and we assume that the culprit of a violent crime is more likely to be someone who has committed such acts in the past than someone who has not. As Justice Cardozo stated, "[t]here may be cogency in the argument that a quarrelsome defendant is more likely to start a quarrel than one of milder type, a man of dangerous mode of life more likely than a shy recluse."¹²⁷

124. *Id.* at 48-49.

125. *Id.* at 47-49. For readers who prefer a more formal description, define α as the correct judgment and $\hat{\alpha}$ as the estimate or actual judgment, and define:

- $E(\hat{\alpha})$ as the expectation of $\hat{\alpha}$ (that is, $\hat{\alpha}$ will equal $E(\hat{\alpha})$ on average);
- $V(\hat{\alpha}) = E[\hat{\alpha} - E(\hat{\alpha})]^2$ as the variance of $\hat{\alpha}$;
- $Bias(\hat{\alpha}) = E(\hat{\alpha}) - \alpha$ as the bias associated with $\hat{\alpha}$; and
- $MSE(\hat{\alpha}) = E[(\hat{\alpha} - \alpha)^2]$ as the mean squared error of $\hat{\alpha}$.

Id. at 47. Then, $MSE(\hat{\alpha}) = E[(\hat{\alpha} - \alpha)^2] = V(\hat{\alpha}) + Bias(\hat{\alpha})^2$. That is, the mean squared error (i.e., the expected square difference between the actual judgment and the correct judgment) can be deconstructed into variance and bias. *Id.*; see also Bavli, *supra* note 119, at 14-15. Note that an understanding of mathematics and statistics—including the notation and technical details in this footnote—is not necessary for a thorough understanding of my arguments in this Article. Throughout this Part, I will sometimes include notation or a technical description in a footnote at the end of a non-technical explanation. However, readers may ignore these details without sacrificing an understanding of the Article's arguments.

126. See FED. R. EVID. 404(a)(1) ("Evidence of a person's character or character trait is not admissible to prove that on a particular occasion the person acted in accordance with the character or trait."); *id.* r. 404(b)(1) ("Evidence of any other crime, wrong, or act is not admissible to prove a person's character in order to show that on a particular occasion the person acted in accordance with the character.").

127. *People v. Zackowitz*, 254 N.Y. 192, 198 (1930).

Notwithstanding the rule against character evidence and its underlying aims, courts and legislatures frequently surrender to the compelling nature of this evidence. Specifically, courts often admit this evidence through an expanding set of legislative exceptions, judicial carveouts, and ad hoc departures from the general rule.¹²⁸ Character evidence is naturally controversial: It is extremely influential, and, depending on the circumstances, its admission in a case can fill crucial evidentiary gaps and lead a jury to the correct outcome, or it can easily lead a jury astray, causing a false conviction and devastating consequences based on evidence of past acts rather than the matter in question.¹²⁹

The rule against character evidence reflects the principle that, at trial, people should be judged based on what they did and not on who they are.¹³⁰ In particular, the primary rationale of the rule is to avoid the substantial risk that jurors will weigh the evidence excessively or that they will punish a defendant (or other litigant) based on past acts rather than the act at issue in a case.¹³¹ As many courts and commentators have noted, the admission of prior-bad-acts character evidence frequently determines a case in the prosecution's favor, regardless of the other evidence—or lack thereof—presented.¹³²

128. See *supra* note 25 and accompanying text; see also Milich, *supra* note 25, at 776 (“The American rule barring character evidence in criminal cases is degrading in every sense of the word. The rule’s vitality has degraded as courts and legislatures expand existing exceptions and add new ones.”).

129. For instance, knowing that a defendant has a history of committing violent acts may be helpful to a jury deciding whether the defendant committed the violent crime in question. But it may also lead the jury to a false conviction if the defendant changed his behavioral pattern or was otherwise uninvolved in the crime in question.

130. *E.g.*, *United States v. Linares*, 367 F.3d 941, 945 (D.C. Cir. 2004); see also Capra & Richter, *supra* note 25, at 771 (“The prohibition on character evidence is a time-honored tenet of evidence law. The American adversary system was designed to convict defendants based upon their conduct and not based on their general character or past misdeeds.”).

131. See *Zackowitz*, 254 N.Y. at 198 (“The natural and inevitable tendency of the tribunal—whether judge or jury—is to give excessive weight to the vicious record of crime thus exhibited, and either to allow it to bear too strongly on the present charge, or to take the proof of it as justifying a condemnation irrespective of guilt of the present charge.” (quoting 1 JOHN HENRY WIGMORE, A TREATISE ON THE SYSTEM OF EVIDENCE IN TRIALS AT COMMON LAW § 194, at 233 (1st ed. 1905))); FISHER, *supra* note 106, at 173.

132. See, *e.g.*, *United States v. Burkhart*, 458 F.2d 201, 204-05 (10th Cir. 1972) (“[A]n obvious truth is that once prior convictions are introduced the trial is, for all practical purposes, completed and the guilty outcome follows as a mere formality. . . . [T]he problem is not a simple evidentiary one, but rather goes to the fundamental fairness and justice of the trial itself.”); Capra & Richter, *supra* note 25, at 772 (“Proof of a criminal defendant’s past crimes has a dramatic effect on a jury, almost guaranteeing conviction.”); Milich, *supra* note 25, at 780 (“Once the jury learns that the defendant has a criminal past, the odds of conviction skyrocket.”); see also *Michelson v. United States*, 335 U.S. 469, 475-76 (1948) (“[Character] is said to weigh too much with the jury and to so overpersuade them as to prejudice one with a bad general record and deny him a fair opportunity to defend against a particular charge.”).

2. Clarifying the meaning of character evidence

There is significant confusion and unpredictability surrounding the rule against character evidence. In part, this is due to a lack of clarity regarding the meaning of character evidence. Although an in-depth analysis of the meaning of character evidence is beyond the scope of this Article, in this Part, I aim to clarify two important points of ambiguity applicable to my argument herein. I then formulate general descriptions of character reasoning and character evidence.

First, propensity is distinct from probability.¹³³ Propensity reasoning can involve a person's tendency to lie, be violent, walk quickly, drive carefully, or skip stairs. It involves evidence of a feature such as a character trait or an other event—separate from the event in question—that affects the probability of the event in question. But propensity reasoning also involves other elements. Define the propensity of a person (or thing) as a force internal to the person that connects the person's acts, such that it causes the person's acts of a certain type to recur across time and circumstance with a frequency reflecting the strength of the propensity.¹³⁴ Applying this definition, propensity reasoning requires a *conditionally independent event (or trait)*. Specifically, it requires an event (or trait) that does not affect the probability of the event in question (or vice versa) with respect to the purpose for which the evidence is offered (i.e., defining the event in question in terms of the purpose for which the evidence is offered),¹³⁵ conditional on the propensity of the person.¹³⁶ This element can

133. Compare, e.g., *Propensity*, MERRIAM-WEBSTER, <https://perma.cc/YTN8-L6LC> (archived Oct. 16, 2024) (“[A]n often intense natural inclination or preference.”), with *Probability*, MERRIAM-WEBSTER, <https://perma.cc/X49R-QBLF> (archived Oct. 16, 2024) (“[T]he chance that a given event will occur.”).

134. Throughout this Article, I treat the concept of propensity as applicable to populations as well as people; however, I treat the concept of character as one that describes a particular person.

135. For example, if the other-event evidence is offered to prove the defendant's *knowledge* of drugs found in his possession, then define the event in question as the defendant's knowledge of such drugs in particular (denoted, for example, by E_k), rather than the defendant's commission of the crime in general. Note also that an insignificant effect on the probability of the event in question can be treated as no effect on this probability. Either way, because an insignificant effect would have minimal probative value for a non-character purpose, the evidence is likely to be excluded at least under FRE 401 (as not relevant) or FRE 403 (as unduly prejudicial).

136. In statistics, “A and B are independent if learning that B occurred gives us no information that would change our probabilities for A occurring (and vice versa).” JOSEPH K. BLITZSTEIN & JESSICA HWANG, INTRODUCTION TO PROBABILITY 56 (2014). “Conditional independence . . . implies that . . . if we know H is true and F and G are conditionally independent given H, then knowing G does not change our belief about F,” or more formally, “ $Pr(F|H \cap G) = Pr(F|H)$.” HOFF, *supra* note 16, at 17. Alternatively, “[t]wo events F and G are conditionally independent given H if $Pr(F \cap G|H) = Pr(F|H)Pr(G|H)$.” *Id.*

be used to distinguish between an event that is, in the courts' language, "extrinsic" or "intrinsic" to the event in question and whether the evidence affects the probability of the event in question via a non-propensity purpose or only via propensity reasoning.¹³⁷

For example, take the prosecution of a robbery. The defendant's commission of an earlier robbery is conditionally independent of whether the defendant committed the robbery in question at trial, conditional on the defendant's propensity, if the fact of the earlier robbery does not change the probability of the later robbery except by showing the defendant's propensity to commit robbery. In contrast, if the defendant previously committed robbery to steal a rare jewel of which only two exist and the value of which more than doubles when coupled with its counterpart, the probability that the defendant committed the second robbery increases even ignoring the defendant's propensity to commit robbery. In other words, knowing that the defendant stole the first jewel increases the probability that the defendant stole the second jewel because he would have been motivated to do so by the resulting increase in value of the first jewel.

Second, a character-based propensity is distinct from other forms of propensity. In addition to involving an event (or trait) that is conditionally independent of the event in question with respect to the purpose for which the evidence is offered, character reasoning involves a specific type of propensity reasoning—one that is based on a person's *character*.¹³⁸ Character is only one type of force that connects a person's acts. There are many non-character forms of propensity. For example, the propensities to throw a ball accurately, to eat salads, to drive trucks, to walk quickly, or to skip stairs have little to do with character. They reflect non-character forces such as skill, preference, interest, and habit.¹³⁹

Character can be described as a particular type of propensity (a "character-based propensity") that involves choices or tendencies of a moral or ethical nature.¹⁴⁰ It includes, for example, tendencies to lie, cheat, murder, steal, or be

137. See, e.g., *United States v. Williams*, 900 F.2d 823, 825 (5th Cir. 1990) ("The proper test to apply in deciding the admissibility of 'similar acts' or 'other acts' evidence depends upon whether the evidence in question is 'intrinsic' or 'extrinsic' evidence. 'Other act' evidence is 'intrinsic' when the evidence of the other act and the evidence of the crime charged are 'inextricably intertwined' or both acts are part of a 'single criminal episode' or the other acts were 'necessary preliminaries' to the crime charged." (quoting *United States v. Torres*, 685 F.2d 921, 924 (5th Cir. 1982))).

138. See FED. R. EVID. 404(a)(1).

139. See, e.g., *id.* r. 406 (regarding the admissibility of habit evidence).

140. See MARJORIE GARBER, *CHARACTER: THE HISTORY OF A CULTURAL OBSESSION* 6-7 (2020) (discussing Aristotle's use of the Greek word "*ethos*" to refer to "character"); STEPHEN HALLIWELL, *ARISTOTLE'S POETICS* 150-51 (Stephen Halliwell trans., 1986) (discussing Aristotle's description of character as demonstrating "the nature of deliberate moral
footnote continued on next page

violent, as well as tendencies to help others or to be honest, kind, or peaceful.¹⁴¹ Recognizing the distinction between character-based propensity and other forms of propensity clarifies various difficulties—for example, why propensities grounded in habit or MO are admissible while those grounded in character are not, and why more “innocent” propensities often seem as though they should not be excluded by the rule against character evidence.

To summarize, character-based propensity reasoning (or just “character reasoning”) requires the following three elements: (1) *evidence of an other event or character trait* that changes the probability of the event in question; (2) *conditional independence* between the other event or character trait and the event in question with respect to the proffered purpose of the evidence, given the *character-based propensity* of the person about whom the evidence is offered; and (3) an *inference* from the other event or character trait regarding the probability of the event in question. And these elements rely on the following definitions: (i) a *conditionally independent* other event (or trait) is an event (or trait) whose occurrence does not affect the probability of the event in question (or vice versa), conditional on the character-based propensity of the person about whom the evidence is offered; (ii) the *propensity* of a person is a force internal to the person that connects the person’s acts, such that it causes the person’s acts of a certain type to recur across time and circumstance with a frequency reflecting the strength of the propensity; and (iii) a *character-based propensity* or character trait is a particular type of propensity that involves choices or tendencies of a moral or ethical nature.

Character reasoning and character evidence can therefore be described as follows:

Character reasoning: an inference regarding the probability of the event in question from evidence of an other event or character trait that is conditionally independent with respect to the proffered purpose of the evidence, given the character of the person about whom the evidence is offered.

Character evidence: evidence whose relevance relies on character reasoning.

These formulations are consistent with—and, indeed, seek to clarify—the less formal descriptions often used by courts, legislatures, and FRE 404.¹⁴²

choice” (quoting ARISTOTELIS, DE ARTE POETICA LIBER 1450b 8-10 (Rudolf Kassel ed., 1965)); see also Paul F. Rothstein, *Intellectual Coherence in an Evidence Code*, 28 LOY. L.A. L. REV. 1259, 1264 (1995) (“While the general propensity called character has a moral tinge to it, other general propensities do not . . .”).

141. See Rothstein, *supra* note 140, at 1264 (“A lawless person, a violent person, a dishonest person, and a thieving person are all descriptions of the propensity we call character.”).

142. For example, these formulations are consistent with those of FRE 404(a)(1), (b)(1), and (b)(2), which prohibit evidence of a defendant’s character trait or other acts to prove that the defendant acted according to a certain character trait on the occasion in question but permit other-acts evidence offered for a non-character purpose. See FED. R. EVID. 404(a)(1), (b)(1), (b)(2).

3. Character evidence as a bias-variance tradeoff

Character evidence can be understood in terms of the statistical concept of Bayesian inference. Bayesian inference is based on Bayes' rule—a formula for combining prior beliefs with new evidence to arrive at a conclusion or a new belief.¹⁴³ In Bayesian terms, character evidence can be viewed as a prior belief (a “prior”) about the defendant that is combined with new evidence directly relating to the event in question (“event evidence”) to determine a judgment (a “posterior” belief regarding the event in question—for example, the defendant's guilt or innocence). While event evidence provides information directly about the event in question, a prior provides information about a meaningful reference population of events of the same general kind that are connected through some central force (in statistical terms, a probability distribution).¹⁴⁴

For example, in a science experiment, a prior may provide information about the outcomes of previous experiments of the same kind. New (event) evidence about the outcome in the current experiment is then combined with the prior to reach a posterior belief or conclusion. In a sense, the prior offers information about previous “samples” or “draws” from the same experimental process. The researcher has a certain expectation based on these earlier samples, reflected in the prior. But the prior is ultimately modified by the new (event) evidence to arrive at a posterior belief.¹⁴⁵

Similarly, a prior regarding the character of a defendant reflects information about other instances of the defendant's conduct (either directly or

143. Bayesian statistical analysis “uses the mathematical rules of probability to combine data with prior information to yield inferences which (if the model being used is correct) are more precise than would be obtained by either source of information alone.” Andrew Gelman, *Bayesian Statistics: What's It All About?*, STAT. MODELING, CAUSAL INFERENCE, & SOC. SCI. (Dec. 13, 2016, 8:47 PM), <https://perma.cc/6CEA-AAQY>; see also HOFF, *supra* note 16, at 1 (“We often use probabilities informally to express our information and beliefs about unknown quantities. However, the use of probabilities to express information can be made formal: In a precise mathematical sense, it can be shown that probabilities can numerically represent a set of rational beliefs, that there is a relationship between probability and information, and that Bayes' rule provides a rational method for updating beliefs in light of new information. The process of inductive learning via Bayes' rule is referred to as *Bayesian inference*.”).

144. See BLITZSTEIN & HWANG, *supra* note 136, at 95 (“The *distribution* of a random variable . . . specifies the probabilities of all events associated with the [random variable] . . .”).

145. Note that a base rate could inform either component of a posterior—the prior or the likelihood function, which reflects the event evidence. See Koehler, *supra* note 15, at 375-76 (“Base rates may inform either prior probabilities or likelihood ratios, though their association with the former is common in the social science literature.”). Relatedly, it is critical not to confuse a statement regarding the probability of certain features conditional on guilt or innocence with a statement regarding the probability of guilt or innocence conditional on those features. This error, known as the prosecutor's fallacy, can cause false convictions and other harms. See *supra* note 45. For an illustration of Bayes' rule and the implications of the prosecutor's fallacy, see note 250 below.

through opinion or reputation evidence). It effectively consists of additional samples generated by the same central force—the defendant’s character. Other-acts character evidence informs this prior. It tells us how the defendant’s acts of a certain type are connected to one another.

Describing character evidence in this way elucidates the definition of character reasoning articulated in Part II.B.2, under which other-acts evidence constitutes character evidence if the other event is conditionally independent of the event in question (with respect to the purpose for which the evidence is offered), conditional on the defendant’s character. Although the other event is *not* independent of the event in question, it is *conditionally* independent given the defendant’s character. In other words, knowledge of the other event changes the probability of the event in question only by providing information about the prior that reflects the defendant’s character (the force connecting the act in question to the defendant’s other acts).

A juror will ultimately use character evidence to arrive at an assessment (or estimate) of this prior—i.e., a character judgment—which is then combined with event evidence to arrive at a verdict (or a finding of fact). For example, in a criminal assault case, a prosecutor may offer evidence that the defendant has committed prior similar assaults—distinct events of the same general kind—to prove that the defendant committed the act in question. The prior assaults provide information about the defendant’s propensity to commit assault (the prior). This character judgment (the estimated prior) is ultimately combined with evidence regarding the assault in question (the event evidence) to arrive at a verdict (a posterior or judgment).¹⁴⁶

Combining event evidence with a prior that reflects character evidence provides context for the event at issue and thereby aims to capitalize on the bias-variance tradeoff to improve accuracy. By providing information about similar events of the same general kind as the event in question, character evidence provides valuable context and thereby reduces the unpredictability of the judgment in question.¹⁴⁷ However, because this information pertains to *other* events, it also introduces bias.

146. See *infra* notes 152-53 and accompanying text.

147. In *An Aggregation Theory of Character Evidence*, I define *aggregation evidence* as a broad category of evidence that “involves inferring information about an event at issue in a case from information about distinct events of the same general kind.” Bavli, *supra* note 110, at 40-41. Character evidence is one form of aggregation evidence. *Id.* at 40. However, aggregation evidence also includes many other types of evidence, such as “anecdotal evidence in discrimination cases; representative evidence in employment cases; ‘comparables’ evidence in takings cases, antitrust cases, and cases involving awards for pain and suffering or punitive damages; and certain types of statistical evidence.” *Id.* at 41.

This process of combining event evidence with information about other events of a similar kind to improve accuracy via the bias-variance tradeoff corresponds with a Bayesian estimation method in statistics called *shrinkage estimation*.¹⁴⁸ Shrinkage estimation improves accuracy because events of a similar kind are frequently bound together by forces of nature.¹⁴⁹ For example, the batting averages of professional baseball players may be concentrated heavily at a certain mean value and thin out when one moves further from the mean. Similar patterns may be observed in the heights of people, lifespans of ants, eruptions of volcanoes, and other types of events. In statistics, a probability distribution describes the link between events in a precise mathematical way using probabilities. Just as a fair coin has a probability distribution that assigns heads a probability of 0.5 and tails a probability of 0.5, a baseball player will have a certain batting average with some probability and a more extreme batting average with a lower probability; and so on and so forth.

Shrinkage estimation may improve the accuracy of an estimate or judgment by combining event evidence with information about other events of a similar kind, thereby capitalizing on the relationship among all such events.¹⁵⁰ In particular, by providing this contextual information, the prior introduces some error in the form of bias—such that the judgment shifts, on average, toward the contextual information—in order to achieve a more significant error reduction by anchoring the judgment to a meaningful context, thus reducing the unpredictability of the judgment.¹⁵¹ The ultimate effect on accuracy will therefore depend on whether the reduction of variance or the introduction of bias dominates and by how much.¹⁵²

148. See *id.* at 48.

149. See Hillel J. Bavli & Yang Chen, *Shrinkage Estimation in the Adjudication of Civil Damage Claims*, REV. L. ECON., July 2017, at 1, 2 (describing shrinkage estimation as improving accuracy by incorporating information about other units in a reference population); see also *infra* note 152.

150. See Bavli, *supra* note 110, at 48.

151. See *id.*; Bavli, *supra* note 119, at 17-19; Edward K. Cheng, Essay, *When 10 Trials Are Better than 1000: An Evidentiary Perspective on Trial Sampling*, 160 U. PA. L. REV. 955, 960-63 (2012).

152. In more formal terms, assume that the goal is to determine a judgment $\hat{\alpha}_*$ that is an accurate estimate of α_* , which indicates whether the defendant committed the act in question. Assume that $\hat{\alpha}_*$ is distributed with mean α_* and variance σ^2 and that α_* is distributed with mean μ and variance τ^2 . That is, $\hat{\alpha}_* \sim (\alpha_*, \sigma^2)$ and $\alpha_* \sim (\mu, \tau^2)$. Then character evidence can be understood as evidence regarding other samples $\alpha_i \sim (\mu, \tau^2)$, for $i = 1, 2, 3, \dots, n - 1$, from the same distribution that gave rise to α_* , offered to improve the accuracy of the judgment in question $\hat{\alpha}_*$ by providing information about the correct judgment α_* via information about μ and τ^2 (the nature and consistency parameters associated with the defendant's character). Bavli, *supra* note 110, at 50.

Character evidence thus informs a prior probability distribution to be combined with other evidence in the case to determine a verdict $\hat{\alpha}_*$. Accordingly, defining $\hat{\alpha}_*$ as a verdict explicitly via shrinkage estimation—that is, a weighted average of $\hat{\mu}$ (an
footnote continued on next page

In a Bayesian process, the value of the prior—and the influence that it will have on the judgment (or posterior)—is based on various important factors related to the features (or parameters) of the prior and the event evidence. To simplify and avoid including distracting technical background, these factors can be summarized by the following principle:

The [Relative-Value] Principle: In combining a prior with new [or event] evidence, the prior should be weighted in proportion to its relative precision with respect to the matter in question. This means that the prior will be most valuable—and should therefore receive substantial weight—when it is highly precise with respect to the matter in question relative to the new evidence. Conversely, the prior will be least valuable—and should therefore receive little weight—when it is highly imprecise with respect to the matter in question relative to the new evidence.¹⁵³

According to this principle and assuming that jurors incorporate information reasonably in proportion to its value,¹⁵⁴ character evidence will be most valuable, and therefore most influential, when “(1) it informs matters that involve a high degree of judgment variability due to poor existing evidence, and (2) it provides precise information regarding those matters.”¹⁵⁵ Conversely, character evidence will be less valuable and influential when “it informs matters that involve a low degree of judgment variability due to strong [event] evidence . . . or when it provides imprecise information regarding those matters.”¹⁵⁶

For example, to facilitate a jury’s judgment as to whether a defendant had discriminatory intent in not promoting a plaintiff employee, the court may admit evidence of other promotions and non-promotions. Based on the premise that these events are connected in some way, this evidence has probative value, and although such evidence may introduce bias by providing

estimator for μ) and the judgment that would occur in the absence of any character evidence $\hat{\alpha}_{(*)}$, weighted by the precision of each, $1/\tau^2$ and $1/\sigma^2$, respectively—we can write the “shrinkage estimator” as:

$$\hat{\alpha}_s = \frac{\hat{\alpha}_{(*)} + \frac{\hat{\mu}}{\tau^2}}{\frac{1}{\sigma^2} + \frac{1}{\tau^2}}$$

Bavli, *supra* note 119, at 20-21 n.67; see Bavli & Chen, *supra* note 149, at 1, 7-9 (applying shrinkage estimation “to show that, for a class of claims, replacing an adjudicated damages award with an award based on shrinkage increases accuracy”).

153. Hillel J. Bavli, *Character Evidence as a Conduit for Implicit Bias*, 56 U.C. DAVIS L. REV. 1019, 1054 (2023). Note that I formerly referred to the relative-value principle as the “shrinkage principle.” *Id.*

154. For an in-depth discussion of this assumption, see *id.* at 1065-69.

155. *Id.* at 1054-55.

156. *Id.* at 1055.

information about distinct events, it reduces the unpredictability of the judgment in question. Specifically, the jury seeks to arrive at a judgment regarding the employer's intent. There is a probability that the employer had discriminatory intent. If this probability were known to be 0.8, for example, it would be likely that the employer had discriminatory intent.¹⁵⁷ Other-acts character evidence can provide information about the employer's intent via information about this probability value.¹⁵⁸

The effect of the other-acts character evidence on the accuracy of the judgment will be based on its relative precision—that is, the precision of the other-acts character evidence relative to the precision of the event evidence (or the precision of the judgment without the character evidence).¹⁵⁹ Precision—the inverse of unpredictability—is based on factors such as the quantity of the evidence (e.g., multiple prior events rather than just one), the uniformity of the evidence with respect to the event in question (e.g., prior events that are similar to one another and similar to the event in question), and the strength of the evidence (e.g., a prior conviction or liability finding rather than a prior accusation). For example, consider character evidence that involves multiple prior incidents in which an employer clearly had discriminatory intent of the same kind as that alleged in the current case—for instance, evidence regarding prior promotion decisions in which the employer made overt statements demonstrating such intent. This evidence is more valuable to prove discriminatory intent in the event in question than if the evidence involved fewer incidents, less uniformity in the evidence, less uniformity with respect to the matter in question, or less clarity.¹⁶⁰ And the evidence will have even greater value if the case otherwise involves only imprecise evidence regarding the employer's discriminatory intent.¹⁶¹

Thus, as depicted in Figure 1, character evidence provides a juror with context for the evidence regarding the act in question. In essence, it allows the juror to inform her prior regarding the defendant's character. It facilitates a character judgment. This prior is then combined—pursuant to the relative-

157. Bavli, *supra* note 110, at 51.

158. *Id.* at 51-53. In more formal terms, the jury seeks to arrive at an estimate $\hat{\alpha}_*$ for α_* , which is equal to 1 if the employer had discriminatory intent and equal to 0 if the employer had no such intent. There is a probability p that $\alpha_* = 1$ (the employer had discriminatory intent). If p were known to be 0.8, for example, there would be a high likelihood that the employer had discriminatory intent. Other-acts character evidence can provide information about α_* by way of information about p (where $\mu = p$ in the more general notation that I use herein). *Id.* at 51.

159. *Id.* at 51-52.

160. *Id.* at 52.

161. *Id.* at 52-53.

value principle—with event evidence to form a judgment regarding the act in question.

Figure 1
Ordinary Character Evidence¹⁶²

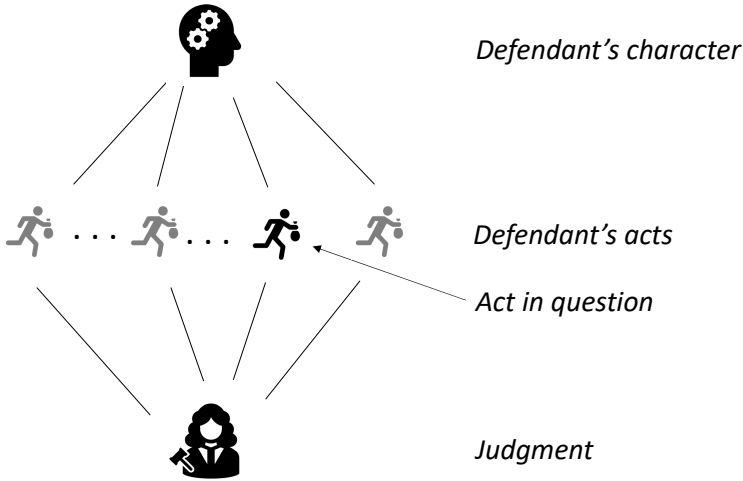
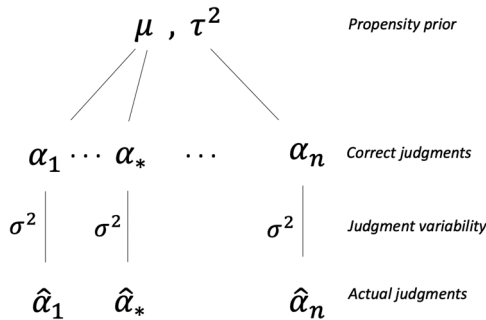


Figure 1. Assuming Bayesian reasoning, a juror uses character evidence regarding a defendant’s other acts to assess the defendant’s character. Pursuant to the relative-value principle, she then combines her character assessment with event evidence regarding the act in question to arrive at a judgment.

162. Using the notation in notes 125 and 152 above, Figure 1 can be drawn as the following figure (which first appeared in *Character Evidence as a Conduit for Implicit Bias*, published by the Regents of the University of California):



Bavli, *supra* note 153, at 1049. As the Figure illustrates, other-acts character evidence can improve the accuracy of the judgment $\hat{\alpha}_*$ by supplying information about the correct judgment α_* regarding the act in question by way of information about the “propensity prior”—the prior regarding the defendant’s propensity. *Id.* at 1048-50 (employing a hierarchical model to illustrate and describe the role of the propensity prior in judgments based on character evidence).

C. The Meaning and Properties of Predictive Character Evidence

Other-acts character evidence is evidence of the defendant's other acts offered to prove that the defendant acted in accordance with their individual propensities. In Bayesian terms, other-acts character evidence allows jurors to update their prior beliefs about how people behave generally with information about the defendant's *individual* propensities. In other words, in the absence of character evidence, a juror may evaluate the evidence in a case with reference to a diffuse set of prior beliefs about how people behave; by contrast, character evidence encourages jurors to replace this relatively uninformative set of prior beliefs with one that is based on the defendant's unique propensities. As discussed, this is based on the premise that a person's acts are connected—that they are somewhat predictable. Again, this is why we ask for references when we hire employees, why we trust people we know to have previously told the truth more than people that we know to have previously told lies, and why we assume that an individual with a serious criminal record is more likely to commit a serious crime than an individual with a clean criminal record. Character inferences are not only logical but commonplace in our everyday reasoning.

However, this reasoning extends beyond the character of an individual. In reality, a person's acts are connected not only to their own other acts but also to the *acts of other people*. This is the broader idea behind shrinkage estimation: Information about other people (or things or events) provides important contextual information that permits inferences regarding the person (or thing or event) in question.¹⁶³

Consider an example from baseball: If a sports statistician observes baseball statistics at the halfway point in a season and wishes to predict the end-of-season batting averages for twenty players, she could use each player's half-season average to predict that player's end-of-season average. But she could improve her predictions by incorporating in the prediction for each player information about the half-season averages of the *other* nineteen players.¹⁶⁴ Thus, if the statistician wishes to predict Roberto Clemente's end-of-season batting average from his average after his first forty-five at-bats of the season—e.g., .400 in the 1970 season—she would be wise to also use the batting averages of other players.¹⁶⁵ For instance, she could compute a weighted mean of Clemente's average and the mean of the other players' averages.¹⁶⁶

163. *See id.* at 1041-53.

164. *See* Bradley Efron & Carl Morris, *Stein's Paradox in Statistics*, *SCI. AM.*, May 1977, at 119, 119-21.

165. *Id.*; *see also* Bavli, *supra* note 153, at 1044.

166. *See* Efron & Morris, *supra* note 164, at 119-21; *see also* Bavli, *supra* note 153, at 1044.

By incorporating the other-player information into her prediction, the statistician improves her estimate by contextualizing Clemente's batting average—by accounting for expectations about batting averages more broadly.¹⁶⁷ In this example, combining Clemente's average with a prior that reflects the averages of other players accounts for the fact that .400 is a very high batting average and that it is likely to go down—to shrink toward the broader mean—in the remainder of the season.¹⁶⁸ This is based on the old scientific idea of regression toward the mean: Clemente's .400 batting average is likely partly due to his individual skill and partly due to luck. By contextualizing Clemente's average and shrinking it toward the population mean, the statistician accounts for this luck and its low likelihood of continuing for the remainder of the season.¹⁶⁹

By similar reasoning, if the statistician wishes to predict the outcome of Clemente's forty-sixth at-bat or to estimate the probability of a certain outcome during this at-bat, the statistician would not want to rely solely on Clemente's forty-fifth at-bat (or solely on information regarding the at-bat in question) because doing so would ignore the valuable contextual information of Clemente's forty-four prior at-bats. Moreover, as above, she would be wise to incorporate not only information from Clemente's first forty-five at-bats but also from the other nineteen players' first forty-five at-bats.¹⁷⁰ Context is central to achieving a good estimate or prediction.

This same logic applies in the legal setting. Just as we can infer valuable information about a baseball player's end-of-season batting average—and hence about a player's individual at-bat—from both the player's own batting history and information about *other* players' batting averages, we can infer valuable information about a person's character and individual acts from both that person's own prior acts and information about the character or acts of *others*. Like other-player information, evidence regarding the acts of others can provide context for evaluating the act in question—it provides information about a reference population's propensity. Thus, I define predictive character evidence as follows:

Predictive character evidence: evidence regarding the other acts or behavioral propensities of a subpopulation offered to prove that an individual member of the subpopulation acted in accordance with a character-based propensity on the occasion in question.

167. See Efron & Morris, *supra* note 164, at 120-21.

168. See *id.* at 121.

169. See *id.* See generally Stephen M. Stigler, *Darwin, Galton and the Statistical Enlightenment*, 173 J. ROYAL STAT. SOC'Y 469, 471-72 (2010) (discussing Francis Galton and regression toward the mean).

170. See Efron & Morris, *supra* note 164, at 119-21.

Predictive character evidence is thus a form of base rate evidence because it regards the prevalence of a feature in a population. But whereas all base rate evidence involves evidence about the prevalence of a feature in a population, predictive character evidence specifically involves evidence about a behavioral propensity of the population (that is, involving the prevalence of a behavioral feature in the population) offered to suggest the existence of this propensity in an individual member of the population and their action in accordance therewith.¹⁷¹ For base rate evidence to constitute predictive character evidence, the evidence must fulfill the following four “PBIC” requirements. It must be:

- (1) **Predictive.** The base rate evidence regarding the prevalence of a feature in a population must be offered to suggest the existence of the feature in an individual member of the population and their action in accordance therewith.¹⁷²
- (2) **Behavioral.** The base rate evidence must regard a behavioral propensity rather than merely a probabilistic tendency separate from the population’s behavior. For example, base rate evidence regarding the tendency of a population of dishwasher machines to break after some amount of time or a population of people to have a certain illness, condition, or pattern of DNA features could not constitute predictive character evidence, whereas base rate evidence regarding the propensity of a population to commit theft offered to prove that the defendant committed theft could.
- (3) **Individualized.** The evidence (and the evidenced behavioral propensity in particular) must be individualized in the sense that it must be connected to the defendant’s features or conduct. In other words, the propensity must describe a

171. I define the concept of predictive character evidence for purposes of terminological and conceptual convenience. The argument that certain forms of base rate evidence—i.e., those that fulfill the PBIC requirements—constitute character evidence and trigger FRE 404 does not rely on the separate concept of predictive character evidence. Rather, I introduce this concept as a way to encapsulate such requirements and bridge the gap between base rate evidence and ordinary character evidence.

172. Predictive character evidence is a subset of base rate evidence. Profile evidence is a type of base rate evidence that frequently constitutes predictive character evidence. It is important to realize that, although profile evidence is generally explicitly framed as evidence describing the probable features or conduct of a type of criminal offender or actor (i.e., informing the probability of the features or conduct conditional on guilt ($P(\text{features}|\text{guilt})$) rather than the probability of guilt conditional on the features or conduct ($P(\text{guilt}|\text{features})$), this evidence is in fact offered for the *purpose* of proving the defendant’s guilt (or an element thereof) conditional on the features or conduct ($P(\text{guilt}|\text{features})$). See, e.g., *United States v. Doe*, 149 F.3d 634, 636-37 (7th Cir. 1998) (involving profile evidence in combination with evidence regarding the defendant’s conduct offered to prove the defendant’s intent). This does not necessarily imply a transpositional error, see *supra* note 45, but rather only that additional information is needed to reach the latter conclusion. Similarly, interpreting typical profile evidence—like that in *Doe*—as predictive (and as offered to show that a subpopulation of people who fit the profile has a certain propensity) is supported by the fact that the evidence is indeed offered to prove guilt (or an element thereof) given the defendant’s features or conduct ($P(\text{guilt}|\text{features})$).

subpopulation that is different from the broader population and that is identified on the basis of the defendant's particular features. For example, evidence regarding the propensity of a subpopulation to steal could constitute predictive character evidence if the subpopulation is identified based on the defendant's financial situation, race, or sex, but not if it is based merely on the general propensity to steal in the broader population.¹⁷³ Whereas base rate evidence may inform a prior regarding the broader prevalence of a feature in a population, predictive character evidence seeks to replace this prior with one that is based on the propensity of a subpopulation defined by the defendant's individual features or conduct.

(4) **Characterizing.** The evidence (and the evidenced behavioral propensity in particular) must be characterizing in the sense that it must be grounded in character rather than a different propensity, such as a propensity based on skill, plan, preference, or habit.¹⁷⁴ As discussed in Part II.B.2, there are various forces that can bind together an individual's or a population's acts. Character is just one such propensity.¹⁷⁵ For base rate evidence to constitute predictive character evidence, it must involve a *character-based* behavioral propensity (such as a propensity to be violent or lie) rather than a different type of propensity (such as a preference-based propensity to drive trucks or a skill-based propensity to be good at sports).¹⁷⁶

Thus, base rate evidence constitutes predictive character evidence when it fulfills the PBIC criteria—that is, when it involves evidence of a subpopulation's propensity that is predictive, behavioral, individualized, and characterizing. Let us consider a number of important features of this evidence. First, like ordinary character evidence, predictive character evidence is relevant because it provides information about the act in question via information about acts of the same general kind¹⁷⁷—but involving acts *of others* rather than other acts of the individual in question. As illustrated in Figure 2 below, while ordinary character evidence informs a prior regarding a

173. To be sure, this element often requires a judgment regarding the natural (broader) population of which the defendant is a member. For example, if a defendant was in a prison population at the time that he committed the crime in question, and a prosecutor seeks to introduce a statistic regarding the behavioral propensity of the prison population, whether this evidence constitutes predictive character evidence may depend on whether, e.g., the prison population is deemed the broader population (in which case, the evidence would not be individualized and therefore would not constitute predictive character evidence) or a subpopulation of the broader U.S. population based on the defendant's prisoner status (in which case, the evidence would be individualized based on the defendant's features and could therefore constitute predictive character evidence).

174. See *supra* notes 138-41 and accompanying text.

175. See *id.*; Rothstein, *supra* note 140, at 1264-65 (“While the general propensity called character has a moral tinge to it, other general propensities do not . . .”).

176. See *supra* notes 138-42 and accompanying text.

177. That is, it falls within a category of evidence that I have called aggregation evidence. See *supra* note 147; Bavli, *supra* note 110, at 40-41.

defendant's propensity to act in a certain way—that is, it provides information about the force that connects an individual's acts—*predictive* character evidence regards a population's propensity and informs a prior on the defendant's character. That is, it provides information about the force that connects a population's acts via information about its members' propensities.

In simpler terms, this means that predictive character evidence provides information about an act in question by providing information about the force that connects people's *propensities* and therefore all of the acts of a certain type in the reference population. In the baseball example, Clemente's own prior performance provides valuable information about his skill (a different type of propensity), which informs the likelihood that he will get a hit in the at-bat in question. Other-player information provides valuable information about the overall population propensity (the force connecting the individual skills of players generally), which also informs the likelihood that Clemente will get a hit in the at-bat in question. Pursuant to the relative-value principle, the combination of evidence regarding Clemente's own prior performance and evidence regarding the population propensity will achieve the greatest accuracy in estimating the likelihood that Clemente will get a hit in the at-bat in question. Similarly, at trial, predictive character evidence provides valuable information about the force that connects the individual propensities of the population's members and therefore about the acts of its members, and about the act in question in particular.

Figure 2
Predictive Character Evidence¹⁷⁸

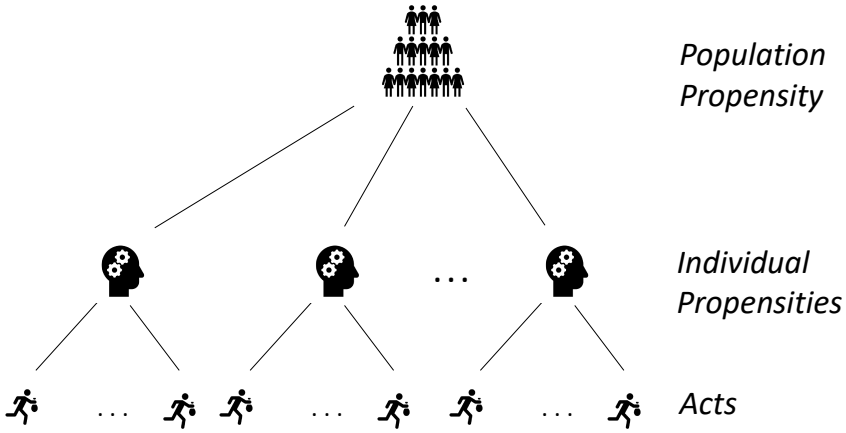
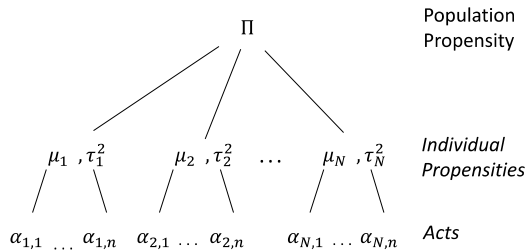


Figure 2. Whereas *ordinary* character evidence informs a prior regarding a defendant’s individual propensity to act in a certain way—that is, it provides information about the force connecting an individual’s acts—*predictive* character evidence regards the population propensity and informs a prior on the defendant’s character. That is, it provides information about the force that connects a population’s acts via information about its members’ propensities.

Importantly, I am not arguing that predictive character evidence should be admitted. Indeed, I argue that it should generally be excluded as impermissible

178. Using the notation defined in notes 125 and 152 above, Figure 2 can be drawn as follows:



Whereas ordinary character evidence provides information regarding a prior probability distribution (μ_i, τ_i^2) that connects an individual’s acts α_i , *see supra* note 162 and accompanying text, predictive character evidence informs a prior probability distribution, Π , on the defendant’s character—that is, a probability distribution that connects the propensities of the population’s members.

under FRE 404 or as unduly prejudicial under FRE 403. However, an understanding of the precise relevance of predictive character evidence is central to understanding the character reasoning inherent in inferences from this evidence, as well as current admissibility decisions and the inconsistency surrounding base rate evidence.

Second, predictive character evidence involves character reasoning and is therefore a type of character evidence. As discussed previously, character evidence is evidence of a person's character or propensity—directly or via evidence of other acts—offered to prove that the person acted in accordance with the character or propensity on the occasion in question.¹⁷⁹ Predictive character evidence is exactly this: It involves evidence regarding the character-based propensity of a person—via the propensity or other acts in a subpopulation of which the person is a member—that is offered to prove that the person acted in accordance with the character or propensity on the occasion in question.¹⁸⁰ For example, evidence regarding the propensity of a reference population may involve the following chain of inferences: The population has a certain propensity; therefore, the defendant, a member of the population, is likely to have such a propensity; therefore, the defendant is more likely to have committed the act in question. The inference connecting the evidence of the population propensity to the act in question—i.e., that the defendant, as a member of the reference population, is likely to have the propensity of the population—is necessary, and it leads to character-propensity reasoning when used to infer the act in question.

The role of character reasoning in inferences based on predictive character evidence is made explicit in Figure 2 and its characterization of predictive character evidence as a hyperprior—i.e., as a prior on the character prior. Specifically, the inference regarding a particular act in question requires traveling through an inference regarding the defendant's character or propensity. Indeed, predictive character evidence is relevant because, in Bayesian terms, it informs a prior on the defendant's character.

Consider *The Walking Dead* hypothetical presented in Part I.A.¹⁸¹ In that example, the citizens of the settlement used predictive character evidence to make an inference about Mo and Jo. Specifically, they used the acts of members of the group to infer that the group—a reference population—has a propensity to commit violent acts; that the members of the group therefore have such a

179. See FED. R. EVID. 404(a), (b); see also *supra* Part II.B.1.

180. Note that FRE 404(b) does not specify that other-acts evidence must pertain to the other acts of the individual in question to constitute impermissible character evidence. See FED. R. EVID. 404(b)(1). Either way, however, predictive character evidence—which involves the other acts of *others*—would constitute evidence of the individual's character or propensity within the meaning of FRE 404.

181. See *supra* notes 48-51 and accompanying text.

propensity; that Mo and Jo (as members of the group) each has such a propensity; and that Mo and Jo are likely to act in accordance with this propensity and commit violent acts, meriting their expulsion. This constitutes character evidence because it involves evidence (specifically, other-acts evidence) offered to prove that the people in question—Mo and Jo—have a certain propensity and are likely to act in accordance with this propensity on the occasion in question. In this example, the act in question is Mo and Jo’s future behavior, but it could also be a crime that they are suspected of committing—for example, whether they committed a masked robbery that occurred in the settlement during their stay.

Similarly, in drug trafficking cases, the prosecution relied on predictive character evidence when it introduced profile evidence to suggest that the defendant acted in accordance with “Nigerian drug trafficking patterns” and therefore had intent to distribute,¹⁸² or to suggest that the defendant fit the profile of a knowing drug courier because he had a clean criminal history and was transporting a “‘legitimate load,’ such as ‘produce,’”¹⁸³ or because he traveled over the U.S.-Mexico border with a spouse and children.¹⁸⁴ This is because the evidence involved a characterizing behavioral propensity (the propensity to knowingly and intentionally traffic drugs) of a subpopulation that was identified based on the defendant’s individual characteristics or conduct. As suggested earlier, this qualitative form of profile evidence constitutes base rate evidence because it suggests the prevalence of a feature in a population—and specifically, it suggests a higher prevalence in the defined subpopulation relative to the general population.¹⁸⁵ This is true even though such evidence does not explicitly supply a quantitative prevalence value—such as a value representing the prevalence of intentional drug trafficking among individuals whose conduct is consistent with “Nigerian drug trafficking patterns” relative to that in the general public.

This common form of base rate evidence is qualitative rather than quantitative, but it nevertheless indicates a comparison between the propensity of a subpopulation and that of a broader population. Moreover, this profile evidence satisfies the PBIC criteria, and like ordinary character evidence, it seeks to replace a naturally occurring prior regarding the conduct

182. *United States v. Doe*, 149 F.3d 634, 636-38 (7th Cir. 1998).

183. *See United States v. Gonzalez-Rodriguez*, 621 F.3d 354, 366 (5th Cir. 2010).

184. *See United States v. Mendoza-Medina*, 346 F.3d 121, 127 (5th Cir. 2003).

185. *See supra* note 59. The probative value of evidence showing, for example, the tendency of individuals with certain features and conduct to knowingly and intentionally traffic drugs arises, in part, from the distinction between the prevalence of the act (here, the knowing and intentional trafficking of drugs) in the subpopulation defined by such features and conduct relative to that in the broader population.

at issue and how people act generally¹⁸⁶ with one that is based on the defendant's individual features and propensities. But while ordinary character evidence would directly inform a prior regarding the defendant's propensity, predictive character evidence indirectly informs a prior on the defendant's propensity via information about the propensity of a subpopulation defined by the defendant's individual features or conduct. That is, predictive character evidence provides information about the force that connects the individual acts in a reference population defined by the defendant's features or conduct.

Consider two other examples. In *United States v. Gomez-Norena* (discussed above in Part I.A), the prosecutor introduced evidence indicating that the defendant fit the profile of a drug courier because he arrived from Colombia, paid for his ticket in cash, was in transit to Australia after only a three-hour layover, and had one piece of checked luggage.¹⁸⁷ This evidence—introduced as “background” to the issue of whether the defendant knowingly possessed cocaine and intended to distribute it¹⁸⁸—is individualized in the sense that it is differentiating. That is, it sets the defendant apart from the rest of the relevant population. Similarly, in *United States v. Gonzalez-Rodriguez*, testimony that the defendant had a clean criminal record, which was offered to prove knowledge of and intent to distribute methamphetamine,¹⁸⁹ is individualized because, again, it places the defendant in a subpopulation based on his individual features and conduct. Both sets of evidence also fulfill the other elements of PBIC and therefore constitute predictive character evidence.

Now consider the requirements of character evidence presented in Part II.B.2. Character reasoning requires (1) evidence of an other event or character trait that changes the probability of the event in question; (2) conditional independence between the other event or character trait and the event in question with respect to the proffered purpose of the evidence, conditional on the character-based propensity of the person about whom the evidence is offered; and (3) an inference from the other event or trait regarding the probability of the event in question.¹⁹⁰ The evidence in *Gomez-Norena*, for example, fulfills these three requirements. First, the drug courier profile pertains to other events that change the probability of the event in question: It describes acts committed by other individuals who fit the described profile and

186. See generally DALE A. NANCE, THE BURDENS OF PROOF: DISCRIMINATORY POWER, WEIGHT OF EVIDENCE, AND TENACITY OF BELIEF 95-101 (2016) (discussing the significance and sources of background information in fact-finding).

187. See 908 F.2d 497, 498-99 (9th Cir. 1990).

188. *Id.* at 501.

189. 621 F.3d 354, 366 (5th Cir. 2010).

190. See *supra* Part II.B.2.

are predictive of the event in question.¹⁹¹ Second, the other events are conditionally independent of the event in question, given the character-based propensity of the defendant, in that the described acts of others are unrelated to the act in question and can only impact the probability of the act in question via an inference regarding the defendant's behavioral and character-based propensity—the propensity to knowingly transport and distribute illegal drugs.¹⁹² Third, the probative value of the evidence—which is individualized—emanates from the inference (a propensity inference) that the defendant is a member of the described subpopulation and therefore has an increased likelihood of being a drug courier. In summary, the evidence relies on character reasoning because it involves an inference regarding the probability of the event in question from evidence of a conditionally independent other event, conditional on the character of the person about whom the evidence is offered.

Now, to consider the element of individualization more deeply, define a “natural” base rate as the base rate that a reasonable juror would naturally use to inform their prior regarding the matter in question (i.e., the matter for which the base rate evidence is offered) but in the absence of the base rate evidence. This natural base rate utilizes a “natural” reference population and informs a “natural” prior.¹⁹³ Applying this terminology, individualizing base rate evidence differentiates the defendant relative to a natural reference population.

To illustrate, consider evidence in the well-known “prison-yard hypothetical,” in which twenty-four out of twenty-five prisoners together murdered a guard in a prison yard, and a prosecutor in a case against one of the prisoners sought to rely on base rate evidence that 96% (24/25) of the prison-yard population engaged in the murder.¹⁹⁴ The base rate evidence in this hypothetical arguably does not constitute predictive character evidence because, although it is predictive, behavioral, and characterizing, it is not individualized. The evidence simply describes the natural base rate—the prevalence in the prison-yard population of prisoners who engaged in the guard's murder. It does not differentiate the defendant from the relevant population consisting of the twenty-five prisoners in the prison yard. Because

191. See *Gomez-Norena*, 908 F.2d at 498.

192. See *id.* at 498-99.

193. See generally Edward K. Cheng, Essay, *A Practical Solution to the Reference Class Problem*, 109 COLUM. L. REV. 2081 (2009) (discussing the reference-class problem and offering a solution based on model-selection theory in statistics); Ronald J. Allen & Michael S. Pardo, *The Problematic Value of Mathematical Models of Evidence*, 36 J. LEGAL STUDS. 107 (2007) (discussing difficulties that arise from the reference-class problem).

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

the natural reference population in this hypothetical consists of the prisoners in the prison yard, the base rate evidence consisting of the 96% value only informs the natural base rate. It does not differentiate the defendant by creating a subpopulation—and a new base rate using this subpopulation—based on the defendant’s features or conduct.¹⁹⁵ Therefore, the individualization element of PBIC is not met.

In contrast, the base rate evidence in *Doe* seeks to differentiate the defendant from the general public by placing the defendant in a narrow population involving “Nigerian drug trafficking patterns.”¹⁹⁶ It replaces the natural base rate (reflecting the broader population) with a new base rate reflecting the defendant’s individual features and conduct.¹⁹⁷ Accordingly, this evidence is individualized.

Similarly, in *United States v. Gonzalez-Rodriguez*, the prosecutor sought to prove that a defendant who was arrested for transporting methamphetamine in a tractor-trailer carrying grapefruits through the U.S.-Mexico border had knowledge of the drugs by introducing evidence that the defendant fit the profile of a drug courier—including that the defendant had no criminal record and that he transported a “legitimate load” consisting of grapefruits.¹⁹⁸ Here again, the evidence is individualized. The natural reference population may consist of individuals stopped with drugs at a border crossing. And the prosecutor sought to place the defendant in a narrow subpopulation based on his clean criminal record and transportation of a legitimate load. The purpose of this evidence was to replace the natural prior with one informed by a base rate derived from the subpopulation based on the defendant’s features or conduct. The prosecutor thus used the evidence to suggest that the defendant,

195. As discussed in note 173 above, the natural base rate and its associated population is, to some extent, a matter of judgment. We may ask, why not define the natural base rate in terms of the general public, such that identifying the defendant as a member of the prison-yard population with a 96% rate of participation in the guard’s murder constitutes differentiation and thus individualization? However, a base rate based on the general public is not natural in this scenario—it has nothing to do with the hypothetical and is barely (if at all) relevant.

196. See 149 F.3d 634, 636-38 (7th Cir. 1998).

197. Regardless of the precise framing of certain profile evidence (and the precise meaning of the conditional probability that it suggests), if the evidence is offered to prove intent, knowledge, or another element of a crime, it often requires a chain of inferences that involves placing the defendant in a subpopulation defined by the profile (e.g., “Nigerian drug trafficking patterns,” *id.* at 638) and inferring the relevant element (and ultimately the probability of guilt) from the defendant’s membership in that subpopulation. See *supra* note 172 and accompanying text.

198. 621 F.3d 354, 366 (5th Cir. 2010); see also *United States v. Mendoza-Medina*, 346 F.3d 121, 127 (5th Cir. 2003) (involving evidence that drug traffickers often travel with their spouse and children when transporting drugs).

as a member of this subpopulation, was more likely to have knowledge of the drugs found in his tractor-trailer.¹⁹⁹

Thus, distinguish the prison-yard hypothetical from an alternative prison-yard hypothetical in which the prosecutor sought to introduce base rate evidence regarding a *narrower* subpopulation to which the defendant belongs: for example, a prison-yard subpopulation consisting of a gang known to be particularly violent.²⁰⁰ Here again, the evidence is individualized. Thus, whether base rate evidence is offered to prove the defendant's identity as the perpetrator of a crime (e.g., as in the prison-yard hypotheticals or *People v. Masters*²⁰¹) or the defendant's knowledge of drugs or intent to distribute them (as in *Doe*²⁰²), to constitute predictive character evidence, the evidence must be individualized in the sense that it differentiates the defendant based on the defendant's particular features or conduct.

Interestingly, the base rate evidence in *Diaz v. United States*, which suggested that most drug couriers are knowing participants in the drug conspiracy in which they are involved,²⁰³ is more ambiguous in this regard.²⁰⁴ Although the evidence involves a characterizing behavioral propensity—the knowing trafficking of drugs—the evidence may not be sufficiently individualized to constitute predictive character evidence. Specifically, just as the natural base rate in the prison-yard hypothetical involved the prison-yard population (rather than a population such as the general public), the natural base rate in *Diaz* arguably involves the incidence of unknowing drug couriers

199. Note that, in addition to being individualized, the evidence in *Gonzalez-Rodriguez* is characterizing because it is offered to prove a propensity for knowingly trafficking drugs—a propensity that is of a moral or ethical nature. See *supra* notes 140-41 and accompanying text.

200. Such evidence could involve, for example, testimony indicating the defendant's membership in the gang, combined with testimony suggesting the gang's frequent participation in attacks.

201. 33 P.3d 1191, 1195-96 (Colo. App. 2001); see *supra* notes 3-8 and accompanying text.

202. See *supra* note 182 and accompanying text.

203. *Diaz v. United States*, 144 S. Ct. 1727, 1731 (2024); *United States v. Diaz*, No. 21-50238, 2023 WL 314309, at *2 (9th Cir. Jan. 19, 2023).

204. *Diaz* involves evidence indicating that most drug couriers are knowing participants in their trafficking of drugs. 144 S. Ct. at 1731-32. There is a possible contention that *Diaz* does not involve profile evidence because the evidence is not structured as describing the probable features (transporting drugs) of a type of criminal offender or actor (a *knowing* drug courier). See *supra* note 47 and accompanying text. Nevertheless, this Article adopts a broad view of profile evidence. Further, this Article focuses on profile evidence only as an important application to a subset of *base rate* evidence. *Diaz* certainly involves *base rate* evidence—if not also profile evidence. Therefore, regardless of whether this evidence fits the definition of profile evidence (as the evidence is structured or through a reframing of the evidence), it is *base rate* evidence and therefore highly pertinent to this Article's discussion.

in the population of drug trafficking incidents.²⁰⁵ Unlike the evidence in *Gonzalez-Rodriguez* (which involved facts similar to *Diaz* but included additional evidence as to the defendant’s clean criminal history and legitimate cargo load²⁰⁶), evidence that most drug couriers have knowledge of their drug activities arguably describes this natural base rate rather than a base rate associated with a *subpopulation* that differentiates the defendant relative to those in a broader population based on the defendant’s individual features or conduct.²⁰⁷

There are possible—although arguably weaker—arguments that the evidence in *Diaz* differentiates the defendant relative to a broader natural population. For instance, the expert in *Diaz* highlighted that it would be unusual for a drug trafficking organization to entrust *the large quantity of drugs found in the defendant’s possession* to an unknowing courier.²⁰⁸ This feature of the expert’s testimony arguably individualizes the evidence by introducing a base rate for the subpopulation associated with couriers who carry a large quantity of drugs. However, if the additional fact that the drugs were substantial in quantity and value is relatively insignificant in terms of changing the base rate or describing the features or conduct of the defendant, it would be limited in its ability to differentiate the defendant. If this is so, then the evidence is unlikely to create a sufficient level of individualization to constitute predictive character evidence.

Third, the influence and effects of predictive character evidence are governed by the relative-value principle and the bias-variance tradeoff. As with ordinary character evidence, predictive character evidence provides context for the act in question. It both introduces bias and reduces variability, and its influence and effect on accuracy will depend on its precision with

205. Here, it is strained (at best) to use a broader population (such as the general public) as the natural reference population.

206. See *United States v. Gonzalez-Rodriguez*, 621 F.3d 354, 366–67 (5th Cir. 2010). In addition to the evidence regarding the defendant’s clean criminal history and legitimate cargo load, *Gonzalez-Rodriguez* involved (among other things) “testimony that the majority of people arrested at immigration checkpoints are couriers,” implying that the defendant “was a drug courier, and therefore knew he was carrying drugs, *because* he was arrested at a checkpoint.” *Id.* (emphasis in original).

207. Contrast the evidence in *Diaz* with that in *Salcedo v. People*, which, like the evidence in *Gonzalez-Rodriguez*, differentiates the defendant based on his features and conduct. See *Salcedo v. People*, 999 P.2d 833, 836 (Colo. 2000) (involving expert testimony suggesting that the defendant “knew the suitcase [he carried] contained cocaine because [his] behavior and characteristics fit the drug courier profile,” including factors such as his attire, his cash purchase of a one-way airline ticket on the day of travel, and his travel from a “source city”).

208. Appellant’s Opening Brief at 10–11, *United States v. Diaz*, No. 21–50238 (9th Cir. Jan. 19, 2023), 2023 WL 314309; Answering Brief for the United States at 46, *Diaz*, No. 21–50238 (9th Cir. Jan. 19, 2023), 2023 WL 314309; see also *Diaz*, 144 S. Ct. at 1731.

respect to the act in question relative to the precision of the other evidence in the case.²⁰⁹

In a sense, *ordinary* character evidence provides a juror with information to replace a general (relatively diffuse) prior regarding the propensities of the population at large with one regarding the propensities of the defendant in particular. More precisely, pursuant to Bayesian principles, a juror would implicitly apply shrinkage to combine character evidence with the juror's prior knowledge about the world and the propensities of people in general to arrive at a character assessment for the defendant.²¹⁰ The influence of the character evidence is based on its precision relative to the precision of the juror's priors about the population generally. The juror's knowledge about the world and how people behave can be understood as a hyperprior—i.e., as a prior that is combined with “new evidence” in the form of character evidence to arrive at a character judgment. Ultimately, in a Bayesian “updating” process, this character judgment would then play the role of a prior that is combined with event evidence in a case to arrive at a judgment regarding the event in question.

Under this model of juror decision-making, predictive character evidence informs the juror's prior on the character of the defendant (regardless of whether ordinary character evidence is offered in a case) via information about the propensity of a reference population. In a sense, it refines and sharpens the precision of this prior. Absent ordinary character evidence, this prior—based on predictive character evidence—will be combined with event evidence to arrive at a judgment regarding the act in question. If ordinary character evidence is offered in a case, the population-level prior will be combined with the ordinary character evidence (the “new evidence” regarding the character of the defendant) to form a character judgment, which in turn, will be combined with event evidence to form a judgment regarding the act in question.

Both instances are analogous to the use of other-player information in the example of Roberto Clemente: If the statistician has no data regarding Clemente's individual skill or prior at-bats, the statistician would rely heavily on the population propensity—her expectation for an average baseball player based on the other-player information—to infer Clemente's likely skill level and, in turn, the likelihood of a hit in the at-bat in question. If the statistician has information about Clemente's individual skill from his prior at-bats, she will combine that information with her prior belief regarding the population

209. See *supra* Parts II.A-B.

210. See Bavli, *supra* note 153, at 1065-69 (discussing the psychology of juror decision-making and a juror's application of shrinkage estimation to character evidence).

propensity to arrive at an estimate of Clemente's skill level and ultimately his likelihood of a hit in the at-bat in question.²¹¹

The Bayesian process of combining a prior with new evidence to arrive at a judgment is governed by the relative-value principle.²¹² The value of ordinary character evidence lies in its ability to provide information about the defendant's character or propensity—a force that connects the defendant's acts to one another. By contrast, the value of predictive character evidence arises from its ability to similarly contextualize the act in question by providing information about the propensity that connects the defendant's acts, *but via the propensity of a reference population rather than the defendant's own other acts*. Its influence and effect on accuracy will depend on factors such as the importance of context, the generality and applicability of the acts of the population, the quantity and certainty associated with the predictive character evidence, and the precision of the event evidence. These factors reflect the relative uniformity and strength of the predictive character evidence, and they speak to the relative precision of this evidence with respect to the event in question.

Thus, let us summarize a few important properties of predictive character evidence:

- (1) Base rate evidence constitutes predictive character evidence when it fulfills the PBIC criteria—that is, when it is predictive, behavioral, individualized, and characterizing. In other words, base rate evidence constitutes predictive character evidence when it regards the other acts or behavioral propensities of a subpopulation offered to prove that an individual member of the subpopulation acted in accordance with a character-based propensity on the occasion in question.
- (2) Predictive character evidence is generally relevant. It can improve accuracy when its precision-enhancing effects outweigh its bias-introducing effects. Depending on the circumstances, it can be quite probative but also highly prejudicial.
- (3) Predictive character evidence involves character reasoning and is therefore a form of character evidence. It conveys information about the act in question by providing information about the defendant's character via information about the propensity of a subpopulation of which the defendant is a member.

211. See *supra* notes 164-70; see also Bavli, *supra* note 153, at 1044.

212. Note that although predictive character evidence involves character reasoning, its effect on accuracy (in terms of bias and variance) is distinct from the effect of ordinary character evidence. This is because the contextual information that predictive character evidence supplies is distinct from that provided by ordinary character evidence. For instance, predictive character evidence may often involve a greater sample of events because it is drawn from an entire population of people rather than just one individual (the defendant). On the other hand, it may involve greater bias because it involves the acts of other individuals rather than those of the defendant.

(4) The influence and effects of predictive character evidence will depend on the relative-value principle and the bias-variance tradeoff. It both introduces bias and reduces variability. If admitted, its influence and effect on accuracy will depend on its precision with respect to the act in question relative to the precision of the other evidence in the case.

III. Implications

Predictive character evidence and its relationship to base rate evidence—and profile evidence in particular—have significant implications for evidence law. In this Part, I begin by examining descriptive implications regarding the unpredictability and confusion in admissibility decisions surrounding profile evidence. I then discuss prescriptive implications regarding the appropriate role of the rule against character evidence in determining the admissibility of profile evidence, and base rate evidence more broadly. Finally, I discuss implications for inferences based on race and other personal characteristics from predictive character evidence and for the use of artificial intelligence (AI) and other technologies that rely on extrapolations from population-level data.

A. Descriptive Implications: Explaining Unpredictability and Confusion in Admissibility Decisions Surrounding Profile Evidence

As suggested in Part I, base rate evidence is commonplace in case law and evidence scholarship. Examples include DNA evidence, fingerprint evidence, and other types of forensic evidence; statistical evidence in toxic-tort cases to show a causal relationship between a substance and a plaintiff's disease; comparison evidence in discrimination cases; statistical evidence regarding the lifespan of a product; and probabilistic evidence regarding the likelihood of certain physical features shared by the defendants and the culprits.²¹³ This evidence is relevant because, through probabilistic inference, it can connect a party to an act, state of mind, or crime in question. Profile evidence—a specific type of base rate evidence—follows a similar pattern of inference. However, courts struggle extensively with its relevance, reliability, and desirability in terms of its probative value relative to its unfair prejudice—as though there is an unrecognized factor that differentiates profile evidence from other forms of base rate evidence.²¹⁴ In this Subpart, I contribute to accounting for the confusion and unpredictability surrounding the admissibility of profile evidence by arguing that courts have missed an important differentiating

213. See notes 44-46 and accompanying text. See generally *People v. Collins*, 438 P.2d 33 (Cal. 1968) (en banc) (involving expert evidence in a robbery case regarding the probability of finding a random couple with certain physical features common to the defendants and a description of the culprits).

214. See *supra* Parts I.A.-B.

factor. They turn to rudimentary principles of relevance and reliability because they often do not recognize profile evidence for what it often is: impermissible character evidence.²¹⁵

Consider again *United States v. Doe*, in which the Seventh Circuit upheld the admission of a DEA agent's expert testimony describing the "practices of Nigerian drug smugglers."²¹⁶ The court deemed the testimony relevant to proving "intent to possess and distribute heroin" and to understanding "the common practices and *modus operandi* of Nigerian drug traffickers," which, in turn, would permit the jury to "compare that information to the facts of th[e] case and [the defendant's] own behavior."²¹⁷ This typical form of profile evidence constitutes predictive character evidence because it is base rate evidence regarding a population propensity, and the described population propensity is predictive, behavioral, individualized, and characterizing. First, it is predictive in that it involves the prevalence of certain conduct—the intentional possession and distribution of heroin—in a population offered to suggest the conduct in an individual member of the population. Second, it is behavioral in the sense that it regards the intentional possession and distribution of heroin. Third, it is individualized because its relevance to the case is based on specific features or conduct of the defendant.²¹⁸ Finally, it is characterizing in that the described behavioral propensity is grounded in character rather than another propensity such as skill or habit.²¹⁹

Of course, profile evidence is not always predictive character evidence. For instance, profile evidence that describes a propensity based on a level of skill in a population is not predictive character evidence. But profile evidence very frequently is predictive character evidence. When this is the case, courts should recognize it as such under FRE 404 and analogous state rules.

But courts generally do not recognize the connection between profile evidence and character evidence.²²⁰ Although they analyze profile evidence

215. See *supra* Part II.

216. 149 F.3d 634, 635-36 (7th Cir. 1998); see *supra* notes 66-67 and accompanying text.

217. *Doe*, 149 F.3d at 636-38.

218. See *supra* notes 171-73, 177 and accompanying text.

219. See *supra* notes 138-41, 175-76 and accompanying text. Note that this evidence does not fulfill the requirements of non-character MO evidence. See *United States v. Trenkler*, 61 F.3d 45, 53-56 (1st Cir. 1995) (discussing the contours of MO evidence). For example, the patterns of behavior are not "sufficiently idiosyncratic." *Id.* at 53. Moreover, profile evidence that is "sufficiently idiosyncratic" to satisfy the requirements of non-character MO evidence raises interesting questions but is nevertheless distinct in that it would involve patterns of behavior in *other* people to suggest the perpetrator's identity as the defendant rather than the defendant's own prior "idiosyncratic" behavior "to support the inference that [a prior act and the act in question] are the handiwork of the same individual." *Id.*

220. See *supra* Part I.A.

under basic principles of relevance and reliability because they may intuit the problematic nature of this evidence, they struggle under these rules because the evidence generally *is* relevant and often *is* reliable.²²¹ On the other hand, the issue of character evidence is often not considered or is considered only superficially and rejected.²²² Interestingly, in *United States v. Diaz*—like many other cases involving profile evidence—there is no mention of FRE 404’s ban on character evidence.²²³ The Ninth Circuit rejected the defendant’s argument that “the district court erred by admitting the government expert’s modus operandi testimony on drug trafficking organizations’ use of unknowing couriers,” ultimately affirming the lower court’s decision and rejecting the defendant’s arguments on grounds of reliability, relevance, and unfair prejudice.²²⁴ The Supreme Court reviewed the Ninth Circuit’s judgment under FRE 704(b), ultimately affirming the judgment and upholding the court’s admission of profile evidence against the defendant.²²⁵

Thus, litigants and courts miss a key component of the analysis: While they may understand that profile evidence is somehow problematic, they struggle to recognize that despite its relevance and frequent reliability, profile evidence is often prohibited by FRE 404’s ban on character evidence.²²⁶ As such, courts attempt to jigsaw their evidentiary decisions to fit their intuition, creating unpredictability and weak logic—and ultimately poor law.²²⁷

To be sure, there are likely multiple factors leading to the confusion and unpredictability surrounding profile evidence.²²⁸ However, the courts’ failure

221. *See supra* Part I.A.

222. *See, e.g.,* *Salcedo v. People*, 999 P.2d 833, 837-41 (Colo. 2000) (analyzing drug courier profile evidence under principles of reliability, relevance, and unfair prejudice but not under the rule against character evidence).

223. *See* *United States v. Diaz*, No. 21-50238, 2023 WL 314309, at *2 (9th Cir. Jan. 19, 2023); *Diaz v. United States*, 144 S. Ct. 1727, 1730 (2024). This is not to imply that the evidence in *Diaz* necessarily constitutes character evidence. *See supra* notes 203-08 and accompanying text. It is just to highlight that, despite this possibility, the issue is nowhere addressed in the case.

224. *Diaz*, 2023 WL 314309, at *2-3.

225. *Diaz*, 144 S. Ct. at 1735.

226. *See* FED. R. EVID. 404.

227. *See, e.g.,* *Masters v. People*, 58 P.3d 979, 992-94 (Colo. 2002) (distinguishing profile evidence in a sexual homicide case from drug courier profile evidence that was previously deemed inadmissible on grounds of reliability, relevance, and unfair prejudice).

228. For example, courts may have discomfort with profile evidence—and even qualitative (rather than quantitative) profile evidence—that may suffer from, or be misinterpreted as a result of, the prosecutor’s fallacy or base rate fallacy. *See supra* notes 45, 145. For instance, evidence regarding the probability of certain features appearing in a type of offender may differ drastically in its meaning with respect to the probability of guilt given those features depending on the population prevalence of the features. *See* Hillel
footnote continued on next page

to recognize this evidence as character evidence is at least one important source. As discussed above, courts commonly fail to recognize the relationship between base rate evidence and character evidence, often leading them to analyze base rate evidence solely under FRE 401 and 403. However, FRE 404 is, in a sense, a specialized application of FRE 401 and 403—it “reflects the judgment of Congress that *as a matter of law* the probative value of propensity evidence is substantially outweighed by the risk it poses of unfair prejudice, juror confusion, and time waste.”²²⁹ As such, the prejudicial nature inherent in predictive character evidence—as a form of character evidence—may shine through in this category of base rate evidence even if its reliance on character reasoning does not. In other words, base rate evidence that involves predictive character evidence may seem more unfairly prejudicial under FRE 403, or less relevant under FRE 401—or, for that matter, less reliable under FRE 702—than base rate evidence that does not. Consequently, courts may be more likely to exclude predictive character evidence based on these rules.

Consistent with this explanation, whether base rate evidence constitutes predictive character evidence seems to correlate with the courts’ admissibility decisions: Courts seem more likely to exclude evidence that constitutes predictive character evidence and admit evidence that involves the prevalence of, for instance, *non-behavioral* propensities. For example, courts frequently admit the following types of evidence, all of which involve base rate evidence but not predictive character evidence: DNA evidence, fingerprint evidence, and other forms of forensic evidence;²³⁰ evidence of the probability or improbability of a certain *natural* event, such as the death of an infant due to Sudden Infant Death Syndrome (SIDS);²³¹ evidence of the probability of an

J. Bavli, *The Incongruence Principle of Evidence*, 99 IND. L.J. 245, 269-74 (2023) (discussing evidentiary implications of the base-rate fallacy, which “describes a cognitive bias that causes observers of evidence to undervalue the general prevalence of an event and overvalue the new evidence or individual result” (citing Maya Bar-Hillel, *The Base-Rate Fallacy in Probability Judgments*, 44 ACTA PSYCHOLOGICA 211, 211 (1980))). See generally *Reid v. Georgia*, 448 U.S. 438, 441 (1980) (per curiam) (concluding that there was no reasonable suspicion on “the basis of th[e] observed circumstances” indicating that the defendant fit within the “drug courier profile,” as these circumstances typically “describe[d] a very large category of presumably innocent travelers, who would be subject to virtually random seizures were the Court to conclude that as little foundation as there was in this case could justify a seizure”).

229. FISHER, *supra* note 106, at 173; see FED. R. EVID. 403 advisory committee’s note to 1972 proposed rules (“The rules which follow in this Article are concrete applications evolved for particular situations.”).

230. See CHRISTOPHER B. MUELLER, LAIRD C. KIRKPATRICK, & LIESA L. RICHTER, *EVIDENCE* 726-27 (6th ed. 2018).

231. See *id.* at 726 & n.13 (citing *State v. Pankow*, 422 N.W.2d 913, 917-18 (Wis. Ct. App. 1988)). See generally *R. v. Clark* [2003] EWCA (Crim) 1020 [172]-[180] (Eng.) (discussing the use of statistical evidence in a case involving an alleged fatality from SIDS).

individual's paternity as proof of intercourse;²³² base rate evidence regarding the lifespan of a cell, organism, or product, or otherwise reflecting a "physical [or] medical fact[ing]";²³³ evidence of the proportion of vehicles with certain features that a certain company owns;²³⁴ and regression analysis in toxic-tort cases to show a causal relationship between a substance and a plaintiff's disease.²³⁵

On the other hand, courts seem more likely to exclude base rate evidence that constitutes predictive character evidence. For example, courts are more likely to exclude population-level evidence regarding heroin smuggling to suggest the quantity of heroin smuggled by a defendant;²³⁶ evidence in a sexual abuse case suggesting that the perpetrator is frequently a close relative of the victim;²³⁷ evidence that a batterer with certain characteristics is more likely to commit murder;²³⁸ and other forms of profile evidence.²³⁹

232. MUELLER ET AL., *supra* note 230, at 726 & n.14.

233. *See id.* at 726 (suggesting that there may be a "difference in judicial treatment" in evidence "involv[ing] physical and medical facts" as compared to evidence "reflect[ing] human choice or volition").

234. *See* Koehler, *supra* note 15, at 377 (citing *Kaminsky v. Hertz Corp.*, 288 N.W.2d 426, 427 (Mich. Ct. App. 1979)).

235. *See* Hillel J. Bavli, *Counterfactual Causation*, 51 ARIZ. ST. L.J. 879, 901 & n.80 (2019) (collecting cases); *United States v. Shonubi*, 895 F. Supp. 460, 517 (E.D.N.Y. 1995) ("In at least two classes of cases, 'naked'—or nearly naked—statistical evidence has proven essential. In mass torts, proof of causation often requires the use of statistically based epidemiological proof."), *vacated*, 103 F.3d 1085 (2d Cir. 1997).

236. *Shonubi*, 895 F. Supp. at 518-20, *vacated*, 103 F.3d at 1090-93 (rejecting reliance on base rate evidence); *United States v. Garcia*, 994 F.2d 1499, 1508-09 (10th Cir. 1993) ("To find that these particular shipments [of drugs] were of average size [on the basis of an FBI agent's experience] is nothing more than a guess and clearly insufficient to carry the government's burden.").

237. *See* *State v. Petrich*, 101 Wash. 2d 566, 576 (1984) (en banc); *see also* *Stephens v. State*, 774 P.2d 60, 64 (Wyo. 1989) (finding the admission of testimony that "eighty to eighty-five percent of child sexual abuse is committed by a relative close to the child" not to constitute plain error, but commenting that "[i]t is difficult . . . to understand how statistical information would assist a trier of fact in reaching a determination as to guilt in an individual case and, had an objection been made, it should have been sustained"), *overruled by* *Large v. State*, 177 P.3d 807, 816 (Wyo. 2008); *People v. Julian*, 34 Cal. App. 5th 878, 885-87 (Ct. App. 2019) (involving testimony indicating that allegations of sexual abuse asserted by children are rarely false); Koehler, *supra* note 15, at 377.

238. *See, e.g.,* *State v. Ketchner*, 339 P.3d 645, 648 (Ariz. 2014) (concluding that "testimony about separation violence and lethality factors was inadmissible profile evidence," and commenting that the testimony "predicted an abuser's reaction to loss of control in a relationship" and was introduced to "invite the jury to find that [the defendant's] character matched that of a domestic abuser who intended to kill or otherwise harm his partner in reaction to a loss of control over the relationship"); *Brunson v. State*, 79 S.W.3d 304, 313 (Ark. 2002) ("We hold that the profiling of batterers likely to become killers and then placing [the defendant] within that category was unduly prejudicial to his case and, thus, violated Rule 403.").

Nevertheless, correlations only go so far. They provide a logical explanation for the courts' treatment of base rate evidence in general and profile evidence in particular. However, principles of relevance and reliability cannot adequately replace FRE 404. Unfortunately, as I will argue in the following Subpart, relying on other evidentiary rules to do the work of the rule against character evidence is deeply insufficient. It leads to unpredictability, poor admissibility decisions, and incorrect verdicts. It is, therefore, critical that courts recognize predictive character evidence and determine the admissibility or inadmissibility of base rate evidence accordingly.

B. Prescriptive Implications: Applying the Rule Against Character Evidence to Assess the Admissibility of Profile Evidence

In the previous Subpart, I argued that predictive character evidence helps to explain the courts' inconsistent treatment of profile evidence. In this Subpart, I show that the admissibility of base rate evidence should depend on whether it constitutes predictive character evidence. More specifically, I argue that when defense attorneys, prosecutors, and courts analyze profile evidence, they should be attentive to FRE 404 (and analogous state rules), and courts should apply the rule against character evidence to exclude profile evidence that constitutes predictive character evidence.

Character evidence is generally impermissible based on FRE 404 and analogous state rules. As discussed above, in light of the nature and effects of character evidence, FRE 404 replaces a balancing analysis with a *rule* against the admission of character evidence.²⁴⁰ The policies underlying this rule—for example, the principle that people should be judged based on what they did and not on who they are²⁴¹—apply similarly to *predictive* character evidence. This evidence, like other forms of character evidence, is inadmissible and should be excluded under the rule against character evidence. If certain circumstances

239. As one leading evidence treatise suggests, “we are less comfortable resting specific decisions about particular people on classwide generalizations” when “probability data . . . reflect human choice or volition.” MUELLER ET AL., *supra* note 230, at 726. Thus, “[c]ourts generally exclude expert testimony describing what are called profiles of various sorts of criminal offenders, if coupled with attempts to link these directly to the defendant” *Id.* at 741. For example, courts “generally exclude testimony describing profiles of typical offenders in settings such as airplane hijackers, drug traffickers, and sometimes abusive spouses or parents, at least where the witness suggests that defendant himself fits such a profile.” *Id.* at 751-52.

240. *See supra* notes 130-32, 229 and accompanying text.

241. *See supra* notes 126-32 and accompanying text.

call for admissibility, they should be addressed in the context of the general rule against character evidence.²⁴²

As discussed in Part I, courts (and defense attorneys) frequently analyze profile evidence under FRE 401 or 403 (or analogous state rules).²⁴³ But even when courts exclude profile evidence on these grounds (and they often do not), there are substantial problems with relying on principles of relevance and unfair prejudice to determine the admissibility of profile evidence.²⁴⁴ Most fundamentally, excluding profile evidence on grounds of relevance or unfair prejudice is problematic for the same reasons that excluding ordinary character evidence on these grounds is problematic. First, as discussed above, profile evidence (like ordinary character evidence) is generally relevant and can sometimes be quite probative. The fiction required to exclude profile evidence as irrelevant results in confusion, poor precedent, and incorrect admissibility determinations in future cases in which a court is unable to characterize the evidence as irrelevant. Indeed, courts have expressed uncertainty about which rule applies to exclude profile evidence, and they sometimes seem to apply FRE 401 and 403 by default for lack of a better option. For example, as the Fifth Circuit has stated, “[w]e have not yet explicitly determined what statute or rule of evidence guilt by association evidence [a

242. For example, the FRE includes exceptions for character evidence in sexual assault cases. See FED. R. EVID. 413-15. In addition, future analysis may fruitfully examine the relationship between predictive character evidence and the doctrine of chances. Under the doctrine of chances, courts allow the introduction of other-acts evidence to prove the absence of accident or mistake. See FISHER, *supra* note 106, at 218-25. There is disagreement over whether evidence falling within this doctrine constitutes character evidence. See *id.* at 222-23; Hillel J. Bavli, *An Objective-Chance Exception to the Rule Against Character Evidence*, 74 ALA. L. REV. 121, 140-43 (2022); Paul F. Rothstein, *Comment: The Doctrine of Chance, Brides of the Bath and a Reply to Sean Sullivan*, 14 LAW, PROBABILITY & RISK 51, 52-54 (2015); Edward J. Imwinkelried, *An Evidentiary Paradox: Defending the Character Evidence Prohibition by Upholding a Non-Character Theory of Logical Relevance, The Doctrine of Chances*, 40 U. RICH. L. REV. 419, 425 (2006); Rothstein, *supra* note 140, at 1262-65. Arguably, evidence admitted under the doctrine of chances is closely related to predictive character evidence based on its reliance on population-level probabilities. On the other hand, it often involves information about the probability of a random occurrence of some event (e.g., a fire or a death by SIDS) rather than a characterizing behavioral propensity.

243. See *Brunson*, 79 S.W.3d at 312-13 (citing cases excluding profile evidence on grounds of relevance and unfair prejudice); *supra* Part I.A. As discussed, courts also frequently exclude associational evidence on the basis of relevance under FRE 401 or unfair prejudice under FRE 403. See *United States v. Polasek*, 162 F.3d 878, 884-85 & n.2 (5th Cir. 1998) (citing cases); *supra* notes 48-51 and accompanying text. My discussion in this Part focuses on profile evidence, but my analysis is similarly applicable to associational evidence.

244. I focus primarily on the courts' application of FRE 401 and 403; however, my analysis applies similarly to the courts' application of FRE 702's rule regarding the reliability of expert testimony. See FED. R. EVID. 702; *infra* notes 265-70 and accompanying text.

variant of profile evidence] violates. Many of our sister circuits, however, have concluded that such evidence is irrelevant under [FRE] 401 and 402 or unduly prejudicial under [FRE] 403.²⁴⁵

Second, as with ordinary character evidence, applying FRE 403's balancing rule is not a substitute for applying FRE 404's rule against character evidence. This problem is far from semantic. The FRE and state evidentiary codes *ban* character evidence rather than apply a FRE 403-type balancing. This broad ban is justified by the severe risk that character evidence poses to values such as accuracy and fairness.²⁴⁶ Profile evidence involves similar risks. Indeed, it involves not only character reasoning but also the acts of *others*, thereby arguably posing an even greater risk of *unfair* prejudice than ordinary character evidence.

Consider, for example, the evidence in *United States v. Gonzalez-Rodriguez* suggesting that the defendant was more likely to have been a knowing drug courier because he had a clean criminal history.²⁴⁷ In one sense, this evidence is in stark contrast with *ordinary* character evidence because the profile evidence involves a *clean* criminal record rather than prior criminal convictions, which are run-of-the-mill for ordinary character evidence.²⁴⁸ However, this profile evidence is predictive character evidence. It is offered for the following chain of inferences: The subpopulation of drug couriers who have a clean criminal record has a propensity to knowingly traffic drugs; therefore, the defendant, as a member of this subpopulation, has a propensity to knowingly traffic drugs; therefore, the defendant is more likely to have committed the crime in question.

Although this evidence highlights interesting differences between *ordinary* character evidence and *predictive* character evidence, the policy considerations underlying the rule against character evidence apply in full force. Evidence of the defendant's *clean* criminal record does not directly result in bad-character inferences, but admitting this evidence still risks a high degree of unfair prejudice: Jurors may give the evidence excessive weight, may be confused by the evidence, and may punish the defendant for other acts rather than the act at issue in the case.²⁴⁹ These prejudicial effects only grow when the evidence is

245. *Polasek*, 162 F.3d at 884 n.2 (citing cases); see also *Salcedo v. People*, 999 P.2d 833, 836 (Colo. 2000) (“We have not previously addressed the admissibility of drug courier profiles as substantive evidence of a defendant’s guilt.”); *supra* Part I.A.

246. See *supra* notes 126-32 and accompanying text.

247. 621 F.3d 354, 366 (5th Cir. 2010).

248. See *supra* notes 130-32 and accompanying text.

249. See also *United States v. Gomez-Norena*, 908 F.2d 497, 498-99 (9th Cir. 1990) (involving evidence suggesting that the defendant fit the profile of a drug courier because he arrived from Colombia, paid for his ticket in cash, was in transit to Australia after only a short layover, and had one piece of checked luggage).

combined with other profile evidence to show that the defendant fits a purportedly clear profile of a drug trafficker. Worse still, the biasing effects of the predictive character evidence are caused by acts of *others* rather than the prior acts of the defendant, exacerbating the *unfair* prejudice associated with the evidence. And these prejudicial effects are further amplified by the fact that, unlike the evidence in *Gonzalez-Rodriguez*, predictive character evidence is frequently based on features or conduct of a defendant with a clear negative connotation (e.g., evidence regarding the profile of a batterer turned murderer in *Brunson v. State* or of a sexual murderer in *People v. Masters*).²⁵⁰

250. See *supra* notes 76-87 and accompanying text. Separate from the application of FRE 404, and aside from profile evidence's prejudicing effects described in the text, carefully scrutinizing profile evidence under FRE 403 is important for another reason that courts often fail to recognize: Profile evidence is highly susceptible to misinterpretation based on the base-rate fallacy and the prosecutor's fallacy. See *supra* notes 45, 145, 228. Viewing profile evidence as informing the probability of certain features of a type of criminal offender—and the probability that the defendant has these features if the defendant is guilty, i.e., $P(\text{features}|\text{guilt})$ —jurors may misinterpret this evidence as the transposition of this conditional statement. That is, jurors may erroneously interpret it as indicating the probability that the defendant is guilty given that the defendant has these features, i.e., $P(\text{guilt}|\text{features})$. This error, known as the prosecutor's fallacy (and in this context, perhaps caused by the closely related base-rate fallacy), is difficult to avoid and should be interpreted as a source of significant unfair prejudice in a balancing analysis under FRE 403. Consider, for example, certain profile evidence introduced in *Gomez-Norena* indicating that the defendant paid for his ticket in cash and checked one item of luggage. The prosecutor sought to connect the defendant to the crime by describing the probable features of a drug courier—suggesting that the probability of these “features” (i.e., conduct) in the defendant if he is guilty (i.e., $P(\text{features}|\text{guilt})$) is high. See 908 F.2d at 498-99. However, pursuant to Bayes' rule, which provides

$$P(\text{guilt}|\text{features}) = \frac{P(\text{features}|\text{guilt}) \times P(\text{guilt})}{P(\text{features})},$$

this evidence (and probability) may differ drastically in its meaning with respect to the probability of guilt given those features, i.e., $P(\text{guilt}|\text{features})$, depending on the general prevalence of drug trafficking and the general prevalence of those features. For instance, the profile evidence is not very probative if *everyone* pays in cash and checks one item of luggage. Ignoring the general prevalence of the features or of drug trafficking in the population, $P(\text{features})$ and $P(\text{guilt})$, respectively, leads to the possibility of a severe misinterpretation of the evidence.

The prosecutor's fallacy and base-rate fallacy only support the argument that courts should address profile evidence (and base rate evidence more broadly) with a high degree of care. Even if a court determines that the evidence is offered for non-propensity purposes under FRE 404 (such as to prove motive), the court should still analyze the evidence closely under FRE 403. Moreover, if certain profile evidence could constitute predictive character evidence but also involves a non-propensity purpose—that is, the evidence entails both character and non-character purposes, so it does not *rely* on character reasoning but nevertheless *risks* impermissible character reasoning—the court should consider both the risk of impermissible character reasoning *and* the risk of misinterpretation due to the above fallacies.

The rule against character evidence reflects the policy that people should be judged based on the act in question rather than on who they are or their unrelated acts—let alone the unrelated acts of other individuals.²⁵¹ Although FRE 403 has an important role in determining the admissibility of profile evidence,²⁵² relying on FRE 403 to determine the admissibility of profile evidence *in place of* FRE 404 introduces judicial discretion where there should be none.²⁵³ Consequently, evidentiary decisions surrounding profile evidence are unpredictable, and courts frequently admit such evidence under FRE 401 and 403 when it should be excluded under FRE 404.²⁵⁴

251. See *supra* notes 126-32 and accompanying text.

252. As with almost all evidence, admissibility is subject to FRE 403. See FED. R. EVID. 403. FRE 403 may have a particularly important function if, for example, profile evidence is somewhat individualized but not sufficiently individualized to constitute predictive character evidence. See, e.g., *supra* notes 203-08 and accompanying text.

253. See *supra* notes 130-32, 229, 240-42 and accompanying text. See generally Koehler, *supra* note 15, at 377 (“Although Bayesian logic shows that base rates play a normative role in probabilistic updating tasks, courts do not always agree that they constitute relevant evidence.”); *id.* at 385-400 (“Although courts are sometimes quick to dismiss base rates as irrelevant, at other times they regard base rates as relevant and even crucial.” (citing cases)).

254. It is important to distinguish character reasoning in predictive character evidence from generalizations inherent in evidentiary inference more broadly. See *supra* Part II.B.2. In a murder trial, evidence that the defendant planned to kill the victim is probative because “[o]n the basis of an acceptable generalization we are able . . . to place [the defendant] in a class of persons in which the incidence of murder is greater than among the general public.” James, *supra* note 42, at 699. Such generalizations may often involve implicit inferences from base rates. Consider, for example, evidence (based on the facts in *Gomez-Norena*) offered to suggest that a defendant had knowledge of drugs and intent to distribute them because he arrived from Colombia and paid for his ticket in cash. As discussed, this base rate evidence constitutes predictive character evidence: It is predictive, behavioral, individualized, and characterizing. It is offered to show that the subpopulation of individuals who fit the profile has a propensity to traffic drugs (relative, e.g., to the broader population of people arriving to the United States by air); therefore, the defendant, as a member of this subpopulation, has a propensity to traffic drugs, and therefore, the defendant is more likely to have committed the crime in question.

However, now consider distinct evidence in a financial crime case that the defendant was in financial trouble. This evidence of financial distress involves non-character reasoning. It shows motive: The defendant had financial trouble; therefore, the defendant had a motive to commit the crime in question; therefore, the defendant is more likely to have committed the crime in question. The inference of motive relies on a generalization that implicitly involves a base rate regarding people who are in financial trouble and their likelihood of committing financial crimes. However, distinguish an implicit generalization based on a base rate from *evidence regarding* a base rate. The motive evidence is not predictive character evidence because, unlike the base rate evidence in the drug-trafficking example, the motive evidence does not involve evidence of other acts or propensities of a reference population. Nor does it constitute character evidence: It depends on a generalization that is based on an implicit base rate—and an implicit inference that the defendant’s likelihood of committing the crime

footnote continued on next page

For example, as a consequence of relying on principles of relevance and unfair prejudice to decide the admissibility of profile evidence, courts have established broad categories of permissible purposes—including to provide

is greater because of that base rate—but it is not probative of the defendant’s character. Further, although the motive evidence arguably involves an “other” act or feature of the defendant, the other act or feature is not separate from, or “extrinsic” to, the act in question. See *supra* note 137 and accompanying text. It directly implies motive without a character inference, notwithstanding any reliance on a generalization grounded in a base rate. This point is reinforced by the policy rationales underlying the rule against character evidence, which apply strongly to the profile evidence above but not to the motive evidence.

The distinction between predictive character evidence and motive evidence can be articulated in terms of the description of (and criteria for) character reasoning set forth in Part II.B.2 above: Character reasoning involves an inference regarding the probability of the event in question from evidence of a conditionally independent other event or character trait with respect to the proffered purpose of the evidence, conditional on the character of the person about whom the evidence is offered. As discussed, a probability is not a propensity. See *supra* notes 133-37 and accompanying text. While evidence of the defendant’s financial trouble in the financial crime case is separate from the act of the financial crime, it is not a conditionally independent event given the defendant’s propensity. The fact of the financial trouble indeed affects the probability of the event in question (the defendant’s commission of the financial crime) through ordinary non-propensity reasoning grounded in a theory of motive. Moreover, although reasoning grounded in motive may rely on a generalization based on an implicit base rate, this case involves no other-event evidence regarding the base rate. Therefore, the base rate cannot be relied on to satisfy the definition of character reasoning.

Additionally, in terms of the Bayesian model presented in Part II, predictive character evidence and ordinary character evidence regard other acts and therefore inform a “prior.” But when the evidence directly regards the event in question—as in the motive example—it informs the “event evidence,” a distinct component of the “posterior.” See *supra* notes 143-47 and accompanying text. In other words, when we refer to a *propensity* inference in the sense of a character-based propensity inference, we refer to an inference from evidence regarding either the defendant’s character itself (e.g., testimony that the defendant is a fraud) or other acts that allow a character inference. This is distinct from an *implicit generalization*—or moreover, deductive logic based on a *theoretical* generalization—that permits a jury to infer an increased *probability* of a certain behavior. In other words, the motive evidence does not depend on a generalization that requires propensity reasoning; and even to the extent that the motive evidence—or other evidence “intrinsic” to the crime in question and therefore admissible under FRE 404(b)—relies on an implicit generalization involving a base rate, the evidence still does not depend on either evidence of other acts of a reference population or propensity reasoning. Character inferences are distinctive in that they are based on the generalization that people act consistently with their own acts and character. Inferences based on a population propensity are distinctive in that they are based on the generalization that people act consistently not only with their own acts and character but also with those of *others* within a reference population. Both predictive character evidence and ordinary character evidence inform a prior that is ultimately combined with the event evidence in a case—including, e.g., evidence of motive—to form a posterior, or a judgment. See *supra* notes 146, 162-63 and accompanying text.

background, to show MO, or to rebut an opponent’s argument.²⁵⁵ However, these permissible purposes are so broad that they altogether swallow any form of common law rule against profile evidence. For example, *United States v. Doe* involves the “practices of Nigerian drug smugglers” offered to show MO,²⁵⁶ *United States v. Diaz* involves testimony regarding the rarity of unknowing drug couriers to prove MO,²⁵⁷ and *United States v. Gomez-Norena* involves profiling based on the defendant’s arrival in the United States from Colombia to provide background.²⁵⁸ But these uses of profile evidence should generally be excluded under the rule against character evidence notwithstanding their introduction to prove things such as background or MO. After all, the evidence frequently involves character reasoning. FRE 404(b)(2) permits other-acts evidence for purposes such as showing plan, intent, knowledge, or motive only if such a showing does not rely on character reasoning.²⁵⁹ Indeed, the rule against character evidence does not give judges discretion to formulate permissible purposes that involve character reasoning.²⁶⁰

Moreover, as discussed above, an appellate court may be less likely to reverse a lower court’s admissibility decision based on an incorrect determination under FRE 401 or 403 than based on an incorrect determination under FRE 404.²⁶¹ That is, if a trial court admits evidence as relevant or as not unduly prejudicial relative to its probative value, and an appellate court reviews the decision *only* under these rules—and not the rule against character evidence—the appellate court is unlikely to reverse a trial court error for two reasons. First, a finding of error under FRE 403 must generally satisfy an abuse-of-discretion standard, which is very difficult to meet, considering the trial court’s vast amount of discretion and FRE 403’s already high standard for excluding evidence (“if [the evidence’s] probative value is *substantially* outweighed by a danger of . . . unfair prejudice”).²⁶² Second, even if the

255. See *supra* notes 56-78 and accompanying text.

256. 149 F.3d 634, 636-37 (7th Cir. 1998).

257. No. 21-50238, 2023 WL 314309, at *2 (9th Cir. Jan. 19, 2023).

258. 908 F.2d 497, 498-99, 501 (9th Cir. 1990).

259. See FED. R. EVID. 404(b)(2); Capra & Richter, *supra* note 25, at 772, 776-802.

260. Unfortunately, many courts have misinterpreted FRE 404(b)(2) as creating exceptions to the rule against character evidence, thereby diluting the effectiveness of the rule. See Capra & Richter, *supra* note 25, at 778-86; see also Hillel J. Bavli, Lecture, *Correcting Federal Rule of Evidence 404 to Clarify the Inadmissibility of Character Evidence*, 92 FORDHAM L. REV. 2441, 2447-52 (2024). But even these courts require a prosecutor to satisfy certain criteria to qualify evidence under a purported exception. There are also protections—such as notice requirements—for criminal defendants. See FED. R. EVID. 404(b)(3).

261. See *supra* Part I.B.2.

262. FED. R. EVID. 403 (emphasis added); see FISHER, *supra* note 106, at 51-52 (explaining that FRE 403 “is friendly toward admission of evidence”).

appellate court finds that the trial court erred in admitting certain evidence under FRE 401 or 403, it is arguably less likely to find *reversible* error—instead finding *harmless* error—than if it found that the trial court erred in admitting the evidence under FRE 404.²⁶³ Erring on grounds of relevance may be viewed as relatively benign, and the effects of an error on grounds of unfair prejudice are often less clear than the effects of admitting character evidence—a category of evidence that is well-recognized as highly prejudicial.²⁶⁴ Thus, courts’ and defense attorneys’ attentiveness to FRE 404 permits better evidentiary decisions not only in the trial court but also on appeal.

Additionally, courts frequently decide the admissibility of profile evidence, which is often presented by an expert, via FRE 702 (and analogous state rules). But FRE 702—a rule regarding the reliability of expert testimony²⁶⁵—in no way replaces an analysis under FRE 404. Here again, courts fail to recognize the applicability of FRE 404 and look to apply an existing framework.²⁶⁶ Judicial analysis of expert testimony under FRE 702 is, of course, important. This is especially true for profile evidence, which often involves statistics or other quantitative information,²⁶⁷ generally invites the jury to make inferences

263. See *supra* note 105 and accompanying text.

264. See *supra* note 107 and accompanying text; see also *United States v. Davis*, 726 F.3d 434, 440-45 (3d Cir. 2013) (discussing the significant requirements of FRE 404, emphasizing that “[n]o [jury] instruction could have eliminated the infirmity at the heart of th[e] case”—the inappropriate admission of the defendant’s prior convictions for possessing cocaine—and indicating that “Rule 404(b) has become the most cited evidentiary rule on appeal.”).

265. See FED. R. EVID. 702 (requiring expert testimony to be, among other things, “the product of reliable principles and methods” and their “reliable application . . . to the facts of the case”).

266. See, e.g., *United States v. Solis*, 923 F.2d 548, 550-51 & n.4 (7th Cir. 1991) (applying FRE 702, 403, and 402 (relevance) to uphold the admission of expert testimony regarding the use of beepers as a feature of the drug trafficking profile); *Masters v. People*, 58 P.3d 979, 987-94 (Colo. 2002) (relying primarily on principles of relevance, reliability, and unfair prejudice to uphold expert testimony regarding the characteristics of perpetrators of sexual homicide); *Salcedo v. People*, 999 P.2d 833, 836-41 (Colo. 2000) (analyzing expert testimony regarding the profile of a drug courier under state analogues to FRE 702, 401, 402, and 403); see also *United States v. Diaz*, No. 21-50238, 2023 WL 314309, at *2 (9th Cir. Jan. 29, 2023) (analyzing the admissibility of profile evidence using principles regarding relevance, unfair prejudice, reliability, and mental state testimony).

267. See, e.g., *State v. McMillan*, 590 N.E.2d 23, 31-33 (Ohio Ct. App. 1990) (reversing the defendant’s conviction, finding that expert testimony suggesting that “in 85 to 90 percent of the cases, an offender was also a victim earlier in his or her life” lacked “scientific studies or authoritative treatises” to support this “[expert] evidence based on percentages”); see also *supra* note 237 and accompanying text.

about a defendant based on extrapolations from population-level data,²⁶⁸ and may be subject to logical fallacies.²⁶⁹ But FRE 702 does not replace FRE 404's ban on character evidence, which addresses the serious risks associated with character reasoning—risks that persist regardless of the evidence's reliability.²⁷⁰

The Supreme Court's decision in *Diaz*²⁷¹ further highlights the importance of utilizing FRE 404 to reach admissibility decisions on profile evidence. The *Diaz* Court rejected the applicability of FRE 704(b),²⁷² which prevents an expert in a criminal case from opining on “whether the defendant did or did not have a mental state or condition that constitutes an element of the crime charged or of a defense.”²⁷³ In doing so, the Court further narrowed the scope of evidentiary tools that may prevent the use of a population's characteristics to suggest an individual's behavior. As discussed above, profile evidence can frequently be relevant under FRE 401 and reliable under FRE 702, and FRE 403 involves only a general balancing analysis that is unlikely to be effective in excluding inappropriate character uses of base rate evidence.²⁷⁴ FRE 704(b)—whose applicability is now even narrower than it was prior to *Diaz*—similarly fails to account for the important concerns of FRE 404. These concerns persist regardless of whether the evidence involves an expert's opinion about the defendant's mental state or whether such a mental state constitutes an element of or defense to the crime in question.²⁷⁵ FRE 404 is needed to define an appropriate boundary based on character reasoning between admissible and inadmissible base rate evidence as it relates to a defendant's mental state and in general.

Importantly, I am not suggesting that courts should refrain from applying FRE 401, 403, 702, 704, or any other evidentiary rule.²⁷⁶ Rather, I am arguing that courts should apply these rules *in addition to* FRE 404. For instance, if a court considers certain evidence under FRE 404 and determines that it does not involve character reasoning—i.e., that there is a permissible, non-character purpose for the evidence—then, as with any form of other-acts evidence, the

268. See *supra* Part I.A; see also Faigman et al., *supra* note 69, at 440-72 (describing admissibility requirements for “framework evidence” and “diagnostic evidence” under FRE 702).

269. See *supra* note 250 and accompanying text.

270. See *supra* notes 130-32 and accompanying text.

271. *Diaz v. United States*, 144 S. Ct. 1727 (2024).

272. See *id.* at 1733-35.

273. FED. R. EVID. 704(b).

274. See *supra* Part I.A; notes 243-46 and accompanying text.

275. See FED. R. EVID. 704(b).

276. See *id.* r. 401-403, 702, 704.

court should also conduct a balancing analysis under FRE 403 and apply any other pertinent evidentiary rules.²⁷⁷ On the other hand, if the relevance of the evidence involves character reasoning, then the evidence should be excluded under FRE 404, leaving no need to turn to the other rules.²⁷⁸

Finally, beyond profile evidence, predictive character evidence should have a role in admissibility decisions surrounding all forms of base rate evidence. As discussed above, many forms of base rate evidence—such as evidence of the effect of a toxin on the likelihood of a disease—do not constitute predictive character evidence or bump up against the ban on character evidence.²⁷⁹ But such evidence may constitute predictive character when it involves an inference about an individual’s act based on a reference population’s behavioral propensity.

Accordingly, courts (and advocates) should apply FRE 404 and analogous state rules in analyzing the admissibility of base rate evidence in general and profile evidence in particular. Courts should recognize that base rate evidence that constitutes predictive character evidence relies on character reasoning. As such, courts should exclude it under FRE 404 or analyze it under FRE 403 if a court determines that the evidence qualifies for an established exception to the rule against character evidence or also involves a permissible non-propensity purpose. This treatment would lead to more predictability and would better comport with evidence law’s aims of accuracy, fairness, and equality.²⁸⁰

277. *See id.* r. 404(b)(2) (“This evidence may be admissible for another purpose, such as proving motive, opportunity, intent, preparation, plan, knowledge, identity, absence of mistake, or lack of accident.”).

278. Certain evidence can involve propensity and non-propensity reasoning. For example, associational evidence may also be offered to prove the existence of a conspiracy. *See, e.g.,* *United States v. Ocampo-Vergara*, 857 F.3d 303, 307-08 (5th Cir. 2017) (distinguishing the “guilt-by-association evidence” in *Polasek* and highlighting this defendant’s conspiracy charge). In this circumstance, there are propensity and non-propensity chains of inferences, meriting a balancing analysis under FRE 403.

279. *See supra* Parts II.C, III.A.

280. *See* FED. R. EVID. 102 (“These rules should be construed so as to administer every proceeding fairly, eliminate unjustifiable expense and delay, and promote the development of evidence law, to the end of ascertaining the truth and securing a just determination.”); *see also* *Estes v. Texas*, 381 U.S. 532, 540 (1965) (“Court proceedings are held for the solemn purpose of endeavoring to ascertain the truth . . .”). Note that my normative argument herein relates to the use of base rates at trial in particular. My argument is not intended to imply how base rates should or should not be used in investigations or in everyday reasoning. As with other forms of character evidence, predictive character evidence gives rise to unique concerns when used at trial. *See* Bavli, *supra* note 228, at 246-51, 280-83 (discussing differences between reasoning in the real world and at trial and their implications for character evidence and evidence law).

C. Legal Outcomes Based on Race and Other Personal Characteristics

Base rate evidence is closely linked to issues of race, sex, economic status, and other personal characteristics of a defendant. It often groups people by their characteristics and permits making inferences about an individual based on the individual's grouping.²⁸¹ This is especially concerning when base rate evidence constitutes predictive character evidence because the evidence encourages jurors to draw inferences regarding the *characterizing behavior* of a defendant based on the defendant's grouping with others. Profile evidence is therefore a form of court-sanctioned stereotyping. Relying on stereotypes involves substantial risks for the aims of fairness and equal treatment based on race, gender, economic status, and other personal characteristics. Further, even if courts and prosecutors use profile evidence that does not rely explicitly on such characteristics, the evidence may well use characteristics that correlate substantially with specific identity groups in the population.²⁸²

FRE 404 excludes character evidence and thereby prohibits such propensity inferences. For example, as suggested above, race, gender, and other personal characteristics are frequently at the center of profile evidence.²⁸³ This evidence is generally analyzed under rules such as FRE 401 and 403 without consideration of FRE 404. However, unlike FRE 401 or 403, the rule against character evidence addresses the problem directly: It prohibits inferences regarding the conduct of an individual based on the behavioral propensities of a reference population identified by the defendant's features or conduct.

Moreover, excluding character evidence is central to avoiding outcomes that are based on factors such as a defendant's race, gender, or economic status in another way. Judgments based on character evidence arguably invite jurors to rely on their implicit biases regarding the background characteristics of a defendant.²⁸⁴ A juror's implicit biases frequently relate to a defendant's character in particular.²⁸⁵ Pursuant to the relative-value principle, a juror's priors are salient and influential when the juror is asked to make a character judgment and draw inferences from it for the act in question.²⁸⁶ The judgment

281. *See supra* notes 43-46 and accompanying text.

282. For example, profile evidence may link the defendant to a crime by describing the probable *conduct* of a type of criminal offender. *See supra* note 1 and accompanying text. Such conduct may correlate with various personal characteristics.

283. *See supra* Part I.B.1.

284. *See Bavli, supra* note 153, at 1024-25, 1056-65.

285. *Id.* at 1061-62 (explaining that "when character evidence is admitted" at trial, "the juror relies heavily on her prior beliefs and prejudices regarding the defendant in assessing the defendant's character" and "determining a judgment").

286. *Id.* at 1053, 1061-62; *see also supra* text accompanying note 153 (defining the relative-value principle).

involves an implicit or explicit assessment of the precise matter to which a juror's implicit biases relate—the defendant's character.²⁸⁷ Also, there is substantial ambiguity regarding how a juror should use other-acts character evidence to determine a judgment. Pursuant to the relative-value principle, this ambiguity further exacerbates a juror's reliance on implicit biases.²⁸⁸

Assuming that character judgments indeed invite jurors to rely on their implicit biases, a court or legislature may mistakenly assume that base rate evidence (and profile evidence in particular) provides a counterweight by encouraging the influence of population-level information *instead of* character reasoning. Perhaps a lawmaker would assume that base rate evidence is, in a sense, more objective because it is statistical in nature rather than a judgment regarding a defendant's character. However, the concept of predictive character evidence belies this assumption by illuminating the connection between base rate evidence and character reasoning. Specifically, predictive character evidence clarifies that base rate evidence that is predictive, behavioral, individualized, and characterizing *relies on* character reasoning. Moreover, due to the added inferential link that predictive character evidence requires to connect the base rate evidence to the act in question—i.e., the connection between the population's propensity and the defendant's propensity—predictive character evidence may create even more room for a juror to rely on implicit biases than ordinary character evidence.

Ultimately, the risks of bias associated with ordinary character evidence likely compound those inherent in extrapolations based on an individual's grouping. These risks combine in profile evidence, which involves such extrapolations and often constitutes predictive character evidence.²⁸⁹ Because profile evidence frequently involves character reasoning, a juror is likely to

287. Bavli, *supra* note 153, at 1060-62 (“[A] juror begins to form prior beliefs regarding the defendant’s character [with respect to race, appearance, and other personal characteristics] as soon as the juror sits for trial, and perhaps even earlier. The impact of these priors on the judgment is relatively muted until the prosecutor introduces character evidence against the defendant. At this point, however, the character evidence in a sense activates the juror’s propensity hyperpriors, and, pursuant to the [relative-value] principle, the juror’s prior beliefs and prejudices then play a substantial role in the juror’s judgment.” (footnote omitted)).

288. *Id.* at 1062-63 (“Jurors are generally asked to make character assessments and propensity inferences based on a small and biased sample of prior acts. . . . [Additionally, the juror] will generally receive little or no information regarding the consistency of the defendant’s behavior across changing circumstances. . . . This absence of information . . . leaves a large gap in the chain of inferences . . . [and] represents a substantial source of imprecision [Therefore, by] providing inadequate and certainly imprecise information . . . the court invites the juror to rely heavily on her prior beliefs and prejudices in making judgments based on her assessment of the defendant’s character.”).

289. *See supra* Part II.

interpret profile evidence in a way that is consistent with her prior beliefs—her implicit biases—regarding a defendant’s background characteristics.

The analysis herein suggests a close connection between the risk of bias associated with inferences from profile evidence and that associated with inferences from character evidence. FRE 404 and analogous state rules provide a mechanism for excluding evidence that poses such risks. Further, an understanding of this connection may facilitate better standards for both categories of evidence as well as safeguards against the risks that these forms of evidence pose to fairness and equality.

D. Implications for the Use of Artificial Intelligence and Other Technologies that Rely on Extrapolations from Population-Level Data

Closely related to profile evidence are methods that rely on artificial intelligence and extrapolation from population-level datasets. These methods are often used in police investigations, bail determinations, sentencing, parole decisions, and other aspects of a case, and they may be used with increasing frequency in legal settings.²⁹⁰ For example, police often use inferences from population-level data to infer characteristics of a suspect, and courts use population-level data to infer risks of recidivistic behavior.²⁹¹ In these settings, character reasoning is not necessarily against public policy. Nevertheless, inferences from population-level data that rely on character reasoning come with dangers, including the risk of biases based on race, economic status, and other personal characteristics. They also create risks of false arrest, false conviction, and over-sentencing based on stereotypes and acts not at issue in a case. Recognizing the character reasoning in these methods may allow better policies surrounding their use.

Moreover, AI and algorithmic technologies may increasingly be used to generate evidence for trial. For example, just as courts may admit profile evidence by permitting a prosecutor to examine a detective-witness regarding the factors underlying the detective’s identification and investigation of a defendant, so too may a court admit evidence regarding the factors that were used by an AI or algorithmic technology to identify an individual as a threat.²⁹² Like ordinary profile evidence, courts may be prone to analyzing such

290. See Paul W. Grimm, Maura R. Grossman & Gordon V. Cormack, *Artificial Intelligence as Evidence*, 19 NW. J. TECH. & INTELL. PROP. 9, 10-14, 34-41 (2021) (describing various applications and indicating that “[t]hese examples are only the tip of the iceberg with respect to how lawyers and judges can expect AI to arise in the cases they handle, and how AI increasingly may be applied in the justice system”).

291. See *id.* at 11, 36-41.

292. See *id.* at 36-37 (describing “algorithms used for predictive policing”).

evidence under principles of relevance, unfair prejudice, and reliability.²⁹³ However, because such technologies make extrapolations from population-level data, a prosecutor's reliance on them for evidence may often involve predictive character evidence. As such, courts should analyze this evidence to determine whether it constitutes character evidence. When the evidence relies on character reasoning, it should be excluded under FRE 404 (or analogous state rules) unless it falls within an established exception.

As these technologies become more prevalent in the trial setting, courts should be attentive to the rule against character evidence and mindful of whether evidence based on these technologies constitutes predictive character evidence.

Conclusion

In this Article, I examined a broad category of evidence called base rate evidence. I showed how evidentiary decisions surrounding an important subset of this evidence called profile evidence are rife with confusion, unpredictability, and incoherence. Then, after clarifying the meaning of character evidence, I defined and developed a concept that I have referred to as predictive character evidence. I applied this concept of predictive character evidence to expose a substantial link between base rate evidence and ordinary character evidence. I showed that whether base rate evidence fulfills the PBIC criteria, and therefore constitutes predictive character evidence, determines whether it involves character reasoning.

I then demonstrated how an understanding of predictive character evidence contributes descriptively to resolving the confusion and inconsistency surrounding profile evidence and how it contributes prescriptively to creating a framework for appropriately analyzing this evidence. By exposing the character reasoning underlying certain uses of base rate evidence—and profile evidence in particular—predictive character evidence clarifies judicial decisions surrounding this evidence. Predictive character evidence also sets forth, via the rule against character evidence, a logical and effective approach to addressing its admissibility. Due, in part, to the increasing role of artificial intelligence and extrapolation from population-level data, base rate evidence is increasingly prevalent and important in civil and criminal trials. The ways in which courts understand and address this evidence is critical. In determining the admissibility of base rate evidence, courts should be attentive to the rule against character evidence and the serious risks to accuracy, fairness, and equality that underlie it.

293. *See id.* at 84-90 (discussing how evidentiary rules regarding relevance, unfair prejudice, and reliability can be applied to address the admissibility of evidence generated by AI).