The Cognitive Psychology of Circumstantial Evidence

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Empirical research indicates that jurors routinely undervalue circumstantial evidence (DNA, fingerprints, and the like) and overvalue direct evidence (eyewitness identifications and confessions) when making verdict choices, even though false-conviction statistics indicate that the former is normally more probative and more reliable than the latter. The traditional explanation of this paradox, based on the probability-threshold model of jury decision-making, is that jurors simply do not understand circumstantial evidence and thus routinely underestimate its effect on the objective probability of the defendant's guilt. That may be true in some situations, but it fails to account for what is known in cognitive psychology as the Wells Effect: the puzzling fact that jurors are likely to acquit in a circumstantial case even when they know the objective probability of the defendant's guilt is sufficient to convict. This Article attempts to explain why jurors find circumstantial evidence so psychologically troubling. It begins by using a variety of psychological research into judgment and decision-making—Kahneman & Tversky's simulation heuristic in particular—to argue that jurors decide whether to acquit in a criminal case not through mechanical probability calculations, but on the basis of their ability to imagine a scenario in which the defendant is factually innocent. The Article then examines the basic epistemological differences between direct and circumstantial evidence and shows how those differences normally make it easier for jurors to imagine a factually exculpatory scenario in a circumstantial case. Finally, the Article concludes by discussing how an ease-of-simulation model of jury decision-making improves our understanding of why false verdicts occur.
B. The Greater Reliability of Circumstantial Evidence
   1. Error Rates
   2. False-Conviction Statistics

II. The Traditional Explanation and the Wells Effect
   A. The Traditional Explanation
   B. The Wells Effect

III. The Ease-of-Simulation Hypothesis

IV. The Simulation Heuristic and the Ease-of-Simulation Model
   A. The Simulation Heuristic
   B. The Simulation Heuristic in the Legal Context
      1. Use of the Heuristic
      2. Toward a Simulation-Based Model of Decision-Making

V. The Ease-of-Simulation Model Applied
   A. The Differences between Direct and Circumstantial Evidence
      1. Representational vs. Abstract
      2. Narrative vs. Rhetorical
      3. Univocal vs. Polyvocal
      4. Unconditional vs. Probabilistic
   B. Imagining the Factually Inculpatory Scenario
      1. Event Representation
      2. Structural Coherence
      3. Vividness
   C. Priming the Imagination of a Factually Exculpatory Scenario
      1. The Need for Priming
      2. When Priming Occurs
      3. The Certainty Effect
      4. What About Unreliability?
      5. The Reliability of Circumstantial Evidence
   D. Imagining the Factually Exculpatory Scenario
      1. Recognizing Evidence of Innocence
      2. Creating an Exculpatory Storyline
      3. Imagining the Factually Exculpatory Scenario
      4. "Undoing" the Factually Inculpatory Scenario

VI. The Paradox of Circumstantial Evidence Revisited
   A. "Ideal- Typical" Direct Cases
   B. "Ideal-Typical" Circumstantial Cases
   C. "Mixed" Cases
   D. False Verdicts

VII. Concluding Thoughts
"He[, the Judge,] says to them: Perhaps ye saw him running after his fel-
low into a ruin, ye pursued him, and found him sword in hand with blood
dripping from it, whilst the murdered man was writhing [in agony]: If this
is what ye saw, ye saw nothing."

Classical Jewish law was profoundly skeptical of circumstantial evi-
dence. Such evidence was per se inadmissible in a criminal case; to convict,
direct evidence of the defendant’s guilt—specifically, the testimony of two
witnesses who saw the defendant commit the crime—was required. The
rationale for the rule, according to Talmudic scholars, was the need to pro-
tect the innocent from unjust conviction: because of its probabilistic nature,
not even the strongest circumstantial evidence could completely prove the
defendant’s guilt. Maimonides explained as follows:

Do not let this puzzle you, or think the law unjust. For among events which
are within the bounds of possibility, some are very probable and others
highly improbable, and still others are in between the two . . . . If we do
not give judgment even on the basis of a very strong presumption, the
worst that can happen is that the sinner will be acquitted; but if we punish
on the strength of presumptions and suppositions, it may be that one day
we shall put to death an innocent person; and it is better and more satisfac-
tory to acquit a thousand guilty persons than to put a single innocent man
to death . . . .

Modern Anglo-American law, of course, does not view circumstantial
evidence as inferior to direct evidence. Wigmore says that “it is out of the
question to make a general assertion ascribing greater weight to one class or
to the other.” The Supreme Court agreed in *Holland v. United States*, hold-
ing that direct and circumstantial evidence are “intrinsically no different.”
The Court acknowledged that circumstantial evidence can lead to an incor-
crect result, but noted that in “both instances, a jury is asked to weigh the
chances that the evidence correctly points to guilt against the possibility of
inaccuracy or ambiguous inference. In both, the jury must use its experience
with people and events in weighing the probabilities.”

2. See Irene Merker Rosenberg & Yale L. Rosenberg, “Perhaps What Ye Say is Based Only
3. In fact, the root of the Hebrew word for circumstantial evidence, *omed*, means “to esti-
mate” or “guess.” *Id.* at 1377.
7. *Id.*
Some scholars, in fact, have argued that circumstantial evidence is superior to direct evidence. Edmund Burke was of that opinion, as was William Paley, who famously explained that a "concurrency of well-authenticated circumstances composes a stronger ground of assurance, than positive testimony, unconfirmed by circumstances, usually affords. Circumstances cannot lie." Error rates and false-conviction statistics support Burke and Paley. Both indicate that direct evidence—false confessions and mistaken or perjured eyewitness identifications—is much less reliable than circumstantial evidence. For example, studies have shown that eyewitness identifications are mistaken more than 58% of the time, whereas less than 1% of DNA matches turn out to be erroneous. Similarly, although 68% of the false convictions that Bedau and Radelet identified in their famous study resulted from problems with direct evidence, only 9% resulted from problems with circumstantial evidence. So if we take seriously Maimonides' assertion that it is better "to acquit a thousand guilty persons than to put a single innocent man to death," direct evidence would seem to be a far better candidate for categorical exclusion than circumstantial evidence. Circumstances may sometimes lie, but witnesses lie far more often.

Empirical research into jury decision-making, however, indicates that jurors agree with Maimonides. That research, discussed in detail below, has consistently found that jurors dramatically undervalue circumstantial evidence and just as dramatically overvalue direct evidence. One study of direct evidence, for example, found that jurors overestimated the accuracy of eyewitness identifications by more than 500%. Conversely, the "most surprising finding" of a study of circumstantial forensic evidence "was how easily people can be persuaded to give no weight" to such evidence.

There is, in short, an unsettling paradox concerning the use of circumstantial evidence in criminal trials: although it is far less likely to lead to a false conviction than direct evidence, jurors are so reluctant to use it to convict that a circumstantial case often results in the opposite problem, a false

acquittal. Indeed, it is only a slight exaggeration to say that the Talmudic prohibition on circumstantial evidence lives on in the minds of modern-day jurors via the shibboleth—regularly disseminated by television and the movies—that "it's all circumstantial."

The question is—why?

The traditional explanation is that jurors simply do not understand the importance of circumstantial evidence—DNA matches, fingerprint comparisons, and the like—and thus underestimate its effect on the objective probability of the defendant's guilt. In one study of blood evidence, for example, sixty-six percent of mock jurors misunderstood the evidence in a way that led them to significantly underestimate its probative value.

That explanation, however, is not the whole story. On the contrary, a series of sophisticated mock-jury studies has found that jurors are likely to acquit in a circumstantial case even when they know the objective probability of the defendant's guilt is sufficient to convict. That phenomenon, known as the Wells Effect, is irreconcilable with the traditional explanation, because it indicates that jurors' undervaluation of circumstantial evidence is psychological, not cognitive.

To understand jurors' reluctance to convict in circumstantial cases, then, we need to explain why jurors find circumstantial evidence so psychologically troubling. Such an explanation might allow us to understand not only their undervaluation of circumstantial evidence, but their overvaluation of direct evidence as well.

The object of this Article is thus twofold: (1) to explain why jurors are likely to acquit in a circumstantial case even when they know that the evidence is objectively sufficient to convict; and (2) to explain why jurors are likely to convict in a direct case even when there is reason to believe that the evidence may be unreliable. The Article's central thesis is that both phenomena result from the same cognitive mechanism—the fact that jurors decide whether to acquit not through mechanical probability calculations, but on the basis of their ability to imagine a scenario in which the defendant

15. See H. Richard Uviller, Acquitting the Guilty: Two Case Studies on Jury Misgivings and the Misunderstood Standard of Proof, 2 CRIM. L.F. 1, 4 (1990). For obvious reasons, it is impossible to know how often false acquittals occur in circumstantial cases. Their existence, however, is supported both by anecdote, cf. id. at 9, and by the empirical research that indicates jurors fundamentally underestimate the probative value of circumstantial evidence.


17. See, e.g., Thompson & Schumann, supra note 14, at 181 ("The most likely explanation is that subjects simply gave less weight to the [circumstantial] evidence than it deserves.").

18. Id. at 179.


is factually innocent. I will argue that, for a variety of reasons, jurors normally find it easier to imagine such a factually exculpatory scenario in a circumstantial case than in a direct case.

The Article itself is divided into seven Parts. Part I presents the experimental and statistical data behind the paradox of circumstantial evidence. Part II discusses the traditional explanation of the paradox and explains why it cannot be reconciled with the existence of the Wells Effect. Part III introduces a later study of the Wells Effect that indicates jurors’ willingness to acquit in a criminal case is determined by their ability to imagine a scenario in which the defendant is factually innocent. Part IV argues that jury decision-making is based on the “simulation heuristic”—a cognitive mechanism individuals often employ to determine the probability of uncertain events—and sketches what a general model of jury decision-making based on the simulation heuristic would look like, what I call the *ease-of-simulation model*. Part V—the theoretical core of the Article—applies the ease-of-simulation model, explaining why jurors normally find it easier to imagine a factually exculpatory scenario in a circumstantial case than in a direct case. Part VI shows how the insights of Part V unravel the paradox of circumstantial evidence—and help deepen our understanding of why false convictions and acquittals occur with such distressing regularity. Finally, Part VII speculates about how it might be possible to counteract the Wells Effect and the paradox of circumstantial evidence it creates.

Before proceeding, two caveats. First, in order to explain why jurors find circumstantial evidence so troubling, I will focus on ideal-typical cases: on the direct side, those in which the prosecution relies exclusively on a confession or an eyewitness identification to prove the defendant’s guilt; on the circumstantial side, those in which the prosecution proves the defendant’s guilt exclusively through forensic evidence. Neither kind of case is uncommon, although most prosecutions involve a combination of direct and circumstantial evidence. How the principles articulated in this Article function in such “mixed” cases is discussed separately in Section VI.

Second, except for its explanation of false verdicts, this Article is long on theory and short on practical application. Although cognitive psychologists and legal scholars have recognized that jurors overvalue direct evidence and undervalue circumstantial evidence, they have never attempted to construct a unified theory capable of explaining both phenomena. It seems appropriate, therefore, to devote the bulk of this Article to elaborating and defending the ease-of-simulation model.


23. Such cases are all technically circumstantial, of course, because proof of the defendant’s guilt requires inference.
The Cognitive Psychology

I. THE PROBLEM DESCRIBED

What I call "the paradox of circumstantial evidence" involves two separate empirical claims: that jurors undervalue circumstantial evidence relative to direct evidence; and that circumstantial evidence is nevertheless more reliable than direct evidence. Section A of this Part defends the first claim; Section B defends the second.

A. Jurors' Misevaluation of Direct and Circumstantial Evidence

For every item of evidence, direct or circumstantial, we must distinguish between two different probabilities: (1) the probability that the defendant is guilty if the evidence is true; and (2) the probability that the evidence is true.

The first probability measures the probative value of an item of evidence. If conditions allowed the eyewitness to accurately identify the defendant as the murderer, how probable does that make the defendant's guilt? If the DNA match did not result from lab error, to what extent does the match make the defendant's guilt more likely? The second probability measures the reliability of an item of evidence—whether viewing conditions did, in fact, allow the eyewitness to see the defendant commit the murder, or whether the DNA match did, in fact, result from lab error.

Although these probabilities are analytically distinct, they are interrelated. The overall probative value of an item of evidence depends, at least in part, on its reliability: if the evidence is less than completely reliable, its probative value is reduced. Consider, for example, a murder case in which an eyewitness positively identifies the defendant as the killer. If we believe that the identification is completely reliable and identity is the only disputed issue in the case, the probative value of the identification is 1.0—it conclusively establishes the defendant's guilt. If we suspect that the eyewitness was too far away to make a perfect identification, however, we have to discount the probative value of the identification to take that concern into account. As a result, its probative value will necessarily be less than 1.0—although the identification may still have some probative value, we can no longer assume that it conclusively establishes the defendant's guilt. Indeed, the more unreliable we find the identification, the lower its probative value will be.

There are, then, two different ways in which jurors can overvalue or undervalue evidence. First, jurors can overestimate or underestimate the probative value of a reliable piece of evidence by assuming that it increases


25. See Griffin & Tversky, supra note 24, at 231.

26. Following Murphy, I use a 0.0–1.0 scale instead of the more cumbersome 0–100% scale.

27. See Murphy, supra note 24, at 344.
the objective probability of the defendant's guilt more or less than it actually does. Second, jurors can overestimate or underestimate the reliability of evidence, thereby assigning it either too much or too little probative value. With those two possibilities in mind, we can examine the specific ways in which jurors overvalue direct evidence and undervalue circumstantial evidence.

1. Direct Evidence

Direct evidence is evidence that "proves a fact without an inference or presumption and which in itself, if true, establishes that fact." The category of direct evidence thus includes eyewitness identifications and confessions, the ideal examples of which prove the defendant's guilt without the need for inference.

a. Eyewitness Identifications

Empirical studies agree that jurors rarely question the reliability of eyewitness identifications, thus failing to discount their probative value adequately in situations where evidence is unreliable.

First, jurors simply believe that eyewitness identifications are far more reliable than they actually are. In the study mentioned earlier, for example, mock jurors predicted an accuracy rate of 71%, although the actual accuracy rate was only 13%. Another study found that jurors believed nearly four out of five mistaken identifications. Such credulity has a direct effect on verdicts: although one meta-analysis concluded that less than 42% of eyewitness identifications are accurate, a study of UK crime statistics found that jurors convict in 74% of eyewitness cases. Indeed, Elizabeth Loftus


29. To be sure, jurors must rely on inference to determine whether an eyewitness identification or confession is reliable. See, e.g., Laurence H. Tribe, Trial By Mathematics: Precision and Ritual in the Legal Process, 84 HARV. L. REV. 1329, 1330 n.2 (1971) (noting that "all legal proof [is] ultimately 'probabilistic,' in the epistemological sense that no conclusion can ever be drawn from empirical data without some step of inductive inference—even if only an inference that things are usually what they are perceived to be"). My point, as this Section demonstrates, is that jurors rarely question the reliability of direct evidence and thus normally accept an eyewitness identification or confession at face value—as if there is no inference required to infer guilt from it.


32. Gary L. Wells et al., Accuracy, Confidence, and Juror Perceptions in Eyewitness Identification, 64 J. APPLIED PSYCHOL. 440, 447 (1979); see also R.C.L. Lindsay et al., Can People Detect Eyewitness Identification Accuracy Within and Across Situations?, 66 J. APPLIED PSYCHOL. 79, 84 (1981) (finding that jurors were able to identify mistaken eyewitness identifications made in low-, moderate-, and high-accuracy situations 39%, 34%, and 25% of the time, respectively).


34. See HON. LORD PATRICK DEVLIN, REPORT ON EVIDENCE OF IDENTIFICATION IN CRIMINAL CASES (1976).
was able to raise the conviction rate in a mock circumstantial case from 18% to 72% simply by adding an eyewitness.\textsuperscript{35}

Second, jurors are insensitive to—and in fact often completely ignore—factors that reduce the accuracy, and thus the reliability, of eyewitness identifications, such as the presence of a disguise, weapon-focus, the level of violence in the crime, retention interval, instruction bias, and foil bias.\textsuperscript{36}

Third, the one factor that jurors do rely on to determine the accuracy of an eyewitness identification—the witness’s confidence that she made a correct identification\textsuperscript{37}—is at best “a poor predictor of identification accuracy,”\textsuperscript{38} and may have no relationship with reliability at all.\textsuperscript{39}

Fourth, trying to encourage jurors to be skeptical of eyewitness identifications by giving them a \textit{Telfaire} instruction\textsuperscript{40} not only fails to accomplish its task, but can actually backfire and make jurors more likely to convict.\textsuperscript{41}

Fifth, jurors often ignore evidence that directly contradicts an eyewitness identification. In the Loftus study mentioned earlier, one set of jurors heard evidence that the eyewitness could not have identified the defendant because he had not been wearing his glasses. Even though that evidence was uncontested, 68% of the mock jurors still voted to convict.\textsuperscript{42}

Sixth, and finally, although cross-examination is the medium through which jurors ostensibly learn of problems with evidence, “eyewitness testimony is curiously resistant to this technique.”\textsuperscript{43} One study, in fact, found that “[e]ven experienced lawyers, free to question the witness as they chose, were unable to lead mock jurors to believe accurate eyewitnesses more than inaccurate eyewitnesses.”\textsuperscript{44} Moreover, in some situations cross-examination can actually cause jurors to find dishonest witnesses more honest—a robust phenomenon known as “the probing effect.”\textsuperscript{45}


\textsuperscript{37} Id. at 189 (“Witness confidence [is] the only statistically significant . . . effect of appreciable magnitude [on jurors’ assessment of identification accuracy].”)


\textsuperscript{39} See Wells et al., \textit{supra} note 32, at 446.

\textsuperscript{40} See United States v. Telfaire, 469 F.2d 552, 558–59 (D.C. Cir. 1972) (instructing witnesses to be skeptical of eyewitness identifications).

\textsuperscript{41} See Penrod & Cutler, \textit{supra} note 30, at 833.

\textsuperscript{42} Loftus, \textit{supra} note 35, at 118.

\textsuperscript{43} George Rahaim & Stanley Brodsky, \textit{Empirical Evidence Versus Common Sense: Juror and Lawyer Knowledge of Eyewitness Accuracy}, 7 LAW & PSYCHOL. REV. 1, 7 (1982).

\textsuperscript{44} R.C.L. Lindsay et al., \textit{Mock-Juror Belief of Accurate and Inaccurate Witnesses}, 13 LAW & HUM. BEHAV. 333, 338 (1989).

\textsuperscript{45} Timothy R. Levine & Steven A. McCormack, \textit{Behavioral Adaptation, Confidence, and Heuristic-Based Explanations of the Probing Effect}, 27 HUM. COMM. RES. 471, 472 (2001). Levine and McCormack suggest that watching a potential liar being probed causes receivers to become falsely confident that they can distinguish truth from falsity, thereby creating a “truth bias” that leads
b. Confessions

Jurors also normally fail to question the reliability of confessions. As Saul Kassin puts it, "confession evidence is so inherently prejudicial that people do not fully discount the information even when it is logically and legally appropriate to do so."\(^{46}\)

First, jurors exhibit a "positive coercion bias" in their consideration of confession evidence.\(^{47}\) One of the earliest studies found that a confession elicited by promises of leniency increased mock jurors' probability-of-commission estimates and the proportion of guilty verdicts, even though the jurors indicated that they believed the confession was involuntary and that it did not play a significant role in their deliberations.\(^{48}\) Later research, moreover, found that the positive coercion bias persisted even when mock jurors were specifically told by a judge to discount the involuntary confession.\(^{49}\)

Second, a recent study found that jurors also exhibit a negative coercion bias.\(^{50}\) When presented with a confession extracted after a police officer waved a gun in the defendant's face, jurors ostensibly responded in the legally appropriate manner: they concluded that the statement was involuntary and disregarded it. Nevertheless, the presence of the confession still significantly increased the number of convictions.\(^{51}\)

Third, and perhaps most troubling of all, confessions are so powerful in the eyes of jurors that they "tend to overwhelm other information, including evidence of innocence."\(^{52}\) Indeed, at least one study has found that 73% of juries will convict even when a confession has been repudiated by the defendant and contradicts the physical evidence in the case.\(^{53}\)

2. Circumstantial Evidence

"Circumstantial evidence is evidence from which the fact-finder can infer whether the facts in dispute existed or did not exist."\(^{54}\) Circumstantial
evidence thus includes all forensic evidence, such as blood or fingerprints, as well as non-forensic evidence that does not by itself prove the defendant’s guilt.

**a. Forensic Evidence**

The primary problem with jurors’ use of circumstantial forensic evidence concerns their assessment of its probative value, not its reliability. Specifically, jurors consistently underestimate the probative value of such evidence. As Thompson and Schumann say, “people generally lack a clear sense of how to draw appropriate conclusions from such evidence and . . . as a result, judgments based on such evidence are highly malleable.”

Thompson and Schumann’s study certainly supports that idea. They asked seventy-three mock jurors to determine how the presence of the defendant’s blood at a murder scene increased the probability—initially set at 0.10—that the defendant committed the crime. According to traditional Bayesian analysis, the blood evidence increased the objective probability of the defendant’s guilt to 0.92. The mean probability estimated by the mock jurors, however, was only 0.28.

Other studies have reached similar conclusions. The most dramatic involved a hypothetical murder case in which five groups of mock jurors were asked to use blood-typing evidence to assess the probability of the defendant’s guilt. Not only did jurors dramatically underestimate the probative value of the evidence relative to the Bayesian norm—the disparity ranging from 80–100%—the undervaluation was actually greatest when the evidence was the most incriminating.

**b. Other Circumstantial Evidence**

The category of circumstantial evidence also includes all other evidence, testimonial or non-testimonial, that relies on inference to prove the defendant’s guilt: real evidence, like the gun used in the crime or a shirt stained with the victim’s blood; partial eyewitness identifications (as in

55. Indeed, jurors are capable of understanding how laboratory error rates affect the probative value of scientific evidence, at least when those rates are presented to them in an understandable form. See Dale A. Nance & Scott B. Morris, *Juror Understanding of DNA Evidence*, 34 J. LEGAL STUD. 395, 436 (2005).


57. *Id.* at 180.

58. See, e.g., Faigman & Baglioni, *supra* note 21, at 13–14 (concluding, in a blood-typing study, that subjects either “virtually ignored the statistical evidence” or “underutilized it when compared to a Bayesian model”); Brian C. Smith et al., *Jurors’ Use of Probabilistic Evidence*, 20 LAW & HUM. BEHAV. 49, 74 (1996) (concluding, in a study involving blood typing, that jurors not only tended to underuse the forensic evidence, but some “actually reduced their guilt assessment in light of the probabilistic evidence”).


60. *Id.* at 373.
Maimonides' hypothetical); testimony about motive; and so on. I discuss how the principles articulated in ideal-typical cases apply to cases involving these kinds of circumstantial evidence in Part VI.

B. The Greater Reliability of Circumstantial Evidence

Jurors, in short, consistently overvalue direct evidence and undervalue circumstantial evidence. That's unfortunate, because research into error rates and false-conviction statistics both indicate that circumstantial evidence is actually far more reliable.

1. Error Rates

Although it is impossible to determine how often confessions are erroneous, numerous studies have found that error rates for eyewitness identifications—the more common form of direct evidence—are extremely high. Penrod and Cutler, for example, conducted a meta-analysis of studies in which subjects witnessed a criminal act and were then asked to pick the perpetrator out of a lineup. When the perpetrator was present in the lineup, subjects failed to identify him accurately more than 58% of the time. Even more disturbing, when the perpetrator was absent from the lineup, subjects identified someone else—an innocent person—nearly 36% of the time.

The studies analyzed by Cutler and Penrod, moreover, involved nearly ideal identification situations, in which the criminal act did not involve violence, visibility was perfect, and there was only a brief delay between exposure and identification. False-positive rates are even higher when the identification situation involves a violent act, imperfect visibility, or a long delay between exposure and identification. In such situations, which more closely approximate real-world identifications, eyewitnesses falsely identify an innocent person as the perpetrator nearly 60% of the time—and nearly 90% of the time when verbal instructions from the police lead them to believe that the perpetrator is present in the lineup.

These error rates stand in stark contrast to the error rates of circumstantial forensic evidence. Although some methods of forensic analysis are so error-prone that they border on junk science—bite-mark comparison, with

61. See Richard A. Leo & Richard J. Ofshe, Using the Innocent to Scapegoat Miranda: Another Reply to Paul Cassell, J. CRIM. L. & CRIMINOLOGY 557, 569 (1998) (noting that it is impossible to determine an error rate for confessions because the error rate for the criminal-justice system as a whole is unknown); Matthew Iverson, Where the Right to Silence Went Wrong, 86 MASS. L. REV. 105, 112 (2002).


63. Id.

64. These represent the percentage of cases in which an innocent person is identified as the perpetrator of the crime.

65. Ralph Norman Haber & Lynn Haber, Experiencing, Remembering and Reporting Events, 6 PSYCHOL. PUB. POL’Y & L. 1057, 1080 (2000).

66. Id.
its false-positive error rate of 64%, for example—most methods are exceptionally accurate. DNA analysis has a false-positive rate of less than 1%, and the false-positive rate of conventional serological testing is 5–7%. Ballistics has a false-positive rate of 2–3%, toolmark analysis has a false-positive rate no higher than 5%, and microscopic hair analysis has a false-positive rate of approximately 4%. Even fingerprint analysis, the objectivity of which has faced increasing scrutiny, has a false-positive rate of less than 1%.

2. False-Conviction Statistics

False-conviction statistics also indicate that circumstantial evidence is more reliable than direct evidence. The statistics, of course, are not conclusive. To some extent, the greater number of false convictions involving direct evidence may simply reflect the fact that there are more convictions in direct cases than in circumstantial cases, either because direct cases are more common or because—as I argue in this Article—jurors are generally less likely to convict in circumstantial cases. Nevertheless, given the error-rate research summarized above, it is reasonable to assume that the abnormally high number of false convictions in direct cases is, in fact, a reflection of direct evidence’s greater unreliability.

a. Eyewitness Identifications

Unreliable eyewitness identifications are by far the most significant cause of false convictions. In Bedau and Radelet’s study, 55% of the 350 false convictions they examined involved perjured or mistaken eyewitness identifications. A 1996 study of 28 false convictions found that all of the

68. See Koehler, supra note 11, at 394.
71. The analysis of marks made by screwdrivers, drill bits, hammers, etc.
72. See Thornton & Peterson, supra note 70, § 31:45.
73. See Peterson & Markham, supra note 69, at 1022–23.
75. See Thornton & Peterson, supra note 70, § 31:38; cf. Simon A. Cole, More Than Zero: Accounting for Error in Latent Fingerprint Identification, 95 J. Crim. L. & Criminology 985, 1027 (2005) (suggesting an error rate from 0.2% to 2.5%).
76. Bedau & Radelet, supra note 12, at 60.
false convictions involved mistaken eyewitness identifications. Of the Innocence Project's first 130 exonerations, 78% involved mistaken or perjured eyewitness identifications. Finally, a 2004 study found that problematic eyewitness identifications were responsible for 64% of 328 false convictions—and for 90% of the false convictions in rape cases.

b. Confessions

False convictions also often result from unreliable confessions. In Bedau and Radelet's study, 14% of the 350 convictions involved coerced or otherwise false confessions. Later studies yielded similar percentages. A full 27% of the Innocence Project's first 130 exonerations involved false confessions, and false confessions were responsible for 15% of the false convictions in the 2004 study.

c. Circumstantial Forensic Evidence

Although by any standard false convictions result far less often from circumstantial evidence than from direct evidence, the number of such convictions depends on how we define the category of circumstantial errors. Specifically, it is useful to distinguish between what we might call "pure" and "hybrid" errors. Pure errors are those that result solely from the ambiguous or problematic nature of the evidence itself—errors that are not caused by human misconduct. Such errors include coincidental DNA matches, unintentional laboratory errors, and coincidences that make an innocent person seem guilty. Pure errors might also include those caused by junk science, assuming that the science in question was, at the time, generally thought to be valid.

Hybrid errors, by contrast, are those that are caused by some kind of intentional human misconduct, including falsified lab results, intentional

77. EDWARD CONNORS ET AL., CONVICTED BY JURIES, EXONERATED BY SCIENCE: CASE STUDIES IN THE USE OF DNA EVIDENCE TO ESTABLISH INNOCENCE AFTER TRIAL 15 (1996).
78. SCHECK ET AL., supra note 53, at 365.
80. Bedau & Radelet, supra note 12, at 57.
81. SCHECK ET AL., supra note 53, at 361.
82. Gross et al., supra note 79, at 544.
84. See Nance & Morris, supra note 55, at 396.
85. See Bedau & Radelet, supra note 12, at 61-62.
laboratory errors, suppression of exculpatory scientific evidence, experts lying about their credentials, and the like.\textsuperscript{87}

If we limit false convictions caused by circumstantial evidence to pure errors, such convictions are very rare. Bedau and Radelet identified 30 cases in which ambiguous circumstantial evidence resulted in a false conviction, less than 9\% of the false convictions in their study.\textsuperscript{88} Of the Innocence Project's first 82 exonerations, 6\% involved contaminated forensic samples and 13\% resulted from misinterpretation of lab results.\textsuperscript{89} The Northwestern Innocence Project found that junk science was involved in 10\% of the false capital convictions they studied,\textsuperscript{90} and forensic errors led to fewer than 2\% of the 205 false convictions C. Ronald Huff's team identified.\textsuperscript{91}

If we expand circumstantial false convictions to include hybrid errors, the numbers fluctuate depending on the study. The Innocence Project is on the high side: in 30\% of their first 82 exonerations, "scientists and prosecutors presented bad or tainted evidence to the judge or jury."\textsuperscript{92} By contrast, of the 328 false convictions Gross and his coauthors examined in their 2004 study, only 7\% involved perjury by a forensic scientist testifying for the government.\textsuperscript{93}

II. THE TRADITIONAL EXPLANATION AND THE WELLS EFFECT

The available data, in short, indicates that jurors overwhelmingly prefer direct evidence to circumstantial evidence, even though circumstantial evidence is far less likely to lead to false convictions. The question is—why?

A. The Traditional Explanation

The traditional explanation is based on the probability-threshold model of juror decision-making.\textsuperscript{94} According to that model, of which Bayesian analysis is the best known version,\textsuperscript{95} jurors will vote to convict only if their subjective estimates of the probability of the defendant's guilt exceed the

\begin{itemize}
  \item \textsuperscript{88} Bedau & Radelet, supra note 12, at 61–62.
  \item \textsuperscript{89} See The Innocence Project, supra note 87. The website does not specifically indicate that these errors did not result from human misconduct. Moreover, the numbers could be lower because a case could have involved both pure and hybrid errors, leading to double-counting.
  \item \textsuperscript{90} See Center on Wrongful Convictions, History, http://www.law.northwestern.edu/depts/clinic/wrongful/history.htm (last visited Aug. 8, 2006).
  \item \textsuperscript{91} C. RONALD HUFF ET AL., CONVICTED BUT INNOCENT: WRONGFUL CONVICTION AND PUBLIC POLICY 64 (1996).
  \item \textsuperscript{92} The Innocence Project, supra note 87.
  \item \textsuperscript{93} Gross et al., supra note 79, at 543.
  \item \textsuperscript{94} See Wells, supra note 19, at 739.
  \item \textsuperscript{95} For an overview of probability-centered models, see Nancy Pennington & Reid Hastie, Evidence Evaluation in Complex Decision Making, 51 J. PERSONALITY & SOC. PSYCHOL. 242, 242–43 (1986).
\end{itemize}
minimum objective probability required by their understanding of "proof beyond a reasonable doubt"—in practice, usually around 0.82. Those subjective probabilities, however, do not necessarily correspond to the objective probability of the defendant’s guilt—the probability a rational Bayesian juror would infer from the evidence presented at trial. That disjunction can be problematic because if jurors’ subjective probabilities are too low in a case in which the objective probability is sufficient to convict, a false acquittal will result.

According to the traditional explanation, that is exactly what happens in cases involving circumstantial evidence. It argues that jurors generally misunderstand how forensic evidence like DNA and fingerprints increases the objective probability of the defendant’s guilt, thus causing them to infer subjective probabilities that are too low to convict.

B. The Wells Effect

There is no question that the traditional explanation is at least partially correct: the studies discussed above indicate that jurors are rarely good Bayesians. But the traditional explanation incorrectly assumes that jurors would be willing to convict if they did understand the probative value of circumstantial evidence. In fact, that’s not always true: as Gary Wells has shown—and other researchers have confirmed—jurors are likely to acquit in a circumstantial case even when their subjective probabilities of guilt are sufficient to convict.

Wells presented three different groups of mock jurors—judges, psychology students, and MBA students—with the facts of a hypothetical civil case in which a colorblind old woman, Mrs. Prob, sued the Blue Bus Company for having run over her pet dog. Each experimental group was given the same basic facts, then heard a transportation official testify that only two bus

97. See Goodman, supra note 59, at 372.
98. See, e.g., Deborah Davis & William C. Follette, Toward an Empirical Approach to Evidentiary Ruling, 27 LAW & HUM. BEHAV. 661, 678 (2003). Conversely, a false conviction will result when the objective probability of the defendant’s guilt is insufficient to convict, but jurors misunderstand the evidence in such a way that their subjective probabilities of the defendant’s guilt are sufficient to convict.
101. See Niedermeier et al., supra note 20, at 541; see also Sykes & Johnson, supra note 100, at 208.
102. Wells, supra note 19, at 744.
companies could have hit the dog—the Blue Bus Company and the Grey Bus Company, each of which had an equal share of traffic in the area. Half of each group then heard direct evidence of the Blue Bus Company’s liability, what Wells called the “weigh-attendant version” of the case:

[A] county transportation official took the stand, was sworn as a witness, and reported that he was on duty as the weigh attendant the day of the bus-dog incident . . . . In the weigh attendant’s log book for the day in question, he had entered “blue bus, 11:30 A.M.” along with a weight. The dog was hit at 11:40 and the distance from the weigh station to the point where Mrs. Prob’s dog was killed is about a 10 minute drive.

The defense attorney for the Blue Bus Company recalled the weigh station attendant and entered evidence showing that his previous log book entries were correct only 80% of the time and wrong 20% of the time.104

The other half of each group heard circumstantial evidence of the Blue Bus Company’s guilt, what Wells called the “tire-tracks version” of the case:

[A] county transportation official took the stand and reported that he examined the dead dog and took prints of the tire tracks. These prints were then transferred onto paper and compared to all 10 of the 10 buses owned by the Blue Bus Company and the 10 owned by the Grey Bus Company. The tracks matched 80% of the Blue Bus Company’s buses and matched only 20% of the Grey Bus Company’s buses.105

Both groups were then asked to estimate the probability that the Blue Bus Company had run over Mrs. Prob’s dog and indicate whether they would render a verdict against the company.106

The results were surprising. The experiment was designed to ensure that the objective probability of the Blue Bus Company’s guilt was the same in both cases—80%—and more than sufficient to find the company liable.107 Nevertheless, all three groups of mock jurors were substantially more likely to find the Blue Bus Company liable in the direct evidence (weigh-attendant) case than in the circumstantial evidence (tire-tracks) case. The judges were four times more likely; the psychology students were five times more likely; and the MBA students were a staggering nine times more likely.108

The traditional explanation of these results, of course, would be that the mock jurors subjectively underestimated the objective probability of the Blue Bus Company’s guilt in the circumstantial case. But that explanation was specifically contradicted by the results of the experiment. Even though the jurors were between four and nine times less likely to convict in the

104. Wells, supra note 19, at 741. Because it was undisputed that a bus hit the dog, the probative value of the weigh attendant’s identification—absent reliability concerns—was effectively 1.0.

105. Id. at 743.

106. Id. at 744.

107. Id. at 743.

108. Id. at 744.
circumstantial case, their subjective probabilities of guilt were more than sufficient to convict. In fact, their mean subjective probability of guilt was 70%—the same mean subjective probability as in the direct case.

On the basis of these counterintuitive results, Wells concluded that there is a fundamental psychological distinction between direct and circumstantial evidence, one that makes jurors reluctant to convict in circumstantial cases. "Psychologically, there seems to be a difference between saying that there is an 80% chance that something is true and saying that something is true based on evidence that is 80% reliable."'

III. THE EASE-OF-SIMULATION HYPOTHESIS

The Wells Effect is puzzling. If jurors in a circumstantial case believed that the evidence was sufficient to convict, why would they still be willing to acquit? And why would that willingness not extend to direct cases?

The beginning of an answer comes from a study of the Wells Effect conducted by Keith Niedermeier. In a series of three experiments designed to test what he called the "ease-of-simulation hypothesis," Niedermeier demonstrated that jurors were more willing to acquit the Blue Bus Company in the circumstantial case because they found it easier to imagine a scenario in which the Company did not run over Mrs. Prob's dog.

Most relevant here is Experiment 2, which presented the Mrs. Prob scenario to two groups of mock jurors. The first group heard Wells's circumstantial tire-track version of the case, in which a transportation official testified that the tire-tracks on the dog matched 80% of the Blue Bus Company's buses and 20% of the Grey Bus Company's buses. The second group, by contrast, heard a version of the case in which the official testified that the tire-track analysis produced a partial match with a blue bus and a partial match with a grey bus, indicating that there was an 80% probability that the blue bus ran over the dog and a 20% probability that a grey bus did so. Niedermeier predicted that mock jurors in the first group would find it easier to imagine a scenario in which a blue bus did not run over the dog, because in the complete-match condition there was "a clear, definite . . . match with at least one grey bus," whereas in the partial-match condition the

109. Id.
110. Id.
111. Id. at 746.
112. See Niedermeier et al., supra note 20.
113. Id. at 537; cf. Ronald J. Allen & Brian Leiter, Naturalized Epistemology and the Law of Evidence, 87 Va. L. Rev. 1491, 1528 (2001) (explaining that in the context of the relative plausibility theory, "the prosecution must provide a plausible account of guilt and show that there is no plausible account of innocence").
114. See Niedermeier et al., supra note 20, at 537.
115. Id.
only available evidence pointed strongly (though not definitively) toward a blue bus.\textsuperscript{116}

The results of the experiment supported the ease-of-simulation hypothesis. "As expected, mock jurors found it easier to imagine that a grey bus killed the dog in the complete match conditions . . . than in the partial match conditions . . . ."\textsuperscript{117} Moreover, ease-of-simulation determined verdict choice: although both groups subjectively understood that the probability of the Blue Bus Company's guilt was more than sufficient to find the company liable, only 26\% of the complete-match jurors actually found for Mrs. Prob, compared to 53\% of the partial-match jurors.\textsuperscript{118}

Niedermeier thus concluded that the ease-of-simulation hypothesis explains Wells's finding that jurors are more reluctant to find liability when there is an 80\% chance of the defendant's guilt than when conclusive evidence of the defendant's guilt is 80\% reliable. In his view, the critical difference between the two kinds of evidence is "the degree to which they permit a juror to simulate a scenario in which the defendant is innocent."\textsuperscript{119}

As we will see, this conclusion is essential to solving the paradox of circumstantial evidence. Niedermeier's study is silent, however, on two critical questions. First, why is the ability to imagine a factually exculpatory scenario the key to acquittal? And second, why do jurors find it easier to imagine such a scenario in a circumstantial case than in a direct case?

IV. The Simulation Heuristic and the Ease-of-Simulation Model

This Part answers the first question: why jurors' willingness to acquit is determined by their ability to imagine a scenario in which the defendant is factually innocent. Section A argues that Niedermeier's study indicates that legal decision-making is based on a cognitive mechanism known as the "simulation heuristic."\textsuperscript{120} Section B examines how the simulation heuristic likely functions in the legal context. Finally, Section C sketches a general model of jury decision-making based on the simulation heuristic.

A. The Simulation Heuristic

The simulation heuristic was initially identified by Daniel Kahneman and Amos Tversky, two pioneers in cognitive psychology. They describe the simulation heuristic as follows:

\textsuperscript{116} \textit{Id.}

\textsuperscript{117} \textit{Id.} at 538.

\textsuperscript{118} \textit{Id.} The results were even more dramatic in Experiment 3, in which 16\% of the complete-match jurors and 61\% of the partial-match jurors held the Blue Bus Company liable. \textit{Id.} at 540.

\textsuperscript{119} \textit{Id.} at 541.

\textsuperscript{120} Daniel Kahneman & Amos Tversky, \textit{The Simulation Heuristic, in Judgment Under Uncertainty: Heuristics and Biases} 201, 201 (Daniel Kahneman et al. eds., 1982).
There appear to be many situations in which questions about events are answered by an operation that resembles the running of a simulation model.... A simulation does not necessarily produce a single story, which starts at the beginning and ends with a definite outcome. Rather, we construe the output of simulation as an assessment of the ease with which the model could produce different outcomes, given its initial conditions and operating parameters.\footnote{121}

The clearest example of the simulation heuristic, according to Kahneman and Tversky, is "the explicit construction of scenarios as a procedure for the estimation of probabilities."\footnote{122} When the heuristic is used in this way, the probability of a particular event is determined by trying to imagine a causal scenario\footnote{123} that produces it. The easier it is to imagine such a scenario, the more probable the event appears to be.\footnote{124}

Assume, for example, you want to determine the likelihood that sometime in 2006 the United States will bomb Iran to destroy its nuclear capabilities. One way to make that determination is to try to imagine a realistic geopolitical scenario that would cause the United States to take such a drastic action. If you find it easy to imagine such a scenario, you will believe that the United States is likely to bomb Iran. But if you find it difficult to imagine—you simply can't see it happening—you will believe that the United States is unlikely to do so.

The basic assumption of the simulation heuristic—that the simple act of imagining a scenario makes it seem more probable—has been validated by research in a variety of disciplines. For example, one day before the 1976 presidential election, subjects were asked to imagine, based on detailed scenarios, either Jimmy Carter or Gerald Ford winning the election. The subjects who were instructed to imagine a Carter victory were far more likely to predict that Carter would win than subjects who were instructed to imagine a Ford victory, and vice-versa.\footnote{125}

Similarly, researchers have examined the effectiveness of messages designed to curb harmful behavior likely to lead to disease, such as smoking and lung cancer. They have consistently found that such messages are more effective when the symptoms of the disease are easy to imagine than when they are not.\footnote{126}

As these examples indicate, though, the simulation heuristic is not necessarily an \textit{accurate} method for determining probabilities. "Like any other

\begin{itemize}
\item \footnote{121}{Id.}
\item \footnote{122}{Id. at 206.}
\item \footnote{123}{A causal scenario is an "educated guess about why an event took place." Michael R.P. Dougherty et al., \textit{The Role of Mental Simulation in Judgments of Likelihood}, 70 \textit{Organizational Behav. \& Hum. Decision Processes} 135, 136 (1997).}
\item \footnote{124}{Kahneman \& Tversky, \textit{ supra} note 120, at 201–02.}
\item \footnote{125}{John S. Carroll, \textit{The Effect of Imagining an Event on Expectations for the Event: An Interpretation in Terms of the Availability Heuristic}, 14 \textit{J. Experimental Soc. Psychol.} 88, 90–92 (1978).}
\item \footnote{126}{Philip Broemer, \textit{Ease of Imagination Moderates Reactions to Differently Framed Health Messages}, 34 \textit{Eur. J. Soc. Psychol.} 103, 115–16 (2004).}
\end{itemize}
heuristic, the simulation heuristic [is] subject to characteristic errors and biases.\textsuperscript{127} Most obviously—and most importantly for our purposes—ease of simulation and objective probability are not necessarily correlated: an event can be easy to imagine yet improbable, or difficult to imagine yet probable.\textsuperscript{128}

B. The Simulation Heuristic in the Legal Context

Reaching a verdict in a criminal trial is, of course, different than guessing who will win an election or predicting whether the United States will bomb Iran. The latter decisions are forward-looking, asking individuals to estimate the probability of a future event by trying to generate a specific scenario that causes it. Deciding whether to convict or acquit, by contrast, is backward-looking: the salient event—the commission of the crime—is already known. What is not known is \textit{how the crime occurred}: is the defendant responsible or not? To make that determination, jurors have to choose between two irreconcilable accounts of the crime: an inculpatory scenario based on the prosecution’s evidence, or an exculpatory scenario based on the defense’s evidence.\textsuperscript{129} And if they choose the inculpatory scenario, jurors also have to decide whether it proves the defendant’s guilt beyond a reasonable doubt.\textsuperscript{130}

The differences between backward-looking legal decision-making and forward-looking applications of the simulation heuristic raise two important questions: (1) do jurors actually use the simulation heuristic to decide cases? and (2) if so, what does a model of jury decision-making based on the simulation heuristic look like?

1. Use of the Heuristic

The best evidence for an affirmative answer to the first question is the ease-of-simulation hypothesis discussed earlier. Although the hypothesis is incompatible with traditional probability-centered models of jury decision-making, it makes perfect sense if we view it as a backward-looking form of

\begin{enumerate}
\item \textsuperscript{127} Kahneman & Tversky, \textit{supra} note 120, at 207.
\item \textsuperscript{128} Deciding whether to purchase insurance provides a particularly dramatic example of such inaccurate decision-making. Research has shown that individuals are willing to pay more for travel insurance covering death from “any act of terrorism” than for travel insurance covering death from “any reason.” Eric J. Johnson et al., \textit{Framing, Probability Distortions, and Insurance Decisions}, 7 J. RISK & UNCERTAINTY 35, 39 (1993). The only persuasive explanation for that asymmetry—which is not rational, given that “any reason” includes “any act of terrorism”—is that being killed by a terrorist is easier to imagine than being killed by some unnamed cause, so it seems more probable. \textit{See} George F. Loewenstein et al., \textit{Risk as Feelings}, 127 PSYCHOL. BULL. 267, 275 (2001); see also Paul Slovic et al., \textit{Violence Risk Assessment and Risk Communication: The Effects of Using Actual Cases, Providing Instruction, and Employing Probability Versus Frequency Formats}, 24 LAW & HUM. BEHAV. 271, 290 (2000).
\item \textsuperscript{129} \textit{See} ROBERT P. BURNS, \textit{A THEORY OF THE TRIAL} 157 (1999).
\end{enumerate}
the simulation heuristic—one that focuses on the ease of imagining a scenario that *might have caused* a known past event, instead of on the ease of imagining a scenario that *may cause* a future event.

This idea is supported by a number of jury decision-making studies. Green and McCloy conducted a series of experiments designed to determine whether jurors analyzed prosecution and defense arguments by envisioning them as causal scenarios or by assessing their quality in light of the evidence that supported them. The data supported the former hypothesis: "reaching a verdict is finding an explanation, and possibly the best explanation, of the events by a process of mental simulation." Similarly, Elizabeth Loftus has concluded that when jurors listen to testimony, "they do more than simply take in the questions and answers. While listening, they construct in their minds an 'image' of an incident that was, of course, never witnessed by any one of them . . . Based on these constructed images, the jurors must then reach a verdict." Finally, and perhaps most famously, the central conclusion of Pennington and Hastie's Story Model is that, during trial, "jurors are engaged in an active, constructive comprehension process in which they make sense of trial information by attempting to organize it into a coherent mental representation."

2. Toward a Simulation-Based Model of Decision-Making

The second question—what a simulation-based model of jury decision-making looks like—is more complicated. We know from the ease-of-simulation hypothesis that jurors' willingness to acquit is determined by their ability to imagine a scenario in which the defendant is factually innocent. But that is only part of the answer, because it raises the most important question: what determines how easily imagined the factually exculpatory scenario ("FES") must be in order for jurors to acquit?

One possible answer is that the minimum imaginability of the FES is a function of the imaginability of the factually inculpatory scenario ("FIS"). The prosecution presents its evidence first, so jurors' initial confidence in the defendant's guilt should be determined by how easy it is for them to use that evidence to imagine an FIS. Jurors' final confidence in the defendant's guilt—the measure that determines their verdict—would then be

132. Id. at 327.
133. Elizabeth F. Loftus, *Psychological Aspects of Courtroom Testimony*, 347 N.Y. ACAD. SCI. 27, 27–28 (1980); cf. Burns, supra note 129, at 187 ("The jury will often seek to imagine, literally to visualize, a sequence of past events in order to decide which of the two opening statements is more adequate."); Willem A. Wagenaar, *The Subjective Probability of Guilt*, in *SUBJECTIVE PROBABILITY* 529, 538 (George Wright & Peter Ayton eds., 1994) (arguing that jurors use the simulation heuristic to determine the probability of a defendant's guilt).
135. See Wagenaar, supra note 133, at 538.
determined by how their initial confidence is affected by the imaginability of the FES: the easier it is for jurors to imagine a scenario in which the defendant is innocent, the less confident they will be that he is guilty.

Craig McKenzie's research into the relationship between prosecution and defense cases supports this view. By examining how jurors reacted to pairs of cases with different strengths—strong prosecution with weak defense; weak prosecution with strong defense; etc.—McKenzie demonstrated that a defense case reduces confidence in the prosecution's case only if it exceeds its "minimum acceptable strength," a threshold that is determined by the strength of the prosecution's case. In fact, McKenzie found that a defense case that fails to exceed its minimum acceptable strength actually backfires and increases confidence in the prosecution's case.

The ease-of-simulation hypothesis suggests that McKenzie's mock jurors determined the strength of individual cases by trying to imagine them—which means that the minimal acceptable strength of a defense case is, in fact, its minimal acceptable imaginability. McKenzie's research thus suggests that a model of jury decision-making based on the simulation heuristic involves two basic stages. First, jurors use the prosecution's case to imagine an FIS. The ease of imagining the FIS determines their initial confidence in the defendant's guilt and establishes the FES's minimum acceptable imaginability. Second, jurors use the defense case to imagine an FES. If the FES exceeds its minimum acceptable imaginability, jurors' initial confidence in the defendant's guilt decreases. If it does not, the FES backfires, increasing jurors' initial confidence in the defendant's guilt. Once jurors have determined their final confidence in the defendant's guilt, their verdict is then determined by the level of confidence they believe necessary to convict. If their final confidence is higher than that level, they convict. If it is lower, they acquit.

Needless to say, this model of jury decision-making is fundamentally different than traditional models, all of which assume that verdicts are determined by jurors' subjective probabilities of guilt. The ease-of-simulation model, by contrast, assumes that verdicts are determined by a very different—though no less subjective—measure of guilt, their "confidence" or "gut-level certainty," which is a function of ease of imagination, not probability calculations. The distinction is not just semantic, because...
the Wells Effect clearly indicates not only that "there can be a dissociation between a person's belief in the objective probability of an event and his or her more intuitive or 'gut-level' perceptions of certainty,"[141] but also that, when there is such a dissociation, gut-level certainty ultimately determines verdict choice.

V. THE EASE-OF-SIMULATION MODEL APPLIED

Having outlined the ease-of-simulation model, we can now explain the second—and most important—question Niedermeier's research leaves unanswered: why jurors normally find it easier to imagine an FES in a circumstantial case than in a direct case.

This Part is divided into three Sections. Section A explores four basic epistemological differences between direct and circumstantial evidence. Section B then explains why an FIS is generally easier to imagine in a direct case than in a circumstantial case, thus establishing a higher minimum acceptable imaginability for the FES. Finally, Section C demonstrates why an FES is generally easier to imagine in a circumstantial case than in a direct case, making a circumstantial FES more likely to meet or exceed its minimum acceptable imaginability and reduce jurors' confidence in the defendant's guilt.

A. The Differences between Direct and Circumstantial Evidence

There are four basic epistemological differences between direct and circumstantial evidence. Direct evidence is representational, narrative, univocal, and unconditional. Circumstantial evidence is abstract, rhetorical, polyvocal, and probabilistic.

1. Representational vs. Abstract

Perhaps the most obvious difference between direct and circumstantial evidence is that direct evidence is a verbal representation of the crime itself, whereas circumstantial evidence is an abstract statement about the connection between the defendant and an incriminating physical trace of the crime, such as blood or fingerprints.[142]

Consider the following direct evidence, the testimony of the key eyewitness in Mumia Abu-Jamal's murder trial:

calculated probability estimations based on participants' understanding of the rules of probability and measures affecting participants' 'gut feeling,' or subjective sense of the likelihood of an event.

141. Windschitl & Young, supra note 140, at 111.

142. This is, of course, Locard's "transfer principle." See Keith Inman & Norah Rudin, Principles and Practice of Criminalistics: The Profession of Forensic Science 93 (2001) ("It is impossible for the criminal to act, and especially to act with the force that a crime demands, without leaving behind traces of his presence." (translating Edmond Locard, L'Enquete Criminelle et les Methodes Scientifique (1920))).
I was standing on the corner and I noticed the lights on top of the police car and the spotlight in the Volkswagen was in front of the police car, and they were pulling over to the side of Locust Street .... The driver of the Volkswagen then struck the police officer with a closed fist to his cheek, and the police turned the driver of the Volkswagen around in a position to handcuff him .... I looked across the street in the parking lot and I noticed he was running out of the parking lot and he was practically on the curb when he shot two times at the police officer. It was the back. The police officer turned around and staggered and seemed like he was grabbing for something. Then he fell. Then he came over and he came on top of the police officer and shot some more times. After that he went over and he slouched down and he sat on the curb.143

From a legal perspective, this eyewitness testimony is important because it proves that Abu-Jamal was the police officer's killer. From the jurors' perspective, though, it does more than that: it also provides a verbal representation of the crime itself, a moment-by-moment account that helps them imagine how the defendant actually committed it.

Contrast that with the following circumstantial evidence, testimony about a DNA match between the defendant and a bloodstain found on a pair of scissors used in a murder:

I tested his sample and established that in the CSF1PO his type would be an 8,13. He is an 8,9 here; a 7,7; an 11,14; a 12,13; an 8,11; a 20,14; and an 8,12 ... Stained Area A is an 8,13; an 8,9; 7,7; 11,14; 12,13; 8,11; 10,14; and 8,12 ... And so, therefore, on Stained Area A, which was on the scissors, the probability that the stained area would be seen again in the population is approximately 1 in greater than 5.5 billion.144

The DNA match is also legally sufficient to prove that the defendant committed the murder, but there its utility ends. Unlike representational direct evidence, this kind of abstract circumstantial evidence does not help jurors imagine how the defendant committed the crime. Instead, it simply describes the probability that the incriminating blood evidence came from the defendant. If the jurors believe that the match is reliable, their subjective probabilities of the defendant's guilt will increase. They will be no closer, however, to imagining the crime itself.

2. Narrative vs. Rhetorical

In Actual Minds, Possible Worlds, Jerome Bruner distinguishes between two modes of thought, the narrative and the rhetorical.145 The narrative mode involves "good stories, gripping drama, [and] believable (though not

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144. Testimony of Carol Palmer, State v. Lovett (unpublished Virginia case, on file with author).
necessarily ‘true’) historical accounts.” The rhetorical mode, by contrast, “deals in general causes, and in their establishment, and makes use of procedures to assure verifiable reference and to test for empirical truth.” The two modes are complementary, but fundamentally different:

They differ radically in their procedures for verification. A good story and a well-formed argument are different natural kinds. Both can be used as means for convincing another. Yet what they convince of is fundamentally different: arguments convince one of their truth, stories of their lifelikeness. The one verifies by eventual appeal to procedures for establishing formal and empirical proof. The other establishes not truth but verisimilitude.

Because direct evidence is representational, it functions in Bruner’s narrative mode. Both eyewitness identifications and confessions attempt to persuade jurors that the defendant is guilty by providing them with an allegedly true historical account of how the defendant committed the crime. In a direct case, therefore, jurors do not decide whether to convict by calculating probabilities or by scrutinizing inferential chains. They simply decide whether the eyewitness identification or the confession is believable — whether it possesses the “lifelikeness” that marks it as true. If it does, there is no question of the defendant’s guilt: ideal direct evidence goes in a “single step” to “the material issue in the case.”

Circumstantial evidence, by contrast, functions in Bruner’s rhetorical mode. Because it is abstract, it does not provide jurors with a historical account of the defendant’s guilt; although it can be incorporated into such an account, it is not itself representational. On the contrary, circumstantial evidence persuades by connecting the defendant to an incriminating “observable” of the crime, thus increasing the probability of the defendant’s guilt. Circumstantial evidence thus depends, as Bruner indicates, on “procedures for establishing formal and empirical proof,” not on “the imagination of the novelist or poet.” It is an argument, not a story.

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146. Id. at 13.
147. Id.
148. Id. at 11; see also Melanie C. Green & Timothy C. Brock, In the Mind’s Eye: Transportation-Imagery Model of Narrative Persuasion, in NARRATIVE IMPACT: SOCIAL AND COGNITIVE FOUNDATIONS 315, 332 (Melanie C. Green et al. eds., 2002) (“In rhetoric-based persuasion, messages consist of arguments; in narrative-based persuasion, stories feature images.”).
149. BRUNER, supra note 145, at 21.
150. BURNS, supra note 129, at 189.
152. BRUNER, supra note 145, at 11, 13.
153. See BURNS, supra note 129, at 36.
3. Univocal vs. Polyvocal

"In order to justify the inferences of guilt" from circumstantial evidence, William Wills once wrote, "the inculpatory facts must be incompatible with the innocence of the accused, and incapable of explanation upon any other reasonable hypothesis than that of his guilt." What Wills failed to recognize is that he was asking the impossible: circumstantial evidence always permits both inculpatory and exculpatory inferences, even if those inferences are not equally likely. That inferential openness, which inheres in the very form of circumstantial evidence, is what I call its polyvocity.

Consider, for example, the murder case in which DNA analysis connected the defendant to the bloodstain on the scissors used in the murder. By itself, that evidence is sufficient to convict; jurors could reasonably infer from the match that the defendant used the scissors to commit the murder. But the evidence is not "incapable of explanation upon any other reasonable hypothesis than that of his guilt." On the contrary, there are at least three steps in the inferential chain where exculpatory inferences are still possible:

[A] suspect who provides a true match may not be the source of the trace if the match is purely coincidental; the source of a trace may not have been at the crime scene if the real perpetrator deliberately left the suspect's genetic material; and, finally, the source of the trace may have left the crime scene trace in a way that is consistent with innocence.

None of these possibilities, it is important to note, require the circumstantial evidence to be unreliable. In each case the evidence is exactly what the prosecution claims it is. Nevertheless, the reliability of the circumstantial evidence does not eliminate its polyvocity. The exculpatory possibilities are, quite literally, endless.

This murder scenario is, of course, greatly oversimplified. In the real world, the circumstantial evidence may be far more damning: the victim's blood might have been found on the defendant's shirt, the defendant might have had a motive to kill the victim, and so on. The concept of polyvocity, however, does not require the exculpatory inferences to be probable—only possible. Because if they are possible, circumstantial evidence can never be "absolutely incompatible with the innocence of the accused."

Direct evidence is different. Innocence is only possible in a direct case if the evidence is unreliable—the eyewitness was mistaken or committed perjury; the confession was coerced or the product of mental illness. If the direct evidence is reliable, the defendant cannot be innocent, because, again,


155. Koehler et al., supra note 83, at 203–04; see also Michael O. Finkelstein & William B. Fairley, The Continuing Debate Over Mathematics in the Law of Evidence: A Comment on "Trial by Mathematics", 84 Harv. L. Rev. 1801, 1805–06 (1971) ("The significance of the conclusion that a trace came from the defendant—i.e., whether it indicates guilt, a frame-up, or mere chance—must be left to other witnesses . . . ").

a perfect eyewitness identification or a confession proves guilt in a single step, without the need for inference.

Consider, for example, a variant on the murder scenario. Replace the blood on the scissors with an eyewitness identification—a neighbor, say, who testifies that she saw the defendant use the scissors to kill the victim. If the jurors question the honesty or accuracy of the eyewitness, they can conclude that the defendant is innocent. But if they accept the eyewitness identification, they are obligated to convict, because the identification cannot logically be "re-narrated" into an account of how the defendant did not commit the crime—there is no possible story in which the defendant is innocent even though the witness did, in fact, see him kill the victim. Unlike circumstantial evidence, then, direct evidence is inherently univocal. Eyewitness identifications and confessions literally "speak in one voice"—a voice that proclaims the defendant’s guilt.

4. Unconditional vs. Probabilistic

The fourth and final difference is the logical corollary of the third. Because circumstantial evidence is inherently polyvocal, consistent with both innocence and guilt, it is also inherently probabilistic—its probative value is always less than 1.0. The evidence may make guilt extremely likely: the exculpatory inference(s) the defendant asks jurors to draw may stretch credulity to the breaking point. But it can never unconditionally prove the defendant’s guilt.157

In the strong version of the murder case, for example, a rational Bayesian juror may conclude that the probability of the defendant’s guilt is 0.98 in light of the bloodstain on the scissors, the victim’s blood on the defendant’s shirt, and the motive evidence. She cannot rationally conclude that the probability of the defendant’s guilt is 1.0, however, because that would mean there are no exculpatory inferences consistent with that circumstantial evidence. And that is simply not possible, given the inherent polyvocity of circumstantial evidence.

Direct evidence, by contrast, is unconditional, not probabilistic. A perfect eyewitness identification says, "I saw the defendant commit the crime." A defendant’s confession admits, "I committed the crime." In both cases, unless jurors question the reliability of the evidence—and we’ve seen that they normally don’t—the probative value of the evidence is 1.0.

B. Imagining the Factually Inculpatory Scenario

We can now turn to the first stage of the ease-of-simulation model, imagining the factually inculpatory scenario (FIS). For three reasons, jurors normally find it easier to imagine an FIS in a direct case than in a circum-

157. Nesson, supra note 103, at 1371 (“In the circumstantial evidence case, even if the jury believed all of the evidence, it still could not generate a verdict that the public could understand as other than a bet.”).
stantial case: (1) direct evidence is representational, while circumstantial evidence is abstract; (2) direct evidence generally provides a more structurally coherent story than circumstantial evidence; and (3) direct evidence is vivid, while circumstantial evidence is pallid.

Before proceeding, it is important to emphasize again that we are interested in the FIS that jurors try to imagine based on the evidence presented at trial. In some cases, the prosecution attempts to facilitate the imaginative process by using its opening argument to present jurors with a narrative account of how the defendant committed the crime. Narrative opening arguments are the exception, however, not the rule; more often, the prosecution uses a rhetorical opening argument that outlines how the various items of evidence will prove the necessary elements of the crime. When the prosecution makes use of a rhetorical opening argument instead of a narrative one, jurors have to imagine an FIS on their own. And even when the prosecution does use a narrative opening argument, there is no guarantee that the FIS jurors imagine will match the prosecution's narrative; indeed, differences are not only possible but likely.

1. Event Representation

The fundamental reason a direct FIS is normally easier to imagine than a circumstantial FIS is that direct evidence is representational, while circumstantial evidence is abstract. By providing the jury with a narrative representation of how the defendant committed the crime, eyewitness identifications and confessions make it easy for jurors to imagine an FIS—they simply have to translate the narrative into its "obvious perceptual analog." Indeed, the process of imagination occurs automatically: similar to becoming lost in a book, jurors become immersed in the nonfictional world narrated by the eyewitness, mentally imagining the specific events as the eyewitness describes them.

According to Daniel Gilbert, there may, in fact, be an evolutionary basis for visualizing events an eyewitness describes. Human beings have always been social animals, dependent upon others—parents, friends, strangers—for their survival. In earlier eras, interdependency put a premium on communication: humans who were able to communicate quickly and effectively with each other survived and reproduced; humans who could not died out. Such communication required listeners to be able to quickly imagine


160. Sykes & Johnson, supra note 100, at 209.

161. See, e.g., VICTOR NELL, LOST IN A BOOK: THE PSYCHOLOGY OF READING FOR PLEASURE 246 (1988) (concluding that "imagery is an essential aspect of the reading experience" for all readers, "good and poor imagers alike," and that "the reader, using a ready-made store of images, at once sees the whole picture—mistily, perhaps, but well enough").

speakers' firsthand reports of specific events: enemy attacks, the presence of animals to hunt, etc. Evolution thus favored humans skilled in imagination over those who were unskilled, ultimately creating a perceptual system in which, at least initially, "an assertion by another person about a physical event is treated in the same manner as an actual apprehension of that event by our perceptual system."\footnote{163}

The key here is that direct evidence is a representation of a "physical event"—the crime itself. Circumstantial evidence does not provide the jury with a representation of the crime; it is simply an abstract probabilistic statement about the defendant's relationship to one of its incriminating physical traces. Unlike direct evidence, then, circumstantial evidence does not facilitate jurors' ability to imagine an FIS. How do jurors imagine a statement like "the probability that the stained area would be seen again in the population is approximately 1 in greater than 5.5 billion"? What is its "perceptual analog"? Such abstract evidence appeals to jurors' understanding of the law's "procedures for establishing formal and empirical proof," not to their imaginations.

Moreover, even if jurors conclude that an item of circumstantial evidence did in fact come from the defendant, thus increasing the subjective probability of his guilt, that evidence still does not help them imagine how the defendant actually committed the crime. At best, it provides them with a small piece of the overall visual puzzle. If jurors accept the prosecution's claim that the bloodstain on the scissors came from the defendant, for example, that evidence only allows them to imagine that at some unknown time the defendant held the scissors. It does not provide them with an image of how the murder itself occurred. And even the image of the defendant with the scissors is an unstable one. Because of the inherent polyvocity of circumstantial evidence, there are many other possible images consistent with the bloodstain: that the real killer planted the defendant's blood on the scissors after he committed the crime himself; that the blood got on the scissors through earlier, innocent contact; and so on.

To imagine an FIS in a circumstantial case, then, jurors always have to rely on multiple items of circumstantial evidence. Each item is a small piece of the visual puzzle; enough items might reveal the puzzle itself. The real question, then, is whether jurors are normally able to weave the various items of evidence in a circumstantial case into an easily imagined account of how the defendant committed the crime. The answer, I believe, is probably not. As the next two Sections demonstrate, a circumstantial FIS is unlikely to be either structurally coherent or vivid, the two factors that determine its ease of imagination.

2. Structural Coherence

A considerable amount of empirical research indicates that the structural coherence of an FIS is critical to its imaginability. A study that examined the
effectiveness of opening arguments in four hypothetical murder cases, for example, concluded that the structural coherence of an opening argument is "critical to narrative quality" and particularly important to an argument's persuasiveness. Another study found that because jurors "judge the plausibility of a story according to [its] structural relations," it is possible that "a well-constructed story may sway judgments even when evidence is in short supply." A third study extended that conclusion even further, finding that "[c]oherence in statements (non-contradictory vs. contradictory) in a narrative is more important in judgments of guilt and plausibility than the amount of evidence.

These studies focus on the relationship between structural coherence and narrative quality, not between structural coherence and imaginability. Melanie Green's transportation-imagery model, however, indicates that high-quality narratives are persuasive precisely because they facilitate imagination. That makes sense: when individuals receive information sequentially—as jurors do in a trial—they comprehend it sequentially as well, creating layers of information and mapping each new item of information onto previous items until global comprehension is achieved. And "the more the incoming information coheres with the previous information, the easier it is to map."

Structural coherence, it is important to note, is not a unitary phenomenon. In fact, Morton Germsbacher suggests that a narrative's overall structural coherence is determined by the interplay of four different kinds of coherence: referential, locational, temporal, and causal. A narrative is referentially coherent when it refers to the same actors and events, locationally coherent when its events take place at the same location, temporally coherent when its events take place in a common time frame, and

164. James F. Voss et al., On the Use of Narrative as Argument, in Narrative Comprehension, Causality, and Coherence 235, 244 (Susan R. Goldman et al. eds., 1999).

165. Id. at 248.


167. Id. at 68. The authors noted that the converse may be true, as well, namely, that "adequately documented but poorly structured accounts will be rejected because they do not withstand careful scrutiny within a story framework." Id. at 67–68.

168. B. Klettke & A.C. Graesser, Coherence and Evidence in Testimony Evaluation on Incest Narratives (July 19–21, 2000) (unpublished manuscript, presented at the Tenth Annual Meeting of the Society for Text and Discourse); see also Bennett & Feldman, supra note 166, at 88 ("[R]egardless of a story's actual truth status, the more ambiguous the story is in . . . structural terms . . . the less plausible it is.").

169. See Green & Brock, supra note 148, at 319.


171. Id.

172. Id. at 53.

173. Id. at 58.

174. Id. at 56.
causally coherent when it explains the occurrence of its events in a consistent way.\textsuperscript{175} With those four "sub-coherences" in mind, we can examine the relative structural coherence of direct and circumstantial factually inculpatory scenarios.

a. Direct Evidence

Because eyewitness identifications and confessions are narrative representations of the crime itself, a direct FIS normally possesses all four kinds of coherence.

i. Referential, Locational, and Temporal Coherence

A direct FIS tends to be referentially and locationally coherent because it focuses on a specific location—the scene of the crime—and involves a discrete number of actors, usually the defendant, the victim, and the witness providing the direct evidence. The eyewitness situation is the most obvious example: the witness simply describes how she saw the defendant commit the crime. A confession can be more complicated, because it may also include statements about motive, post-crime concealment, and the like, but the fact that it is a first-person narrative ensures that all of the actors and events it contains will be configured around the defendant's own actions.

A direct FIS is also usually temporally coherent. Although "evidence is presented at trial in a disconnected question and answer format,"\textsuperscript{176} the most natural way for the prosecution to elicit testimony from an eyewitness is to ask questions that allow her to describe what she saw chronologically.\textsuperscript{177} Confessions, moreover, are not even broken up by the prosecution's questions; they are read into the record by a police officer or, where taped, played for the jurors.

ii. Causal Coherence

The causal coherence of a direct FIS is normally guaranteed by the narrative structure of direct evidence. For a narrative to be causally coherent:

\[\text{[I]}\text{t must be more than a "simple succession" or "enumeration of events in serial order"; it must be "a configuration." This configuration has a part-whole structure of a particular type: In Aristotle's famous dictum describing the prerequisites of a proper, complete story, "a thing is a whole if it has a beginning, a middle, and an end." A story is conceptualized as}\]

\textsuperscript{175} Id. at 61.

\textsuperscript{176} Pennington & Hastie, supra note 95, at 244.

movement along a path, the sequence of its events configured by means of
the source-path-goal schema.\textsuperscript{178}

Both eyewitness identifications and confessions are configurations, not
"simple successions," because they structure their events according to the
source-path-goal schema that Winter identifies as emblematic of a causally
coherent narrative. A confession is the clearest example: it not only unfolds
"in serial order," each action leading to the next, it involves the defendant
himself (the source) describing how he actually committed the crime (the
path) and what motivated him to commit it (the goal). Similarly, although an
eyewitness identification does not explain the defendant’s motive, it still
follows a classic version of the source-path-goal schema: it begins with the
victim before the crime (the protagonist), describes how the defendant en-
countered the victim and how they interacted with each other (the antagonist
+ the \textit{agon} \textsuperscript{179}), and concludes with what happened after the crime was com-
mited (the destination).\textsuperscript{180}

Critical, here, is the fact that both eyewitness identifications and confes-
sions rely on cause-to-consequence reasoning. Formally, criminal trials are
structured consequence-to-cause: the consequence is known (the crime it-
tself), and the purpose of the trial is to determine whether the defendant is
the cause (the perpetrator). Eyewitness identifications and confessions, how-
ever, temporarily reverse that relationship: the witness identifies the
defendant as the perpetrator (the cause) and explains how the defendant
committed the crime (the consequence). That temporary reversal is what
creates direct evidence’s causal coherence. As Tversky and Kahneman point
out, individuals find it “more natural and easier to follow the normal se-
quence and reason from causes to consequences than to invert this sequence
and reason from consequences to causes.”\textsuperscript{181}

The causal coherence of a direct FIS is strengthened, moreover, by its
semantic absolutism. Witnesses and prosecutors rarely use equivocated ex-
pressions like “might have,” “strongly indicates,” and “almost certainly” in a
case that is based on direct evidence, because such evidence, if reliable,
conclusively establishes the defendant’s guilt. From a cognitive standpoint,
that causal absolutism is critical to jurors’ ability to imagine an FIS. Re-
search has found that “the use of probabilistic wording or wording that
reduces causal certainty, especially when such wording provides a sense of
doubt about some aspect of the accused’s role in committing the crime,”
dramatically reduces the structural coherence—and thus imaginability—of a
narrative.\textsuperscript{182}


\textsuperscript{179} Understood as the conflict between the antagonist and protagonist. \textit{Id.} at 2238.

\textsuperscript{180} \textit{Id.}


\textsuperscript{182} Voss et al., \textit{supra} note 164, at 246.
b. Circumstantial Evidence

Circumstantial evidence is rhetorical, not narrative—it persuades by increasing the probability of the defendant's guilt, not by presenting jurors with a compelling account of how he committed the crime. The rhetorical nature of circumstantial evidence normally ensures that a circumstantial FIS lacks structural coherence, particularly in comparison to a direct FIS.

i. Referential and Locational Coherence

Like a direct FIS, a circumstantial FIS focuses on reconstructing the crime itself. A circumstantial FIS, however, cannot focus solely on the actions of the victim and the defendant, because their actions must be inferred from items of evidence that are discovered, collected, processed, and explained by other individuals. The prosecution necessarily relies on the actions of those individuals to establish the admissibility of the circumstantial evidence.\(^{183}\) By doing so, however, it decreases the referential coherence of the FIS.

For similar reasons, a circumstantial FIS is also less locationally coherent than a direct FIS. Because circumstantial evidence consists primarily of physical traces of the crime, such evidence is likely to be scattered far beyond the spatial confines of the crime scene. Moreover, the FIS has to account for all of the locations involved in the collection and processing of the circumstantial evidence—a lesson the O.J. Simpson prosecutors learned the hard way when they failed to explain why Detective Vannatter carried Simpson's blood between the Bundy and Rockingham estates.\(^{184}\)

ii. Temporal Coherence

To assess the temporal coherence of a circumstantial FIS, we need to distinguish between cases in which the prosecution uses a narrative opening argument and cases in which it uses a rhetorical one. When the prosecution uses a rhetorical opening argument, jurors are unlikely to imagine a temporally coherent FIS, because in a circumstantial case the prosecution rarely, if ever, structures its case-in-chief as a chronological narrative—evidence of planning coming before evidence of commission, evidence of commission coming before evidence of concealment, and so on. For example, the prosecution generally asks an expert scientific witness to discuss all of the physical evidence that falls within his or her expertise, even if that evidence was generated at different times during the crime.\(^{185}\) Similarly, the prosecu-

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\(^{185}\) See Lempert, supra note 158, at 566. During the Simpson trial, for example, Dennis Fung, an LAPD criminalist, discussed the forensic evidence he found in Simpson's white Bronco, at Simpson's Rockingham estate, and then at Bundy. A chronological presentation would have been Bundy, Bronco, Rockingham.
tion often introduces all of its scientific evidence at one time, regardless of chronology. Other common examples include calling the arresting officer as the first witness, presenting motive evidence at the end of the case for rhetorical effect, and calling the coroner early in the case to establish cause and time of death. It is extremely difficult for jurors to weave such temporally disordered items of evidence into a unified chronological account of how the defendant committed the crime. As Jean Matter Mandler points out, because the elements of a story are "recognized primarily because of what has gone before," the movement of an element "to another place in the story is apt to cause the listener trouble."

If the prosecution uses a narrative opening argument, jurors are more likely to imagine a temporally coherent FIS, because the argument will help them keep track of the circumstantial evidence the prosecution presents in its case-in-chief. But even then there is no guarantee: it is still possible that the temporal coherence of the opening argument will be overwhelmed by the "unpersuasive jumble of facts" created by the prosecution's decision to have its witnesses testify out of story order.

iii. Causal Coherence

A circumstantial FIS is also likely to be less causally coherent than a direct FIS. Most importantly, because circumstantial evidence is rhetorical, not narrative, it necessarily relies on consequence-to-cause reasoning: the consequences of the crime (the circumstantial evidence) are proof of its cause (the defendant). As already noted, such reasoning is particularly difficult for jurors to follow.

The impact of the consequence-to-cause nature of circumstantial evidence should be most severe when the prosecution uses a rhetorical opening argument and presents its evidence in witness order. In such cases, jurors have to weave evidence that lacks referential, locational, and temporal coherence into a causally coherent account of the defendant's guilt on their

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187. Lempert, supra note 158, at 562.

188. The trial of Rich Tabish and Sandy Murphy for killing casino owner Ted Binion is an example.

189. This was done, for example, in the Sam Sheppard trial.

190. JEAN MATTER MANDLER, STORIES, SCRIPTS, AND SCENES: ASPECTS OF SCHEMA THEORY 25–26 (1984); see also Loftus, supra note 133, at 33 ("Perhaps it is easier for jurors to work with a smooth account, modifying it here and there depending upon subsequent evidence, than to take small fragments and weave them together into a coherent image.").

191. See Lempert, supra note 158, at 564.

192. Id.

193. See Tversky & Kahneman, supra note 181, at 50.
own—a nearly impossible task, as Pennington and Hastie's research into the effect of evidence presentation on story construction has shown.¹⁹⁴

Moreover, even if the prosecution does use a narrative opening argument, jurors may still be unable to imagine a causally coherent FIS. First, as with temporal coherence, the causal coherence of the prosecution’s FIS may simply be overwhelmed by the non-narrative structure of evidence presented out of story order. Indeed, that possibility seems even more likely with causal coherence, given that weaving disparate events into a source-path-goal configuration requires more than just arranging them chronologically.¹⁹⁵

Second, whatever causal coherence the prosecution’s circumstantial FIS does possess will inevitably be undermined by its lack of semantic absolutism. Because circumstantial evidence is inherently probabilistic, expert witnesses and prosecutors in a circumstantial case have to qualify their factual assertions with expressions like “might have,” “strongly indicates,” and “almost certainly.” Such qualifiers, however, undermine the causal coherence of an FIS.¹⁹⁶ A mock juror in Voss’s study put it best when asked to explain why a causally “soft” opening argument didn’t make sense to him—”[y]ou should not have used the word probably so much.”¹⁹⁷

3. Vividness

Even if jurors do manage to imagine a structurally coherent FIS in a circumstantial case, that scenario is unlikely to be vivid—the other factor that determines the imaginability of an FIS. The vividness of an item of evidence is determined by three factors: (a) its emotional interest; (b) its concreteness; and (c) its sensory, temporal, and spatial proximity.¹⁹⁸ All three factors indicate that a circumstantial FIS is generally more pallid than a direct FIS.

a. Emotional Interest

Although the underlying crime in a circumstantial case might be emotionally compelling, circumstantial evidence itself is not. Base rates, likelihood ratios, and random-match probabilities are important, but they do not make for gripping testimony. Moreover, it can take hours, if not days, for an expert to explain forensic evidence to the jury, which is why prosecutors and defense attorneys continually obsess over ways to make the presentation of such evidence more interesting.¹⁹⁹

¹⁹⁴. Pennington & Hastie, supra note 130, at 542.
¹⁹⁵. See Winter, supra note 178, at 2235.
¹⁹⁷. Voss et al., supra note 164, at 245.
Direct evidence, by contrast, epitomizes the fascination of criminal trials. The sleazy informant forced to confess on the stand that he is the real killer, the black youth whose life depends on convincing twelve white jurors that white cops beat his "confession" out of him—these are the moments that sell books and pack theaters. To be sure, most criminal trials that turn on an eyewitness identification or a confession lack such Perry Mason moments. But even "ordinary" direct testimony can't help but engage jurors' emotions, because as the witness testifies they become witnesses to the crime themselves, watching it unfold in their minds as if they had actually been there.200

b. Concreteness

The difference between direct and circumstantial evidence is even starker in terms of their concreteness, "the degree of detail and specificity about actors, actions, and situational context" they provide.201 Circumstantial evidence is pallid and abstract; the only detail or specificity it provides about a crime is that its commission left behind a physical trace consistent with the defendant's guilt. And even that statement goes too far: because circumstantial evidence is inherently probabilistic, it can only establish the likelihood that the trace belongs to the defendant or the victim.

Direct evidence, by comparison, always provides a great deal of detail and specificity about a crime.202 Because eyewitness identifications and confessions are narrative representations of the crime itself, they necessarily provide jurors with a rich description of its events.203 The snippet of eyewitness testimony from Abu-Jamal's trial is a perfect example: in a few lines, it manages to convey a great deal of information about who the victim and the murderer were, what the murderer did, and in what context the murder took place.204

c. Proximity

Finally, direct evidence is more proximately vivid than circumstantial evidence. "There is much anecdotal evidence that information obtained firsthand, through one's own sensory apparatus, is more vivid and likely to exert an impact on one's judgments and inferences than is information obtained verbally from a secondhand or thirdhand source.205 Both direct and circumstantial evidence are communicated secondhand, through the verbal

200. See Green & Brock, supra note 148, at 324.
201. NISBETT & ROSS, supra note 198, at 47.
202. The amount of detail and specificity an eyewitness or confession provides, of course, will not always be the same. See Brad E. Bell & Elizabeth F. Loftus, Vivid Persuasion in the Courtroom, 49 J. PERSONALITY ASSESSMENT 659, 660 (1985).
203. Loftus, supra note 133, at 31.
204. See supra text accompanying note 143.
205. NISBETT & ROSS, supra note 198, at 50.
testimony of a witness. For evolutionary reasons, however, "an assertion by another person about a physical event is treated in the same manner as an actual apprehension of that event by our perceptual system."\(^\text{206}\) Direct evidence involves such assertions; circumstantial evidence doesn't. As a result, jurors will process direct evidence as if they were witnessing the crime themselves, making it seem more spatially, temporally, and sensorially proximate than circumstantial evidence.

d. Vividness and Imagination

All three factors, in short, indicate that direct evidence is far more vivid than circumstantial evidence. That difference is critical, because vivid evidence is easier to imagine than pallid evidence: "the degree of detail and specificity about actors, actions, and situational context . . . contribute to the 'imaginability' of information, that is, its tendency to prompt sensory imagery."\(^\text{207}\) Vivid evidence, with its "rich description of events,"\(^\text{208}\) provides jurors with a great deal of information they can use to imagine the witness's description of the crime; pallid evidence, with its abstraction and emotional sterility, does not.\(^\text{209}\)

The implications of the positive correlation between vividness and imaginability are profound. To begin with, their relationship means that direct evidence will be easy for jurors to imagine, no matter how unreliable it may be. The eyewitness might be lying or mistaken. The defendant's confession might have been coerced. Either way, jurors will still find it easy to imagine how the crime could have happened the way the eyewitness or the defendant says it did—and will thus find it even easier to overlook questions about that testimony's reliability.

Equally important, the correlation also means that jurors will find it difficult to imagine circumstantial evidence, no matter how probative it might be. As Richard Nisbett and Lee Ross point out:

The most disconcerting implication of the principle that information is weighted in proportion to its vividness is that certain types of highly probative information will have little effect on inferences merely because they are pallid. Aggregated, statistical, data-summary information is often particularly probative, but it is also likely to lack concreteness and emotional interest.\(^\text{210}\)

206. Supra note 163.

207. NISBET & ROSS, supra note 198, at 47; see also Bell & Loftus, supra note 202, at 660 ("[V]ivid, detailed information may have a greater affective impact than pallid information, perhaps because of its imaginable attributes."); Carroll, supra note 125, at 94 ("The effect of the imagination instructions may depend upon the provision of a relatively detailed, vivid, and concrete scenario.").

208. Loftus, supra note 133, at 33.


210. NISBET & ROSS, supra note 198, at 55; see also Carroll, supra note 125, at 95.
Items of circumstantial evidence, of course, do not stand or fall on their own. As discussed earlier, jurors will attempt to imagine an FIS through all of the circumstantial evidence in a case, with or without the prosecution's help. Nevertheless, given that individual items of circumstantial evidence are generally pallid, there is no reason to believe that a circumstantial FIS will be any more vivid.

Consider, for example, a murder trial in which Jack is accused of giving his bipolar wife, Jill, a lethal dose of Lithium. The prosecution's case is based on four items of circumstantial evidence: Jack's skin was found under Jill's fingernails; Jack had fresh scratch-marks on his cheek; Jack waited 20 minutes to call 911 and sounded calm on the phone; and the couple had recently purchased $1 million of additional life insurance for Jill naming Jack as the beneficiary. The evidence is probably sufficient for jurors to imagine a structurally coherent FIS in which Jack forced Jill to swallow the Lithium, despite being scratched by her as she tried to resist. That scenario, however, is little more than a "bare narrative of the movements in space or time"; it has none of the detail and texture that is inherent in direct evidence—a confession, for example:

"Yeah I did it, and I'm not sorry neither. I earned that money, every last cent. You got no idea the hell I put up with . . . twenty years, nothing but her screaming and crying and pickin' at me . . . All I ever heard was how she hated me and her life and how she wished she wasn't even here, and so I made that happen, and I'm not sorry. She was too crazy to get out of bed without her Lithium, so I made sure she got plenty. A few extra doses, and that was it. Sure she fought it, but the crazy witch wasn't gonna claw my hand away. I shoved the pills in her mouth and held her jaw shut and it's been quiet ever since. And I'm not sorry, neither.

A narrative opening argument would, of course, help close the gap between the bare narrative and the confession. But the gap would still remain. Consider the following opening argument:

What will the evidence show? First and foremost, that Jill did not commit suicide, as the defense would have you believe. The defendant had reasons to kill her that night—one million of them. And kill her he did. He entered the room, held her down, and forced her to take a massive overdose of Lithium. How do we know that? The defendant's skin was found under her fingernails, and he had fresh scratch marks on his face. That means Jill struggled with the defendant, fighting desperately—and vainly—for her life. Those are not the acts of a suicidal woman. And then there's the 911 call. The defendant waited twenty minutes after his beloved wife supposedly OD'ed to call for an ambulance—and didn't even bother to sound upset. Why? Because this was a murder, not a suicide, and he needed time to get rid of the evidence and figure out what he was going to tell the police . . . .

211. See, e.g., Loftus, supra note 133, at 33.
212. Burns, supra note 129, at 185.
This is not a bad scenario—it provides a clear and logical explanation for the three items of circumstantial evidence. But it is nowhere near as vivid as the confession, nor can it be—if the prosecutor tried to equal the confession's vividness by embellishing his opening argument, the judge would almost certainly sustain a defense objection that he was being argumentative.215

C. Priming the Imagination of a Factually Exculpatory Scenario

A factually inculpatory scenario, in short, is generally more difficult for jurors to imagine in a circumstantial case than in a direct case. As a result, the minimum acceptable imaginability of the factually exculpatory scenario is usually lower in a circumstantial case. That lower minimum has two implications: (1) it is easier for the FES in a circumstantial case to exceed its minimum acceptable imaginability and reduce jurors' initial confidence in the defendant's guilt; and (2) the FES in a circumstantial case does not have to reduce jurors' initial confidence as much in order for them to acquit.

We cannot necessarily assume, however, that jurors always try to imagine an FES. On the contrary, research into counterfactual thinking indicates that jurors must be "primed" to do so214—and that they are far more likely to be strongly primed to imagine an FES in a circumstantial case than in a direct case. This Section explains why.

1. The Need for Priming

Most judgmental heuristics function automatically—whenever it is appropriate for an individual to use them, he or she will.215 "Unlike other heuristics," however, "the simulation heuristic is less automatic and needs some prodding to be activated."216 Left to their own devices, in other words, individuals do not always try to imagine alternatives to an initial scenario; if the initial scenario is sufficiently plausible, they may "cease the simulation process and fail to consider alternative scenarios that imply a different outcome."217

Because the simulation of alternative scenarios requires priming, we cannot assume that jurors always try to imagine an FES in a criminal case. If the successful simulation of a focal scenario inhibits the simulation of alternative scenarios, jurors may not try to imagine an FES in a case that involves an easily imagined FIS. Empirical research supports that conclu-
sion: an ambitious study involving a hypothetical theft, for example, found that twenty-five percent of mock juries “articulated only a single interpretation of the case.”

If jurors do not even attempt to imagine an alternative to the FIS, the defendant will be convicted in all but the weakest cases. An FIS that is imaginable enough to interrupt the simulation heuristic is almost certainly one that is imaginable enough to convict; otherwise, why would jurors lose interest in the defendant’s possible innocence? In the absence of an FES, therefore, jurors’ initial confidence in the defendant’s guilt will become their final confidence—and the defendant will be convicted.

2. When Priming Occurs

Priming jurors to consider an FES is, in short, almost always a necessary condition of an acquittal. It is thus imperative that we understand when—and why—such priming is likely to occur.

To date, no study has addressed priming in the legal context. Nonlegal research, however, indicates that priming is determined by two factors: whether the structure of the decision-making task encourages the consideration of alternative scenarios; and whether the nature of the decision itself involves “negative affect” such as fear or regret.

The first factor suggests that attempting to imagine an FES should be the norm, not the exception. A criminal trial has an explicitly binary structure: jurors are asked to determine whether the defendant is guilty or innocent. To some extent, therefore, jurors should always be primed to imagine an FES simply by the nature of their decision-making task.

The key here is “to some extent.” Not all priming is alike; alternative scenarios “can differ dramatically in the attention or weight they receive when a focal outcome is being judged.” Priming created by the binary nature of a criminal trial itself likely falls on the weak end of the spectrum: if jurors are very confident that the defendant is guilty (as a result of an easily imagined FIS), they have little incentive to try to imagine how the defendant might be innocent—and individuals conserve their cognitive resources whenever possible.

The second factor, by contrast—whether the decision involves negative affect—is likely to lead to far stronger priming. With negative affect, priming results not from the nature of the decision-making task, but from its


219. The ease-of-simulation model does not rule out the possibility that some prosecution cases will be so difficult to imagine that jurors will refuse to convict even in the absence of an easily imagined FES.


221. Windschitl & Young, supra note 140, at 131.

importance to the individual's well-being: "[n]egative affect signals to the organism that a problem needs rectifying, and counterfactual thinking . . . is mobilized to confront the problem." Affect-based priming, in other words, occurs "where corrective thinking is most essential." Does a criminal trial involve the kind of negative affect that might be sufficient to create strong priming? I would suggest there is an obvious candidate: the fear of falsely convicting the defendant. Jurors believe that they "should make accurate determinations with respect to the actual guilt or innocence of the defendant," and they experience considerable stress in trying to comply with that self-imposed mandate. Moreover, jurors consistently report that choosing a verdict is the most stressful aspect of a criminal case. It makes sense, then, that the fear of a false conviction would prime jurors to put significant effort into imagining a scenario in which the defendant might be innocent: if they succeed, they can acquit; if they fail, they can convict knowing that they took their obligation as jurors seriously. Either way, their fear is alleviated—the goal of counterfactual thinking.

This theory of priming, of course, does not explain why a circumstantial case is more likely to generate stronger priming than a direct case. The possibility of a false conviction exists in all criminal cases. The theory would thus seem to suggest that strong priming is equally likely to occur in direct cases.

Looks, however, can be deceiving. It is true that both direct and circumstantial cases can lead to false convictions. But they do so in different ways: in a direct case, jurors falsely convict because they rely on unreliable evidence; in a circumstantial case, jurors falsely convict because they rely on (normally) reliable evidence that cannot exclude the possibility that the defendant is innocent. That difference may not be legally important, but in fact empirical research into the psychology of risk indicates that jurors will only fear falsely convicting the defendant in the latter situation, in which the evidence cannot prove his guilt to an absolute certainty.

223. Roese, supra note 220, at 135.
224. Id. at 143.
225. See, e.g., Laith Alattar et al., Poster Presented at the Society for Judgment and Decision Making Annual Conference, Wrongful Convictions vs. Wrongful Acquittals: Who Sees Which as Worse, and Why? (Nov. 13, 2005) (finding that nearly eighty percent of jurors view a false conviction as worse than a false acquittal). This is not to say that the fear of a false acquittal is unimportant; as noted above, it helps explain why jurors will try to imagine a factually inculpatory scenario even if the prosecution does not provide them with one. The fear of false acquittal is irrelevant, though, to whether jurors will be primed to imagine a factually exculpatory scenario.
228. See id. at 71.
229. Roese, supra note 220, at 144.
230. Normally, not always. False convictions in circumstantial cases do occasionally result from unreliable evidence—contamination, lab error, etc. See Huff et al., supra note 91, at 64.
3. The Certainty Effect

As we've seen, there is a fundamental distinction between direct and circumstantial evidence in terms of probative value. The probative value of reliable direct evidence is necessarily 1.0 because it proves a fact directly rather than through inference. A perfect eyewitness identification says, "I saw the defendant commit the crime." A perfect confession admits, "I committed the crime." In both cases, the defendant cannot be innocent unless the jury concludes that the evidence is somehow unreliable.

The probative value of even the most reliable circumstantial evidence, by contrast, is necessarily less than 1.0, because it is inherently polyvocal—logically consistent with both innocence and guilt. A DNA match, for example, may make guilt overwhelmingly likely; the exculpatory inference(s) the defendant asks jurors to draw may stretch credulity to the breaking point. But it can never unconditionally prove the defendant's guilt.

Does this distinction matter? The objective probability of guilt in a circumstantial case is often well beyond what most jurors believe is the minimum required by the reasonable-doubt standard—0.82—and is sometimes very near to 1.0. In the Smith study discussed earlier, for example, the overall probability of the defendant's guilt was 0.98.231 Is there any reason to believe that jurors will be more afraid of a false conviction in a 0.98 circumstantial case than in a 1.0 direct case?

As it turns out, there is a reason: "responses to uncertain situations appear to have an all or none characteristic that is sensitive to the possibility rather than the probability of strong positive or negative consequences, causing very small probabilities to carry great weight."232 In other words, when individuals make decisions that could turn out to be wrong, they "overweight outcomes that are considered certain, relative to outcomes which are merely probable"—a phenomenon Kahneman and Tversky aptly call the certainty effect.233

The certainty effect is even greater when an uncertain decision is accompanied by "anticipatory emotions" such as fear, anxiety, and dread.234 When individuals confront such an emotionally powerful decision, the need for certainty intensifies, leading to an even more dramatic overweighting of the possibility—however insignificant—of a negative outcome.235 Faced with the frightening prospect of being poisoned by insect spray, for example, individuals will pay far more to reduce their risk from

231. Smith et al., supra note 58, at 58.
234. Loewenstein et al., supra note 128, at 267.
235. Yuval Rottenstreich & Christopher K. Hsee, Money, Kisses, and Electric Shocks: On the Affective Psychology of Risk, 12 PSYCHOL. SCI. 185, 186–87 (2001); see also Slovic et al., supra note 232, at 318 ("If the potential outcome of a gamble is emotionally powerful, its attractiveness or unattractiveness is relatively insensitive to changes in probability as great as from 0.99 to 0.01.").
five-in-ten-thousand to zero than they will to reduce it from fifteen-in-ten-thousand to five-in-ten-thousand, even though the risk reduction in the latter case is twice as large.\textsuperscript{236}

The certainty effect indicates that there is, in fact, a fundamental psychological difference between 1.0 and .98 probabilities of guilt. Reaching a verdict in a criminal trial is a quintessential example of affect-rich decision-making, as the juror-stress statistics indicate. Because of the certainty effect, therefore, jurors will dramatically underweight the "merely probable" circumstantial case and dramatically overweight the "considered certain" direct case—making the circumstantial case seem far more likely to result in a false conviction.

Once again we are confronted with the limitations of the probability-threshold model. The certainty effect indicates that it is not enough for jurors to believe that the probability of the defendant's guilt exceeds some minimum threshold; because the possibility of a false conviction is so aversive, \textit{they need to be completely confident that the defendant is guilty}.\textsuperscript{237} Direct evidence, with its appearance of certainty, is that convincing; circumstantial evidence, with its open admission of the possibility of error, is not. Daniel Shaviro says it best: "[s]tatistical-probability cases do not involve a greater risk of verdict error than other types of cases, only a more overt risk."	extsuperscript{238}

\textbf{4. What About Unreliability?}

This explanation of why a direct case normally leads to weaker priming than a circumstantial case assumes, of course, that the reliability of direct evidence does not affect whether jurors are afraid of a false conviction. If jurors question the reliability of direct evidence, they have to discount its probative value to take their concerns into account. And if that happens, the possibility of a false conviction will be just as overt as in a circumstantial case.

As a matter of theory, there is no question that the probative value of direct evidence is never 1.0. "Since the credibility of a witness always rests in part on circumstantial evidence, the probative value of all evidence always

\textsuperscript{236} Loewenstein et al., \textit{supra} note 128, at 276; \textit{see also} Daniel Kahneman \& Amos Tversky, \textit{Choices, Values, and Frames}, in \textit{CHOICES, VALUES, FRAMES}, \textit{supra} note 233, at 1, 9 ("[P]eople greatly undervalue a reduction in the probability of a hazard in comparison to the complete elimination of that hazard.").

\textsuperscript{237} In fact, one study found that 28\% of the individuals surveyed did not believe that even a 99.5\% probability of guilt is sufficient to convict. Eric Magnusson, \textit{Incomprehension and Miscomprehension of Statistical Evidence: An Experimental Study} 3 (July 6-8, 1993) (unpublished manuscript, presented at Law, Medicine and Criminal Justice), \textit{available at} http://www.aic.gov.au/conferences/medicine/magnus.pdf. That finding is a striking example of the disjunction between jurors' probabilistic understanding of reasonable doubt, which hovers around 0.82, and the gut-level certainty that ultimately determines their verdict choice.

effectively rests on circumstantial evidence."^239 Nor is there any question that, in practice, jurors sometimes question the reliability of eyewitness identifications and confessions.

Neither fact, however, is fatal to the theory of priming I am advancing here. First, we are concerned with how jurors actually interpret evidence, not with its epistemological status. The certainty effect says that jurors "overweight outcomes that are considered certain,"^240 not outcomes that are certain.

Second, as explained in Part I, research indicates that jurors rarely question the reliability of direct evidence. Jurors dramatically overestimate the accuracy of eyewitness identifications, ignore the factors that determine whether an identification is reliable in favor of one—witness confidence—that doesn't, and convict in eyewitness cases even in the face of exculpatory evidence. A similar pattern emerges regarding confessions, which are so compelling that they "tend to overwhelm other information, including evidence of innocence."^241 And then there are the false-conviction statistics themselves, which paint an even more disturbing picture of jurors deferring to eyewitness identifications and confessions with little or no concern for their reliability.

The question is—why? Jurors can hardly be unaware that individuals sometimes lie and make mistakes, and only the most incompetent defense attorney will fail to challenge the honesty or accuracy of an eyewitness or the "voluntariness" of a confession.^242 Why, then, are jurors so rarely swayed by those challenges?

The answer, I believe, is twofold. First, in many situations jurors simply fail to recognize problems with the reliability of direct evidence. And second, jurors often accept direct evidence even when they are aware of problems with its reliability.

\[a. \text{The Truth Bias}\]

Jurors are extremely poor at detecting when a witness is lying or mistaken. In terms of honesty, "people's ability to distinguish truths from lies tends to be significantly, but only slightly, better than chance levels."^243 In fact, demeanor evidence^244 actually hurts jurors' ability to detect
deception, because they normally rely on the wrong behavioral cues to distinguish truth from lies.

Jurors are even worse at detecting inaccuracy. "The studies in which subjects seek to distinguish between accurate and inaccurate witnesses . . . reveal a complete inability to outdo chance, even when using the verbal content of cross-examined testimony along with demeanor." That inability is due, in large part, to the fact that they base their accuracy assessment almost exclusively on confidence, instead of on factors that actually are related to witness accuracy, such as testimony's internal consistency.

The basic reason for these failures is that the "most 'fundamental' of all phenomena in person perception" is the tendency "to accept the autobiographical propositions implicit (or explicit) in others' words and deeds," regardless of their veracity. As Norbert Schwarz points out:

[A] large body of psycholinguistic research documents [that] social discourse proceeds according to a "cooperative" or "relevance" principle. This principle holds that speakers should "try to be informative, truthful, relevant, and clear" and that listeners interpret the speakers' utterances "on the assumption that they are trying to live up to these ideals."

It may seem counterintuitive that the truth bias would affect jurors, who expect witnesses to be less than completely objective. In fact, not only does the bias occur even when receivers "know full well that the assertions stand an excellent chance of being wrong," suspicion is actually likely to backfire, "undermining receivers' ability to detect deceit and, perhaps more unsettling, also making truth tellers look deceptive."

246. See, e.g., Levine et al., supra note 243, at 126.
247. See Wellborn, supra note 245, at 1088.
248. Id. at 1088–89.
250. Gilbert, supra note 162, at 112; see also Levine et al., supra note 243, at 126 ("Numerous studies have found that independent of actual message veracity, individuals are much more likely to ascribe truth to other's messages than deceit.") (citation omitted).
252. See, e.g., McKenzie et al., supra note 136, at 15.
253. Gilbert, supra note 162, at 112.
254. Judee K. Burgoon et al., Testing Interpersonal Deception Theory: Effects of Suspicion on Communication Behaviors and Perceptions, 6 COMM. THEORY 243, 263–64 (1996). Burgoon's explanation is that receiver suspicion provides dishonest speakers with the feedback they need to be more convincing, and leads honest speakers to seem defensive or uncomposed—behaviors stereotypically associated with dishonesty. Id. at 264.
b. Responsibility-Laundering

There is also reason to believe that jurors are far less suspicious of witnesses who provide direct testimony than false-conviction statistics indicate they should be. Given their role as the ultimate finders of fact, jurors have a clear incentive to believe that direct evidence is true: if the defendant turns out to be innocent, they can blame the witness instead of themselves, minimizing their responsibility for the false conviction.²⁵⁵

Consider, for example, a case in which jurors have to decide whether to convict the defendant on the basis of an eyewitness identification. If the jurors question the eyewitness's honesty but convict anyway, they will have no one to blame but themselves if the defendant turns out to be innocent. By contrast, if they do not question the eyewitness's honesty and the defendant turns out to be innocent, they will be able to reassure themselves that they didn't falsely convict the defendant, the eyewitness did. They simply believed he was telling the truth, as he had sworn to do.²⁵⁶

Trusting direct evidence is, in short, a kind of "responsibility-laundering"—a way for jurors to manage the fear engendered by the possibility of a false conviction. By putting their faith in eyewitnesses and confessions, jurors not only convince themselves that the defendant is actually guilty, they ensure that they have a convenient scapegoat should their certainty turn out to be misplaced.

c. Narrative Transportation

There is a third reason why jurors rarely recognize the unreliability of direct evidence: narrative transportation, understood simply as the phenomenological experience of being "temporarily immersed in a story."²⁵⁷ When an individual is transported by a narrative, all of her mental systems—attentive, imagistic, emotive—converge on its events,²⁵⁸ with dramatic real-world results: her ability to think critically about the narrative is reduced, making her more likely to believe that it is authentic²⁵⁹ and less skeptical of the credibility of its author.²⁶⁰ Melanie Green explains why:

[I]ndividuals need both motivation and ability to correct beliefs based on untrue, inaccurate, or incomplete information. The reduction of negative

²⁵⁶. See Wells, supra note 19, at 750 (noting that, in the weigh-attendant case, jurors could say "I believed him and he was wrong!").
²⁶⁰. Green & Brock, supra note 258, at 719 ("[O]nce a reader is rolling along with a compelling narrative, the source has diminishing influence . . . . Thus, narratives might be used to advantage by low-credible sources or by speakers who lack cogent arguments.")
cognitive responding resulting from transportation [is thus] due to ability factors—the person's mental resources are so engaged in experiencing the story that they are not able to "disbelieve" story conclusions.  

Narrative transportation occurs with both fictional and nonfictional narratives, and with both readers and listeners.  

Because direct evidence normally provides jurors with a vivid and structurally coherent narrative of how the defendant committed the crime, it is a perfect candidate for transportation. "Although transportation theoretically could occur with any text, it is far more likely to be experienced in response to . . . well-crafted, high-quality narratives," especially ones with "rich, concrete descriptions." Indeed, news stories are replete with references to the silence that descends on a courtroom as the jurors, judge, and spectators hang on an eyewitness's every word.  

If direct evidence does lead to narrative transportation, we would expect jurors to overlook potential problems with its reliability. Questioning narratives like eyewitness identifications and confessions requires significant cognitive resources, and jurors simply lack those resources during transportation. As a result, they should be less willing to question the witness's credibility and more likely to accept the witness's story as true.  

\[d. \textit{Belief-Perseverance}\]  

Despite the truth bias, responsibility-laundering, and narrative transportation, there will still be cases in which jurors recognize the potential unreliability of direct evidence. Will jurors in such cases fear false convictions and thus be primed, as in circumstantial cases, to imagine an FES? The answer, unfortunately, is probably not. The problem is a cognitive phenomenon known as belief-perseverance: the tendency of individuals to "adhere to their beliefs when the original evidential basis of the beliefs is shown to be flimsy, false, or nonexistent." Clinging to an eyewitness identification or confession in light of information discrediting its reliability is a classic example of belief-perseverance.  

In fact, two aspects of direct evidence indicate that such evidence is likely to lead to belief-perseverance that is particularly strong. First, direct evidence is normally concrete, and empirical research indicates that belief-perseverance is stronger "when the initial belief is based on concrete data than when based on abstract data, even if the concrete data is  

262. Green & Brock, \textit{supra} note 258, at 718, 702.  
263. \textit{Id.} at 718–19.  
264. \textit{See, e.g.}, Pat Schneider, \textit{Rape Survivor Testifies About Attack}, \textit{Capital Times} (Madison, Wi.), Dec. 2, 1992, at 3A ("The silence in the courtroom during her grim, detailed account of the attack was broken once as a friend of the victim ran sobbing from the courtroom.").  
logically... inferior." Second, direct evidence is normally causally coherent, because it configures its sequence of events according to the source-path-goal schema, and a great deal of research indicates that belief-perseverance is strongest when the discredited evidence is part of a "coherent, causally related account in which a single or minimal correction has a significant impact on the construal of meaning." Put more simply, when rejecting an item of evidence as unreliable would require an individual to discard a narrative of an event that she finds causally convincing, the individual will almost always hold onto the narrative and disregard the evidence instead.

Consider, for example, Jack's confession that he poisoned Jill. His confession is causally coherent; it simply makes sense that Jack would have forced Jill to take a lethal overdose of Lithium because she was driving him crazy and he wanted her life insurance. Indeed, in the absence of evidence pointing to a different scenario, it is difficult to imagine how the confession could be wrong. So what happens if we later learn that Jack only confessed because the police beat the confession out of him? Logically, we can no longer rely on the confession. Psychologically, however, knowing that the confession was involuntary does not make Jack's confession any less compelling, nor does it help us imagine a scenario in which Jack is innocent. We thus ignore the inconvenient fact of police brutality and stick with the confession, telling ourselves "just because they beat the confession out of him doesn't mean he didn't do it..."

5. The Reliability of Circumstantial Evidence

The truth bias, responsibility-laundering, narrative transportation, and belief-perseverance help explain why jurors rarely question the reliability of direct evidence and thus rarely fear a false conviction in a direct case. Ironically, they also indicate that jurors are much more likely to recognize the unreliability of circumstantial evidence.

First, the truth bias should have only a minimal effect in circumstantial cases. The bias leads receivers to ignore evidence that calls into question the honesty and accuracy of a speaker's autobiographical statements, but the most important potential problems with forensic evidence—coincidental matches and unintentional laboratory errors—do not involve dishonesty or

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266. Craig A. Anderson, Abstract and Concrete Data in the Perseverance of Social Theories: When Weak Data Lead to Unshakeable Beliefs, 19 J. EXPERIMENTAL SOC. PSYCHOL. 93, 95 (1983).

267. Hollyn M. Johnson & Colleen M. Seifert, Sources of the Continued Influence Effect: When Misinformation in Memory Affects Later Influences, 20 J. EXPERIMENTAL PSYCHOL.: LEARNING, MEMORY & COGNITION 1420, 1432 (1994); see also Davies, supra note 265, at 563 ("Once a causal explanation has been created, it becomes functionally independent of the original evidence so that if this evidence is discredited, the explanation nevertheless remains intact and available to sustain the belief." (citation omitted)).

268. Empirical research supports this idea. For example, one study involving more than 1500 subjects found "no evidence that jurors will (in any systematic way) ignore the risk of lab error" in a DNA case—a result that refuted the researchers' initial hypothesis. See Nance & Morris, supra note 55, at 425.
inaccuracy on the part of the expert witness. Jurors can accept evidence of such problems, therefore, while continuing to believe that the expert witness was honest and accurate—in which case the truth bias simply doesn’t apply.\textsuperscript{269}

Second, responsibility-laundering is not an option for jurors in circumstantial cases. Even if jurors trust the witnesses who present circumstantial evidence in a case, they cannot rationally conclude there is no chance the defendant is innocent. As a result, if jurors convict a defendant in a circumstantial case and the conviction turns out to be false, they have no one to blame but themselves—they knew the defendant could be innocent,\textsuperscript{270} but convicted him anyway.

Third, narrative transportation should not occur with circumstantial evidence, because it is rhetorical instead of narrative. “[T]ransportation is unlikely in response to even very good rhetoric, whereas . . . it can readily occur in response to a moderately compelling narrative.”\textsuperscript{271} Narrative transportation results from the convergence of attention, imagery, and feelings that a well-crafted story creates in the mind of a reader or listener. An argument, no matter how well-crafted, simply doesn’t generate such convergence.\textsuperscript{272}

Fourth, and finally, belief-perseverance should be much less pronounced in a circumstantial case. As discussed above, belief-perseverance is strongest when the evidence supporting a belief is concrete and causally coherent. Circumstantial evidence is neither, whether considered individually or in terms of an overall FIS.

D. Imagining the Factually Exculpatory Scenario

We can now turn to the second stage of the ease-of-simulation model, imagining the factually exculpatory scenario. It is not enough for jurors to be \textit{primed} to imagine an FES; if it were, convictions in circumstantial cases would be few and far between. Instead, the question is whether, once they are primed, jurors can imagine an FES that sufficiently exceeds its minimum acceptable imaginability to justify an acquittal. This Part explains why jurors are far more likely to succeed in a circumstantial case than in a direct case.

\textsuperscript{269} It is possible that the truth bias will reduce jurors’ willingness to consider evidence of what I call “hybrid” circumstantial errors—falsified lab results, intentional laboratory errors, experts lying about their credentials, and the like—which do depend on the honesty or accuracy of the expert witness.

\textsuperscript{270} As indeed they do. \textit{See}, e.g., Magnusson, \textit{supra} note 237, at 3 (reporting that 85.4\% of the individuals in his study were aware that a blood test cannot completely prove guilt).

\textsuperscript{271} Green & Brock, \textit{supra} note 258, at 719.

\textsuperscript{272} \textit{See id.} at 718–19.
1. Recognizing Evidence of Innocence

Juror decision-making is an active process in which "[m]eaning is assigned to trial evidence through the incorporation of that evidence into one or more plausible accounts or scenarios describing what happened during crime-related events testified to during the trial." Evidence, therefore, is logically prior to narration: before jurors can imagine an FES, they must first be able to recognize evidence that indicates the defendant could be innocent. In the absence of evidence of innocence, jurors will simply lack the raw material necessary for imagination.

For two reasons, jurors are less likely to recognize evidence of innocence in a direct case than in a circumstantial case: (a) a direct case does not always contain evidence of innocence, whereas a circumstantial case always does; and (b) jurors will often ignore evidence of innocence in a direct case, but will rarely do so in a circumstantial case.

a. Evidence of Innocence

To begin with, there is no guarantee that there will be evidence of innocence in a direct case. Eyewitness identifications and confessions cannot themselves be evidence of innocence, because their univocity makes them consistent only with the defendant's guilt. The testimony of a rape victim identifying the defendant as her assailant, for example, is exclusively inculpatory; it cannot be re-narrated into an account of how the defendant did not commit the rape.

This is not to say that jurors have to believe direct evidence. There will always be cases in which they question its reliability. In the hypothetical rape case, for example, the victim's own testimony may make it clear that she did not see her assailant long enough to identify him accurately. But even that will not turn the identification or confession into evidence of innocence: questioning the defendant's guilt is not the same thing as being able to imagine a scenario in which the defendant is factually innocent. And the ease-of-simulation hypothesis indicates that only the latter will lead jurors to acquit.

To find evidence of innocence in a direct case, then, jurors must look beyond the eyewitness identification or the confession itself. But where will they look? The additional evidence must come from either the prosecution or the defense. The prosecution is rarely a viable option: because eyewitness identifications and confessions are more than sufficient to convict by

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273. Pennington & Hastie, supra note 95, at 253.

274. I am intentionally using "evidence of innocence" instead of "exculpatory evidence." The latter term refers to any evidence that makes the defendant's guilt less probable; the former refers to evidence that not only makes the defendant's guilt less probable, but also can be incorporated into a factually exculpatory scenario. All evidence of innocence, therefore, is exculpatory evidence, but not all exculpatory evidence is evidence of innocence.
themselves, they are often the prosecution's only evidence in a direct case.275 The defense is a more likely choice, because it is responsible for convincing the jurors to acquit.276 And indeed, there are cases in which the defense attempts to rebut an eyewitness identification or confession by providing jurors with evidence that the defendant could not have committed the crime.277

Not all defenses, however, attempt to establish the defendant's factual innocence.278 A "pure" reasonable-doubt defense, for example, puts on no evidence at all, choosing instead to "attack[] the prosecution's case as one whose narrative 'does not make sense' or 'cannot be trusted' or 'raises suspicion, but nothing more.'"279 Such defenses are particularly common in direct cases, because the univocity of eyewitness identifications and confessions often limits the defense to challenging their reliability. But their use comes with a price: depriving the jury of its most likely source for affirmative evidence of innocence.

In a circumstantial case, by contrast, there is always evidence of innocence, because the polyvocity of circumstantial evidence means that it is simultaneously evidence of guilt and innocence. As a result, regardless of whether the defense introduces its own evidence of innocence, the prosecution provides jurors with evidence they can use to imagine an FES simply by building its case out of circumstantial evidence.

Consider again the murder case in which the defendant's blood was found on the murder weapon, a pair of scissors. The bloodstain is certainly inculpatory; guilt, in fact, is probably the most logical inference a juror could draw from it. As we saw earlier, however, the evidence is not "incapable of explanation upon any other reasonable hypothesis than that of his guilt."280 The bloodstain is thus evidence of innocence as well as evidence of guilt.

b. The Confirmation Bias

To recognize exculpatory evidence, jurors must be able to distinguish objectively between evidence that supports innocence and evidence that supports guilt.281 Once jurors conclude that the defendant is most likely


276. Pragmatically, not legally—because the burden of proof is on the prosecution, the defense has no legal responsibilities at all.

277. An alibi or evidence that someone else committed the crime are examples.


280. Wills, supra note 154, at 171.

guilty, however, such objectivity becomes almost impossible to maintain—a confirmation bias sets in that limits their ability to recognize evidence inconsistent with that conclusion. The extent of the bias, moreover, is determined by jurors' confidence in their verdict: the greater their confidence, the more significant the distortion.

The confirmation bias is likely to be devastating to the defense in direct cases, where jurors' initial confidence in the defendant's guilt is normally very high. First, jurors may focus exclusively on evidence that confirms their belief that the defendant is guilty, preventing them from recognizing evidence that is consistent with the defendant's innocence. An example is the Thrower case in Bedau and Radelet's study, in which jurors accepted a biased eyewitness identification—by the murdered police officer's partner—even though three unrelated witnesses testified that the defendant was in a different state when the crime was committed.

Second, even when jurors recognize exculpatory evidence, they may simply discount it or subject it to unfairly critical evaluation. For example, jurors may recognize that a confession was coerced, but conclude that the coercion doesn't mean the defendant didn't commit the crime (discounting). Or jurors may disregard an alibi on the ground that the witness was biased, even though there is no evidence to that effect in the record (unfairly critical evaluation).

Third, jurors may accept inculpatory evidence at face value, ignoring questions about its reliability. This is another form of belief-perseverance, one that undermines the defense's attempts to impeach a witness through extrinsic evidence instead of through cross-examination.

Fourth, and finally, jurors may interpret ambiguous evidence in a manner consistent with the defendant's guilt. For example, if alibi evidence strongly but not definitively suggests that the defendant did not commit the crime, jurors may give the prosecution the benefit of the doubt and assume that the defendant could still have committed it.

In a circumstantial case, by contrast, the confirmation bias will be much weaker. The most obvious reason is that, as we've seen, jurors' initial updating models "all presume jurors' unbiased interpretation of the new information, followed by a reweighting of this evidence as it is aggregated to form the juror's decision").

282. See Sanbonmatsu et al., supra note 222, at 893.
283. Carlson & Russo, supra note 281, at 93.
286. See Sanbonmatsu et al., supra note 284, at 278; see also Derek J. Koehler, Explanation, Imagination, and Confidence in Judgment, 110 PSYCHOL. BULL. 499, 511 (1991).
289. See Koehler, supra note 286, at 511; see also Sanbonmatsu et al., supra note 284, at 278.
confidence in the defendant’s guilt is usually far lower in circumstantial cases, minimizing the magnitude of the bias.\textsuperscript{290}

There is, however, an even more important reason: the strong priming characteristic of circumstantial cases will counteract the confirmation bias, making jurors far more likely to recognize evidence of innocence they can use to imagine an FES. When jurors are confident that the defendant is guilty, “a certain inertia sets in, which makes it more difficult to consider alternative hypotheses impartially.”\textsuperscript{291} That inertia then leads to the various effects of the confirmation bias.\textsuperscript{292} The most effective way to overcome the confirmation bias is thus for jurors to try to simulate an alternative hypothesis—a factually exculpatory scenario—without the intention of confirming the defendant’s guilt. Such effort will reduce the inertia created by the FIS, “altering the framing of the problem in a way that makes the person less biased in favor of the original hypothesis.”\textsuperscript{293}

The debiasing effects of a “consider-the-opposite” strategy have been widely documented. Individuals who consider the opposite pay more attention to evidence that contradicts their initial hypothesis,\textsuperscript{294} show less belief-perseverance,\textsuperscript{295} and interpret evidence more impartially.\textsuperscript{296}

2. Creating an Exculpatory Storyline

If jurors do recognize evidence of innocence, they must then use that evidence to imagine a factually exculpatory scenario. The latter does not necessarily follow from the former: recognizing that one or more items of evidence is consistent with the defendant’s innocence does not necessarily allow the juror to imagine how the defendant might actually be innocent. Imagining an FES, therefore, initially requires jurors to create a “causal explanation that . . . account[s] for the data present in the decision problem”—the scenario’s storyline.

There are three reasons why jurors should normally find it difficult to create an exculpatory storyline in a direct case. First, the univocity of direct evidence renders it useless for exculpatory story-creation: if eyewitness identifications and confessions cannot be incorporated into a narrative account of the defendant’s innocence, they certainly cannot generate the storyline of such an account. Consider again the rape case mentioned above. Nothing in the victim’s testimony suggests that the defendant had an alibi,

\begin{itemize}
\item \textsuperscript{290} See Carlson & Russo, supra note 281, at 93.
\item \textsuperscript{291} Koehler, supra note 286, at 503.
\item \textsuperscript{292} See id. at 511.
\item \textsuperscript{293} Id. at 512.
\item \textsuperscript{294} See id. at 513; Asher Koriat et al., Reasons for Confidence, 6 J. EXPERIMENTAL PSYCHOL.: HUM. LEARNING & MEMORY 107, 113 (1980).
\item \textsuperscript{295} Lord et al., supra note 287, at 1240.
\item \textsuperscript{296} Id. at 1239.
\item \textsuperscript{297} Dougherty et al., supra note 123, at 136.
\end{itemize}
that someone else was the rapist, that the victim consented, etc. Those exculpatory storylines are all logically possible—but they require evidence other than the victim’s identification for the jury to imagine them. All her testimony suggests is that the defendant is guilty.

Second, because eyewitness identifications and confessions are normally only vulnerable to attacks on their reliability, the defense is very likely to use a pure reasonable-doubt defense in a direct case. By definition, however, that defense does not help jurors create an exculpatory storyline: knowing how the crime didn’t happen doesn’t help them imagine how it did.298

Third, even when the defense does use a factual-innocence defense, there is no guarantee that jurors will take its exculpatory storyline seriously. The confirmation bias not only limits individuals’ ability to recognize evidence that challenges their focal hypothesis, it also leads them to truncate their search for alternative hypotheses.299 In a direct case, therefore, where jurors’ initial confidence in the defendant’s guilt is normally very high, the confirmation bias is likely to cause jurors to overlook whatever exculpatory storyline the defense might offer.

In a circumstantial case, by contrast, jurors should find it much easier to create an exculpatory storyline. To begin with, the fact that there is necessarily evidence of innocence in a circumstantial case promotes storyline creation. Because of polyvocity, jurors can always draw exculpatory instead of inculpatory inferences from the prosecution’s circumstantial evidence. Those exculpatory inferences can then form the basis of an exculpatory storyline. Recall the murder trial in which the circumstantial evidence consisted of Jill’s skin under Jack’s fingernails, fresh scratches on Jack’s cheek, Jack’s delay in calling 911 and calmness on the phone, and the recently purchased insurance policy on Jill’s life. Although the inculpatory inferences the prosecution asks jurors to draw certainly make sense, exculpatory inferences are possible as well: Jill wanted the life-insurance policy because she was suicidal; she was twitching violently from the Lithium overdose when Jack tried to help her; and Jack was still in shock when he called 911.

Taken together, those exculpatory inferences suggest a coherent storyline for Jack’s FES. There is no guarantee, of course, that jurors will draw the inferences that are necessary to create that story. Nevertheless, because they do not have to generate the inferences ex nihilo, there is at least a reasonable likelihood that jurors will draw them—especially given that the strong priming characteristic of circumstantial cases will motivate them to want to imagine how Jack might be innocent.

In addition, the defense is more likely to provide jurors with an exculpatory storyline in a circumstantial case. The defense only uses a pure

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298. I am not suggesting that it is impossible for the defense to use a pure reasonable-doubt argument to suggest an exculpatory storyline. For example, the defense could use questions about the veracity of an eyewitness to suggest that the eyewitness is, in fact, the real killer. See, e.g., Bedau & Radelet, supra note 12, at 103 (describing the case of Nathaniel Carter). Still, such defenses are unlikely to be persuasive in the absence of additional evidence linking the eyewitness to the crime—in which case the “pure” defense is really a factual-innocence alternative-perpetrator defense.

299. See, e.g., Koehler, supra note 286, at 512.
reasonable-doubt defense in a direct case out of necessity—because the univocity of eyewitness identifications and confessions limits it to attacking their reliability. In a circumstantial case, by contrast, the defense rarely faces such a dire predicament: even if it has no affirmative evidence of the defendant’s innocence, it can always take advantage of the polyvocal nature of circumstantial evidence to suggest an exculpatory storyline to jurors. That kind of modified reasonable-doubt defense—one that provides an exculpatory storyline and acknowledges that even the strongest circumstantial case leaves open the possibility of the defendant’s innocence—is likely to be effective, because the absence of a pronounced confirmation bias in circumstantial cases will normally ensure that jurors pay attention to it.

3. Imagining the Factually Exculpatory Scenario

Once jurors recognize evidence of innocence and use that evidence to construct an exculpatory storyline, the factually exculpatory scenario is essentially complete. The question then becomes—how easy is that FES to imagine? Two factors determine the imaginability of the FIS: structural coherence and vividness. It is reasonable to assume that the same factors apply to the FES as well.

If that assumption is correct, the ease of imagining the FES depends primarily on the kind of evidence used to construct it. When the defense uses direct evidence, the evidence’s narrative structure will lead jurors to imagine an FES that is both vivid and structurally coherent. When it uses circumstantial evidence, the rhetorical structure of the evidence will lead jurors to imagine an FES that is pallid and structurally incoherent.

There is also reason to believe that jurors normally find it more difficult to imagine a structurally coherent FES in a direct case than in a circumstantial case. A critical factor determining the persuasiveness of a scenario—inculpatory or exculpatory—is its coverage, “the extent to which the story accounts for evidence presented at trial.” The greater a scenario’s coverage, the more acceptable jurors find it as an explanation of the evidence. Pennington and Hastie never explain why coverage is so important to persuasiveness, but other research indicates that lack of coverage undermines a scenario’s causal coherence. That makes sense: how can a scenario be plausible if it simply ignores contradictory evidence? In the Lithium case, for example, no matter how causally coherent Jack’s “suicide” scenario may be on its own terms, it would seem much less causally coherent if it did not and could not explain why his skin was found under Jill’s fingernails.

The prosecution’s evidence in a circumstantial case rarely creates a coverage problem for the FES. Because circumstantial evidence is polyvocal,
The Cognitive Psychology

The cognitive psychology of the FIS juror is an additional factor. No doubt, jurors do not have to discount the prosecution's circumstantial evidence in order to imagine a causally coherent FES; that evidence can simply be incorporated into the FES via its exculpatory inferences. Even if jurors believe that the skin evidence is reliable, for example, the presence of the skin under Jill's fingernails is consistent with the idea that the side-effects of her suicidal overdose led her to scratch Jack accidentally when he tried to help her.

In a direct case, by contrast, the prosecution's evidence almost always creates a coverage problem. Because direct evidence is univocal, it cannot logically be incorporated into an FES. There is no way, for example, to incorporate the substance of Jack's confession into an account of how he did not commit the crime. As a result, any FES the jury considers—that she committed suicide, for example—will directly contradict Jack's confession; they cannot both be true. And therein lies the coverage problem: the FES simply makes no causal sense unless jurors are willing to disregard the confession, something we know they are loath to do. Why would Jack confess to the crime if she actually killed herself? After all, people don't confess to crimes they didn't commit.  

4. "Undoing" the Factually Inculpatory Scenario

In terms of recognizing evidence of innocence, creating exculpatory storylines, and avoiding structural incoherence, then, jurors normally find it far more difficult to imagine an FES in a direct case than in a circumstantial case. There is a fourth difficulty as well: research indicates that jurors not only have to imagine an FES in a direct case, they also have to mentally "undo" the FIS. Before jurors in a direct case can believe the defendant is innocent, in other words, they have to affirmatively unbelieve that he is guilty.

What explains this requirement—and why would it not also apply in a circumstantial case? Once again, the answer depends on the fact that direct evidence is representational, whereas circumstantial evidence is abstract. Although both are capable of persuading jurors that the defendant committed the crime, the kind of belief they engender is different. Two things occur when jurors hear direct evidence: they construct a mental representation of the crime that tracks the witness's testimony—an FIS—and they believe, however preliminarily, that the crime took place the way the witness says it did. That initial belief does not mean they cannot later reject the direct FIS. But it does mean they cannot reject it without first "undoing" the

303. See Saul M. Kassin & Katherine Neumann, On the Power of Confession Evidence: An Experimental Test of the Fundamental Difference Hypothesis, 21 LAW & HUM. BEHAV. 469, 482 (1997) (noting that because "a confession is a first-hand admission of culpability, a statement presumably made by someone with intimate knowledge of the event in dispute," jurors "find it difficult to believe that anyone would confess to a crime he or she did not commit").
304. Sykes & Johnson, supra note 100, at 205.
305. Id. at 209.
mental representation the witness’s description evoked—a process that requires cognitive effort.306

Circumstantial evidence, by contrast, is not a narrative account of how the crime “really happened”; it is simply a probabilistic statement about the connection between the defendant and an incriminating physical trace of the crime. When jurors hear circumstantial evidence, therefore, they may imagine an FIS, but they do not have to believe it is true. As Sykes says, “the comprehension of probabilistic information does not mandate a belief in the reality of a specific event.”307 Rejecting the circumstantial FIS later thus does not require jurors to undo the mental representation evoked by the evidence—and thus requires no extra cognitive effort at all.308 In short, even when a direct FIS is no easier to imagine than a circumstantial FIS, it will still be harder for jurors to imagine an FES in the direct case. “[A] belief engendered by an assertion about an event is more difficult to mutate than a belief based solely on statistical probabilities.”309

This extra cognitive effort may seem insignificant, but it’s not. To begin with, the amount of extra cognitive effort is not static: the easier the direct FIS is to imagine, the greater the effort required to replace it with an FES. As Sykes found in her study of the Blue Bus problem, jurors “who found it easiest to imagine the represented event found it more difficult to ‘undo’ that event and imagine its alternative. In the probabilistic condition, by contrast, ease of imagining the likely event did not hinder imagination of its alternative.”310

Moreover, because jurors’ overall processing capacity is not unlimited, they normally conserve their cognitive resources.311 Jurors are rarely strongly primed to try to imagine an FES in a direct case, so the extra cognitive effort required to undo the FIS may make the difference between recognizing evidence of innocence and simply overlooking it.

VI. The Paradox of Circumstantial Evidence Revisited

At the beginning of this article, I unpacked the “paradox of circumstantial evidence” into two questions. First, why are jurors likely to acquit in a circumstantial case even when they know that the evidence is sufficient to convict? And second, why are jurors likely to convict in a direct case even when there is reason to believe that the evidence may be unreliable?

Having examined the two basic stages of the ease-of-simulation model—imagining the FIS and the FES—as well as the priming mechanism that mediates between them, we can now answer those questions. This Part

306. Id. at 202 ("Some effort ... is required to disbelieve a witness—to ‘undo’ the representation the witness makes about an event.").
307. Id. at 209.
308. Id. at 209.
309. Id.
310. Id.
311. See Sanbonmatsu et al., supra note 222, at 893.
begins by applying the model to ideal-typical direct and circumstantial cases. It then discusses how the principles gleaned from those cases likely function in "mixed" cases, in which both direct and circumstantial evidence are present. Finally, it shows how the ease-of-simulation model helps deepen our understanding of why false acquittals are so common in circumstantial cases and false convictions are so common in direct cases.

A. "Ideal-Typical" Direct Cases

The ease-of-simulation model explains why jurors are likely to convict in a direct case even when there is reason to believe that the evidence may be unreliable. First, no matter how unreliable the evidence may be, jurors usually find it easy to imagine an FIS in a direct case. Because direct evidence is a complete narrative representation of the crime, the FIS jurors imagine is normally both vivid and structurally coherent—the two factors that determine a scenario's imaginability. In a direct case, therefore, jurors' initial confidence in the defendant's guilt and the minimum acceptable imaginability of the FES are both likely to be quite high.

Second, jurors in a direct case are rarely strongly primed to imagine an FES, because the unconditional nature of direct evidence combines with the truth-bias, responsibility-laundering, narrative transportation, and belief-perseverance to effectively eliminate the fear of a false conviction that would lead to priming.

Third, jurors normally find it difficult to imagine an FES in a direct case. Not only does the univocity of direct evidence render the prosecution's evidence useless for an FES, but the lack of priming means that the confirmation bias limits jurors' ability to recognize evidence of innocence or exculpatory storylines provided by the defense—assuming the defense provides them at all.

A direct case, in short, often leads to an easily imagined FIS, a high minimum acceptable imaginability for the FES, and an FES whose ease of imagination does not exceed its acceptable minimum. As a result, even if jurors' initial confidence in the defendant's guilt is not sufficient for them to convict, the FES is likely to backfire and increase their initial confidence—increasing the likelihood that they will convict, as well.

B. "Ideal-Typical" Circumstantial Cases

The ease-of-simulation model also explains why jurors are likely to acquit in a circumstantial case even when they know that the evidence is sufficient to convict. First, regardless of the objective probability of the defendant's guilt, jurors usually find it difficult to imagine an FIS in a circumstantial case. The rhetorical nature of circumstantial evidence—the fact that it is evidence of a crime, not a representation of it—not only makes a structurally coherent FIS difficult to imagine, it also normally ensures that any FIS jurors do imagine (with or without the prosecution's help) lacks vividness. In a circumstantial case, therefore, jurors' initial confidence in the
defendant’s guilt and the minimum acceptable imaginability of the FES are both likely to be quite low.

Second, jurors in a circumstantial case are almost always primed to imagine an FES, because the probabilistic nature of circumstantial evidence necessarily leaves open the possibility that the defendant is innocent, leading jurors—as a result of the certainty effect—to fear a false conviction.

Third, jurors generally find it relatively easy to imagine an FES in a circumstantial case. The polyvocity of circumstantial evidence means that the prosecution’s own evidence is available for use in an FES, and strong priming normally ensures that jurors will pay close attention to any evidence of innocence or exculpatory storylines that the defense offers.

Relative to a direct case, then, a circumstantial case often leads to an FIS that is difficult to imagine, a lower minimum acceptable imaginability for the FES, and an FES whose ease of imagination exceeds its acceptable minimum. As a result, not only is jurors’ initial confidence in the defendant’s guilt normally quite low, the FES they imagine often reduces their initial confidence even further, increasing the likelihood that they will acquit.

C. “Mixed” Cases

Though ideal-typical cases are certainly not rare, cases in which the prosecution uses both direct and circumstantial evidence to prove the defendant’s guilt are more common. How do the principles we have identified in the context of ideal cases apply to such “mixed” cases?

A general answer to that question is impossible; all criminal cases are different. If we think of the ideal cases as the opposite ends of a spectrum, however, we can move along the spectrum and examine five kinds of mixed cases that are most likely to occur.

First, closest to the “ideal direct” end, there are cases in which the prosecution uses circumstantial evidence to reinforce direct evidence that, by itself, would be sufficient to prove the defendant’s guilt—a rape case, for example, in which a DNA match supports the victim’s identification of the defendant as her attacker. This kind of case is functionally equivalent to an ideal direct case: the fact that the account is a complete narrative representation of the crime makes the FIS easy to imagine, prevents strong priming, and inhibits imagining an FES. Moreover, even though the presence of the DNA potentially opens up exculpatory inferences—perhaps the sex was consensual?—the confirmation bias means that jurors will likely ignore or discount them.

Second, there are cases in which only direct evidence is present, but that evidence does not create a complete narrative representation of the crime. An example would be the Maimonides scenario, in which a witness saw everything but the actual murder itself. Here, the probative value of the prosecution’s evidence is necessarily less than 1.0, creating the possibility

that jurors will be strongly primed to imagine an FES. Strong priming, though, is still unlikely: although jurors are extremely sensitive to deviations away from certainty, research indicates they are generally willing to convict on the basis of probabilistic evidence that—like this scenario—establishes a 0.995 likelihood of the defendant's guilt. And if jurors are not strongly primed, they are almost certain to convict, because the univocity of the prosecution's direct evidence will prevent it from being used in an FES and the confirmation bias will ensure that jurors ignore or discount any FES the defense offers.

Third, there are cases involving more significant gaps in direct evidence—a murder case, for example, in which a witness saw the defendant and victim arguing at the scene of the crime near the time of the murder, but did not see the defendant actually commit the crime. In this kind of case, the FIS is more difficult to imagine because of the gaps in the eyewitness's narrative and strong priming is more likely because the probative value of the direct evidence, though sufficient to convict, is substantially less than 0.995. In the absence of strong priming, an acquittal is still unlikely: even though the minimum acceptable imaginability of the FES will be lower, univocity and the confirmation bias will still make it difficult for jurors to imagine an FES.

If jurors are strongly primed, however, conviction becomes much less certain. Here the determining factor should be whether the defense provides jurors with an imaginable FES: although the direct evidence will not itself suggest an exculpatory storyline to jurors, the fact that the evidence functions circumstantially makes it structurally compatible with an exculpatory scenario. An alibi defense, for example, will be causally coherent and easy to imagine as long as it does not contradict the eyewitness's testimony about the fight.

Fourth, there are cases in which the prosecution constructs its FIS out of roughly equal proportions of direct and circumstantial evidence, using the latter to fill in the gaps in the former—a cocaine possession case, for example, in which eyewitnesses testify that the defendant normally sells drugs in front of a particular house, but the only evidence placing the defendant inside the house is a set of fingerprints found on a sofa. This kind of case is even more likely to lead to an acquittal: not only is the direct evidence consistent with a scenario in which the defendant buys his cocaine in the house but does not live there, the fact that his fingerprints were found only on the sofa actually suggests that scenario—the polyvocity of circumstantial evidence in action.

Finally, closest to the "ideal circumstantial" end of the spectrum, there are cases in which the prosecution's evidence is almost completely circumstantial—an arson-for-insurance case, for example, in which there was no sign of forced entry, the police found flammable chemicals in the owner's

313. Edward F. Wright et al., Factors Affecting the Use of Naked Statistical Evidence of Liability, 136 J. Soc. Psychol. 677, 685 (1996). Note, though, that Magnusson's research indicates a percentage of jurors will not convict even then!
house, financial records indicate that the business was nearly bankrupt, and an eyewitness saw the owner near his business not long before the fire erupted. This kind of case is the functional equivalent of an ideal circumstantial case, in which the rhetorical nature of the evidence leads to a difficult to imagine FIS, strong priming, and an easy to imagine FES. The only difference is that any FES the defense offers or jurors try to imagine will have to explain why the defendant was near his business before the fire, because the truth bias means that jurors will likely assume the eyewitness’s testimony is reliable.

**D. False Verdicts**

In addition to unraveling the paradox of circumstantial evidence, the ease-of-simulation model also helps explain why false verdicts are so common. Traditional models of jury decision-making have to explain false convictions and false acquittals as distortions in subjective probability, with jurors either overestimating or underestimating the objective likelihood of the defendant’s guilt. Such errors clearly take place, but there is no question that false verdicts also occur in cases where the possibility of a substantial deviation between objective and subjective probability is extremely unlikely. Not all forensic evidence is difficult to understand, for example, yet the Wells Effect shows that such evidence is still likely to lead to false acquittals.

To begin with, distinguishing between subjective probability and gut-level certainty via the ease-of-simulation model helps explain false acquittals. Because there is no necessary relationship between the subjective probability of an FIS and its ease of imagination, there are likely many cases—normally involving circumstantial evidence—in which jurors find it difficult to imagine an FIS that they recognize is objectively sufficient to convict. Whenever one of those cases also involves an easily imagined FES, however improbable, a false acquittal will likely result.

Gut-level certainty also helps explain false convictions. Two different possibilities exist, each of which normally involves direct evidence. First, there are cases in which the objective and subjective probability of the defendant’s guilt require acquittal, but the FIS is so easy to imagine that jurors’ initial confidence is sufficient to convict. In such cases, a false conviction will result unless the FES exceeds its minimum acceptable imaginability to such a degree that jurors’ final confidence falls below the level of confidence they believe necessary to convict—unlikely with direct evidence.

Second, and even more troubling, are cases in which the objective and subjective probability of the defendant’s guilt require acquittal and an FIS is not so easily imagined that jurors’ initial confidence is high enough to convict. An acquittal should be a fait accompli in that kind of case, but the ease-of-simulation model indicates that it’s not: although the weak FIS will establish a low minimum acceptable imaginability for the FES, the FES may

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314. See, e.g., Davis & Follette, *supra* note 98, at 678.
still turn out to be so difficult to imagine that it backfires, increasing jurors’ initial confidence in the defendant’s guilt. If the backfire is sufficient to elevate jurors’ final confidence above the level of confidence they believe necessary to convict, a false conviction will still result.

VII. CONCLUDING THOUGHTS

Research indicates that the possibility of reaching an incorrect verdict causes jurors considerable stress. And why not? Although they alone are responsible for deciding the defendant’s fate, they are expected to make that decision solely on the basis of evidence that has been vetted by the judge and presented by attorneys they know—or at least suspect—are more concerned with winning than with discovering the truth.

As important as this predicament is, research into jury decision-making rarely takes it seriously. Probability-centered models like Bayesian analysis banish emotion entirely, reducing the decision to convict to the same kind of calculus one might use to buy a new car. And even narrative-based models like the Story Model still ultimately reduce the decision to convict to the mechanical application of legal concepts—verdict categories, procedural instructions, and the burden of proof.

If this Article has shown anything, though, it is that jurors are far more interested in the defendant’s factual guilt than his legal guilt. The Wells Effect can only be explained through the concept of gut-level certainty, and the concept of gut-level certainty is simply irreconcilable with formal models of jury decision-making. It is clearly not enough for jurors to believe that it is extremely likely the defendant committed the crime; they need to feel confident in their gut that the defendant actually committed it. If that feeling is absent, jurors won’t convict no matter how objectively likely they believe the defendant’s guilt to be.

That insight has enormous consequences, the most important of which is that jurors’ need for certainty leads to the paradox of circumstantial evidence and an unacceptable number of false verdicts. Because gut-level certainty is a function of ease of imagination, not mechanical probability calculations, there is no necessary or predictable relationship between gut-level certainty and the objective or subjective probability of the defendant’s guilt. And as we’ve seen, it is all too easy for guilty defendants to appear innocent in circumstantial cases and innocent defendants to appear guilty in direct cases.

But is psychology destiny? Do we simply have to accept that jurors will decide whether to acquit by trying to imagine a scenario in which the defendant is factually innocent? Or is there some way to eliminate the simulation heuristic—and the paradox of circumstantial evidence along with it?

315. See Nat’l Ctr. for State Courts, supra note 227, at 72.

316. For example, Pennington and Hastie simply assume, without empirical evidence, that jurors will reject their preferred story if it isn’t strong enough to prove the defendant’s guilt beyond a reasonable doubt. Pennington & Hastie, supra note 130, at 531 n.24.
Preventing jurors from using the simulation heuristic is probably too ambitious of a goal. Judgmental heuristics are normally unconscious, automatic processes, and there is no reason to believe that the simulation heuristic is any different. It may be possible, however, to limit the heuristic’s effects, both in terms of the overvaluation of direct evidence and the undervaluation of circumstantial evidence.

Consider, for example, the absence of strong priming in direct cases—one of the principal reasons jurors overvalue direct evidence. It may well be possible to approximate the debiasing effects of strong priming by specifically instructing jurors to try to imagine a scenario in which the defendant is factually innocent. Anderson and Lindsay have found that inducing an individual to engage in a “counter-explanation” process in which she “imagines and explains how a different relation is (or might be) true” reduces both belief-perseverance and the confirmation bias. Similarly, Hirt and Markman have found that asking individuals to explain an alternative outcome, “even an alternative version of the same outcome,” completely eliminates “the effects of the prior explanation task on likelihood judgments.”

The most important problem with direct evidence, of course, is that its narrative structure makes it too easy to imagine an FIS and too difficult to imagine an FIS. Conversely, the basic problem with circumstantial evidence is that its rhetorical structure makes it too difficult to imagine an FIS and too easy to imagine an FIS. Those problems are likely to prove intractable, because the relative imaginability of direct and circumstantial evidence seems to reflect their fundamental epistemological differences. We obviously cannot order jurors to stop imagining direct evidence and start imagining circumstantial evidence.

It may be possible, however, to short-circuit the relationship between ease of imagination and jurors’ verdict choices. Researchers have found, for example, that although jurors sometimes decide whether the defendant committed a particular crime simply by comparing the facts of the case to their preexisting prototypes of what that kind of crime “looks like,” a well-crafted jury instruction that “inform[s] jurors that their preferred decision strategy is inappropriate” and “explain[s] the proper strategy” can almost completely eliminate that effect. A similar instruction might prevent jurors from deciding whether to convict solely on the basis of the simulation heuristic. In terms of circumstantial evidence, for example, the judge could tell jurors that the ability to imagine an FIS is not the same as reasonable doubt.

317. See Nisbett & Ross, supra note 198, at 18.
319. Hirt & Markman, supra note 217, at 1083–84 (emphasis added).
321. Smith, supra note 320, at 869.
and then explain in detail how they should use the evidence presented at trial to determine the objective probability of the defendant’s guilt. By itself, instruction in Bayesian analysis does not counteract jurors’ undervaluation of circumstantial evidence. But that might be due to the fact that, in the absence of instruction to the contrary, jurors determine guilt solely through the simulation heuristic. The combination of the two may work.

Similarly, on the direct evidence side, the judge could combine Bayesian instruction with an explanation of how an easily imagined FIS does not necessarily prove the defendant’s guilt beyond a reasonable doubt. Indeed, the judge could specifically address the fact that the narrative structure of direct evidence tends to make even weak or unreliable eyewitness identifications or confessions easy to imagine.

In both cases, the judge’s goal would be “concept revision, not merely concept formation”—the key to successful debiasing. There is no guarantee, of course, that such instructions would minimize the number of false convictions and false acquittals caused by the paradox of circumstantial evidence. Given the alternative, though, it certainly seems worth a try.

322. See, e.g., Smith et al., supra note 58, at 78.

323. Smith, supra note 320, at 869.