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Does Impeachment by Conviction Create Undue Prejudice? An Experiment and an Analysis

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I. INTRODUCTION

Rule 609 of the Federal Rules of Evidence allows a lawyer to use a witness's criminal conviction for impeachment.[1] But the Rule imposes several limits on this kind of credibility attack. For example, it limits the use of convictions over ten years old.[2] It also requires review under the standard in Rule 403 for most witnesses, so that a conviction is excluded if prejudice substantially outweighs probative value.[3] And most importantly, Rule 609(a)(1)(B) says that the criminal defendant cannot be impeached by a conviction unless the probative value of impeachment "outweighs its prejudicial effect."[4]

There are several assumptions underlying this last part of the Rule. One assumption is that a qualifying criminal conviction means lesser credibility for the witness, no matter what the crime.[5] Justice Holmes gave a clear explanation of this concept. A conviction, he said, shows a "general readiness to do evil" from which the jury can "infer a readiness to lie in a particular case."[6] Alternatively, the "background" theory allows the jury to assess the plausibility of the defendant's testimony by considering his past. This is a kind of reasoning that seems to allow the jury to recognize general propensity to crime,[7] although the Rule is designed to prohibit this inference. And another assumption is that the fact of conviction can cause the defendant to suffer prejudice, ranging from mild to severe, that cannot be avoided completely by an instruction to the jury.[8] These are intuitive assumptions, and they have not all been extensively examined in quantitative ways, although there are some studies of the overall effects

1. FED. R. EVID. 609.

2. FED. R. EVID. 609(b). *See* United States v. Estes, 994 F.2d 147 (5th Cir. 1993) (affirming exclusion of older conviction).

3 FED. R. EVID. 609(a)(1)(A).

4. FED. R. EVID 609(a)(1)(B). The seminal case applying this section was *United States v. Smith*, 551 F.2d 348 (D.C. Cir. 1976).

5. *See, e.g.*, Knight ex rel. Kerr v. Miami-Dade Cty., 856 F.3d 795, 817 (11th Cir. 2017) ("[T]he implicit assumption of Rule 609 is that prior felony convictions have probative value." (quoting United States v. Burston, 159 F.3d 1328, 1335 (11th Cir. 1998)); State v. Randall, 639 N.W.2d 439, 444 (N.D. 2002) (stating that "inherent in Rule 609(a) is an acknowledgement that prior convictions are probative of a witness's credibility," without any limit on the type of convictions referred to); Commonwealth v. Daniels, No. 1286 EDA 2015, 2016 WL 5852208, at *8 (Pa. Super. Ct. Aug. 9, 2016) (holding that witness's convictions made her "less credible" than someone without convictions).

6. Gertz v. Fitchburg R.R. Co., 137 Mass. 77, 78 (Mass. 1884).

7. *See infra* note 25 and accompanying text.

8. *See* authorities cited *supra* note 4.

of convictions.[9] This article is an effort to study the assumption of relatively automatic prejudice that is implicit in Rule 609(a)(1)(B).

To be specific, the past experiments have not been designed to differentiate well between the effects of alleged prejudice and those of lawful use of prior convictions. They show a generally higher rate of conviction, but not in a way that shows whether jurors are properly using the evidence to evaluate credibility or improperly responding to a suggestion of propensity.[10] In fact, the two possible uses are difficult to separate because both uses make guilt more probable.[11] One usage infers that the defendant is probably guilty because his tendency is to commit crimes and the other infers that he is guilty because he is telling a false story. Furthermore, if the background theory is accepted, the two are virtually impossible to separate because propensity becomes proper reasoning. The experiments described in the present article reflect an attempt to devise scenarios in which it is clear that the defendant's testimony is not credible, the prior conviction therefore should have little effect on evaluations of credibility, and—under the usual assumptions—the propensity inference becomes the dominant influence of the conviction on outcomes.[12]

Part I of the article considers the theory underlying the balancing test in the Rule. This review, for the most part, is familiar territory, although the article extends the usual analysis to describe unexpressed assumptions that may be necessary to support the balancing test in the Rule. Part II reports about an experiment that strongly suggests the possibility that the standard assumption of prejudice may be erroneous, particularly in cases

9. The experiments have not been designed to differentiate between the effects of alleged prejudice and those of proper use of prior convictions, as distinguished from the overall effects of prior convictions. *See, e.g.*, Edith Greene & Mary Dodge, *The Influence of Prior Record Evidence on Juror Decision Making*, 19 LAW & HUM. BEHAV. 67, 70–77 (1995) (reporting on a study involving 105 "mock jurors," and concluding that those who were informed of prior conviction were "significantly more likely to convict him of a subsequent offense than were jurors without this information," but not separating alleged prejudice from proper use of convictions); Roselle L. Wissler & Michael J. Saks, *On the Inefficacy of Limiting Instructions When Jurors Use Prior Conviction Evidence to Decide Guilt*, 9 LAW. & HUM. BEHAV. 37, 39–47 (1985) (reporting on experiment involving 160 mock jurors and concluding, although not in quantitative way, that "it appears that [they] used the prior conviction evidence to help them judge the likelihood that the defendant committed the crime charged . . . even though they had been instructed not to use the information for that purpose," but this conclusion reflects what "appear[ed]" to the authors); *see also* HARRY KALVEN, JR. & HANS ZEISEL, THE AMERICAN JURY 146–48 (LITTLE, BROWN & CO., 1966) (finding that conviction rates were twenty-seven percent higher when jurors knew of prior conviction evidence, but not separating allegedly prejudicial use from proper use).

10. *See* authorities cited in *supra* note 4.

11. *See infra* Part II.

12. *See infra* Part II.

in which the prosecution's evidence is itself very persuasive. The experiment produced a statistically significant result in which a prior conviction, coupled with a limiting instruction, made mock jurors more prone to *acquit* than to convict: a counterintuitive outcome. Part III discloses the limits of the experiment, and it makes suggestions for further research. A final section contains the author's conclusions, which include the suggestion that the main assumption underlying Rule 609, of prejudice, may be more doubtful than intuition might tell us.

II. THE RULE LIMITING CONVICTIONS OF THE CRIMINAL DEFENDANT

Rule 609(a)(1)(B) is the most important part of the Rule governing impeachment by conviction. It contains the principles that most often exclude conviction evidence. The judge is a gatekeeper charged with admitting the defendant's convictions only if "the probative value of the evidence outweighs its prejudicial effect to [the] defendant."[13]

This standard is loaded toward exclusion. It can be explained as the "reverse, altered Rule 403 balancing test." Rule 403 admits all relevant evidence for which probative value is not "substantially outweighed" by prejudice or other counterweights.[14] Thus, 403 is weighted in favor of admissibility.[15] But for the criminal defendant's prior convictions, Rule 609 stands the 403 test on its head. It instead requires probative value to outweigh prejudice, although it alters this reversed 403 balance so that the probativity does not have to "substantially" outweigh prejudice for the evidence to be admitted.

A. What Are the Factors That the Rule Balances?

Thus, the Rule calls for the court to measure probative value. But what probative value is it measuring? The answer is that it is measuring the probative value of the conviction as impeachment of the defendant.[16] In other words, the objective is to determine how much the jury will devalue the testimony of the criminal defendant after learning that he has been convicted of a past crime.[17] But there is more to it than this. The cases also measure the "need" for evidence that impeaches the defendant,

13. FED. R. EVID. 609 (a)(1)(B).
14. FED. R. EVID. 403.
15. *See* United States v. White, 692 F.3d 235, 247 (2d Cir. 2012).
16. *See* authorities cited *supra* note 5 and accompanying text.
17. *See* authorities cited *supra* note 5. *See also* Walden v. Ga.-Pac. Corp., 126 F.3d 506, 523 (3d Cir. 1997).

a concept that is discussed further below.[18] Impeachment effectiveness is added to the usefulness of impeachment to determine probative value.[19] The addition of two imprecise quantities produces an even more imprecise quantity.

This imprecise quantity is then compared to the imprecise quantity of prejudice that the conviction creates for the defendant.[20] Prejudice, in turn, is the implication of the conviction about the character of the defendant. To be more exact, prejudice is the possible inference of a propensity of the defendant to commit the crime on trial.[21] This factor, then, requires consideration of the policy of the Rules to exclude propensity evidence—unless it is propensity of certain kinds, such as repeated methods of operation that show intent.[22] Here, there is more imprecision.

Beyond the problem of imprecision of measurement, the Rule does not tell us very well what we are measuring. Nor do the cases. The cases do not provide a clear view of which crimes carry the most probative value on impeachment.[23] The assumption behind the rule is that all convictions, including those for crimes that do not feature truthfulness or honesty as elements, show that the defendant is less credible.[24] Thus, crimes such as involuntary manslaughter or negligent homicide, or for that matter antitrust crimes or air pollution crimes, can qualify even though they do not contain credibility-related elements. The inference behind the Rule is that if you were to round up all living persons convicted of non-intent crimes like involuntary manslaughter, the people in that group would be less likely to tell the truth, and more likely to prevaricate, than the rest of the population. This assumption may strike the reader as plausible, or as unfounded. In any event, it is one of the largely unexamined assumptions underlying Rule 609.

In fact, there is another theory of the impeachment value in prior convictions. In this view, the meaning of the prior conviction lies in

18. *E.g.*, United States v. Pritchard, 973 F.2d 905, 909 (11th Cir. 1992); United States v. Flowers, No. 3:14cr100/MCR, 2015 WL 13404113, at *2 (N.D. Fla. Aug. 3, 3015).

19. *See* FED. R. EVID. 609 (a)(1)(B).

20. *See Flowers*, 2015 WL 13404113, at *2 (stating that courts "also" should consider the need for impeachment).

21. *See id.*

22. *See generally* United States v. Huddleston, 485 U.S. 681, 685 (1988) (citing usual policy against other-crimes evidence but admitting it if properly offered for purpose other than propensity).

23. *See infra* Part IB.

24. *See* authorities cited *supra* note 5.

showing the defendant's "background." This "background theory" is explained by Professors Greene, Nesson, and Murray:[25]

> Impeachment by prior crimes could alternatively be viewed as a practical counterbalance to the fifth amendment, allowing the prosecution minimal latitude in telling the factfinder about the background of a defendant who chooses to step out from behind the shield of the fifth amendment to assert his innocence. The defendant with a criminal record is thereby prevented from presenting himself to the jury as naively innocent. Many courts harbor this view of Rule 609.
>
> The logic of this approach would forswear the idea that the sole function of introducing prior convictions is to prove by the nature of the prior crime that the defendant has a dishonest character. The harsh truth is that all defendants have an extremely powerful incentive to tell a story consistent with their innocence. Instead, the function of impeachment by prior crimes could be conceived more broadly: to give the factfinder some background about the defendant to provide a framework in which to judge the plausibility of the defendant's story of innocence.

This "background theory" would seem to allow the jury to consider propensity toward crime, at least in deciding whether to credit the defendant's testimony. If the defendant's profession of innocence is viewed through the lens of a prior conviction, considering whether the testimony is plausible becomes an exercise in deciding how likely it is that he is guilty as a means of deciding whether he is telling the truth. But the instruction that usually is given to jurors contradicts this theory, or seems to.[26]

B. Which Convictions Carry How Much Impeachment Value?

Unfortunately, Rule 609(a)(1) does not tell us which convictions carry the most impeachment value. So, perhaps the weights of convictions can be inferred from the structure of the rest of the Rule. Rule 609(a)(2), sometimes called the "automatic admit,"[27] tells us that a crime that includes "a dishonest act or false statement" must be admitted without any

25. Eric Green, Charles Nesson & Petter Murray, *Commentary: The Use of Prior Convictions*, PROBLEMS, CASES, AND MATERIALS ON EVIDENCE, https://wiki.harvard.edu/confluence/display/GNME/COMMENTARY%3A+THE+USE+OF+PRIOR+CONVICTIONS [https://perma.cc/99MG-2ZUH].

26. *See infra* notes 79–80 and accompanying text; *see also* Appendix B (excerpting a version of the instruction).

27. *See* State v. York, 427 P.3d 371, 375 (Utah 2018) (quoting authority stating that such a conviction is to be "automatically" admitted).

balancing test.[28] Perjury is an example, presumably, and so is a crime of evidence tampering that contains an element of dishonesty.[29]

But Rule 609(a)(2) has a counterintuitive twist to it. The Rule applies only if the crime "requires proof of" a dishonest act or false statement.[30] Thus, shoplifting does not qualify.[31] Theft may not qualify, perhaps, depending on the particular brand of theft committed.[32] Robbery may not qualify, because robbery can be committed without any element that involves "an act of dishonesty or false statement."[33] If a person were to say, "of course robbery is a crime of dishonesty!", the observation would be correct in common sense terms, but it is not always correct in the convoluted logic of Rule 609(b).[34] Thus, the structure of Rule 609 does not provide a great deal of help in weighing the impeachment value of most crimes.

The cases are not definitive either. It depends on the jurisdiction. There is some suggestion that crimes qualifying in the vernacular as dishonest have greater impeachment value that those that do not, but it is only a suggestion,[35] and there is a suggestion that possession crimes have lower value,[36] but the cases furnish little else that describes the comparative weights of probativity. There is no scale provided by the cases or the Rule by which to measure degrees of impeachment power. Survey results show that both judges and students regard theft-related

28. FED. R. EVID. 609.

29. *See York*, 427 P.3d at 375.

30. *See id.*

31. *See, e.g.*, United States v. Glenn, 667 F.2d 1269, 1273 (9th Cir. 1982) (holding that theft convictions are not usually admissible under 609(a)(2) but may be if the definition of the particular kind of theft includes an element of dishonesty).

32. *See* State v. Winegardner, 397 P.3d 363, 366 (Ariz. Ct. App. 2017) ("[S]hoplifting is not a dishonest act or false statement within the meaning of Rule 609(a)(2).").

33. *See* State v. Sims, 526 N.W.2d 201, 201 (Minn. 1994) (holding that robbery did not "directly involve dishonesty or false statement."). *But see infra* note 34 (citing contrary cases).

34. *See* State v. Al-Amin, 578 S.E.2d 32, 34, 37 (S.C. Ct. App. 2003) (stating that majority of jurisdictions admit robbery convictions under 609(a)(2)), *overruled by* State v. Broadnax, 779 S.E.2d 789, 792 (S.C. 2015) (holding that a robbery conviction "is not probative of untruthfulness.").

35. For example, some courts say that burglary and larceny are crimes that reflect on credibility, but they do not expressly rank them as having high impeachment value in comparison to other crimes. *See* United States v. Wilson, 536 F.2d 883, 885 (9th Cir. 1976); United States v. Hatcher, 496 F.2d 529, 530 (9th Cir. 1974); *cf.* United States v. Glenn, 667 F.2d 1269, 1272 n.2 (9th Cir. 1982) (stating that theft-related convictions have "some bearing on credibility.").

36. *E.g.*, State v. Roche, 878 P.2d 497, 500 (Wash. Ct. App. 1994) (stating that impeachment value of defendant's possession convictions was a "close question," mentioning a defendant's argument that their convictions "simply do not reflect on his dishonesty," and criticizing state's argument).

convictions as likely to qualify for admission into evidence, but there is no codified or decisional basis for this tendency.[37]

Some cases contain lists of factors to consider in assessing impeachment value, but they do not rank types of convictions. For example, Washington's *Alexis*[38] factors must be applied whenever a court in that state weighs probative value and prejudice:

> Those factors are: (1) the length of the defendant's criminal record, (2) the remoteness of the prior convictions, (3) the nature of the prior crimes, (4) the centrality of the credibility issue, and (5) the impeachment value of the prior crimes.[39]

Another jurisdiction's similar list appears in *Hankins v. State*.[40] These authorities tell us that the "nature" of the witness's crimes and their "impeachment value" are to be weighed, but they do not hint at how to assign the controlling "weights."

C. The Need for Impeachment and the Need for the Defendant's Story

Into this mix of uncertainty, the courts have sometimes inserted two other considerations. As indicated above, some courts have referred to the need for the prosecution to use impeachment material.[41] Others have asserted that there is a need for the jury to hear the defendant's story. Neither of these factors is expressed directly in the Rule. Perhaps it can be argued that they are implicitly included in the balancing factors that the Rule does set out: by the inference that impeachment value depends on the need for impeachment and prejudice is to be measured by the value of the evidence that it denigrates, although these do not seem to be the most natural conclusions from the text of the Rule.[42] As one judge put it, "There may be cases where it would be of greater importance that the jury hear a defendant's story than that the defendant forego testifying because of the fear of prejudice founded upon a prior conviction."[43]

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37. Ric Simmons, *An Empirical Study of Rule 609 and Suggestions for Practical Reform*, 59 B.C. L. REV. 993, 1020–24 (2018). This study was a survey and did not consider the effects of convictions on jury decisions.

38. State v. Alexis, 621 P.2d 1269, 1272 (Wash. 1980).

39. State v. Roche, 878 P.2d 497, 500 (Wash. Ct. App. 1994) (citing factors).

40. Hankins v. State, 180 S.W.3d 177, 181 (Tex. Ct. App. 2005), *citing* Hernandez v. State, 976 S.W.2d 753, 755–56 (Tex. Crim. App. 1989).

41. FED. R. EVID. 609 (a)(1)(B); *see also* cases cited *supra* note 18.

42. FED. R. EVID. 609 (a)(1)(B) itself refers to the probative value "of the evidence" and to "its prejudicial effect," not to the otherwise credible or non-credible nature of the defendant's story as a whole.

43. Evans v. United States, 397 F.2d 675, 680 (D.C. Cir. 1968) (Bazelon, J., dissenting).

In any event, the need for impeachment and the value of hearing the defendant's story are mentioned in some of the cases. But how is one to evaluate these factors for balancing purposes? It might seem that the need for impeaching material is at its greatest when the prosecution's evidence is potentially doubtful. But that conclusion would insert material thought to be harmful to the defendant precisely when the defendant's case is most appealing. On the other hand, it might be argued that the need for impeaching evidence is at its highest when the prosecution's case is strongest, because then the possibility of a miscarriage of justice from a false defense is most serious.

As for the assertion that the jury needs to hear the defendant's story, there are even greater difficulties in finding a scale by which to weigh this factor. One problem is that there is a frequently unanswerable question: just what *is* the defendant's story? The Fifth Amendment relieves the defendant of the duty to inform the court, except in some specific circumstances, such as those involving alibi or insanity.[44] In instances in which the court knows or suspects what the defense is, this factor seems to put the court in an awkward position, one that judges usually should avoid, because it seems to require the court to weigh the value of the defendant's exonerating testimony before hearing it or allowing the jury to hear it.

D. Estimating the Degree of Prejudice Created by the Conviction

Then, there is the matter of weighing prejudice. The potential prejudice comes from two sources created by evidence of a criminal conviction: the "bad individual"[45] inference and the "propensity"[46] inference. If the crime on trial is theft and the conviction offered for impeachment is involuntary manslaughter, there is probably not much suggestion in the conviction of propensity to commit theft, but the conviction does show that the defendant has been a bad individual in the past. The factfinder might devalue the defendant's right to proof beyond reasonable doubt. But this inference, even if prejudicial, seems to be built

44. FED. R. CRIM. P. 12.1(a) (requiring notice of alibi); FED. R. CRIM. P. 12.2 (notice of insanity).

45. *See, e.g.*, United States v. Wells, 879 F.3d 900, 926 (9th Cir. 2018) (quoting United States v. Curtin, 489 F.3d 935, 944, (9th Cir. 2007)) (stating that Rule 404 "curtails . . . 'bad man' evidence."). But almost any evidence used to prove a crime will support this inference.

46. FED. R. EVID. 404(b) usually excludes conduct used to prove "action in conformity," or in other words, propensity.

into the Rule as an acceptable influence because it is the basis of the impeachment itself.[47]

But if the crime on trial is theft and the conviction is also for theft, inferences from the impeachment may include not only that the defendant has been a bad individual, but also that he has been, and possibly still is, a thief. Thus, in *United States v. Brown*,[48] the court said that the danger of unfair prejudice is particularly present where the prior conviction "involves precisely the same activity as the [present offense]." This propensity inference contravenes the principle in Rule 404(b) that evidence about character usually may not support a conclusion about action in conformity.[49] There are exceptions in which evidence used for propensity is allowed, but the policy of the Rules generally disfavors the propensity inference.

There is reason to criticize the anti-propensity principle,[50] but for better or worse, it is deeply ingrained in the Rules.[51] It seems likely that an intelligent layperson would consider the result exactly backward because the anti-propensity principle means that the more similar the impeaching conviction is to the crime on trial, the more likely it is that the theory of the Rule requires excluding the conviction.[52] Thus, the logic says that if a defendant testifies to an alibi in a robbery case, his earlier conviction for robbery will be less likely to be allowed to impeach him—but his conviction for murder will more likely be admitted.[53] It should immediately be added that reality does not always follow this pattern. A judge may exercise discretion to admit a robbery conviction against a robbery defendant, possibly by recognizing a need for impeachment.[54] In fact, one study shows that judges are "much more likely" than students to

47. The inference is that the defendant is a bad person, and therefore conviction of any kind of crime bears on credibility. *See* cases cited *supra* note 5 and accompanying text.

48. United States v. Brown, 606 F. Supp. 2d 306, 312 (E.D.N.Y. 2009) (alteration in original) (quoting United States v. Joe, No. 07 Cr. 734, 2008 WL 2810169, at *4 (S.D.N.Y. July 21, 2008)).

49. *See supra* note 42 and accompanying text.

50. For example, FED. R. EVID. 404(a)(1) (allowing character evidence offered by the defendant) is an exception, and so is FED. R. EVID. 413 (allowing similar crimes in sexual assault cases).

51. *See* David Crump, *The Case for Selective Abolition of the Rules of Evidence*, 35 HOFSTRA L. REV. 585, 625–33 (2006) (offering arguments for admitting propensity evidence).

52. *See* David Crump, *An Edifice of Misshapen Stones: Interpreting Federal Rule of Evidence 404(a)*, 43 HOFSTRA L. REV. 667, 681–82 (2015).

53. *See supra* notes 42, 48 and accompanying text.

54. The Government's need for impeaching evidence is a factor in favor of admissibility. *See supra* notes 12–13 and accompanying text.

consider convictions admissible for impeachment.[55] But the theory of the rule suggests that similarity of the two crimes is prejudice.

II. EXPERIMENTAL EVALUATION OF PREDUDICE

Given the uncertainties underlying the determinants in Rule 609, it is surprising that there has not been more statistical evaluation of the existence or weight of prejudice that an impeaching conviction can create. The author of this article conducted a pair of experiments[56] that were intended to find out about this question with a scenario aimed at isolating the alleged prejudice.

A. The Experiment: Two Pairs of Scenarios, Illustrated by Appendices A and B to This Article

(1)The First Pair of Scenarios. A group of 61 first-year law students taking a course in criminal law took part in the first stage of the experiment. As is usual for first-year students, these experimental subjects had had no formal exposure to the Rules of Evidence.[57] They were divided into two groups and given two closely similar scenarios. Both scenarios depicted a robbery of a clerk in a convenience store. A police officer responded quickly and promptly apprehended the suspect, who matched the clerk's description, a few blocks away after he ran upon seeing the officer's vehicle. The clerk had told the officer that the defendant had taken $45, with a faded, yellowed $5 bill on top. During a search incident to arrest, the officer found $45 in the suspect's front pocket, with a faded, yellowed $5 bill on top, and he also found a pistol as described.[58] In summary, the identification was unshaken, and the corroboration was very strong.

Also, according to both scenarios, the defense lawyer cross-examined both the clerk and the officer with best efforts, to little effect.[59] The defendant testified in his defense, saying that he had earned the $45 by washing dishes and that he was walking to his aunt's home. He was cross-examined, and the cross-examination revealed that his aunt's home

55. Ric Simmons, *supra* note 37, at 1024–25 (reporting on survey of judges and students).

56. Experiment conducted during course in Criminal Law, Spring Semester, 2018, University of Houston Law Center.

57. At this law school (University of Houston Law Center), and customarily in others, Evidence is not a first-year subject, and the Criminal Law course does not cover it.

58. *See infra* Appendices A and B.

59. *See infra* Appendix A. This feature of the scenario was included to increase effects of the conviction evidence and to decrease other effects.

was nowhere near the direction he was walking.[60] Both scenarios repeatedly told the readers that conviction could result only upon proof beyond a reasonable doubt.[61]

But there was a difference in the two scenarios. The first scenario ended with this set of facts, in a more extended version. The second scenario, however, also included the introduction into evidence of the defendant's prior conviction for theft.[62] This scenario also included a version of a pattern instruction telling the readers that they could consider the conviction only in assessing the credibility of the defendant and not in deciding whether he had committed the crime of which he was accused.[63]

The individuals in both groups were instructed to state, by checking a box, whether they would probably find the defendant guilty or not guilty if they encountered this case in court. Participants were asked to set aside the fact that the scenario was hypothetical and to do their best to decide what they would actually do as jurors.[64]

The first pair of scenarios, and the questions and instructions accompanying them, are set out as Appendices A and B to this article.

(2) The Second Pair of Scenarios: The Same, but with the Same Crime of Robbery. The second pair of scenarios was identical to the first, except that the crime of prior conviction was identified as robbery—the same crime as the crime on trial. The two scenarios used in this second part of the experiment are not attached, because the only difference from the first set was the substitution of the word "robbery" as the crime of prior conviction.

(3) A Brief Summary of the Result. Contrary to expectation, neither pair of scenarios produced any greater tendency toward a finding of guilty from the prior conviction. The first pair of scenarios resulted in more convictions *without* the prior conviction than with it. In this instance, the numbers were not statistically significant. The second pair of scenarios again resulted in more findings of guilty without the prior conviction than with it, but this time, the result was statistically significant. In other words, the results are counterintuitive. Including a prior conviction, together with a limiting instruction, prompted more mock jurors to *acquit*, rather than to convict.

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60. *See infra* Appendices A and B.

61. In addition, participants were especially acquainted with the burden of proof beyond a reasonable doubt because their casebook included a complete chapter dedicated to the subject. DAVID CRUMP ET AL., CRIMINAL LAW: CASES, STATUTES, AND LAWYERING STRATEGIES Ch. 4 (3d ed. 2012).

62. *See infra* Appendix B.

63. *Id.*

64. *See infra* Appendices A and B.

B. The Hypothesis Formed before the Experiment—and the Experimental Design

The author hypothesized, on the basis of the well-known suspicion of prejudice embedded in Rule 609,[65] that there would be significantly more findings of guilty in response to the second scenario of each pair: the one with the prior conviction. The "bad individual" inference was there, if it exists.[66] As for the propensity inference, the conviction in the first pair of scenarios was not squarely the same as the crime on trial, but similar enough to give rise to the suggestion that this defendant was prone to the kind of crime for which he was accused.[67] The second scenario strengthened this inference by using the same crime as the one on trial. It was expected that the existence of prejudice underlying the Rule would be inferable from the results.

The experimental scenarios were designed to heighten the effect of the conviction. An effort was made to create a crime that sounded simple, typical, and believable. At the same time, the effort was to produce scenarios with strong evidence of guilt, consistent with brevity.[68] And the effort was to have the defendant testify, and the defense lawyer examine and cross-examine witnesses completely, although the evidence was unfavorable to the defendant throughout.[69] It was hoped that these conditions would produce distributions of responses that would lead to a statistically significant result,[70] in which the second scenarios in each pair would produce more convictions, consistently with the inference of prejudice.

It should be added that if the "background theory" of impeachment by conviction is accepted as a part of the rationale for Rule 609, the idea of prejudice is so difficult to define that it probably cannot be detected by experiment.[71] Since Professors Greene, Nesson, and Murray state that "many courts" accept this theory,[72] it can be argued that none of the studies, including this one, can really detect any prejudice. The analysis reported here, however, is an effort to detect prejudice in the form of propensity use of conviction evidence.

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65. *See* Gertz v. Fitchburg R.R. Co., 137 Mass. 77, 78 (Mass. 1884).

66. *See supra* notes 45–47 and accompanying text.

67. MODEL PENAL CODE § 222.1 (AM. LAW INST. 2009) (defining robbery as conduct committed during a theft).

68. This feature was included to enhance the effect of the prior conviction by minimizing other issues.

69. *See supra* note 68 and accompanying text.

70. *See supra* notes 68–69 and accompanying text.

71. *See* Green, *supra* note 25 and accompanying text.

72. *See id.*

C. The Previous Experiments

Previous experiments or works are exemplified by those cited above, including those by Greene and Dodge, Wissler and Saks, and Kalven and Zeisel.[73] Although all are credible and valuable, none of these studies was designed so that they could separate and evaluate the effects of alleged prejudice, if indeed that ever can be done. Greene and Dodge, for example, manipulated information about prior acquittals, prior convictions, and instructions to disregard.[74] They found that subjects who were told that the defendant had a prior conviction were significantly more likely to find him guilty than subjects without this information and that limiting instructions had limited effect.[75] This result is interesting, but not because of a demonstration of prejudice. The findings simply are consistent with the conclusion that mock jurors responded to the prior conviction by disbelieving the defendant's version of events, or in other words, by using the conviction properly under either the diminished credibility or background approaches.

Kalven and Zeisel's work is a landmark, but it does not address the point at issue. Their method included studies of actual juries' results, and not of controlled comparisons. Their finding was that prior convictions increased the likelihood of a finding of guilt.[76] But this result, again, is consistent with a conclusion that jurors simply discounted previously convicted defendants' versions of events.

Wissler & Saks's work is more closely on point. Using an approach roughly similar to that of Greene and Dodge, these researchers concluded that mock jurors could not follow limiting instructions telling them to use prior convictions solely to evaluate credibility.[77] As a result, Wissler & Saks concluded that it "appear[ed]" that the experimental subjects were responding to an inference that the accused was of bad character.[78] But the problem with this inference is first, that it is an inference and not a direct result of the experiment, and second, that the inference of lessened credibility is supposed to work that way. The prior conviction, as Justice

73. *See* authorities cited *supra* note 9 and accompanying text.

74. Edith Greene & Mary Dodge, *The Influence of Prior Record Evidence on Juror Decision Making*, 19 LAW & HUM. BEHAV. 67, 70–77 (1995).

75. *Id.*

76. HARRY KALVEN JR. & HANS ZEISEL, THE AMERICAN JURY 146–48 (1966).

77. Roselle L. Wissler & Michael J. Saks, *On the Inefficacy of Limiting Instructions: When Jurors Use Prior Conviction Evidence to Decide Guilt*, 9 LAW. & HUM. BEHAV. 37, 39–47 (1985).

78. *Id.*

Holmes said, is supposed to show a "general readiness to do evil," from which the jury can "infer a readiness to lie in a particular case."[79]

It should be added that the finding that jurors cannot follow this kind of limiting instruction is not a great discovery. The instruction is logically inconsistent and impossible to follow if taken literally. It typically tells jurors not to consider the prior conviction in assessing guilt but to consider it in evaluating the defendant's exonerating testimony. If the conviction is used to diminish the defendant's credibility and therefore his story, it is used to determine guilt, so the proper use of the evidence is also (or appears to be) an improper use. Granted, there is a way to see the two uses as different, but it requires really close reasoning, or as the poet said, the ability to know the dancer from the dance.[80]

D. How This Experiment Is Different

The experiment reported here reflects important differences from others that have been done. The design features a prosecution that is supported by convincing evidence. In contrast, the defendant's testimony is not credible at all. The impeaching conviction is close to but not identical to the crime on trial in one scenario, and it is identical in the other.

Why were these features chosen? The experiment is designed to maximize the potential effect of the propensity inference: the conclusion that because the defendant has committed and been convicted of a similar crime before this event, he is more likely to be guilty of this crime. This result, it was thought, would decrease the impact of the prior conviction for purposes of credibility and increase its potential use to support a propensity inference.

In other words, these experimental conditions were thought to make the prohibited jury usage of the prior convictions—as an inference of propensity—more readily recognizable, if it existed.

E. The Result of the Experiment

The result was not consistent with the hypothesis at all.

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79. *See* Gertz v. Fitchburg R.R. Co., 137 Mass. 77, 78 (Mass. 1884).

80. W.B. YEATS, *Among School Children*, *in* THE POEMS OF W.B. YEATS: A NEW EDITION (Richard J. Finneran ed., Macmillan Pub. Co.) (1989). "O body swayed to music, O brightening glance, / How can we know the dancer from the dance?" are the last two lines of this poem. A superficial reading would translate this passage by saying that that we cannot visualize the thing separately from the evidence of the thing.

(1) The First Pair of Scenarios. The first group in this pair, the one without the conviction, might be called the control group,[81] and the second the experimental group. In response to the first pair of scenarios, without the conviction, 25 subjects out of a 32-person population gave responses of Guilty. With the conviction, 20 out of 29 answered guilty.[82] This meant that 69% in the experimental group opted for guilty, versus 78% in the control group. In summary, the second scenario, which included the defendant's prior conviction, was *less* likely, not more likely, to receive answers of guilty from these particular experimental subjects.

The experiment suggested—but only suggested[83]—that the inference of prejudice underlying Rule 609(a)(1)(B) may be mistaken. At the least, it suggests that prejudice is not terribly significant, in a case with circumstances like the scenarios. But the data, in this first phase of the experiment, were not robust enough for statistical significance.

(2) The Second Pair of Scenarios. The second pair of scenarios, with the prior conviction the same as the crime on trial, produced another surprise, and this time a statistically significant correlation. In the first group, 26 responded with guilty, 3 with not guilty. In the second group, with the prior conviction, 17 said guilty; 9 said not guilty. This result was statistically significant, as will be explained below. But it is certainly in contradiction to the expected outcome.

(3) Why did these results occur? The experimental subjects were debriefed about their reasons. The most cogent explanation for a difference in the two groups was that the instruction about how not to use the conviction[84] was confusing and internally contradictory.[85] This report from the subjects was not surprising. As is indicated above, telling decisionmakers to use the conviction to evaluate the credibility of the defendant's testimony, and at the same time telling them not to use it to decide the case, is to demand the impossible. In addition, the subjects offered the rationale that readers of the second scenario might have inferred from the prior conviction that the defendant faced a very long

81. Use of a control group reduces the effects of confounding variables and increases the likelihood that differences actually reflect the independent variable of interest. *See* DAVID CRUMP, HOW TO REASON: A MULTIDISCIPLINARY THINKER'S TOOL KIT 450 (Quid Pro Books, 2d ed. 2014) [hereinafter "HOW TO REASON"].

82. Copies of responses are held by the author.

83. Mere suggestion is all, because the result lacks statistical significance. *See infra* Part IIIA.

84. *See infra* Appendix B.

85. Unless the reader of the instruction has taken an Evidence course, it probably seems contradictory. On one hand, the instruction tells the reader not to use the conviction to decide the defendant's guilt, but on the other hand, it tells the reader to go right ahead in using it to decide his guilt, by using it to reject his defense.

prison sentence and may have withheld a finding of guilt as a cautionary measure.

The rest of the responses did not explain the result. The subjects pointed out, for example, that reading a scenario is less compelling than seeing testimony under oath from a flesh-and-blood victim or from a real defendant who faces imprisonment. But this and other explanations apply equally to the responses of both groups.

IV. THE LIMITS OF THE EXPERIMENT AND SUGGESTIONS FOR FURTHER RESEARCH

A. The Meaning of the Experiment

(1) The First Pair of Scenarios: Counterintuitive, but Not Statistically Significant. The result produced by the first pair of scenarios is not statistically significant.[86] The p-value as calculated by Mathematica[87] is 0.561524. There is a greater than 50% probability that distributions this strong or stronger in support of the null hypothesis would result from randomness.[88] A statistician usually would not accept results with a p-value greater than a pre-set alpha value of 0.05.[89]

Doesn't the result, then, support the null hypothesis: that the conviction does not create a greater likelihood of a guilty response? It may suggest this conclusion, but not in a statistically significant way. A failure to reject the null hypothesis is not equivalent to statistical support for the null hypothesis.[90] In other words, the first pair of scenarios does not prove statistically either that a conviction in these circumstances is prejudicial or that it is not.

(2) The Second Pair of Scenarios: Counterintuitive AND Statistically Significant(!) The second pair of scenarios again produced

86. *See* HOW TO REASON, *supra* note 81, at 425 (explaining that statistical significance results from a low p-value, meaning that there is a low probability of an equally strong or stronger distribution at random).

87. Wolfram Mathematica is a web-based system for technical computation. *See* WOLFRAM MATHEMATICA, https://www.wolfram.com/mathematica [https://perma.cc/3B9G-SWWA]. The second group was evaluated with the Fisher Exact test.

88. The p-value is the probability that an equally strong or stronger distribution would result at random. *See* HOW TO REASON, *supra* note 81, at 425.

89. *See id.* The "alpha value" is a somewhat arbitrary pre-set level above which we will not accept a higher p-value.

90. The null hypothesis is the conjecture that there is no correlation. But the failure to detect a correlation does not prove that one is not there. The "power" of a data set is its likelihood of rejecting the null hypothesis and evidencing a sufficiently significant correlation. *See* HOW TO REASON, *supra* note 81, at 427. With greater power, we might see statistically significant evidence of a correlation.

a counterintuitive result, but this time, the numbers were statistically significant. This part of the experiment, then, shows that giving the prior conviction and instruction to jurors makes them *more acquittal prone.* The p-value here is 0.0484776, below the pre-set alpha value of 0.5. This result may be reflective only of cases in which the evidence of guilt is strong, and it may be valid only if the mock jurors are particularly likely to read and follow the court's instructions. In any event, it certainly is surprising.

(3) Are the Experimental Conditions Acceptable? One limitation of the experiment is that the respondents were not placed in the positions of real jurors. A real jury would see the robbery victim and experience through her the horror of having a gun pointed at one's head. They would see and hear Officer Bob Brown, who performed admirable police work. And, of course, they would see and hear the accused: the defendant. It can immediately be added that any experiment of this kind is likely to exhibit these limitations, because it would be difficult to produce a completely realistic set of conditions in an ethical experiment. The study would have to be based upon manipulation of a real trial of a real defendant, and there are ethical and practical reasons why that cannot be done.

A further difficulty with the experiment is that it involves small populations. Statisticians are skeptical of the result of any survey including only a small population.[91] This factor means that the power of the study—the likelihood of it demonstrating a correlation if one exists—is relatively low,[92] although the second scenario did detect a correlation: a surprising one.

Furthermore, the participants were a convenience sample.[93] The experimental subjects do not correspond exactly to the ideal population, which would be jurors. A law student population is likely to be different from a population of jurors. The average age is much less than that of jurors, and the subjects have self-selected for fondness for the law. One might also hazard the guess that this population is more acquittal-prone than a group of real jurors might be.

The scenarios in the experiment were constructed with a particular kind of case in mind. The prosecution's evidence was strong, the defendant's evidence weak, and the impeaching conviction was likely to be perceived as showing dishonesty.[94] In a different kind of case—with a

91. *See* HOW TO REASON, *supra* note 81, at 427 (explaining effect of sample size); HOW TO REASON, *supra* note 81, at 424–45 (demonstrating with examples).

92. *See* HOW TO REASON, *supra* note 81, at 427.

93. *See id.* at 448–49 (explaining the sampling frame and convenience samples).

94. These attributes were chosen in an effort to minimize the effects of confounding variables. *See infra* Appendices A and B.

more credible defense, a less persuasive prosecution, and a conviction unrelated to dishonesty—the experiment might produce different distributions.

On the other hand, most of these defects are not fatal to the value of the experiment. Sometimes convenience samples are perfectly acceptable.[95] One sometimes sees a survey-taker at the mall, stopping passers-by; and the assumption is that the result can be useful even though the sample is artificial and even though non-response bias will be significant.[96] Psychology departments often use students, who sometimes are gathered by quasi-coercive means such as course requirements.[97] The comparison of a control group with an experimental group also supports the value of this kind of experiment.[98] The sample size would weaken[99] but not invalidate the experiment if it produced significant results.[100] The orientation of the scenarios, with strong prosecution, weak defense, and persuasive impeachment, was constructed precisely to produce a result showing prejudice if it existed.[101]

B. Incidental Results

One interesting aspect of the experiment is the incidental demonstration of limited probabilistic reasoning by the survey participants. Evidence consisting of credible testimony of an eyewitness coupled with significant corroborating circumstances is strong evidence. The scenarios here, with a solid live witness and corroborating evidence including the $45 in the defendant's possession, the faded yellow $5 bill, the black pistol on his person, the defendant's close proximity, and his

95. *See* HOW TO REASON, *supra* note 81, at 448.

96. *See id.*

97. One of the best-known experiments in social psychology is Zimbardo's "prison experiment," which used students designated as "prisoners" and "guards," and which produced so much mistreatment of the prisoner–students that the experiment had to be prematurely terminated. *See* David Crump, *The Social Psychology of Evil: Can the Law Prevent Groups from Making Good People Go Bad?*, 2008 B.Y.U. L. REV. 1441, 1446–47 (2008) (citing PHILIP ZIMBARDO, THE LUCIFER EFFECT: UNDERSTANDING HOW GOOD PEOPLE TURN EVIL 174–94 (2007)).

98. *See* authorities cited *supra* note 81.

99. *See* HOW TO REASON, *supra* note 81, at 427 (explaining effect of sample size); HOW TO REASON, *supra* note 81, at 424–45 (demonstrating with examples).

100. Smaller data sets can lead to significant results. *See* HOW TO REASON, *supra* note 81, at 427–29 (showing an example in which increasing a population from five to ten, which is a data set much smaller than the experiment here, produced statistically significant results).

101. *See supra* notes 68–70 and accompanying text.

evidently false exonerating story, provided significant proof of guilt.[102] But many participants did not perceive the case this way.

Bayes' Theorem provides a way of calculating a revised probability when new evidence is added to an antecedent probability.[103] The Theorem is useful in updating a subjectively generated likelihood with another piece of information that is more precise, such as an evaluation of an eyewitness identification combined with corroborating evidence. Its mathematics are set out in an Appendix to this article, Appendix C. Bayes' Theorem produces a high level of probability, very near certainty, for the scenarios used in the experiment.[104] Even if one assumes relatively low reliability in the identification of the defendant by the store clerk, and even if one assigns a relatively conservative estimate to the likelihood of finding exactly $45 on a random person with a faded $5 bill on top, Bayes' Theorem compels a result that approaches certainty.[105]

Many of the experimental subjects did not seem to understand this concept. Debriefing of the population gave rise to several comments that showed doubt based upon even a relatively small possibility of error in the clerk's identification. One participant actually wrote on his response that "[i]t depend[ed]" on whether he believed the eyewitness, evidently indicating that he did not appreciate the significance of the corroboration.[106] This reasoning showed little grasp of the principle underlying Bayes' Theorem. Even a shaky identification is strengthened to near certainty by the kind of corroboration present here. But the genius of the jury, in real life, probably would ensure an understanding of the point, because members would almost certainly alert other members to the rarity of the corroboration.[107]

C. Further Research

A new experiment could productively be done with the same two scenarios involved here, but with more participants. One could hope, then,

102. One can hypothesize conditions under which the evidence is not so strong, such as by introducing a suspicion that the robbery victim and the officer have conspired to concoct false testimony describing $45 in bills and a faded $5 bill when neither existed. This kind of suspicion seems far-fetched, however, in this scenario.

103. *See infra* Appendix C.

104. *See infra* Appendix C.

105. *See infra* Appendix C.

106. *See supra* note 62 (author retains responses).

107. This is not to say that jurors would be likely to understand the mathematics of Bayes' Theorem set out in Appendix C. *See infra* Appendix C. Instead, lay people have an intuitive sense that rare corroboration greatly increases confidence. Some members of the experimental population may have missed this point and did not have others to explain it.

to produce more robust data and an experiment with more power.[108] Such an experiment could, perhaps, provide a statistically significant demonstration that the use of a criminal conviction to impeach does produce a higher incidence of convictions even when impeachment is not needed, owing to the strength of the prosecution's case and the apparent falsity of the defendant's story. This result would provide support to the hypothesis that the conviction induces at least some inference of propensity and therefore—under the logic of the Rules—some amount of prejudice.[109] Or the experiment might produce significant results supporting the null hypothesis: that the conviction does not produce prejudice under these conditions.[110]

Furthermore, the experiment could productively be varied. Subjects might be given scenarios with even greater strength in the prosecution's case. For example, the arrest might be staged immediately outside the door of the store. The corroborating evidence might be made more compelling. The perpetrator might be described as having escaped with not only $45 with a faded $5 bill on top, but also with a gold necklace taken from the clerk with her name on it.[111] The potential propensity inference might be strengthened, as by amending the second scenario to include a prosecution for aggravated (not simple) robbery and a prior aggravated robbery conviction used to impeach.[112]

It would also be productive to try to tease out differences in the force of different kinds of past convictions. One might imagine a prosecution for a crime that is not so serious or dishonest as robbery—say, a prosecution for driving while intoxicated—and the use of one scenario in which the accused is impeached with a conviction for theft and another in which the conviction is for assault.[113]

All of these experiments could be conducted by anyone who has access to a group of potential survey subjects. The effort would begin with amendment of the scenarios provided with this article or even the re-use of these scenarios with a larger audience. The results can readily be

108. *See* authorities cited *supra* notes 66–80 and accompanying text.

109. This was the experimental hypothesis. *See* Simmons, *supra* note 55 and accompanying text.

110. This was the result that the experiment actually suggested.

111. The corroborating evidence would have much greater force than that in the experiment here.

112. Similarity in the convictions is said to increase the prejudice. But does it? We have only the unexplained inference. *See supra* Part ID.

113. This experiment would tell us whether one type of crime has more impeachment value than another. *See supra* Part IB (explaining lack of clear authority on this point).

tabulated, and available software on the internet will produce the statistical measurements.[114]

V. CONCLUSION

Rule 609(a)(1)(B) is the most important part of the Rule governing impeachment by criminal conviction. It imposes a significant qualification on the use of this device to test credibility when a criminal defendant undertakes to tell an exonerating story. The Rule is based on several assumptions, which are intuitively appealing but largely unexamined by empirical method. The issue arises frequently, has an important effect in the outcomes of criminal trials, and ought to be the subject of research.

The most important assumption underlying the Rule is that impeachment by criminal conviction can raise a propensity inference.[115] This assumption suggests that the defendant is disposed to criminal activity, or so the argument goes. This suggestion, in turn, leads to the inference that impeachment by conviction is potentially prejudicial, at least according to the logic of the Rules.[116]

The experiment described in this article suggests that the assumption about prejudice is overvalued, and it does so in a statistically significant way.[117] The experimental populations were relatively small[118]—it is difficult to amass populations of significant size for such an effort—and there remains the possibility that an experiment with more data could show a contrary result.[119] More experimentation would be desirable, and this article describes the patterns that it might follow. Meanwhile, the experiment is valuable because it shows that the assumption underlying the Rule is subject to greater doubt than intuition might tell us.[120]

APPENDIX A
FIRST SCENARIO USED IN EXPERIMENT
AT THE END OF THIS DESCRIPTION, YOU WILL BE ASKED THIS QUESTION: "WOULD YOU SAY THAT THIS

114. *See supra* note 87 (citing Mathematica Software).

115. *See supra* Part ID.

116. *See supra* Part ID.

117. It does so by failing to demonstrate any of the prejudice under the conditions of the scenario.

118. This aspect of the experiment means that it did not have power to show a correlation either way. *See supra* Part IIIA.

119. *See supra* Part IIIA.

120. It suggests this conclusion, although not in a statistically significant way.

DEFENDANT IS GUILTY BEYOND A REASONABLE DOUBT, OR NOT GUILTY?"

The Defendant, whose name is Dee Fendant, has been on trial for robbery. The first witness was Courtney Cline, who testified to having been an attendant on duty at the Go-N-Tote on Antoine Drive in this city and county on the date stated in the indictment. Dee came in and walked slowly to the back of the store where refrigerated items are kept. Courtney watched carefully because Dee was looking all around. Courtney testified that Dee lingered in the back, within Courtney's view, until a time when all customers were out of the store. Dee then hurried to the checkout counter, pulled out a black pistol, and demanded money. "This is a robbery. Give me everything in that cash register." Courtney immediately complied, handing over the full contents of the cash register, while looking carefully at Dee, who grabbed the money and ran away toward the west. When asked whether that person who demanded and took the money was present, Courtney pointed out Dee. "Are you certain?" "Yes." Courtney immediately called the police, and an officer, whom Courtney now knows as Officer Bob Brown, arrived "almost immediately" and took off in his vehicle to the west. Dee told Officer Brown that the robber had taken forty-five dollars, and that a faded, yellowish five-dollar bill was on top. No one else saw the robber.

Courtney was cross-examined, of course, by Dee's defense lawyer. "How good do you feel about identifying a person of different race, like Dee?" "I know that cross-racial identifications are sometimes difficult, but Dee has a distinctive face with a crooked nose." "Weren't you scared and looking mostly at the gun?" "Yes, I was scared, but I got a good look at him, and he's very recognizable." And there were other questions, but this is a sample. The cross-examination did not lessen Courtney's credibility.

Officer Bob Brown testified that he received a call about a robbery at the Go-N-Tote on Antoine and was close nearby. He got there quickly and briefly asked the attendant, whom he identified as Courtney Cline, what had happened, what was taken, what the robber looked like, and which way the robber was going. He got into his vehicle and took off to the west. He saw an individual who generally fit Courtney's description of the robber. He stopped and told the individual to "Freeze." The individual took off running, but within a block, Officer Brown was able to make an apprehension. Asked whether he saw the individual in the courtroom, Officer Brown said yes and identified Dee. Immediately after securing his arrestee, Officer Brown conducted a search incident to arrest, and he found a wad of bills in Dee's right front pocket. The bills are in an

evidence bag, which is put into evidence. They total forty-five dollars, and there is a faded, yellowish five-dollar bill on top, just as Courtney said was taken. Dee's other front pocket contained a small black Umarex pistol, just as Courtney said, and the pistol is placed in evidence.

Again, there was cross-examination. "Did Dee have any other money on his person?" "Yes, a wallet in his back pocket with six dollars in it." "Did you ask where Dee was going?" "Dee said, I was heading to my auntie's home." And there were other questions, but this is a sample.

After the state rested its case, Dee Fendant took the witness stand and testified that someone else must have committed this crime, if anyone; Dee had no idea who did it. Dee does have an auntie. And Dee testified that that was where Dee was going.

On cross examination, Dee admitted that actually, the auntie doesn't live anywhere near where he was headed. "Why'd you run from the police?" "I'm not sure. I was scared of going to jail." "Where do you claim you got the money?" "Washing dishes in the neighborhood." Again, there were more questions, but this is a representative sample.

You may assume that all required elements in this case are covered by sufficient evidence, all corresponding to the indictment, and the only question is the identification of Dee as the robber.

The judge gives instructions to the jury, of which you are a member. These include an instruction that the defendant must be acquitted unless guilt is proved beyond a reasonable doubt. In fact, the jury is given the reasonable doubt instruction several times, and the jurors have heard it from both attorneys throughout the trial.

NOW: There is no way to perfectly create a trial experience in a description like this, but you should try to imagine it. Of course, a trial would take much longer than this reading, but try to put yourself in the frame of mind of someone who has heard a complete trial containing this information. If you were on a jury that has heard such a trial, NOW, ANSWER THIS QUESTION:

WOULD YOU SAY THAT THIS DEFENDANT IS GUILTY BEYOND A REASONABLE DOUBT, OR NOT GUILTY?

CHECK ONE:

GUILTY _____ NOT GUILTY _____

APPENDIX B
SECOND SCENARIO USED IN EXPERIMENT
AT THE END OF THIS DESCRIPTION, YOU WILL BE ASKED THIS QUESTION: "WOULD YOU SAY THAT THIS DEFENDANT IS GUILTY BEYOND A REASONABLE DOUBT, OR NOT GUILTY?"

The Defendant, whose name is Dee Fendant, has been on trial for robbery. The first witness was Courtney Cline, who testified to having been an attendant on duty at the Go-N-Tote on Antoine Drive in this city and county on the date stated in the indictment. Dee came in and walked slowly to the back of the store where refrigerated items are kept. Courtney watched carefully because Dee was looking all around. Courtney testified that Dee lingered in the back, within Courtney's view, until a time when all customers were out of the store. Dee then hurried to the checkout counter, pulled out a black pistol, and demanded money. "This is a robbery. Give me everything in that cash register." Courtney immediately complied, handing over the full contents of the cash register, while looking carefully at Dee, who grabbed the money and ran away toward the west. When asked whether that person who demanded and took the money was present, Courtney pointed out Dee. "Are you certain?" "Yes." Courtney immediately called the police, and an officer, whom Courtney now knows as Officer Bob Brown, arrived "almost immediately" and took off in his vehicle to the west. Dee told Officer Brown that the robber had taken forty-five dollars, and that a faded, yellowish five-dollar bill was on top. No one else saw the robber.

Courtney was cross-examined, of course, by Dee's defense lawyer. "How good do you feel about identifying a person of different race, like Dee?" "I know that cross-racial identifications are sometimes difficult, but Dee has a distinctive face with a crooked nose." "Weren't you scared and looking mostly at the gun?" "Yes, I was scared, but I got a good look at him, and he's very recognizable." And there were other questions, but this is a sample. The cross-examination did not lessen Courtney's credibility.

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to make an apprehension. Asked whether he saw the individual in the courtroom, Officer Brown said yes and identified Dee. Immediately after securing his arrestee, Officer Brown conducted a search incident to arrest, and he found a wad of bills in Dee's right front pocket. The bills are in an evidence bag, which is put into evidence. They total forty-five dollars, and there is a faded, yellowish five-dollar bill on top, just as Courtney said was taken. Dee's other front pocket contained a small black Umarex pistol, just as Courtney said, and the pistol is placed in evidence.

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After the state rested its case, Dee Fendant took the witness stand and testified that someone else must have committed this crime, if anyone; Dee had no idea who did it. Dee does have an auntie. And Dee testified that that was where Dee was going.

On cross examination, Dee admitted that actually, the auntie doesn't live anywhere near where he was headed. "Why'd you run from the police?" "I'm not sure. I was scared of going to jail." "Where do you claim you got the money?" "Washing dishes in the neighborhood." Again, there were more questions, but this is a representative sample.

And also, Dee's credibility was impeached by the fact that four years ago, he was convicted of theft and spent two years in prison. A "prison packet" containing Dee's photograph, the judgment, the sentence, and a set of fingerprints was introduced into evidence, showing Dee's conviction for theft. A fingerprint analyst testifies that the fingerprints in the prison packet match a set taken by the analyst from Dee. The picture is Dee's.

You may assume that all required elements in this case are covered by sufficient evidence corresponding to the indictment, and the only question is the identification of Dee as the robber.

The judge gives instructions to the jury, of which you are a member. These include an instruction that the defendant must be acquitted unless guilt is proved beyond a reasonable doubt. In fact, the jury is given the reasonable doubt instruction several times, and the jurors have heard it from both attorneys throughout the trial.

The judge also gives a limiting instruction telling the jurors that the theft conviction is to be used only for the limited purpose of helping to judge Dee's credibility, if it does help in that, and not as creating an inference that he is a robber.

NOW: There is no way to perfectly create a trial experience in a description like this, but you should try to imagine it. Of course, a trial would take much longer than this reading, but try to put yourself in the frame of mind of someone who has heard a complete trial containing this information. If you were on a jury that has heard such a trial, NOW, ANSWER THIS QUESTION:

WOULD YOU SAY THAT THIS DEFENDANT IS GUILTY BEYOND A REASONABLE DOUBT, OR NOT GUILTY?

CHECK ONE:

GUILTY _____ NOT GUILTY _____

APPENDIX C
CALCULATING A NEW PROBABILITY WHEN THERE IS NEW EVIDENCE: BAYES' THEOREM

What Bayes' Theorem Demonstrates. Given an initial probability, Bayes' Theorem provides a mathematical equation for computing a revised probability, resulting from an independent additional piece of information. In other words, Bayes' Theorem provides a quantitative method for adjusting the computation of a probability, based upon new evidence. The theorem is named after Reverend Thomas Bayes, who discovered it during the 1800's. Today, Baysean analysis is used for some kinds of legal problems, as we shall see.

If the new information is such that its random occurrence is extremely unlikely (e.g., possession of a roll of bills totaling exactly $ 45.00 with a faded $ 5.00 bill on top), then the adjustment to even a moderate initial probability, such as 0.5, may produce a probability surprisingly close to 1.0. Without going through the exercise represented by Bayes' Theorem, one might underestimate this probability. Similarly, if the initial probability is low, say 0.1, and the additional information is such that its random occurrence is not unlikely, the probability, as adjusted, will likely still be low. Intuition might cause one to overvalue it.

An Intuitive Concept of Bayes' Theorem. But now, imagine we get a key piece of new information: The first coin flip has turned up heads. Now, what are the new odds, or "Oddsnew" of two heads? The answer is that we simply multiply the old odds (Odds initial) by something called the "likelihood ratio" to compute the new odds, or Odds new:

$$Odds_{new} = (Likelihood\ Ratio) \times Odds_{initial}.$$

In other words, it is intuitively obvious that the odds change when we get new information. How much do they change? The answer also is intuitively obvious: The odds change in proportion to the likelihood of the new information turning up if the event were going to happen, as versus if it were not. This proportion is what we call the likelihood ratio.

The Likelihood Ratio: A Member Equal to the Probability of the New Information Appearing if the Event Were GOING to Happen, Divided by the Probability of the New Information Appearing if the Event Were NOT Going to Happen. This is the likelihood ratio: the ratio of two probabilities of the new information. Let Peviftrue be the probability of this new evidence appearing if the proposition were true (if the event is

going to occur). Let Pevifnot be the probability of the new evidence if not (if the event is not going to occur). Then:

$$\text{Likelihood Ratio} = P_{eviftrue} / P_{evifnot}.$$

And Bayes Theorem becomes:

$$Odds_{new} = (P_{eviftrue} / P_{evifnot}) \times Odds_{initial.}$$

This simple, four-factor equation is all there is to Bayes' Theorem. In English, it means that to compute new odds of the truth of a proposition based on new evidence, you multiply the old odds by the ratio of the probability of seeing the new evidence if the proposition is true to the probability of seeing the new evidence if it is not. It should be added, however, that this terminology is not standard, and the theorem is usually stated in terms of probabilities without odds. This equation is equivalent and much easier to teach or learn.

Using Bayes' Theorem as a Heuristic Device. One way to use Bayes' Theorem is to make a chart that lists a range of initial odds, and then to apply Bayes' Theorem to combine the new evidence with all of the possible initial odds in the chart. Thus, in our example, imagine that there were only one in 1,000 odds that a randomly chosen person would possess the $ 45.00 with a faded $ 5.00 bill on top, and the initial odds are subjective: the evaluation of an eyewitness identification. (One in 1,000 seems a very conservative estimate, but it leads to very high new odds.) What if we think the initial odds are only one to nine? Or two to eight? We can apply Bayes' Theorem to each possible set of initial odds. And so, we construct our chart, as in Figure 1:

Figure 1: Chart for Heuristic Use of Bayes' Theorem, with New Evidence at 1:1,000 Odds

Initial Estimated Odds of Correctness	**New Odds**
0:1 (certainty of error)	0:1 (zero probability)
1:9	111:1 (111/112 probability = .99107)
2:8, or 1:4	250:1 (250/251 probability = .99602)
3:7	429:1 (429/430 probability = .99767)
4:6, or 2:3	667:1 (667/668 probability = .99850)
5:5, or 1:1	1000:1 1000/1001 probability = .99900)
6:4, or 3:2	1500:1 (1500/1501 probability = .99933)
7:3	2333:1 (2333/2334 probability = .99957)
8:2, or 4:1	4000:1 (4000/4001 probability = .99975)
9:1	9000:1 (9000/9001 probability = .99989)
1:0 (certainty of correctness)	1:0 (1.0 probability)

This chart enables us to use Bayes' Theorem as a heuristic, or investigative device. It shows us visually the impact of the 1,000:1 random-selection blood evidence. What is striking is that even with very low initial odds, such as one to nine, we get more than one-hundred-to-one new odds. This is because of the power of the new evidence: 1,000 to one against a random person having the characteristics at issue. Without Bayes' Theorem, we might underestimate the new probability.

Use of Bayes' Theorem in Law and Public Policy. Bayes' Theorem may provide guidance in evaluating increments of circumstantial evidence. For example, imagine that eyewitness identifications are strong but uncertain, leading to a 0.7 probability that the defendant is the perpetrator. But imagine, also, that the defendant was apprehended shortly after the crime in possession of an item of property corresponding to one taken in the robbery, an item that only one in one thousand people in the general population usually possesses under similar circumstances.

This additional, circumstantial piece of information produces a higher revised probability than one might guess. In fact, the probability is .99957 (see above). In some legal applications, it may even be possible to use Bayes' Theorem in mathematical form to produce evidence that a party might wish to offer in court.