

# EVIDENCE, PROCEDURE, AND THE UPSIDE OF COGNITIVE ERROR

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**Abstract:** Humans are imperfect information processors, a fact almost universally bemoaned in legal scholarship. But when it comes to how the legal system itself processes information, cognitive limitations are largely good news. Evidentiary procedure—inclusive of trial, discovery, and investigation—relies heavily on the fact that human mental capacity is limited. Such limits are crucial to separating sincere from insincere testimony. Moreover, notes and other “cognitive artifacts” that individuals make to compensate for their limited cognitive ability are an important source of evidence. This article’s primary objective is to elucidate the extent to which cognitive imperfection is beneficial rather than detrimental to evidentiary process and thus to law as a whole. Secondly, the article discusses how the law of evidentiary process tilts the playing field of litigation in a manner that exacerbates the cognitive limitations of the potentially insincere and offsets the limitations of competing participants.

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As an information processor,<sup>1</sup> the human mind falls far short of its own ideal. Working memory—where intermediate information is stored in multi-step thinking<sup>2</sup>—holds only about seven items,<sup>3</sup> and only for several seconds.<sup>4</sup> Longer term memories can be purposefully acquired, but only with substantial effort and attention.<sup>5</sup> Even when successfully acquired, long term memories cannot always be retrieved on demand.<sup>6</sup> Indeed, focusing the attention required for managing long term memory—as well as for many other cognitive tasks—can itself be a challenge.<sup>7</sup> And on top of all this, the mind’s capacity only constricts as it quickly grows fatigued.<sup>8</sup>

When legal scholars make reference to the limitations of human cognition, it is usually in connection with bad news about the legal system. Nowhere is this more clearly the case than in applications of cognitive psychology to evidentiary procedure.<sup>9</sup> A vast literature stretching back several decades is almost uniform in its grim prognosis for fact-finding.<sup>10</sup> Eyewitnesses, we are told, see little,

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<sup>1</sup> See generally DONALD E. BROADBENT, *PERCEPTION AND COMMUNICATION* (1958) (pioneering the information processing approach to human cognition and drawing a broad analogy between human cognition and computer processing).

<sup>2</sup> See generally ALAN D. BADDELEY, *WORKING MEMORY* (1986) (describing the working memory model and reviewing supporting evidence therefor). Working memory is used, for example, in mental multiplication, as when one stores “7 x 63 = 441” while calculating 5 x 63, all in the process of multiplying 57 x 63. More generally, working memory is central to learning, *id.* at 41-44, memory retrieval, *id.* at 44-53, language comprehension, *id.* at 54-64, and reasoning, *id.* at 64-72.

<sup>3</sup> See, e.g., George A. Miller, *The Magical Number Seven Plus or Minus Two: Some Limits on Our Capacity for Processing Information*, 63 *PSYCHOL. REV.* 81, 91 (1956) (reviewing findings on the number of items that working memory can hold and emphasizing that the individual determines what constitutes an item or, as Miller terms it, a “chunk.”); Alan D. Baddeley, *The Magic Number Seven: Still Magic After all These Years?* 101 *PSYCHOL. REV.* 353, 353 (1994) (discussing lasting impact of Miller, *Magical Number Seven*).

<sup>4</sup> See, e.g., Murray Glanzer & Anita R. Cunitz, *Two Storage Mechanisms in Free Recall*, 5 *J. VERBAL LEARNING & VERBAL BEHAV.* 351 (1966) (finding that subjects who are read a list of items have better recall for the last few items in the list because these are still in working memory during the recall task, but that this “recency” effect dissipates with a brief filled delay between hearing and recalling).

<sup>5</sup> See, e.g., Fergus I. Craik & Robert S. Lockhart, *Levels of Processing: A Framework for Memory Research*, 11 *J. VERBAL LEARNING & VERBAL BEHAV.* 671 (1972) (finding that the depth at which memory is “encoded,” which is correlated with the amount of effort exerted in memorizing, determines in part the durability of the memory).

<sup>6</sup> See generally ENDEL TULVING, *ELEMENTS OF EPISODIC MEMORY* (1983) (finding that memory encoding is environment-specific and that this causes retrieval difficulties in environments different from that in which the memory was acquired).

<sup>7</sup> See generally DANIEL KAHNEMAN, *ATTENTION AND EFFORT* (1973) (modeling attentive mental processing as a problem of scarce resource allocation).

<sup>8</sup> See, e.g., Dennis H. Holding, *Fatigue*, in *STRESS AND FATIGUE IN HUMAN PERFORMANCE* 145 (R. Hockey, ed., 1983) (reviewing the effects of fatigue on cognition); Alan Hobbs & Ann Williamson, *Associations between Errors and Contributing Factors in Aircraft Maintenance*, 45 *HUM. FACTORS* 186 (2003) (demonstrating a correlation between fatigue and cognitive error in aircraft maintenance).

<sup>9</sup> I use the terms “evidentiary procedure” and “evidentiary process” to denote a hybrid field of law concerning the manner in which the legal system itself processes information. This field contains most of Evidence and those portions of Civil and Criminal Procedure involving discovery, investigation, interrogation, and fact-finding.

<sup>10</sup> The following chronologically ordered list is but a small sample of this literature: PATRICK M. WALL, *EYEWITNESS IDENTIFICATION IN CRIMINAL CASES* (1965) (discussing “memory source confusion” in relation to eyewitnesses: in identifying suspects in a police lineup, eyewitnesses are apt to confuse

remember less, and often believe they remember what they never saw.<sup>11</sup> Witnesses' indications of confidence in the accuracy of their perceptions bear little relationship to actual accuracy.<sup>12</sup> Juries and judges nonetheless place substantial weight on witnesses' expressions of certainty and doubt.<sup>13</sup>

Indeed, fact finders are purportedly prone to a full catalogue of "illusions and biases," symptoms of their more general cognitive shortfall.<sup>14</sup> "Hindsight bias,"<sup>15</sup> for example, causes them to believe

familiarity with suspect due to prior viewing of the police photo array with familiarity due to sighting the suspect in connection with crime), *cited with approval* in *U.S. v. Wade*, 388 U.S. 218, 229, 230, 232, 234 (1967) and *Simmons v. U.S.*, 390 U.S. 377, 383, 386, 388 (1968); I. Daniel Stewart, Jr., *Perception, Memory, and Hearsay*, 1970 Utah L. Rev. 1 (1970) (discussing eyewitness fallibility generally); Muriel Lezak, D., *Some Psychological Limitations on Witness Reliability*, 20 WAYNE L. REV. 117 (1973) (same); Evan Brown, et al., *Memory for Faces and the Circumstances of Encounter*, 62 J. APPL. PSYCHOL. 311 (1977) (discussing memory source confusion in relation to eyewitnesses); ELIZABETH F. LOFTUS, EYEWITNESS TESTIMONY 20-109 (1<sup>st</sup> ed. 1979; 2d ed. 1996) (discussing eyewitness fallibility generally); Gary L. Wells, R. C. L. Lindsay, Tamara Ferguson, *Accuracy, Confidence, and Juror Perceptions in Eyewitness Identification*, 64 J. APPL. PSYCHOL. 440 (1979) (identifying the "confidence-accuracy correlation" problem: the weak or nonexistent correlation between eyewitnesses' confidence in the accuracy of their memories and the actual accuracy of those memories); Stephen Landsman, *Reforming the Adversary Procedure: A Proposal Concerning the Psychology of Memory and the Testimony of Disinterested Witnesses*, 45 U. PITT. L. REV. 547 (1984) (discussing various memory shortcomings in relation to witness coaching); John S. Applegate, *Witness Preparation*, 68 TEX. L. REV. 277 (1989) (same); R.C.L. Lindsay, Gary L. Wells, Fergus O'Connor, *Mock-Juror Belief of Accurate and Inaccurate Eyewitnesses*, 13 LAW & HUM. BEHAV. 333 (1989) (presenting findings on the confidence-accuracy correlation problem); Steven I. Friedland, *On Common Sense and the Evaluation of Witness Credibility*, 40 CASE W. RES. L. REV. 165 (1989-1990) (arguing that jurors are poor at assessing the accuracy of testimony); Russell Korobkin & Chris Guthrie, *Psychological Barriers to Litigation Settlement: An Experimental Approach*, 93 MICH. LAW REV. 107 (1994) (arguing that cognitive limits hamper the settlement of disputes); BRIAN L. CUTLER & STEVEN D. PENROD, MISTAKEN IDENTIFICATION: THE EYEWITNESS, PSYCHOLOGY, AND THE LAW (1995) (discussing the fallibility of eyewitness identification generally); Jeffrey J. Rachlinski, *A Positive Psychological Theory of Judging in Hindsight*, 65 U. CHI. L. REV. 571 (1998) (arguing that judicial fact finders are prone to "hindsight bias," defined *infra* at note 15); Jeffrey J. Rachlinski, *Heuristics and Biases in the Courts: Ignorance or Adaptation?* 79 OR. L. REV. 61 (2000) (arguing that fact finders are prone to "hindsight bias" as well as errors caused by employment of the "representativeness heuristic," defined *infra* at note 17); Deborah Davis & William C. Follette, *Foibles of Witness Memory for Traumatic/High Profile Events*, 66 J. AIR L. & COM. 1421 (2001) (comprehensively surveying the current state of research on eyewitness fallibility generally); Chris Guthrie, Jeffrey J. Rachlinski, Andrew J. Wistrich, *Inside the Judicial Mind*, 86 CORNELL L. REV. 777 (2001) (discussing cognitive illusions in decision making by judges); Bennett L. Gershman, *Witness Coaching by Prosecutors*, 23 CARDOZO L. REV. 829, 838-844 (2002) (discussing various memory shortcomings in relation to witness coaching); AMINA MEMON, ALDERT VRIJ, RAY BULL, PSYCHOLOGY AND LAW: TRUTHFULNESS, ACCURACY AND CREDIBILITY 87-167 (2d ed. 2003) (reviewing findings on eyewitness fallibility); Erica Beecher-Monas, *Heuristics, Biases, and the Importance of Gatekeeping*, MICH. ST. DCL L. REV. (forthcoming 2004) (arguing that heuristics and biases in jury decision making justify the judge's role as gatekeeper with regard to expert testimony); Michael J. Saks & D. Michael Risinger, *Baselines, The Presumption of Guilt*, MICH. ST. DCL L. REV. (forthcoming 2004) (arguing that decision makers' errors in revising their probabilistic assessments in the light of new evidence—specifically their failure to fully account for underlying population frequencies, or "baselines"—"will lead to more erroneous decisions in one direction or the other.").

<sup>11</sup> See, e.g., ELIZABETH F. LOFTUS, EYEWITNESS TESTIMONY 20-109 (1<sup>st</sup> ed. 1979; 2d ed. 1996); Michael Risinger & Jeffrey L. Loop, *Three Card Monte, Monty Hall, Modus Operandi, and "Offender Profiling": Some Lessons of Modern Cognitive Science for the Law of Evidence*, 24 CARDOZO L. REV. 193 (2002) ("the last century has seen the accumulation of literally thousands of studies on the weaknesses of eyewitness testimony").

<sup>12</sup> See, e.g., Gary L. Wells, R. C. L. Lindsay, Tamara Ferguson, *Accuracy, Confidence, and Juror Perceptions in Eyewitness Identification*, 64 J. APPL. PSYCHOL. 440 (1979); R.C.L. Lindsay, Gary L. Wells, Fergus O'Connor, *Mock-Juror Belief of Accurate and Inaccurate Eyewitnesses*, 13 LAW & HUM. BEHAV. 333 (1989).

<sup>13</sup> See, e.g., sources cited above at *supra* note 12.

<sup>14</sup> It is important to note that the specific cognitive illusions and biases discussed in the literature are in turn grounded in more general limits on cognitive capacity. Amos Tversky & Daniel Kahneman, *Judgment Under Uncertainty: Heuristics and Biases*, 185 SCI. 1124, 1124-27 (1974) ("[P]eople rely on a limited number of heuristic principles which reduce the complex tasks of assessing probabilities and predicting values to simpler judgmental operations. In general, these heuristics are quite useful, but sometimes they lead to severe and systematic errors."); Christine Jolls, Cass R. Sunstein, Richard Thaler, *A Behavioral Approach to Law and Economics*, 50 STAN. L. REV. 1471, 1477-1478 (1998) ("We have limited

that accidents that happened to occur were bound to happen, and thus that sufficiently cautious defendants were negligent.<sup>16</sup> The “representativeness heuristic”<sup>17</sup> induces them to place too much weight on whether the evidence matches their mental picture of, for example, negligent behavior, and too little weight on the base frequency of such behavior in the population.<sup>18</sup>

Though somewhat less pronounced, a similar pessimism informs applications of cognitive psychology to substantive law fields.<sup>19</sup> Many of the applications in this more recent research program are put forward primarily as challenges to the methodology of law and economics, with its “working assumption” that individuals are perfectly rational.<sup>20</sup> But many also speak directly to the features of the substantive law. Thus, we read that consumer choice in regard to dangerous products may not be the rational expression of economic preference, but rather the outcome of systematic mistakes in judging

computational skills and seriously flawed memories...To deal with limited brain power and time we use mental shortcuts and rules of thumb...[R]ules of thumb ...lead us to erroneous conclusions.”)

<sup>15</sup> Baruch Fischhoff, *For Those Condemned to Study the Past: Heuristics and Biases in Hindsight*, in KAHNEMAN ET AL. JUDGMENT UNDER UNCERTAINTY: HEURISTICS AND BIASES 335, 341 (1982):

In hindsight, people consistently exaggerate what could have been anticipated in foresight. They not only tend to view what has happened as having been inevitable, but also view it as having appeared “relatively inevitable” before it happened. People believe that others should have been able to anticipate events much better than was actually the case.

<sup>16</sup> See, e.g., Jeffrey J. Rachlinski, *A Positive Psychological Theory of Judging in Hindsight*, 65 U. CHI. L. REV. 571 (1998); Jeffrey J. Rachlinski, *Heuristics and Biases in the Courts: Ignorance or Adaptation?* 79 OR. L. REV. 61 (2000). But see, Chris Sanchirico, *Finding Error 1-3* (2003) (unpublished manuscript available at <<http://www.ssrn.com>>) (identifying rational twin of across person hindsight bias).

<sup>17</sup> Amos Tversky & Daniel Kahneman, *Judgments of and by Representativeness*, in JUDGMENT UNDER UNCERTAINTY: HEURISTICS AND BIASES 84, 84-87 (Daniel Kahneman et al. eds., 1982); Jeffrey J. Rachlinski, *Heuristics and Biases in the Courts: Ignorance or Adaptation?* 79 OR. L. REV. 61 (2000) (“the representativeness heuristic refers to the reliance on the degree of apparent similarity between the features of the events to the features of the category in judging whether an event is a member of a particular category.”).

<sup>18</sup> Michael J. Saks & D. Michael Rysinger, *Baselines, The Presumption of Guilt*, MICH. ST. DCL L. REV. (forthcoming 2004); Jeffrey J. Rachlinski, *Heuristics and Biases in the Courts: Ignorance or Adaptation?* 79 OR. L. REV. 61, 81-85 (2000). Strikingly versatile, the representativeness heuristic also causes fact finders to “make categorical predictions that are insensitive to the reliability of the evidence supporting their predictions, misunderstand what a random sequence of events looks like, and fail to appreciate common statistical phenomena like regression to the mean.” *Id.* See also Amos Tversky & Daniel Kahneman, *Judgments of and by Representativeness*, in JUDGMENT UNDER UNCERTAINTY: HEURISTICS AND BIASES 84, 84-87, 98 (Daniel Kahneman et al. eds., 1982) (describing specific errors due to the employment of the representativeness heuristic and including an example whereby the jury fails to understand the basic logic of conjunction: specifically, that the event, “the defendant left the scene of the crime” must be more likely than the event, “the defendant left the scene of the crime for fear of being accused of murder.”).

<sup>19</sup> I use the term “substantive law” to encompass the central issues of Torts, Contracts, Commercial Law, Tax Law, Constitutional Law, Corporate Law, etc... Some articles on evidentiary process straddle the two literatures discussed in this and the previous paragraph. See, e.g., Jeffrey J. Rachlinski, *Heuristics and Biases in the Courts: Ignorance or Adaptation?* 79 OR. L. REV. 61, 81-85 (2000).

<sup>20</sup> See, e.g., (in chronological order) Cass R. Sunstein, *Behavioral Analysis of Law*, 64 U. CHI. L. REV. 1175, 1194 (1997) (“Economic analysis of law has proceeded on the basis of inaccurate understandings of decision and choice”); Christine Jolls, Cass R. Sunstein & Richard Thaler, *A Behavioral Approach to Law and Economics*, 50 STAN. L. REV. 1471, 1546-1547 (1998) (similar); Jon D. Hanson & Douglas A. Kysar, *Taking Behavioralism Seriously: The Problem of Market Manipulation*, 74 N.Y.U. L. REV. 630, 630 (1999) (“[S]cholars have been well justified in incorporating the behavioralist account of human behavior into law and economics. Nevertheless...those scholars simultaneously have failed to take the findings of behavioral research to their logical conclusion”); Russell B. Korobkin & Thomas S. Ulen, *Law and Behavioral Science: Removing the Rationality Assumption from Law and Economics*, 88 CAL. L. REV. 1051, 1053 (2000) (“As law and economics turns forty years old, its continued vitality is threatened by its unrealistic core behavioral assumption: that people subject to the law act rationally.”).

risk, which have, in turn, been manipulated by producers.<sup>21</sup> And even in the absence of transaction costs (as conventionally defined), parties to a nuisance dispute may not bargain around an ill-informed verdict, as the Coase theorem<sup>23</sup> would optimistically predict.<sup>24</sup>

Taken individually, many elements of the literature applying cognitive psychology to substantive and procedural law make valuable contributions, not just to our understanding of the legal system, but also to its practical design.<sup>25</sup> Viewed as a whole, however, the literature offers a woefully unbalanced account of what human imperfection means for law. Ironically, nowhere is the account more askew than with regard to evidentiary process. For when it comes to how the legal system itself processes information, the limits of the human mind are as much an instrument as an impediment.

Elucidating the instrumental value of cognitive imperfection to evidentiary process is the primary object of this article.<sup>26</sup> Secondly, the article sets out to show how the law of evidentiary process tilts the playing field of litigation in a manner that mitigates the cognitive failings of certain actors while exacerbating the failings of others. En route to both objectives, the article provides a novel perspective on

<sup>21</sup> Jon D. Hanson & Douglas A. Kysar, *Taking Behavioralism Seriously: The Problem of Market Manipulation*, 74 N.Y.U. L. REV. 630, 727 (1999) (“[I]ndividuals’...departure from models of scientific and statistical reasoning...creates an opportunity for manufacturers to shape, influence, and exploit consumer perceptions.”).

<sup>23</sup> Ronald H. Coase, *The Problem of Social Cost*, 3 J.L. & ECON. 1, 4 (1960).

<sup>24</sup> Christine Jolls, Cass R. Sunstein & Richard Thaler, *A Behavioral Approach to Law and Economics*, 50 STAN. L. REV. 1471, 1497-1501 (arguing that the “endowment effect” may prevent bargaining; although rightly questioning the effect on efficiency, if the endowment effect changes preferences).

<sup>25</sup> See, e.g., RONALD P. FISHER & R. E. GEISELMAN, *MEMORY-ENHANCING TECHNIQUES FOR INVESTIGATIVE INTERVIEWING: THE COGNITIVE INTERVIEW* (1992) (applying “cognitive interview” techniques to improve the questioning of witnesses); U.S. v. Wade, 388 U.S. 218, 228-237 (1967) (citing with approval PATRICK M. WALL, *EYEWITNESS IDENTIFICATION IN CRIMINAL CASES* (1965), *supra* note 10, in finding a Sixth Amendment right to the presence of counsel at postindictment lineups).

<sup>26</sup> This assertion, that cognitive limitations have instrumental value, should be distinguished from two orthogonal assertions. The first is that the law has “adapted” to cognitive limitations. See, e.g., 1A JOHN HENRY WIGMORE, *EVIDENCE IN TRIALS AT COMMON LAW* §58.2 (Tillers rev. 1983) (justifying restrictions on character evidence on the basis of the tendency of the jury to give such evidence too much weight); Jeffrey J. Rachlinski, *A Positive Psychological Theory of Judging in Hindsight*, 65 U. CHI. L. REV. 571 (1998) (arguing that the law has in some cases adapted to the hindsight bias). For the contrast between this adaptation hypothesis and the instrumental value hypothesis put forward in this article see the text surrounding *infra* note 36.

The second assertion is that cognitive limitations have been overstated. See, e.g., (in chronological order) David C. Funder, *Errors and Mistakes: Evaluating the Accuracy of Social Judgment*, 101 PSYCHOL. BULL. 75, 84 (1987) (critiquing findings of error in social judgment); Gerd Gigerenzer, *How to Make Cognitive Illusions Disappear: Beyond “Heuristics and Biases,”* 2 EUR. REV. SOC. PSYCHOL. 83 (1991) (errors overstated); Gerd Gigerenzer & Peter M. Todd, *Fast and Frugal Heuristics: The Adaptive Toolbox*, in SIMPLE HEURISTICS THAT MAKE US SMART 3, 21-22, 29-31 (Gerd Gigerenzer et al. eds., 1999) (similar); Gregory Mitchell, *Taking Behavioralism Too Seriously: The Unwarranted Pessimism of the New Behavioral Analysis of Law*, 43 WM. & MARY L. REV. 1907 (2002) (critiquing heuristics and biases literature and its application to law on the basis of experimental design, statistical method, and ecological validity); *People v. Legrand*, 747 N.Y.S. 2d 733 (Sup. Ct. 2002) (holding expert testimony on eyewitness fallibility not “generally accepted” under a *Frye* standard for the admissibility of expert testimony); Ebbe B. Ebbesen, *Some Thoughts About Generalizing the Role That Confidence Plays in the Accuracy of Eyewitness Memory*, [www.psy.ucsd.edu/eebbesen/Confidence.htm](http://www.psy.ucsd.edu/eebbesen/Confidence.htm), (last visited February 28, 2003) (critiquing the experimental design of studies showing little correlation between eyewitness accuracy and confidence); Gregory Mitchell, *Mapping Evidence Law*, MICH. ST. DCL L. REV. (forthcoming 2004) (critiquing the literature on cognitive error as applied to evidence law).

several critical though under-analyzed topics in the law of evidentiary process. In addition, the article casts new light on the significance of cognitive limits for law as a whole.

The argument for the existence of an upside to cognitive deficiency begins with a simple, but apparently elusive point: the normative status of mental limitations depends on the object to which the mind is directed. This article's take on cognitive error stands apart because it focuses on a set of mental objectives that to date have been largely ignored in applications of cognitive psychology to law, both substantive and procedural.

Where cognitive psychology has been applied to substantive legal rules, these are most often considered in a form that is disembodied from the problem of how the law gathers the information required for implementation and enforcement. In this artificial realm, we may stipulate, the fact that individuals have limited cognitive capacity is usually a detriment to social welfare. When, for example, the individual's mental objective is to identify remote contractual contingencies, or minimize accident avoidance costs, the greater her capacity to process information, the better for society.

Applications of cognitive psychology to evidentiary process, on the other hand, have addressed only certain issues in that field. Near exclusive attention has been paid to the perception and memory of the truly disinterested witness and the rationality of the truly impartial trier of fact. Again, we may stipulate that when the mind under study belongs to one of these beneficent actors, the greater its cognitive capacity, the better for social welfare.

But surely the *dramatis personae* of evidentiary process consists of more than just disinterested witnesses and impartial fact finders. After all, what about the “bad actor”<sup>27</sup> of evidentiary process—the one who cogitates about evasion, who ruminates on deceit, who deliberates about how to break the law without a trace; the one who lies under oath,<sup>28</sup> alters phone logs,<sup>29</sup> shreds key documents?<sup>30</sup> We well

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<sup>27</sup> Oliver W. Holmes, *The Path of the Law*, 10 HARV. L. REV. 457 (1897) (proposing that the law be analyzed from the perspective of the “bad man”). See also Charles R. Nesson, *Incentives to Spoil Evidence in Civil Litigation: The Need for Vigorous Judicial Action*, 13 CARDOZO L. REV. 793, 795, 805 (1991) (advocating Holmes’ “bad man” approach in the context of evidentiary process, and more specifically the law regulating evidentiary foul play).

<sup>28</sup> E.g., *Margo v. Weiss*, 213 F.3d 55 (2nd Cir. 2000) (Sanctioning plaintiffs for lying in their affidavit regarding the timing of their claim); *Jones v. Clinton*, 36 F.Supp.2d 1118, 1121-1125 (E.D.Ark.1999) (Finding that President Clinton lied under oath).

<sup>29</sup> See, e.g., *Superceding Indictment, U.S. v. Stewart*, S1 03 Cr. 717 (MGC) at 12-13 (SDNY 2003) (charging *inter alia* that domestic icon, Martha Stewart altered, but then restored, phone logs and that Stewart’s broker Peter Bacanovic altered customer worksheets.)

<sup>30</sup> See, e.g., Kurt Eichenwald, *Andersen Misread Depths of the Government’s Anger*, N.Y. TIMES, March 18, 2002 (describing former accounting firm Arthur Andersen’s shredding of documents relating to investigation of accounting practices relating to Enron’s special purpose entities); *Indictment, U.S. v. Arthur Andersen, LLP*, Case No. CRH-02-121 (S.D. Tex. Mar. 7, 2002).

understand the archetype of the evil genius.<sup>31</sup> Then, too, we should understand that when the individual puts her mind to fabricating an air-tight alibi, covering up a paper trail, or obfuscating clear of her opponent's burden of proof, her cognitive limitations are a boon for system function.<sup>32</sup>

The perfect mind, after all, effortlessly constructs the perfect lie, anticipating much of cross examination.<sup>33</sup> It easily comprehends the constellation of evidence that is likely to be available to the other side, and weaves its lie through these fixed objects with agility. Even when a question is unanticipated, the perfect mind spontaneously and consistently extrapolates in a manner consistent with both its own prior statements and other available evidence.

Needing no notes to keep straight the details of its illicit plan, the perfect mind leaves no evidentiary trail of documents, records, and other "cognitive artifacts."<sup>34</sup> Even when the perfect mind must resort to making records, it remembers if and where the records are stored, it keeps straight whether and where any copies were made, and it comprehensively erases these evidentiary traces of its activities—without then leaving additional traces of the erasure.

The limited mind, in contrast, has difficulty thinking more than several steps ahead in anticipating the give and take of cross examination. It pauses to answer the questions it has failed to foresee as it attempts to calculate what kind of answer will be both consistent with prior testimony and also unlikely to lead to yet

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<sup>31</sup> See, e.g., MARY W. SHELLY, *FRANKENSTEIN* (1818); Sir Arthur Conan Doyle, *The Final Problem*, in *THE COMPLETE SHERLOCK HOLMES*, 422 (Gramercy ed. 2002) (Says Sherlock Holmes of Professor Moriarty:

“a man of good birth and excellent education, endowed by nature with a phenomenal mathematical faculty. At the age of twenty-one he wrote a treatise upon the binomial theorem, which has had a European vogue. On the strength of it he won the mathematical chair at one of our smaller universities, and had, to all appearances, a most brilliant career before him. But the man had hereditary tendencies of the most diabolical kind. A criminal strain ran in his blood, which, instead of being modified, was increased and rendered infinitely more dangerous by his extraordinary mental powers.”

<sup>32</sup> Chris Sanchirico *Relying on the Information of Interested—and Potentially Dishonest—Parties*, 3 AM. L. & ECON. REV. 320, 329 (2001), Chris Sanchirico, *Games, Information and Evidence Production: With Application to English Legal History*, 2 AM. L. & ECON. REV. 342, 348 (2000), Chris Sanchirico, *Enforcement by Hearing: How the Civil Law Sets Incentives* (Colum. Econ. Dept. Discussion Paper No. 95-9603, 1995) (first circulated version of Sanchirico, *Relying* and Sanchirico, *Games, supra*), and ALBERT VRIJ, *DETECTING LIES AND DECEIT: THE PSYCHOLOGY OF LYING AND THE IMPLICATIONS FOR PROFESSIONAL PRACTICE* 210, 212, 215 (2000).

A similar point might be made about other “bads,” including coordination problems (see discussion at *infra* note 188 regarding witness exclusion) and uncertainty (see Chris Sanchirico, *Evidence Tampering*, DUKE L. J. (forthcoming 2003) (manuscript at Part V, on file with author).

<sup>33</sup> The following paragraphs summarize the body of the paper; supporting citations are omitted here.

<sup>34</sup> See, e.g., Donald A. Norman, *Cognitive artifacts*, in *DESIGNING INTERACTION* 20, (John M. Carroll, ed. 1991) (“A cognitive artifact is an artificial device designed to maintain, display, or operate upon information in order to serve a representational function.”). But see Edwin Hutchins, *Cognitive Artifacts*, in *MITECS: THE MIT ENCYCLOPEDIA OF THE COGNITIVE SCIENCES* (Frank Keil Robert Wilson, ed., 1999) (“There is no widespread consensus on how to bound the category ‘cognitive artifacts.’ The prototypical cases seem clear, but the category is surrounded by gray areas consisting of mental and social artifacts, physical patterns that are not objects, and opportunistic practices.”)

another difficult question. The limited mind quickly fatigues, wherein its attention and working memory become woefully impaired. Late in the day, deep into the deposition, it cannot remember the details of the answer it gave to a sneakily similar question five hours earlier. Rehearsal is an intense, time-consuming, and doubtful solution. The limited mind, unable to fully anticipate the questions it will face, is equally unable to target preparatory effort. What it ultimately decides to rehearse, it is slow to learn and quick to forget.

In the process of perpetrating its crime, tort, or breach, the limited mind takes copious notes to help it pay attention, to help it comprehend, to help it remember what to do next and what to say to whom. It forgets that these notes exist. It fails to keep straight the genealogical tree by which these notes are duplicated and passed along to exponentially growing numbers of others. If it takes notes about these notes, it loses track of these as well. In the end, it avoids exposing itself to the limitations of its unaided ability only by exposing itself to discovery of the devices it uses to free itself therefrom.

In terms of the social objectives of evidentiary process, the fact that humans are of limited cognitive capacity has several positive implications ranging along the timeline from *ex ante* to *ex post*. Furthest *ex post*, after evidence has been presented, it means that liars are more frequently caught in their lies. To the extent that one views truth finding *per se* as an ultimate objective of evidentiary process, this is in itself a positive effect.

Medially *ex ante*, at the time when parties and witnesses are choosing what evidence to prepare and present, it means that those who might choose to lie if they thought they could get away with it, choose instead to be truthful. To the extent that a lie might still have been successful, this too enhances the accuracy of fact-finding. And even to the extent that the lie would not have been successful anyway, this saves the incremental cost of exposing, prosecuting, and punishing its perpetration.

But perhaps the most important positive effect of cognitive shortcomings resides even farther toward the *ex ante* end of the timeline.<sup>35</sup> This is the effect on the choices that people make well

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<sup>35</sup> The author has elsewhere expressed the view that evidentiary process is too frequently analyzed in terms of its effect on truth finding *per se* and too rarely in terms of its direct effect on primary activity incentives. See generally Chris Sanchirico *Relying on the Information of Interested—and Potentially Dishonest—Parties*, 3 AM. L. & ECON. REV. 320 (2001) (modeling evidence production in terms of its effect on the incentive to comply with the law in the primary activity, while also accounting for the incentive to fabricate and destroy evidence); Chris Sanchirico, *Games, Information, and Evidence Production: With Application to English Legal History* 2 AM. L. & ECON. REV. 342 (2000) (extending the model in Sanchirico, *Relying*); Chris Sanchirico, *Character Evidence and the Object of Trial*, 101 COLUM. L. REV. 1227 (2001)

before the rare prospect of litigation arises, choices they make on a daily basis, on the job, in the conduct of business, in the ordinary course of their personal lives. These are the individuals' "primary activity" decisions and they implicate the law of tort, contract, commercial law, corporate law and every other substantive law field.

Faced with the prospect of legal penalties and motivated by the desire to avoid them, the hypothetical perfect mind and the actual limited mind make very different choices in the primary activity arena. Each chooses between two costly and imperfect means of avoiding the penalties. One option is to incur the cost of complying with the substantive law, thus reducing the chance of legal sanction by attacking the possibility of penalty at source. The other course of action is to ignore the costly dictates of the substantive law and focus instead on precluding or erasing evidence of noncompliance. The perfect mind, because it is more likely to succeed at evidentiary evasion at lower cost in terms of money, time, and effort, is more likely to choose cover-up over compliance. The limited mind, to the extent that it at least is cognizant of the fact that it is limited, more likely finds compliance, rather than evasion the most cost effective means of avoiding legal penalties.

Thus it is that, buried beneath a mountain of scholarship cataloguing and substantiating the foibles of sincere witness memory and fact finder decision making, and drowned out by the dialogue between lawyer-psychologists and lawyer-economists about whether it is appropriate to analyze law as if its subjects were perfectly rational, lies a fundamental, and fundamentally distinct, point about the implications of cognitive imperfection for law as a whole. On the isthmus of evidentiary process—over which every substantive field of law must pass on its way from paper rule to real effect—the big story is not that law is hampered by cognitive imperfection, nor even that it has “adapted”<sup>36</sup> to human error, but rather that the law relies upon mental limitations, that it exploits cognitive shortcomings, and that it would not function nearly as well were humans truly perfectly rational.<sup>37</sup>

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(arguing that character evidence rules are best explained and evaluated according to their effect on primary activity incentives rather than truth finding); Chris Sanchirico, *Evidence Tampering*, DUKE L. J. (forthcoming 2003) (manuscript at Parts I, IV, and V, on file with author) (arguing that the law's regulation of perjury, obstruction, evidence destruction and the like is more fruitfully analyzed from a primary activity perspective). See also Chris Sanchirico & George Triantis, *Evidence Arbitrage: The Fabrication of Evidence and the Verifiability of Contract Performance* (UVA L. & Econ. Research Paper No. 02-17, 2002) (arguing that contracting parties will not necessarily design contracts to maximize the “verifiability” of performance).

<sup>36</sup> See, e.g., 1A JOHN HENRY WIGMORE, *EVIDENCE IN TRIALS AT COMMON LAW* §58.2 (Tillers rev. 1983) (justifying restrictions on character evidence essentially as an adaptation to the jury's tendency to give such evidence too much weight); Jeffrey J. Rachlinski, *A Positive Psychological Theory of Judging in Hindsight*, 65 U. CHI. L. REV. 571, 575 (1998) (“The law has adapted well to the fallibility of human judgment.”); Jeffrey J. Rachlinski, *Heuristics and Biases in the Courts: Ignorance or Adaptation?* 79 OR. L. REV. 61, 70 *et seq.* 85 *et seq.* (2000) (partial adaptation to hindsight bias and representativeness heuristic).

<sup>37</sup> At first glance, this assertion may seem susceptible to the following objection: Were humans perfect information processors, human fact finders would be perfect as well. In that case, fact finders would

Parts I-V analyze testimonial evidence.<sup>38</sup> Part VI, real evidence. The treatment of each topic is informed by the primary and secondary objects of the article. With regard to the primary object, the discussion in each case describes the manner in which the law makes use of the cognitive limitations of the potentially insincere. Regarding the article's second objective, each treatment also discusses how the law of evidentiary process tilts the playing field of litigation so as to amplify the cognitive limitations of the potentially insincere and soften the limitations of competing participants. Part VII concludes.

## I. The Test of Testimony: Necessity

A first cut etymology of the word “testify” turns up two potential derivations, each evoking a very different picture of testimony. One derivation traces *testi-* to the Italic roots *tres*, meaning three, and *stare*, meaning stand.<sup>39</sup> In the image of testimony thus drawn, a “third party stands by”<sup>40</sup> to recount her observations of the event or condition at issue. The party’s “thirdness,” of course, represents her

infallibly detect crimes and wrongs. Therefore, one cannot say that imperfection is a boon for system design. However, this objection does not survive careful scrutiny.

First, it conflates perfect information *processing* with perfect information. Perfect rationality does not imply omniscience. One can make a perfectly rational decision with limited information, and an irrational decision with perfect information. Analogously, an ideal computer with an infinite hard drive, infinite RAM, and an infinitely powerful CPU may still have no data. More to the point, the literature on cognitive error and law to which I am responding bemoans not a lack of information per se, but a lack of information processing capacity.

Were perfect information processing packaged with perfect information, the combination might well be unbeatable for evidentiary process. But a world in which all actors are only perfectly rational—not also omniscient—is far from ideal. In this case, the competition between the perfect fact finder and the perfect evidentiary bad actor turns largely on who has the informational advantage. This is likely to be the latter. When, for example, the perfectly rational criminal goes up against the perfectly rational detective, who wins? Probably the perfectly rational criminal, who commits the crime specifically so as to put the detective at an informational disadvantage.

On the other hand, in a world where humans are *imperfect* information processors, any informational advantage of the bad actor is overwhelmed by the limitations on her information processing capacity, combined with the manner in which the playing field is tilted to mitigate the information processing problems of the investigator and exacerbate those of the criminal. *See infra* Part V (discussing how the playing field of litigation is tilted).

The second problem with this objection is that it does not take into account the role of imperfection in *erasing* the bad actor's natural informational advantage. There are at least two respects in which this erasure occurs. First, the imperfection of human information processing leads to the creation of cognitive artifacts to aid in cognition. These may later become unfavorable evidence. *See infra* Part VI.A. Second, the imperfection of human information processing also leads humans to fail to comprehensively and cost effectively destroy or preclude the creation of unfavorable evidence—cognitive artifact or no. *See infra* Part VI.B.

<sup>38</sup> A more detailed outline of Parts I-V is provided at the end of the introduction to Part I at p 11 .

<sup>39</sup> *See, e.g.,* WEBSTER'S THIRD NEW INTERNATIONAL DICTIONARY, UNABRIDGED. Etymological references in this source for the word “testify” refer the reader to the entry for “testament,” which reads in part: “[L]atin] *testis* akin to Oscan *trstus* witnesses; both fr[om] a prehistoric Italic compound whose first and second constituents respectively are akin to L[atin] *tres* three and to L[atin] *stare* to stand; from the witness standing by as a third party in a litigation.” *Accord, OXFORD ENGLISH DICTIONARY, UNABRIDGED.*

<sup>40</sup> WEBSTER'S at “testament.”

lack of personal interest in what is done with the information she offers, and thus her lack of incentive to offer anything but the truth.

An alternative and seemingly more straightforward etymology links “testimony” to the word “test,” which in turn derives from the Latin *testum*, a clay vessel or bowl in which metals were heated to determine their true nature.<sup>41</sup> Unlike the third party in *tres-stare*, the party standing by here is hardly disinterested in how her offer is received, having much to gain if the metal she is tendering is taken to be gold. Realizing this, and unable to discern gold from lead at room temperature, the tenderee “puts” the metal “to the test,” heating it to the point where gold’s otherwise invisible chemistry emits telltale signs.<sup>42</sup>

Further investigation reveals that the first derivation, *tres-stare*, is the accepted one. In fact, no connection between “testify” and “test,” in the sense of *testum*, appears in any of the common etymological references.<sup>43</sup> Were etymological alignment the touchstone for external validity, therefore, the existing law review literature applying cognitive psychology to the topic of witnesses would be well positioned. That literature is similarly disposed towards viewing testimony in terms of “third parties standing by.”<sup>44</sup> Research on eyewitness fallibility, which constitutes by far the largest wedge in the research pie chart,<sup>45</sup> is self-consciously focused on a species of witness having no personal stake in the outcome of the suit.<sup>46</sup> Similarly, the literature on witness preparation emphasizes above all

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<sup>41</sup> See, e.g., WEBSTER’S at “test” (“ME, vessel in which metals were assayed...fr[om] L[atin] *testum* earthen vessel; akin to L[atin] *testa* piece of burned clay, earthen pot, shell.”).

<sup>42</sup> The *testum* appears to have been used to separate different metals composites as much as to test their composition.

<sup>43</sup> See, e.g., WEBSTER’S at “testify” and “testament.” *Accord* OXFORD ENGLISH DICTIONARY. It seems doubtful that the word “testify” is completely unrelated to the word “test,” taking into account the likely melding and misspelling along the way from ancient root to modern usage. I will, nonetheless, leave resolution of that issue to linguists.

<sup>44</sup> See, e.g., Deborah Davis & William C. Follette, *Faibles of Witness Memory for Traumatic/High Profile Events*, 66 J. AIR L. & COM. 1421, 1435 (2001) (providing an extensive up-to-date survey of research on eyewitness fallibility, citing hundreds of articles and scores of results, and yet stating in its introduction that “Throughout the article, the discussion will be confined to sources of unintentional errors.”). More specifically, *see id.* at 1434. (describing the extensive research comparing witness confidence and witness accuracy: “the research ...was conducted with eyewitness accounts of crimes, persons, and events that did not directly involve them. Thus, the witnesses were uniformly free from any personal involvement or motivation that might promote false accounts.”)

<sup>45</sup> Landsman *Reforming* at 550n8 (“[disinterested] eyewitnesses have been the subject of the most extensive judicial comment and psychological study. The reason for our preoccupation with eyewitnesses is not entirely clear...For whatever reason, the literature on eyewitnesses is by far the most abundant, detailed and sophisticated.”)

<sup>46</sup> This literature sometimes defends its focus on disinterested witnesses by pointing to the importance of eyewitnesses in general. See, e.g., Thomas Tomlinson, M., *Note: Pattern-Based Memory and the Writing Used to Refresh*, 73 TEX. L. REV. 1461, 1473 (1995). (“Testimony of eyewitnesses has always been an important part of the American legal system. Indeed, this source of evidence has long been cited as the most powerful and persuasive influence in a jury trial.”). Of course, an eyewitness may well be interested in the outcome of the suit.

others the danger of subconsciously corrupting impartial, well-meaning witnesses.<sup>47</sup>

Yet whatever the mutual alignment between the etymology and the existing literature, both are out of line with the reality of evidentiary process in its modern manifestation. While “testimony’s” etymology may fairly describe the institution’s earliest historical manifestations, today, the false etymology is the truer metaphor. Modern testimony is, and has been for some time, more akin to testing metal than tallying third party accounts.<sup>48</sup>

Like the bulk of evidentiary process,<sup>49</sup> most of this article is devoted to the test that is testimonial evidence. This Part I locates the necessity for testing witnesses in the unhappy fact that those with information to offer tend to also have interests at stake. Part II describes alternative test designs, settling on the importance of a test that is scored in terms of certain characteristics of the testimony’s semantic content. Parts III and IV detail the crucial role played in this test by the limits of human cognitive capacity. Specifically, Part III treats the exercise of preparing for testimony; Part IV, the performance of testifying. All told, Parts I through IV comprise the article’s application to testimony of its first theme—the instrumental role of cognitive limitations. The discussion of testimony concludes in Part V with application of the article’s second theme: the manner in which the law tilts the playing field of litigation to maximize the impact of cognitive limits on the insincere witness and minimize the same for sincere witnesses, opposing attorneys, and fact finders.

### ***A. Correlation Between Knowledge and Interest***

The first parallel between metal testing and modern testimony is that modern witnesses frequently have an interest in how their offer is

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<sup>47</sup> Stephen Landsman, *Reforming the Adversary Procedure: A Proposal Concerning the Psychology of Memory and the Testimony of Disinterested Witnesses*, 45 U. PITT. L. REV. 547 (1984) (memory shortcomings in relation to witness coaching); John S. Applegate, *Witness Preparation*, 68 TEX. L. REV. 277 (1989) (same); Bennett L. Gershman, *Witness Coaching by Prosecutors*, 23 CARDOZO L. REV. 829, 838-844 (2002) (memory shortcomings in relation to witness coaching). For an alternative view of witness preparation see Charles Silver, *Preliminary Thoughts on the Economics of Witness Preparation*, 30 TEX. TECH. L. REV. 1383 (1999).

<sup>48</sup> Cf. Roger C. Park, *Adversarial Influences on the Interrogation of Trial Witnesses*, in ADVERSARIAL VERSUS INQUISITORIAL JUSTICE 131, 153-58, 153, 154 (Peter J. van Koppen, Steven D. Penrod ed., 2003). (using the word “test” in a narrower, more literal sense—i.e., as one technique of cross-examination wherein the “examiner quizzes the witness about her knowledge of facts, or puts her perception or expertise to a practical test,” as in the case where an expert doctor is asked “to put the skeleton of the foot into the ankle joint, and put it into the knee joint instead,” or where the seemingly illiterate witness who claims to have kept a log is asked to write something down.)

<sup>49</sup> Regarding trial, see 2-12 FEDERAL EVIDENCE PRACTICE GUIDE §12.01 (“oral testimony remains the mechanism by which most of the proof in trials is offered and received.”). Regarding the importance of depositions upon oral questions, see THOMAS A. MAUET, PRETRIAL (4th ed. 1996) §6.11 (“depositions [upon oral questions] play a critical role in the discovery plan of virtually every case.”)

received.<sup>50</sup> Ironically, the fact that interested witnesses are ubiquitous follows in large part from the same principles of cognitive psychology that have to date been applied solely to the performance of witnesses who are assumed to be disinterested.

## 1. The Parties Themselves

Were it not for the literature's tight focus on "third parties," it would probably be too obvious to point out that those most often "standing by" to testify are the parties themselves. At least since abrogation in the early 19<sup>th</sup> century of the ancient rule of "disqualification for interest,"<sup>51</sup> testimony by the parties has been a crucial source of information in factual disputes.

In the civil arena, it is hard to imagine a civil suit of substantial size in which both plaintiffs and defendants are not deposed,<sup>52</sup> or a civil suit of *any* size in which the parties, in negotiating a settlement, or the judge, in ruling on summary judgment, do not anticipate that the parties will be called as witnesses, if the litigation survives to trial.

In criminal suits, the situation is different, but only marginally. Although they may choose not to testify,<sup>53</sup> criminal defendants nevertheless often do take the stand.<sup>54</sup> Moreover, victims, whose testimony is often crucial to the prosecution's case, might also be regarded as interested "parties" for the present purpose, given their frequent role as complainants, their psychic interest in retribution, their potential gain from constraining the accused (as in criminal business litigation), and their potential pecuniary interest in issue preclusion in relation to follow-up civil litigation (as in wrongful death suits).

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<sup>50</sup> Roger C. Park, *Adversarial Influences on the Interrogation of Trial Witnesses*, in *ADVERSARIAL VERSUS INQUISITORIAL JUSTICE* 131, 153 (Peter J. van Koppen, Steven D. Penrod ed., 2003) ("Many witnesses are not neutral. Some are biased from the start, without any aid from the trial process. They have an interest in the lawsuit, either as parties, business associates, friends, or family.")

<sup>51</sup> John Langbein, *Historical Foundations for the Law of Evidence: A View from the Ryder Sources* 96 *COLUM. L. REV.* 1168 (1996); J. H. BAKER, *AN INTRODUCTION TO ENGLISH LEGAL HISTORY* 107-108 (1990). But see, MUELLER & KIRKPATRICK, *EVIDENCE* §6.2 (pointing out that Dead Man's Statutes are an "historical remnant of the common law disqualification based on interest.")

<sup>52</sup> See *sources cited infra* at note 274 (establishing that the extent of discovery is dependent on the size of case).

<sup>53</sup> U.S. CONST. amend. V (privilege against self-incrimination); *U.S. v. Echeles*, 352 F.2d 892, 897 (7<sup>th</sup> Cir. 1965 ('universally held' interpretation of this right prohibiting any person who is on trial for a crime from being called to the witness stand), *quoting* 8 *WIGMORE ON EVIDENCE* 406 (Claim of Privilege, § 2268)).

<sup>54</sup> While there appears to be no systematic empirical evidence on this point, some indication of the prevalence of testimony by the accused is implicit in the case law establishing a right *to* testify for criminal defendants. See, e.g., *Brooks v. Tennessee*, 406 U.S. 605, 612 (1972) ("Whether the defendant is to testify is an important tactical decision as well as a matter of constitutional right."); *Rock v. Arkansas*, 483 U.S. 44, 49 (1987) ("[I]t cannot be doubted that a defendant in a criminal case has the right to take the witness stand and to testify in his or her own defense.") Furthermore, there is indeed systematic empirical evidence on the related issue of how often suspects waive their Miranda rights, including the right not to provide the state with evidence of a testimonial nature during custodial interrogation. See, e.g., Paul G. Cassell & Bret S. Hayman, *Police Interrogation in the 1990's: An Empirical Study of the Effects of Miranda*, 43 *UCLA L. REV.* 839 (1996).

Indeed, in many cases, the parties are the *only* witnesses on specific elements or defenses. It is common to assert, for example, that suits arising from alleged sexual offenses display a frustrating “he said, she said” nature with regard to the defense of consent, meaning that the near totality of the evidence on key points consists of one party’s word against another’s.<sup>55</sup> This feature has been regarded as so prevalent in such cases as to justify special evidentiary rules.<sup>56</sup> But, notwithstanding these special provisions, it is difficult to see why the “he said, she said” problem, broadly defined, is not endemic to a much larger array of charges and claims. Examples that come immediately to mind include auto-accidents on deserted roads, contract disputes about agreements reached over the phone, and (non sexual) assaults in dark alleyways.

In fact, the list likely extends well beyond these obvious examples. For it stands to reason that perpetrators will generally go out of their way to avoid committing crimes in public. Likewise, false accusers can generally be expected to script their fabrications out of public view. Cases of “he said, she said,” therefore, seem less like occasional bad luck for the system and more like the manifestation of a natural tendency in the generation of evidence for adjudication. Arguably, it was precisely this tendency—and the resultant vacuum left by precluding the testimony of interested parties—that necessitated the end of “disqualification for interest” in the common law.<sup>57</sup>

## 2. Partisan Nonparties

Notwithstanding the organic centrality of party witnesses, *nonparty* witnesses often do play an important role in fact-finding. But, nonparty witnesses may themselves have an interest in litigation outcomes. Indeed, in many cases these interests are nearly as obvious as those of the parties themselves. Thus, friends or relatives may be called to support the defendant’s alibi.<sup>58</sup> Employees, their

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<sup>55</sup> See, e.g., David Karp, *Evidence of Propensity and Probability in Sex Offense Cases and Other Cases*, 70 CHI-KENT L. REV. 15 (1994) (pointing to “the typically secretive nature of [sex offense] crimes, and resulting lack of neutral witnesses in most cases.”); CONG. REC. H8991-92 (Aug. 21, 1994) (Floor statement of Representative Susan Molinari) (depicting sexual assault cases as “unresolvable swearing matches”).

<sup>56</sup> CONG. REC. H8991-92 (Aug. 21, 1994) (Floor statement of Representative Susan Molinari) (justifying, as principal House sponsor, enactment of FED. R. EVID. 413-415, which allow evidence of similar crimes in sexual assault and child molestation cases)

<sup>57</sup> J. H. BAKER, AN INTRODUCTION TO ENGLISH LEGAL HISTORY 107-108 (1990) (“At common law the testimony of parties and interested persons had been excluded, on the grounds of bias, and this frequently made it impossible to prove a just cause of action or defense.”), *citing* at 108 n93, Lord Coleridge, 57 CONTEMP. REV. at 798 (“Nonsuits were constant, not because there was no cause of action, but because the law refused the evidence of the only persons who could prove it.”). See also Chris Sanchirico, *Games, Information and Evidence Production: With Application to English Legal History*, 2 AM. L. & ECON. REV. 342 (2000) (linking the end of disqualification for interest to increases in labor productivity brought on by the industrial revolution, and to the earlier transformation of the jury from witness pool to impartial fact-finder).

<sup>58</sup> See, e.g., *Murphy v. Bonano*, 663 A.2d 505, 506-508 (1995) (principal nonparty witnesses in domestic dispute were friends and relatives of parties).

careers in the balance, or so they perceive, may testify for their employers.<sup>59</sup> Disgruntled former employees may be keen to blow the whistle on a former boss.<sup>60</sup> Competitors—both business and social—may stand to gain if a particular party loses the case.<sup>61</sup> Co-conspirators may cooperate in return for a favorable deal with prosecutors.<sup>62</sup>

In fact, as with “he said, she said” suits, the prevalence among non party witnesses of those with evident interests is probably also no coincidence. To be useful in illuminating the underlying event or condition, a witness has to have been present and paying attention.<sup>63</sup> Neither characteristic is randomly determined. To the extent that location is volitional, the physical presence of a witness will tend to indicate that she has a connection to the parties or an interest in what has allegedly transpired. With regard to mental presence, cognitive psychology has long analogized attention to a scarce resource that humans carefully budget.<sup>64</sup> In the same vein, when we say that we “pay” attention, presumably it is implicit that the payment comes from a source of cognitive funds that is hardly infinite. It follows— theoretically and experimentally—that those who are not just physically present, but also mentally aware will tend to have a reason to so allocate their attention.<sup>65</sup>

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<sup>59</sup> See, e.g., *Banker’s Trust Co. v. Publicker Industries, Inc.*, 641 F.2d 1361, 1363 (2<sup>nd</sup> Cir. 1981) (Vice president of investment bank is its “principal witness” in action to recover finder’s fees for sale of client corporation’s divisions).

<sup>60</sup> See, e.g., *Capellupo v. FMC Corp.*, 126 F.R.D. 545, 546 (D. Minn. 1989) (employee attempts to gather evidence for gender-based discrimination suit against employer); *Steffan v. Cheney*, 920 F.2d 74 (D.C. Cir. 1990) (ex naval officer sues over constructive discharge for admitted homosexuality).

<sup>61</sup> See, e.g., *JOEL BRINKLEY & STEVE LOHR, U.S. V. MICROSOFT 4-5* (2001) (describing role of competitor Netscape in instigating Justice Department suit against Microsoft).

<sup>62</sup> See, e.g., *U.S. v. Henry*, 325 F.3d 93, 104 (2<sup>nd</sup> Cir. 2001) (unindicted co-conspirator testifies for government).

<sup>63</sup> See, e.g., Davis & Follette, *Foibles of Witness Memory*, at 1441, 1445:

It has been demonstrated in countless areas of research and is uncontested among psychological researchers that: (a) memory follows the focus of attention, such that what is most focused on will be remembered better; and (b) that memory is a function of the amount of attention devoted to a particular event or object. Memory is better for any object or event where more attention is devoted to it. This includes both the quality of attention (concentration, lack of distraction) and/or the duration of attention. Events that are not attended to will be poorly remembered, if at all. Further, features of an event that are not well attended to will be remembered poorly. Thus, anything about the event, the conditions under which it is witnessed, or the state of those witnessing it that reduces either the amount or the quality of attention to it will also impair memory.

<sup>64</sup> Kahneman *supra* note 7.

<sup>65</sup> See, e.g., Davis & Follette, *Foibles of Witness Memory*, at 1449:

Attention is naturally drawn to things relevant to one’s own personal interests, goals, or current concerns... When planning to buy a car, for example, one tends to notice different makes and models in parking lots, car ads on TV, and other relevant information where it is encountered. If cars are not of concern, such information is either not noticed at all or not deeply processed. The world is generally filtered through the lens of our own interests and needs.

Viewed in this light, then, it is no coincidence that the defendant's husband was the one who witnessed her comings and goings on the day of the murder. Nor that the person who witnessed the accident from the passenger seat of the plaintiff's car was the plaintiff's son.<sup>66</sup> Nor that the executives of the company are the ones who know the most about the allegedly illicit plan to derail competitors.<sup>67</sup> Nor that the defendant's partner in crime understands the complicated scheme for insurance fraud.<sup>68</sup> Nor that the defendant was sleeping with the daughter of the acquaintance who turned him in.<sup>69</sup> Nature does not draw nonparty witnesses like lottery balls. Rather, the natural choice of witnesses exhibits a severe "selection bias" toward those who care about the outcome of the resulting law suit.

It is worth pausing to emphasize that the cognition and evidence literature has a somewhat ironic relationship to the attention costs that help produce this selection bias. This literature has repeatedly pointed out that such attention costs are an important source of the *cognitive* biases exhibited by the purely disinterested witnesses that it studies.<sup>70</sup> Yet these same attention costs call into question that literature's relevance. The experimental results in this literature are rife with episodes in which disinterested subjects fail to pay attention.<sup>71</sup> By one interpretation, the central message of these results is that people remember surprisingly little of what occurs right before their eyes when such events do not concern them personally. By contrapositive logic, then, the cognition and evidence literature must also be saying that if a witness *did* pay enough attention to have real information to offer in the present case, that witness is probably not at all like the subjects of its own experiments.

### 3. Truly Impartial Witnesses

An apologist for the existing literature's tight focus on disinterested witnesses might respond that despite these tendencies toward

<sup>66</sup> See, e.g., *Degelos v. Fidelity & Casualty Co.*, 313 F.2d 809 (5th Cir. 1963) (similar facts).

<sup>67</sup> See generally *JOEL BRINKLEY & STEVE LOHR, U.S. V. MICROSOFT* (2001).

<sup>68</sup> See, e.g., *United States v. Sheffield*, 55 F.3d 341, 342 (8th Cir. 1995) ("the government's prime witness ... described negotiations with [the accused] in which [the accused] told him he would report the car as stolen and collect on his insurance and requested [the witness] to dispose of the car for an amount equal to the deductible on his insurance policy.").

<sup>69</sup> *U.S. v. Rinke*, 778 F.2d 581 (10th Cir. 1985) (similar facts).

<sup>70</sup> See, e.g., *Davis & Follette, Foibles of Witness Memory*, at 1451. ("Try as we may to focus our attention undisturbed, it is nevertheless vulnerable to distraction by both internal and external forces."); *Id.* at 1447-1448. ("The amount of information in the environment exceeds the limits of our attentional resources, a situation that forces attention to selectively focus on some features of the situation and to neglect others.").

<sup>71</sup> *Landsman, Reforming*, at 550 n8:

a troubling oversight...in the eyewitness literature is its failure to consider possible distinctions between interested and disinterested observers. This failure may be nothing more than an error of omission because most studies appear to focus exclusively on disinterested witnesses. The absence of discussion of the interest factor, however, is ground for some concern because observer interest or bias might have a substantial impact on experimental results.

partiality, truly disinterested witnesses do make an appearance in modern evidentiary process.<sup>72</sup> Moreover, when they do, the apologist might continue, they have a disproportionately powerful impact for the fact of their impartiality.<sup>73</sup>

Two remarks deflate this otherwise compelling response. First, it must be pointed out that the shrunken territory of relevance to which this response retreats is wildly out of proportion to the great estate held by the disinterested witness in the literature on cognition and evidence. However important the role played by disinterested witnesses in the case that they exist, interested witnesses must by process of elimination be playing the same important role in the far more frequent case in which disinterested witnesses are nowhere to be found. Yet it is the interested witness who is virtually nowhere to be found in the literature on cognition and evidence.

Second, although it must surely be true that not all witnesses are interested in fact, it is just as obvious that we cannot tell who these witnesses are merely by looking at them. Self-interest, as complicated and unfathomable as the web of business and social relationships that tie society together, is not always readily apparent. And we cannot expect the covertly biased witness to help us trace her connections to the suit. If we accept the apologist's premise that apparent impartiality magnifies testimony's import, we must also accept the implication that witnesses will have a strong incentive to appear impartial when in fact they are not.

The literature on cognition and evidence populates its experiments with witnesses whose impartiality is a given by experimental design. But in the real world, wherein we cannot trust our ability to pick the truly disinterested witness out of the crowd, there is good reason to treat every witness as partial, even if we have no specific evidence that she is so. The same dynamic that produces selection bias in favor of self-evidently interested witnesses, as discussed above, also suggests that even witnesses lacking apparent bias will tend to have hidden interests. The fact that the witness was present and paying attention serves to indicate that her interests were aroused by the underlying event or condition. Indeed, the more proximate the witness's physical and mental presence, the greater also her likely interest in the fact finder's decision. Thus, paradoxically, the witness's very utility is some indication of her partiality.

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<sup>72</sup> Elizabeth F. Loftus, *EyeWitness Testimony: Psychological Research and Legal Thought*, in 3 CRIME AND JUSTICE: AN ANNUAL REVIEW OF RESEARCH 105, 128-32 (Michael Tonry & Norval Morris eds., 1981).

<sup>73</sup> Davis & Follette, *Foibles of Witness Memory*, at 1430 ("Jurors tend to believe that witness testimony (particularly that of uninterested witnesses) is accurate.").

Consequently, while it must be true that not all witnesses are actually interested, the best position is that all witnesses should be treated as if they are. Thus, the focus of the cognitive psychology literature on witnesses who are axiomatically impartial is not merely incomplete, but—in this particular, yet practical sense—completely inapplicable.

#### 4. Impeachment for Bias

This account of rampant partisanship may seem too cynical. But existing scholarship notwithstanding, cynicism has long been the position taken in existing law. As early as 1836, in the case of *Thomas v. David*,<sup>74</sup> it was not even in contention that defense counsel could ask the plaintiff's witness, his "female servant," "whether she did not constantly sleep in the same bed with her master."<sup>75</sup> Rather, the issue in that case was whether the defense counsel could offer an additional witness to contradict her when she denied the relationship.<sup>76</sup> In holding that defense counsel could so proceed, the court gave some indication of prevailing views in the early 19<sup>th</sup> century on the centrality of bias impeachment:

the question is, whether the witness had contracted such a relation with the plaintiff, as might induce her the more readily to conspire with him to support a forgery, just in the same way as if she had been asked if she was the sister or daughter of the plaintiff, and had denied that.<sup>77</sup>

One hundred and fifty years later, the U.S. Supreme Court established that the common law tradition of allowing bias impeachment—apparently already in force by the time of the *Thomas* case just referred to—would carry forward under the then pubescent Federal Rules of Evidence. In *U.S. v. Abel*<sup>78</sup> the Court approved of allowing the prosecutor to impeach the accused's exonerating witness by showing that both the witness and the accused belonged to a secret organization, the "Aryan Brotherhood,"<sup>79</sup> whose members pledged to aid each other by any means necessary, including lying. As a further signal of the importance placed on bias impeachment, the court also carried forward the *Thomas* rule, by that time well-ensconced in practice,<sup>80</sup> that the subject witness's bias may be "proved by extrinsic evidence,"<sup>81</sup> as it is now said. Thus, the impeaching party may proffer secondary witnesses (as in *Thomas*) or

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<sup>74</sup> *Thomas v. David*, 7 Car. & P. 350 (1836).

<sup>75</sup> *Thomas*, 7 Car. & P. at 350 (1836).

<sup>76</sup> *Thomas*, 7 Car. & P. at 351 (1836).

<sup>77</sup> *Thomas*, 7 Car. & P. at 351 (1836).

<sup>78</sup> *United States v. Abel*, 469 U.S. 45 (1984).

<sup>79</sup> *Abel*, 469 U.S. at 47 (1984).

<sup>80</sup> *Abel*, 469 U.S. at 51 (1984).

<sup>81</sup> With regard to a specific witness's testimony "extrinsic evidence" is evidence sourced from outside the four corners of that testimony (inclusive of cross examination), such as evidence presented in the form of testimony from another witness or in the form of documents or things. GRAHAM C. LILLY, AN INTRODUCTION TO THE LAW OF EVIDENCE (3<sup>rd</sup> ed. 1996) § 8.2 at 389.

non-testimonial evidence, for the purpose of showing that the subject witness has an interest in the outcome of the suit. Such extrinsic evidence of bias is allowed even though it will often have the effect of lengthening trials and discovery to cover “collateral” matters not directly related to the historical merits of the case. This is so even though, in principle, allowing impeachment on collateral matters opens up the potential for an infinite regress wherein bias witnesses are similarly collaterally impeached and so on.<sup>82</sup> Other forms of impeachment—by prior inconsistent statements, by contradiction, or by character for untruthfulness—are generally not so favored.

That said, unimpeded impeachment for bias can no more fully illuminate witness interests than testimony itself can fully illuminate the facts of the case. And thus even after the opposing party has given this form of impeachment its best shot, the bare fact of attention and presence remain informative of the existence of still hidden interests. The witness who has not been successfully impeached in fact, is not necessarily unimpeachable in principle.

Nor does impeachment cleanse the system of the ill effects of the biases that it does uncover. Even strong bias proven beyond a reasonable doubt does not render the witness “incompetent” to testify.<sup>83</sup> Rather, she continues to testify and the evidence of her bias is merely data for interpreting her testimony. Why this should be and how anything can be gleaned about the case from a biased witness are questions to which we now turn.

### ***B. The Need for Some Test***

The second parallel between metal testing and modern testimony follows from the first. The fact that witnesses who have information to offer often also have an axe to grind means there is no easy solution to the problem of interested witnesses. In particular, excluding testimony absent a preliminary showing that the witness is impartial is probably a nonstarter. The correlation between knowledge and interest implies that excluding interested witnesses would substantially reduce the information flow from testimony.<sup>85</sup> Maintaining an acceptable level of enforcement would then require

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<sup>82</sup> *The Attorney-General v. Hitchcock*, 1. EX. 91, 96 (1847) (impeachment on collateral matters “would render an inquiry which ought to be simple, and confined to the matter in issue, intolerably complicated and prolix, by causing it to branch out into an indefinite number of collateral issues.”). Rules like FED. R. EVID. 403, under which relevant evidence may be excluded for considerations of undue delay, would no doubt end the madness here.

<sup>83</sup> See, e.g., FED. R. EVID. 601 advisory committee’s note (“Included among the grounds [for incompetence] thus abolished [by Rule 601] are...connection with the litigation as a party or interested person or spouse of a party or interested person. With the exception of the so-called Dead Man’s Acts, American jurisdictions generally have ceased to recognize these grounds.”).

<sup>85</sup> See *supra* note 57.

tapping into substitute sources of information. But what would those sources be? Mounted camcorders? On the margins—in train stations, at ATMs, at stop lights—this substitution may well be occurring.<sup>86</sup> But the recording device that is human perception and memory, however imperfect, would be difficult completely to replace. Human camcorders may not as reliably record what they focus on. But they are by definition present where human conduct occurs. They swivel and focus on unusual human activity. They are good judges of what *is* unusual. They automatically edit down the recording to the features of special interest to human kind. Mounted on legs, rather than walls, their presence is unsettlingly unpredictable to the would be wrongdoer.<sup>87</sup> Matching that kind of ubiquitous, yet selective coverage with electronic substitutes would be extraordinarily expensive, perhaps beyond our current technical capacity, and in many respects normatively unpalatable. In any event, given that electronic substitutes are not, and could never be tamper-free,<sup>88</sup> it is not clear to what extent the playback of a camcorder recording is more likely to be “sincere” than the play back of human memory.

Thus, the correlation between knowledge and interest makes it worth examining whether there is acceptable way to work with interested witnesses, making use of their relative ubiquity, extracting as much real information from them as we can. We thus arrive at the following question: when an evidently or potentially self-interested witness comes forward offering to relate to us the content of her memory, how can we judge whether that offer is genuine? The answer is again provided by our metal testing metaphor. Finding ourselves in the same position as the skeptical tenderer of supposed “gold,” we do just as she does. We devise a test.

## II. The Test of Testimony: Design

Any test has three basic elements: a set of *unobservable*<sup>89</sup> characteristics, features of ultimate interest whose invisibility necessitates the test in the first place; a set of *observable test outcomes*, which are, by choice, discernible to the tester; and an *associative mechanism* by which

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<sup>86</sup> See, e.g., Sabrina Tavernise, *Watching Big Brother; On This Tour, Hidden Cameras Are Hidden No More*, N.Y. TIMES, B1 (January 17, 2004) (describing the plethora of private hidden surveillance cameras in the Greenwich Village neighborhood of New York City)

<sup>87</sup> On the value of unpredictability in evidentiary process, see Sanchirico, *Evidence Tampering*, DUKE L.J. (forthcoming 2003) (manuscript at Part V, on file with author).

<sup>88</sup> Chris Sanchirico, *Games, Information and Evidence Production: With Application to English Legal History*, 2 AM. L. & ECON. REV. 342, 348 (2000) (“Any photo can be doctored, any video can be staged. Technological advance is Sisyphean in this regard: the understanding required to invent each new technology of “proof” is likely sufficient to artfully manipulate it.”)

<sup>89</sup> The term “observable” is used throughout this article to mean “evident to the any of the senses.”

differences in unobservable characteristics predictably manifest in differences observable test outcomes.

In our metal testing metaphor, for example, the unobservable characteristic is the chemical composition of the tendered metal. The observable test outcome concerns how the metal behaves before the naked eye under extreme temperatures. And the principles of thermochemistry provide the associative mechanism linking atomic structure to behavior in the heated bowl.

For the test of testimony, the unobservable characteristic of interest is reasonably clear: the relevant content of the witness's long term memory. But the other test components are not so obvious. Regarding observable test outcomes, we know that these must revolve around the witness' performance "before" the fact finder.<sup>90</sup> Yet, the kind of performance that should be required, the aspects of that performance that ought to be monitored, and how these ought to be judged requires further analysis. Regarding the associative mechanism, this must be simultaneously identified along with the observable test outcome. Their association with unobservable characteristics is what justifies observing observable test outcomes.

This article takes the position that the observable outcome of the test of testimony resides chiefly in the semantic content of the witness's account, and, in particular, in the tension between detail and consistency. This is justified with an associative mechanism that relies heavily on the fact that the human cognitive capacity is limited. But before describing how such a test might work—and the important role played therein by cognitive imperfection—it is worthwhile running through a number of alternative tests designs that fall short of what is required. Each example, by the problems that result from its lack of particular test qualities, will concretely illustrate the necessity of these qualities.<sup>91</sup> In addition, the observation that these alternatives taken together fall short of what is needed will point toward the necessity of another form of test. In the space thus cleared, we will locate the interplay among detail, consistency and cognitive imperfection.

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<sup>90</sup> I mean to define the preposition "before" broadly to include other statements by the individual that may be admissible for some purpose. See *infra* Parts III.E and IV.B.3.

<sup>91</sup> The analysis will draw on the notion of "costly signaling" as introduced into economics by MICHAEL SPENCE, MARKET SIGNALING (1974), and as extended to "endogenous cost signaling" and used to model evidence production in Sanchirico, *Relying*, Sanchirico, *Games*, and Sanchirico, *Evidence Tampering*.

## *A. Alternative Tests*

### 1. The Oath

Consider first a testimonial test keyed solely to bare assertion under oath.<sup>92</sup> That is, after swearing the witness in, we ask her whether her memory of the event or condition at issue conforms to the depiction being put forward by her proponent (namely herself, if she is a party witness). We accept her answer as true, no further questions asked. If she answers, “yes” therefore, she furthers her proponent’s interests, as well as possibly her own.

Federal Rule of Evidence 603 instructs that the oath be administered in such way as to “awaken the witness’s conscience.”<sup>93</sup> (To be sure, administration of the oath also awakens the perjury statute,<sup>94</sup> a point to which we shall return.<sup>95</sup>) Supposing for purpose of argument that the witness does have a conscience and that it is indeed stirred by swearing in, the moral aspect of the oath produces a kind of *signal cost differential* that is keyed to the underlying content of the witness’s memory. In particular, the moral cost of the *rewarded signal*<sup>96</sup>—here the cost of answering “yes,” that her proponent’s depiction is accurate<sup>97</sup>—is lower if her proponent’s depiction is indeed accurate.<sup>98</sup> More specifically, when “yes” is the lie, the cost of answering “yes” is the moral cost of insincerity. On the other hand, when “yes” is the truth, its moral cost is zero.<sup>99</sup>

To the extent that the oath opens up a cost differential as between the sincere and insincere witnesses, it is at least a step in the right direction. The existence of a differential cost—whether that cost is to conscience, calendar, or financial accounts—is a *necessary condition* for the test of testimony. Without it, the rewarded signal is

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<sup>92</sup> FED. R. EVID. 603, for example, requires that witnesses in civil and criminal cases in United States district courts (FED. R. EVID. 1101) swear by oath or affirmation to testify truthfully. FED. R. CIV. P. 30(c) requires that deponents in civil cases in United States district courts do the same.

<sup>93</sup> FED. R. EVID. 603.

<sup>94</sup> See, e.g., 18 U.S.C. §1621-23 (federal perjury statutes).

<sup>95</sup> See Part II.A.5, *infra*.

<sup>96</sup> Two technical notes are in order here: 1) we measure the cost incrementally, relative to the cost of other possible answers; 2) the reward here is measured in terms of up ticks in the favorability of the “litigation lottery.” The “litigation lottery” is the list of possible litigation outcomes each paired with its probability.

<sup>97</sup> It is implicitly assumed here that the other relevant alternative signal choice imposes no moral costs on the witness. Alternatively, one could require that the witness answer “yes” or “no,” and focus on the differential cost across witnesses of the incremental cost of answering “yes.” Nothing in the analysis would change, except for the simplicity of the example.

<sup>98</sup> Indeed, relative to answering “no” (see *supra* note 96) the cost of “yes” is negative when “yes” is truthful, because in that case “no” would be a lie.

<sup>99</sup> Perhaps it is even negative, which it to say there is moral “benefit” to truth telling. The analysis easily accommodates this possibility.

completely manipulable, and the social objectives of evidentiary process completely defeated.<sup>100</sup>

Consider first the social objective (instrumental or ultimate) of truth finding. In the complete absence of a cost differential for the rewarded signal, those witnesses for whom the proponent's depiction was true would face precisely the same testimonial choice problem as those for whom it was false. Their signal choice problems being the same, so too their actual signal choices.<sup>101</sup> Thus, whatever (same) choice these differing actors choose to make, the test would fail to distinguish between them. At best, the system would understand this, and realize that test outcomes lack information content. At worst, the system would be fooled by the insincere. In either event, the goal of truth finding would not be served.

Secondly, the absence of a cost differential for the rewarded signal also defeats the social objective of providing primary activity incentives.<sup>102</sup> Imagine for this purpose that the witness is the proponent herself.<sup>103</sup> When the cost of sending the rewarded signal is the same regardless of whether the depiction of events that it corroborates corresponds to what actually happened, the signal contributes nothing to primary activity incentives. When the proponent follows the dictates of the substantive law in the primary activity and then tells the truth about it in litigation, her litigation payoffs are the same as when she follows the dictates of her private interests in the primary activity and then lies about it in litigation. Litigation payoffs being the same, primary activity private interests are decisive in the primary activity choice problem. Accordingly, there is no incentive to follow the substantive law to the extent that it diverges from these interests.

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<sup>100</sup> This discussion implicates to some extent the game theoretic concept of "cheap talk." See, e.g., Joseph Farrell & Matthew Rabin, *Cheap Talk*, 10 J. ECON. PERSP. 103, (1996). A signal choice is said to be cheap talk when it has no direct payoff consequences. *Id.* at 104. But this commonly stated definition is unhelpfully terse. In particular, it does not seem to fully account for the fact that there are two dimensions to contend with: the underlying truth (or "type") and the signal. Referencing the discussion in the text, if "yes" was more expensive than "no" for truthful witnesses and *equally* so for untruthful witnesses, this would presumably not be "cheap talk" under the definition just given: choice of signal would have direct payoff consequences (for both types). But it would not work as a test for testimony: the choice and payoffs of both types would be identical. Conversely, suppose that answering "yes" cost the same as "no" for the truth teller, and the same equality held for the liar. This *would* presumably satisfy the above stated definition of cheap talk: the choice of signal would have no direct payoff consequence (for either type). Yet such a signal *would* be helpful in setting primary activity incentives if the equal cost across signals for the truth teller were significantly lower than the equal cost across signals for the liar. For these reasons and others, I have decided not to cast the current discussion in terms of cheap talk.

<sup>101</sup> MICHAEL SPENCE, *MARKET SIGNALING* (1974).

<sup>102</sup> Sanchirico, *Relying*; Sanchirico, *Games*; Sanchirico, *Evidence Tampering*. *C.f.*, *supra* note 101.

<sup>103</sup> The same holds when the witness and the proponent are not one and the same, to the extent that the proponent bears the signal costs of the witness, as where the proponent and the witness are in a anything other than a one-shot relationship. The sound bite that "witnesses may be paid for their time, but not for their testimony" does not account for punishments or rewards meted out in repeat play situations as between parties and their witnesses. Consider, for example, the complexities of payback among family members, or as between employers and employees.

But even though the moral import of the oath takes a step in the right direction, that step is likely too short. While a cost differential of some size is necessary for both truth finding and primary activity incentive setting, it is sufficient for neither. The cost differential must not only exist, but also be comparable to the organic incentive that it is meant to counteract. With regard to truth finding, if the litigation payoffs from answering “yes” are larger than the moral cost of lying, those moral costs will not be decisive in testimonial choice. When “yes” is true, certainly “yes” will be the answer. But so also when it is not.<sup>104</sup>

Likewise for primary activity incentive setting. To be sure, unlike truth finding, primary activity incentive setting can occur even when all witnesses choose to send the rewarded signal, so that testimony per se is completely uninformative. Evidence production can produce primary activity incentives by its mere cost, irrespective of whether it leads to the desired litigation verdict (and by implication truth finding).<sup>105</sup> The cost of lying, to the extent that it is born by the proponent,<sup>106</sup> is a tax on making those primary activity choices that must be lied about to avoid punishment. But this too requires a large enough cost differential. A primary activity actor who realizes that she can acquire sizable primary activity gains without incurring unfavorable verdicts simply by paying the relatively small conscience costs of lying, will not adequately be deterred from the wrongful act in the primary activity.

Indeed, when we view the oath in this light—i.e., in terms of the balance between moral costs and litigation benefits—it becomes questionable whether it has any positive effect at all. If we accept

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<sup>104</sup> Perhaps there will be some witnesses who are truly disinterested in the outcome of the case and will answer “yes” for their proponent simply because it is true. For these witnesses the costs of conscience, however small, will be decisive. But as already discussed, many of those with information to convey are not so disinterested. And even if by coincidence we had before us a truly disinterested witness, how would we know? If the witness answers “yes,” how would we distinguish that from the “yes” of an interested and lying witness? If the witness answers “no”—well then, in most cases, she would not have been called by this party, but by the other side, for whom she would answer “yes,” producing the same problem in reflection.

Perhaps, conversely, we have before us a witness whose conscience is so strong as to make morality decisive for her even when it goes against strong self-interest. But again, how would we know? Certainly not by asking another yes-or-no question: the witness without a conscience would just pretend to have one. That being the case, to build the system around conscience costs is to build a system that effectively taxes the moral and transfers the revenues to the immoral, hardly the result we are after. Further, over the longer term, it is likely that this fact will alter the dictates of conscience under the circumstances. Quite possibly, it will become apparent that the test employed—a test of conscience as much as of memory—punishes those with a strong moral sense. No doubt there are moral systems—in theory and in practice—that would relax the stricture against lying in a system that rewards liars.

<sup>105</sup> In other words, evidence production need not separate proponents according to the testimony of their witnesses. Sanchirico, *Relying*, at 332-336.

<sup>106</sup> See note 103, *supra*.

without analysis that the witness comes to the stand with her conscience asleep, it is perhaps fair to suppose that her sense of consequence is also in repose. When the oath awakens her conscience, therefore, it may also arouse her awareness that what she says hereafter is not idle chit chat, but of immediate moment to her private interests. Among the oath's conflicting wake up calls, in other words, one of these may stir the witness's recognition that if there were ever an occasion to bear the conscience cost of lying, this is it.

## 2. The Ordeal

The oath suffers as a testimonial test because faking solemn corroboration is insufficiently costly. In the medieval trial by ordeal, by contrast, the rewarded signal was difficult to fake. The problem with the ordeal, rather, was that this largely unmanipulable signal was largely unrelated to the underlying characteristic of interest.<sup>107</sup>

In one variant of trial by ordeal, the accused was forced to walk nine paces with a hot iron rod laid across his upturned palms. His hand would then be "covered under seal"<sup>108</sup> for three days. Thereafter the burn wounds would be inspected to see if they had festered. If they had, the defendant was declared guilty; if they hadn't, he was acquitted.<sup>109</sup>

Perhaps the defendant could have encouraged the healing process by soaking his sealed bandages in piping hot water or rubbing them with garlic paste. But let us reign in our imagination regarding how the system might have been manipulated (as it were) and suppose, for purposes of illustration, that whether the defendant's wounds festered depended on biological factors that were effectively out of his control. For "healthy healers," let us say, not festering was of essentially zero cost. For poor healers, not festering was simply not an option; in other words, it was of infinite cost. Thus the ordeal, or at least this caricature of it, entailed very large cost differentials in the sense that the defendant could not successfully pretend that the wound had healed.

Unfortunately, this sizable cost differential was not correlated with the underlying characteristic of interest: namely, guilt or innocence. As such, the ordeal may have been an effective test of something—perhaps the immunologic health of defendants or the sterility of the

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<sup>107</sup> I will be caricaturizing this process to make a more general point about testimony. For a more nuanced view see, e.g., Mirjan R. Damaska, *Rational and Irrational Proof Revisited*, 5 *CARDOZO J. INT'L & COMP. L.* 25 (1997).

<sup>108</sup> ERNEST F. HENDERSON, *SELECT HISTORICAL DOCUMENTS OF THE MIDDLE AGES*, (London: George Bell and Sons, 1910), pp. 314-317.

<sup>109</sup> *Id.*

cleric's bandaging job—but it was not an effective test of what it was designed to uncover.

### 3. Demeanor

Demeanor evidence consists of everything the fact finder can readily discern about the witness's performance, excluding the semantic content of her testimony.<sup>110</sup> Whether the witness fidgets, gesticulates, averts her gaze, whether her voice cracks, stutters, or rises in pitch, how frequently she pauses and for how long, all these are regarded as demeanor cues.<sup>111</sup>

Once solemnly regarded,<sup>112</sup> such cues are now discounted by many process scholars.<sup>113</sup> This is due in large part to an influential article published by Olin Guy Wellborn in 1991,<sup>114</sup> which surveyed the experimental literature on deception cues up to that point and found little support for the faith in demeanor exhibited by contemporary jurists. In terms of the framework we are constructing, demeanor evidence suffers variously, and sometimes simultaneously, from both a cost differential problem and a correlation problem.

Consider first demeanor's cost differential problem. Suppose that we believe people tend to feel guilty when they lie, and that in attempting to dissociate themselves from their deception, avert their gaze.<sup>115</sup> Based on this belief, we add gaze aversion to bare assertion under oath as a second signaling dimension. Now, when we ask the sworn witness whether her memory conforms to her proponent's account, we do not simply listen for "yes" or "no." We also watch the witness carefully, crediting a "yes" answer with belief, only when pronounced looking the questioner directly in the eye.

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<sup>110</sup> See, e.g., VRIJ, DETECTING LIES at xiii (using term "non-verbal behavior" as I use the term "demeanor," and distinguishing this concept from "speech content" and "physiological responses.>").

<sup>111</sup> DePaulo Bella M., James J. Lindsay, Brian E. Malone, Laura Muhlenbruck, Kelly Charlton, Harris Cooper, *Cues to Deception*, 129 PSYCH. BULL. 74, Appendix A (2003) (listing 158 deception cues that have been subject to experimental research, but also including in this list cues that go to semantic content and are thus not demeanor); VRIJ, DETECTING LIES at 32-33 (providing list of experimentally studied non-verbal behaviors: *vocal characteristics*—speech hesitations, speech errors, pitch of voice, speech rate, latency period (duration of silence between question and answer), frequency of pauses, pause duration; *facial characteristics*—gaze, smile, blinking; and *movements*—self-manipulations (e.g., head scratching), illustrators (i.e., intentionally communicative hand and arm gestures), hand and finger movements, leg and foot movements, trunk movements, shifting position.).

<sup>112</sup> See sources cited in Olin Guy Wellborn, *Demeanor*, 76 CORNELL L. REV. 1075, 1076-1078 (1991); See also sources cited in Honorable James P. Timony, *Demeanor Credibility*, 49 CATH. U. L. REV. 903, 916-922 (2000).

<sup>113</sup> Olin Guy Wellborn, *Demeanor*, 76 CORNELL L. REV. 1075 (1991); Roger C. Park, *Empirical evaluation of the hearsay rule*, in ESSAYS FOR COLIN TAPPER 91-93 (Peter Mirfield & Roger Smith eds. 2003); But see Honorable James P. Timony, *Demeanor Credibility*, 49 CATH. U. L. REV. 903, 916-922 (2000) (defending demeanor evidence).

<sup>114</sup> Olin Guy Wellborn, *Demeanor*, 76 CORNELL L. REV. 1075 (1991).

<sup>115</sup> See, e.g., Zuckerman, M., DePaulo, B. M., & Rosenthal, R., *Verbal and nonverbal communication of deception*, in 14 ADVANCES IN EXPERIMENTAL SOCIAL PSYCHOLOGY 1, 9-10 (L. Berkowitz, ed. 1981) (discussing this hypothesis in the literature).

Even if we assume that there is a natural tendency to avert one's gaze while lying, the impulse is too easily masked. Consequently, gaze aversion is self-defeating as an indicator of insincerity. Were it the case that averting one's gaze were recognized as a sign of lying, liars would learn to fix their gaze, and looking away would no longer indicate insincerity.<sup>116</sup> The cost differential across liars and truth tellers of holding the inquisitor's gaze is too small to overcome most witness's interest in the outcome of the suit.

Consistent with this, experimental research both before, and in the decade since Wellborn's article is nearly unanimous in finding that gaze aversion is of essentially no use in detecting lies.<sup>117</sup> Such results are typical of demeanor cues generally. A recent meta-analysis<sup>118</sup> by Bella DePaulo and her colleagues,<sup>119</sup> which analyzes experimental data on a list of 158 potential cues<sup>120</sup> to deception across a virtually comprehensive list of prior studies,<sup>121</sup> reports that "effect sizes"<sup>122</sup> are

<sup>116</sup> See sources on costly signaling cited *supra* note 91. The lie detection literature per se is starting to embrace the game theoretic notion of costly signaling (though not by that name). VRIJ, DETECTING LIES at 38 ("Gaze aversion is not a reliable indicator of deception. The reason for this is that it is so easy to control. It does not involve much effort for liars to look at their conversation partners straight in the eyes if they wish to. Obviously, behaviours which are easy to control can never be reliable indicators of deception."). For an earlier reference, see Bond, C. F. Jr., Kahler, K. N., & Paolicelli, L. M. (1985). *The miscommunication of deception: An adaptive perspective*. 21 J. EXPERIMENTAL SOC. PSYCH. 331 (earlier evolutionary argument against the possibility that a specific cue for lying exists).

Admittedly, there would be some lag time before all witnesses realized that gaze aversion was the thing to avoid. In fact, there would likely be a perpetual residual of uninformed witnesses who were caught in their lies (or truths) because they didn't know enough to maintain eye contact. But this kind of realistic slack in the system probably just makes matters worse. A system in which sophisticated—and so presumably well practiced liars—go free, while naïve first timers are routinely nabbed seems at least as perverse as a system in which everyone is in the know and exonerated.

<sup>117</sup> DePaulo Bella M., James J. Lindsay, Brian E. Malone, Laura Muhlenbruck, Kelly Charlton, Harris Cooper, *Cues to Deception*, 129 PSYCH. BULL. 74, Table 4 (2003) (meta-analysis of experiment research finding *inter alia* that "32 independent estimates of eye contact produced a combined effect that was almost exactly zero.").

<sup>118</sup> A meta-analysis quantitatively combines the results of prior studies meeting express criteria. See, e.g., R. Rosenthal & M. R. DiMatteo, *Meta-analysis: Recent Developments in Quantitative Methods for Literature Reviews*, 52 ANN. REV. PSYCH. 59 (2001) (primer on meta-analysis).

<sup>119</sup> DePaulo Bella M., James J. Lindsay, Brian E. Malone, Laura Muhlenbruck, Kelly Charlton, Harris Cooper, *Cues to Deception*, 129 PSYCH. BULL. 74 (2003)

<sup>120</sup> *Id.* at Appendix A (2003) (listing cues considered)

<sup>121</sup> *Id.* at Section VI.A. (criteria for inclusion); Table 1 (2003) (prior studies included)

<sup>122</sup> DePaulo et al. 2003 measure "effect size" with Cohen's *d*. COHEN, STATISTICAL POWER ANALYSIS FOR THE BEHAVIORAL SCIENCES 20-24 (2<sup>nd</sup> ed. 1988). Suppose, for example, that the cue under consideration were "facial touching." Cohen's *d* would be the ratio of: 1) the "sample mean difference:" the average number of times in this experiment that liars touched their noses less the average number of times that truth tellers touched their noses, over 2) the "pooled sample standard deviation:" approximately, the average over all subjects—liars and truth tellers—of the amount by which a subject's actual nose touching deviated from average nose touching. Roughly, then, we are meant to think of *d* as the proportion of deviation from the mean that is explained by the difference between lying versus truth telling as opposed to "noise" factors such as individual and circumstantial differences.

In fact, conclusions based on the statistic of effect size are of little use to evidence scholarship—and possibly many other applications. The probative value of a signal is captured by its "likelihood ratio": in the present context, the chance of the observed degree of face touching given that the subject is lying, divided by the chance of the observed degree of face touching given that the subject is telling the truth. According to Bayes' rule, on seeing the signal, one should multiply one's prior assessment of the odds of the underlying characteristic (e.g., the chance that the subject is lying divided by the chance that the subject is telling the truth) by the likelihood ratio for that signal in order to derive one's posterior odds. Even under very strong assumptions about distributional class (e.g., all distributions are normal), one cannot recover enough information about the relevant distributions from the summary statistic that is effect size. This means, in particular, that very informative tests (those with large likelihood ratios) may have small effect sizes, while, conversely, very uninformative tests may have large effect sizes.

“small”<sup>123</sup> for many classic demeanor cues—including fidgeting, blinking, shrugging, face touching, smiling, lip pressing, object fidgeting, brow lowering, lip corner pulling, etc.<sup>124</sup>

Where demeanor evidence does not have a cost differential problem, it appears to have a correlation problem. The demeanor cues<sup>125</sup> that DePaulo and her colleagues find to have “large effect sizes”<sup>126</sup> consist mainly of cues related to stress and arousal. For example, these researchers find support for the proposition that liars speak with higher pitched voices, noting that “pitch typically rises with stress.”<sup>127</sup>

But the link between stress cues and lying involves a medial inference. Stress cues are not themselves direct cues to lying. Rather

<sup>123</sup> Cohen proposes that we regard a *d* of between  $-.20$  and  $+.20$  as a “small effect size” *Id.* at 25. To intuitively calibrate “small effect size,” Cohen points out that in judging whether a human female is 15 or 16 years old, height has a small effect size. We are thus invited to conclude that it is no easier to tell a liar from a truth teller by demeanor cues like gaze aversion than it is to tell a 15 year old female from a 16 year old female by her height. In fact, this comparison is invalid because two signals with the same effect size may have very different likelihood ratios. See *supra* note 122.

<sup>124</sup> DePaulo et al. at Table 8 (2003). To be sure, in the decade since Wellborn’s article brought this line of research to the attention of legal scholars, several relatively obscure demeanor cues have been found to exhibit larger effect sizes. Two approaches, in particular, have met with some success.

First, Paul Ekman’s work has focused on “microfacial expressions,” small movements of the facial muscles detectable only for a fraction of a second. PAUL EKMAN, CLUES TO DECEIT IN THE MARKETPLACE, POLITICS, AND MARRIAGE 123-161 (2001). Such microfacial expressions are specifically not detectable by lay observers, although lay observers, it is asserted, can be trained to notice them.

A second approach asks whether the masking of demeanor cues might itself be detectable. Zuckerman et al., at \_\_\_ (1981) The general idea is that liars, in resisting their natural inclination to fidget and avert their gaze, will overdo it and end up seeming *Zombie-like* relative to truth tellers.

But game theoretic reasoning suggests that findings of modest success for these relatively obscure cues ought to be regarded with skepticism, precisely *because* the cues are obscure. The fact that a demeanor cue has a large effect size is of little use to evidence law if experimental subjects did not realize that this aspect of their demeanor was being watched. In fact, one may make the bolder statement that such results are of little use unless the cue is utilized in subjects’ daily environments, so that they come to the experiment with whatever natural skill would likely develop over time with regard to masking the cue. Evidence law ought not—and as a matter of practice, cannot—count on one-time surprise and temporary (no doubt, unequally distributed) secrecy. The test of testimony must be viable even when all witnesses know precisely what that test consists of.

More generally, game theoretic reasoning indicates that what cues actually work and what cues lay observers believe to work are simultaneously determined. Deception cues may show large effect sizes only because they are not (yet) used by observers in the subjects’ daily environments. Put another way, the holy grail of the lie detection literature is not, as the literature sometimes seems to indicate, the undiscovered and informative cue, but rather the well-understood cue that nonetheless continues to inform.

Some part of the experimental literature on non verbal cues to lie detection has come to realize the game theoretic interdependence between the cues that actually indicate deception and the cues that observers believe to indicate deception. ALBERT VRIJ, DETECTING LIES AND DECEIT 111 (2000). (discussing this form of learning with respect to “verbal criteria.”); Vrij, DETECTING LIES AND DECEIT, at 210. (suggesting the possibility that liars will use books like his to “change their response strategy... This will always happen. Liars and lie detectors are in an arms race with each other.”).

But the realization of this game theoretic interdependence has not permeated the field. This is manifest in the fact that the literature is still mainly divided into two separate pieces—one for the study of potential deceivers, one for the study of the potentially deceived. A first group of studies concerns the “objective cues” to deception: i.e., what observations really do indicate lying. See, e.g., Vrij, DETECTING LIES, at xiii (so organizing the topic of lie detection by nonverbal cues). A second asks what lay observers think these cues are when attempting to detect deceit. When results are compared across the two fields, it is often reported with implicit irony and surprise that what lay people think to be viable deception cues are precisely the least viable objectively.

<sup>125</sup> DePaulo et. al. consider more than just “demeanor cues,” as we have defined that phrase. See discussion at *supra* note 110.

<sup>126</sup> But see discussion at *supra* notes 122 and 123.

<sup>127</sup> DePaulo et. al., at \_\_\_.

they are cues to an emotional state, which is in turn posited to be associated with lying. This second link is problematic. There is good reason to believe that *any* witness—insincere or sincere—will be nervous at trial or on deposition. Even if stress cues accurately signal stress, therefore, stress itself may be signaling only the gravity of the situation, not the witness’ insincerity.

Accordingly, the relative success of stress-related cues may be an artifact of the laboratory, wherein most studies of demeanor cues are undertaken.<sup>128</sup> Budgetary and ethical constraints keep the stakes faced by subjects, and so also their stress levels, necessarily small in laboratory settings. Thus, any association between stress cues and lying uncovered in laboratory experiments may be uninformative of real world high stakes, high stress situations.<sup>129</sup>

#### 4. The Polygraph

The logic behind the polygraph is similar to the logic behind stress-related demeanor cues. But whereas the observable test outcomes for demeanor are generally directly observable, the polygraph test employs various instruments to measure otherwise invisible blood pressure, breathing rate and palmar perspiration.<sup>130</sup>

Although these readings would seem to be more reliable than demeanor cues in measuring stress *per se*, the polygraph is also prone to the same tenuous connection between stress and lying in a high stress situation. To be sure, advocates of polygraph testing have probably been more attune to this problem than those who study demeanor.<sup>131</sup> But this additional attention has not produced a workable solution, and serious correlation problems remain.

Consider, for example, one variant of polygraph testing, the Control Question Test.<sup>132</sup> This test pairs “relevant questions” with “control

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<sup>128</sup> VRIJ, DETECTING LIES at 44. *But see* Samantha Mann, Aldert Vrij, Ray Bull, *Suspects, Lies, and Videotape: Analysis of Authentic High-Stake Liars*, 26 LAW & HUM. BEHAV. 365 (2002) (case study).

<sup>129</sup> To be sure, one could always claim that, even though every witness will be stressful at trial, the guilty or insincere will be even *more* stressful, and consequently stress cues will still have utility. DePaulo et al., at \_\_\_. Whether or not this proposition holds, it is clear that laboratory correlations regarding stress cues provide it with no support. Like many lie detection researchers, DePaulo and her colleagues specifically focus their analysis on everyday lying, displaying less interest in studying deception in high stakes ceremonies like trial. *Id.* at \_\_\_.

In contrast to the literature on demeanor cues, the literature on the polygraph, as described below in Part II.A.4, does specifically focus on the differential stress of liars and truth tellers in high stress situations. But as we shall see, serious problems hamper making this kind of second-order determination.

<sup>130</sup> VRIJ, DETECTING LIES, at 170. Sometimes brain electrical behavior is monitored as well. *Id.*

<sup>131</sup> This may be a reflection of the fact that, as mentioned in *supra* note 129, those studying demeanor cues appear to be most interested in everyday lying, while those studying the polygraph are more interested in police investigation and litigation.

<sup>132</sup> Explanations of the logic behind the Control Question Test are not entirely coherent. *Accord*, EKMAN, CLUES TO DECEIT, at 200. The following text paragraphs contain the author’s own attempt to make sense of the test mechanic.

questions.” If the issue is whether the subject assaulted the victim, a relevant might be, “did you assault the victim?” And the control question might be “Have you ever struck anyone in anger?” A control question is designed to be one that the subject believes is nearly as pertinent to her interests in the present suit as the corresponding relevant question—as if similar past transgressions will be used against her in this case. Moreover, the control question should be one that nearly all subjects, innocent or guilty, would answer insincerely.

Consider how this plays out—first for the innocent subject. In falsely answering the control question, the innocent subject experiences two sources of stress: from the pertinence of the question and from lying. In truthfully answering the relevant question, on the other hand, the innocent subject experiences only “pertinence stress.” Plausibly, pertinence stress from the relevant question is greater than for the control question. But so long as the control question’s relative shortfall in pertinence stress is not so great as to overwhelm the fact that she experiences lying stress on it and not the relevant question, the innocent subject will exhibit more *total* stress in response to control questions.

The guilty subject, on the other hand, lies on both questions. For the guilty subject, therefore, the greater pertinence stress of the relevant question is decisive, and total stress is greater for the relevant question than for the control question. Thus guilty subjects will exhibit more stress on the relevant question, while innocent subjects will exhibit more stress on the control question.

Obviously this is all a bit fragile, as has been pointed out repeatedly in the literature. To take a somewhat novel critical angle, consider that it must simultaneously obtain that: 1) the past transgression forming the subject of the control question is so common that the examiner can be fairly certain that any innocent subject has committed it, despite her denial; 2) the subject believes that this past transgression—in fact so common that *any* innocent subject who walked into the room would have committed it—is now going to be regarded by the examiner as informative of whether the subject committed the particular crime in question.

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The other major polygraph test is the Guilty Knowledge Test, described below in the text surrounding note 135. The Guilty Knowledge Test has the opposite correlation problem, finding the guilty too often innocent. The problem seems to be that the guilty know less than is supposed. The guilty suspect, for example, might not realize that she has dropped her hat—after all if she had realized it at the time, at least, she would have picked it up. Thus, she shows no greater arousal for this alternative. In general the kinds of clues that this technique relies upon are often those that escaped the consciousness of the accused, else she would have prevented their existence. Consistent with this field data show significant false findings of innocence, while laboratory experiments, under which the examiner can be more sure of what the guilty would know, do not show the same problem. VRIJ, DETECTING LIES AND DECEIT, at 197-198, 200.

The difficulty of finding this sort of “magic bullet” question produces a serious correlation problem. Perhaps the transgression is so commonplace that the innocent subject doubts its pertinence to the present case. Or perhaps, the transgression is not common enough, and when the innocent witness answers “no,” she is not really lying. The shared result of both of these complementary sources of error—i.e., that innocent subjects are insufficiently stressed by the control question relative to the relevant question—is consistent with the data. Both laboratory studies<sup>133</sup> and field studies<sup>134</sup> show that the Control Question Test has a roughly 20% chance of finding the innocent guilty.

Perhaps a 20% chance of a “false positive” is not so bad if the test is used in conjunction with other evidence. Or perhaps one could find a better way than the Control Question Test to separate the stress of the situation from the stress of lying. That still leaves the fact that, in addition to its correlation problem, the polygraph suffers also from a significant cost differential problem. Whatever the precise form of the polygraph test, all that is necessary to beat it, is to figure out on which questions the innocent are meant to exhibit more stress and then artificially produce stress in answering these questions. Stress may be artificially produced by, for example, pressing one’s finger nails into one’s palms, biting one’s tongue, or pushing one’s toes into the floor.

Consider, for instance, how another variant of the polygraph test, the Guilty Knowledge Test, may be so manipulated. In that test, we begin with something that only the guilty subject would know. For example, the perpetrator might know that she dropped her hat at the scene of the crime. The subject is then asked the multiple choice question: “what did the suspect drop at the scene of the crime: a) a scarf, b) a glove, c) a hat, or d) a shoe?” She is instructed to answer “yes” or “no” after each alternative is named. The guilty suspect, and only the guilty suspect, exhibits more arousal in answering “no” to question c). The innocent suspect shows no discernible difference across the alternatives. But the guilty subject can produce the same effect by pushing her toes into the floor when answering “no” to alternatives a), b), and d).<sup>135</sup>

Correspondingly, there is evidence that individuals can be quickly taught to beat the polygraph test.<sup>136</sup> If few individuals have in fact

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<sup>133</sup> VRIJ, *DETECTING LIES*, at 197.

<sup>134</sup> VRIJ, *DETECTING LIES*, at 199.

<sup>135</sup> Similarly, for the Control Question Test, the guilty subject need only learn to identify control questions and produce artificial stress in answering them.

<sup>136</sup> VRIJ, *DETECTING LIES*, at 181, 203 (pointing to dozens of books, articles, newspaper reports, about the Control Question Test; listing studies showing that 30 minutes or so of training in countermeasures can be very effective, one showing that examiner had difficulty detecting countermeasures.)

been so taught thus far, this is probably only a reflection of the test's lack of employment. Were it more frequently employed, the polygraph's error rates would likely well exceed 20%.

## 5. Perjury and obstruction

Might laws against perjury or obstruction of justice<sup>137</sup> provide the kind of test we are looking for? Perhaps we ought to disconnect the blood pressure meter, stop watching for body language, throw away the bible and the hot iron, and simply inform the witness that if she lies she will be convicted of perjury and sentenced to ten months in prison.<sup>138</sup> That would certainly produce a significant correlation; only those who answer falsely pay the high cost. And it would also produce sizable signal cost differentials; the additional cost of answering "yes" when it is false, compared to when it is true, is ten months in prison and all that entails.<sup>139</sup>

The problem, of course, is that stating a punishment is not the same as figuring out who to punish. The fact that perjury carries a stiff sentence does not mitigate the problem that it too requires some test to determine who should be forced to serve that sentence. Thus, bare reliance on perjury and obstruction is a form of "process begging," wherein the problems of evidentiary process are not solved, but just shunted to a different, unanalyzed phase.<sup>140</sup>

## 6. Summary

In the course of running through these alternatives, we have identified two important test qualities for the test of testimony. First, the rewarded signal, as we have called it, must be naturally correlated with the underlying content of the witness's memory. Second, that signal must be relatively difficult to manipulate, which is to say that there must be a sizable cost differential as between sending that signal when it is truly existent as compared to when it must be fabricated.

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<sup>137</sup> E.g., 18 U.S.C. 1621-1623 (perjury statutes) and 18 U.S.C. 1503, 1512(c) (obstruction of justice statutes most pertinent to court cases). For a review of these laws, see Sanchirico, *Evidence Tampering at Part III*.

<sup>138</sup> Federal Sentencing Guidelines, 2J1.2 (Obstruction of Justice), 2J1.3 (Perjury or Subornation of Perjury; Bribery of Witness), Chapter 5, Part A (Sentencing Table), and 5E1.2 (Fines for Individual Defendants).

<sup>139</sup> This is the position implicitly taken in a recent series of papers on the economic analysis of perjury. Winand Emons, Perjury versus Truth-Revelation: Quantity or Quality of Testimony (November 2003) (unpublished manuscript on file with the author), Robert Cooter & Winand Emons, *Truth-Revealing Mechanisms for Courts*, 159 J. INST'L & THEOR. ECON. 259 (2003), Robert Cooter & Winand Emons, *Truth-Bonding and Other Truth-Revealing Mechanisms for Courts*, 17 EUR. J. L. & ECON. 3 (2004).

<sup>140</sup> Sanchirico, *Relying* at 330-331.

## ***B. Testing Semantic Content***

To be sure, the kinds of problems that we have identified with the oath, demeanor cues, and the polygraph, do not by themselves dictate excluding these forms of evidence.<sup>141</sup> Their flaws of correlation and cost differential afflict all forms of evidence. Sensibly, the requirement of relevance is not that evidence exhibit perfect correlation and infinite cost differentials, but only that it contribute some amount of probative value in our overall determination.<sup>142</sup>

Nonetheless the problems we have identified with these candidate test outcomes indicate that they alone are not sufficient for the test of testimony, that there must be something more. What can this be? Conspicuously absent from the array of testimonial test outcomes so far considered—and oddly deemphasized in much modern scholarship on evidence<sup>143</sup>—are cues based on the semantic content of testimony. Apart from the issue of *how* the witness says what she says—whether under oath, with averted gaze, or with increased pulse—is the issue of *what* the witness says.

### **1. Detail and Consistency as Observable Test Outcomes**

Throughout Parts III-V, this article examines how the semantic content of testimony operates as an important observable test outcome for testimony. The article specifically focuses on two dimensions of semantic content: detail and consistency. Testimony is consistent when it contradicts neither itself, nor external facts that can be established by the opponent. Testimony is detailed to the extent that it is *contradictable*. Thus by definition, consistency is in tension with detail. Every additional detail is another chance to contradict either what the examiner can prove about the world, what one has already said, or what one is yet to say. Because of this tension, detail signals authenticity, and conversely, every missing detail is that much less verisimilitude and that much more seeming circumspection.

From the outset, it is important to note that, in this formulation, there is nothing inherently useful about consistency and detail apart from their utility in the test of testimony—just as there is no reason to heat up the tendered metal apart from its utility as a test of chemical composition. Were all witnesses axiomatically sincere, there

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<sup>141</sup> Of course, there may be other reasons to exclude these forms of evidence, including lack of scientific reliability, the risk that the jury will overweight the evidence, and the fact that such evidence “invades the province of the jury.” Polygraph evidence, for example, is per se inadmissible in the 4<sup>th</sup> Circuit. *United States v. Prince-Oyibo*, 320 F.3d 494, 501 (4th Cir. 2003).

<sup>142</sup> See, e.g., FED. R. EVID. 401 (evidence relevant if it has some tendency to make the existence of some fact of consequence to the action more or less probable than it would be without the evidence).

<sup>143</sup> VRIJ, *DETECTING LIES*, at 109.

would be no reason to monitor detail and consistency in testimony. We would, for example, simply ask the accused whether she had an alibi. If she said “yes” that would be the end of it. Only because we think she might choose to lie, are we interested in hearing the details of the alibi, as opposed to just the bare fact of its existence. We want the accused to go out on a limb, telling us where she was when, what she saw there, who was with her, when she returned, how she returned, generally reciting to us propositions about the world that *could* be falsified with contradictory data/evidence, or her own statements, past or future.

Conversely, the answer to the question of *why* a story is viewed as sincere when it is both consistent and detailed is nothing more than that the test “works:” that these dual observable test outcomes exhibit sufficient signal cost differentials and correlation. Asking why consistent detail implies sincerity is like asking why particular behavior in the heated bowl implies the presence of so much gold. The answer is not inherent in the test outcome. Rather the answer lies in the associative mechanism linking that outcome to the underlying characteristic of interest.

## **2. Cognitive Limitations and the Associative Mechanism**

What then is the associative mechanism in this formulation? The reason that detail and consistency are viable observable test outcomes is the fact that they are more difficult to produce in testimonial performance when the witness is insincere than when she is sincere. The wedge that props open that differential of difficulty is the imperfection of human cognition. It is because of that imperfection that the task of the insincere witness in producing detailed and consistent testimony is substantially more difficult than the same task for the sincere. For the perfect mind, the differential collapses.

To substantiate these assertions, I devote the following Parts, III and IV to reviewing and contrasting the cognitive tasks involved in producing consistent detailed testimony for the sincere and insincere witness. I divide these tasks (somewhat arbitrarily) into “preparation” and “performance.”

## **3. General Empirical Evidence for Detail and Consistency as Test Outcomes**

Before turning to these specifics, however, it is worth pointing out that several forms of empirical evidence point toward the overall

efficacy and use of detail and consistency as observable test outcomes. We have already deployed DePaulo et al.'s meta analysis of deception cues to substantiate the weakness of demeanor cues, as conventionally defined. In fact, that meta analysis also provides some support for the proposition that detail and consistency *are* effective cues.

Of the twelve cues to deception that were both based on a reliable number of independent samples and resulted in large effect sizes, a substantial portion concerned cues that may be considered components of detail and consistency. Specifically, the “prediction that liars would provide fewer details than would truth tellers was clearly supported”<sup>145</sup> “Like good novelists, truth tellers sometimes describe the settings of their stories; liars were somewhat less likely to do this, and they provided nonsignificantly fewer unusual details.” Regarding consistency, “[b]y all three of the indicators, the lies made less sense than the truths. They were less plausible...[and] more likely to be internally discrepant.”<sup>146</sup>

Indeed, experimental data on detail and consistency is likely to understate the importance of these signals in litigation. In particular, many of these experiments did not, and could not, replicate the kind of relentless probing from an opponent advocate backed by the subpoena and contempt power of the court. Thus, it is likely that laboratory liars supplied more detail than they otherwise would for the fact that they knew they would not be further questioned about that detail. Or perhaps they understood that, even if they were further questioned, they could refuse on some pretense to answer the question. The only real risk of additional detail for these liars was the risk of contradiction in the initial telling. In a litigation setting, by contrast, every new detail is fodder for additional probing.

Moreover, the lack of persistent follow up questioning in the lab probably means that consistency's importance was also understated. For the most part the only inconsistencies observed in these laboratory experiments were inconsistencies in the original telling. Inconsistencies that might have been uncovered via additional questioning, or produced in turn by additional answers to additional questions, were not recorded by these experiments.

Additional empirical evidence of the efficacy of detail and consistency—albeit of a more casual form—is provided by the actual *use* of these observable test outcomes in litigation practice. Here we can identify two sources of support. First, two of the five modes of impeachment generally recognized in evidence law directly implicate

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<sup>145</sup> DePaulo et al. at \_\_\_\_.

<sup>146</sup> DePaulo et al. at \_\_\_\_\_. See also VRIJ, DETECTING LIES at Chaps. 4-6.

detail and consistency testing. Thus, a witness's prior inconsistent statements are liberally admitted to impeach her credibility.<sup>147</sup> Furthermore, a witness may be impeached by contradicting her testimony with the prior statements of other witnesses, with documents or other tangible evidence, or by judicial notice.<sup>148</sup>

To be sure, the view that these two forms of impeachment primarily concern the observable test outcomes of testimony is not wholly in line with conventional conceptions of their function. The most often stated rationale for these forms of impeachment is the (unnecessarily Latin) phrase *falsus in uno, falsus in omnibus*, an inference logically distinct from that which we have just described. But this deduction cannot really be the full justification for these two modes of impeachment by contradiction. If it were, these modes would reduce to a special case of impeachment by character for untruthfulness. *Falsus in uno, falsus in omnibus* is practically the definition of character impeachment by specific instances of lying. Yet the terms under which character-based impeachment may proceed—for example, the rules regarding when extrinsic evidence<sup>149</sup> may be offered—are typically distinct from those under which a witness may be impeached by prior inconsistent statements or contradiction.<sup>150</sup> Making sense of these distinctions in evidence law requires making a distinction between the kind of deductions the fact finder makes based on a specific instance of lying on a past employment application, for example, and the kind of deduction she makes based on a specific instance of contradiction in her current testimony. The distinction I am offering here is that impeachment by prior inconsistent statements and contradiction are observable test outcomes for the test of testimony. They are not primarily means of calibrating that test to fit the disposition with regard to truthfulness of the particular witness before us—as we might view character impeachment generally.<sup>151</sup> They are themselves the results of the test.

Secondly, what empirical evidence there is on the frequency with which various modes of impeachment are employed in court suggests the importance of these two techniques. Professor Uviller, for instance, finds in his survey of trial judges that prior inconsistent

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<sup>147</sup> In Federal District Court, under certain conditions—most notably, that it was made at a judicial proceeding or deposition—the prior inconsistent statement may even be used substantively, as opposed to purely for impeachment. FED. R. EVID. 801(d)(1)(A).

An elaborate and uneven set of rules govern the question whether “extrinsic evidence” (as defined *supra* note 81) may be used to prove the statement, as well as the process governing impeachment by this means.

<sup>148</sup> The general rule, however, is that “extrinsic evidence” (as defined *supra* note 81) may not be used to contradict the witness unless the matter contradiction is not collateral.

<sup>149</sup> See *supra* note 81.

<sup>150</sup> *C.f.*, FED. R. EVID. 608 [Character impeachment] and FED. R. EVID. 613 [Impeachment by prior inconsistent statements].

<sup>151</sup> For an analysis of the pros and cons of using character evidence to tailor the application of legal rules to individual characteristics, see Sanchirico, *Character Evidence*, at 1264 *et seq.*

statements and contradiction are the most often used ways of determining credibility.<sup>152</sup> In accord with this finding, other experienced commentators make bold statements (though often not specifically substantiated) about the frequent employment of these two impeachment devices.<sup>153</sup>

### III. Preparing for Testimony: Witness Coaching

The cognitive enterprise of preparing for testimony is markedly different for sincere and insincere witnesses. For the sincere witness, the main task is to retrieve existing memories of actual events, as if pulling down from the shelf of memory something that is already there.<sup>154</sup> The insincere witness, in contrast, must first fabricate the story and then lodge it in memory, before later retrieving it.

This section compares these preparation tasks in detail, emphasizing differences in the cognitive load that each requires. To be sure, neither set of tasks is easy. But neither are they of the same level of difficulty. This section argues that the tasks faced by the insincere witness are substantially more difficult than those faced by the sincere, the size of that difference being the result of cognitive shortcomings.

#### A. Existing Scholarship

A number of important law review articles over the last several decades have addressed the issue of witness preparation.<sup>155</sup> Various tagging it “coaching,” “sandpapering,”<sup>156</sup> “horseshedding,”<sup>157</sup> and “woodshedding,”<sup>158</sup> this literature generally condemns the practice.<sup>159</sup>

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<sup>152</sup> H. Richard Uviller, *Credence, Character, and the Rules of Evidence: Seeing Through the Liar's Tale*, 42 DUKE L.J. 776, 816-817, 827 (1993).

<sup>153</sup> Accord JACK B. WEINSTEIN & MARGARET A. BERGER, WEINSTEIN'S FEDERAL EVIDENCE §607.06[1] (contradiction “a well-recognized technique”) [hereinafter WEINSTEIN]; MUELLER & KIRKPATRICK, EVIDENCE UNDER THE RULES 663 (2000) (impeachment by contradiction “goes on every day”).

<sup>154</sup> To be sure, for some purposes this is not an apt analogy for memory retrieval.

<sup>155</sup> See, e.g., John S. Applegate, *Witness Preparation*, 68 TEX. L. REV. 277 (1989); JEROME FRANK, COURTS ON TRIAL: MYTH AND REALITY IN AMERICAN JUSTICE (1949); Bennett L. Gershman, *Witness Coaching by Prosecutors*, 23 CARDOZO L. REV. 829 (2002); Stephen Landsman, *Reforming the Adversary Procedure: A Proposal Concerning the Psychology of Memory and the Testimony of Disinterested Witnesses*, 45 UNIVERSITY OF PITTSBURGH LAW REVIEW 547 (1984); John H. Langbein, *The German Advantage in Civil Procedure*, 52 U. CHI. L. REV. 823 (1985); Charles Silver, *Preliminary Thoughts on the Economics of Witness Preparation*, 30 TEX. TECH. L. REV. 1383 (1999).

<sup>156</sup> Langbein, *The German Advantage in Civil Procedure*, at 835 n36.

<sup>157</sup> Gershman, *Witness Coaching*, at 829 n5.

<sup>158</sup> *Id.*

The most commonly expressed concern is that partisan preparation will distort the witness's sincere memory and so impede the pursuit of truth.<sup>160</sup> Judge Jerome Frank's account is commonly quoted:

[The witness] often detects what the lawyer hopes to prove at the trial. If the witness desires to have the lawyer's client win the case, he will often, *unconsciously*, mold his story accordingly. Telling and re-telling it to the lawyer, *he will honestly believe* that his story, as he narrates it in court, is true, although it importantly deviates from what he originally believed. [emphasis added]<sup>161</sup>

The approach to witness preparation taken in this article differs from past treatments along several important dimensions.

First, the focus here is on the preparation of actively interested witnesses (inclusive of the parties themselves).<sup>162</sup> Frank seems to soft pedal witness interests focusing on the danger that partisans will cause vaguely sympathetic witnesses to “unconsciously” alter their “honest beliefs.” For Frank witness interests produce a subconscious proclivity, but not a conscious impetus. Professor Stephen Landsman, who has also importantly written on witness preparation, is less ambiguous with regard to witness interests, assuming them away from the get-go.<sup>163</sup> In contrast to both Landsman and Frank, the witnesses who populate the account herein not only have interests, but also view preparation as the perfect occasion to *actively* pursue them.

I have already argued for the external validity of focusing on witness interests.<sup>164</sup> But when it comes specifically to witness preparation, an explicit treatment of witness interests also has advantages in terms of internal consistency and coherence. The existing literature's treatment of witness preparation in relation to truly disinterested witness suffers from certain logical instabilities. It sometimes seems as if that literature is asking us to believe that impartial witnesses are somehow fooled into thinking that the partisan “preparing” them is similarly impartial, a feat of astounding naïveté, especially given the generally negative lay attitude toward lawyers. At other times we are

<sup>159</sup> Langbein, *The German Advantage in Civil Procedure*, at 833; Frank, COURTS ON TRIAL: MYTH AND REALITY IN AMERICAN JUSTICE, at 86; Gershman, *Witness Coaching*, at 829; Landsman, *Reforming the Adversary Procedure: A Proposal Concerning the Psychology of Memory and the Testimony of Disinterested Witnesses*, at 554-555. But see generally Silver, *Witness Preparation*. (defending witness preparation) and Applegate, *Witness Preparation* (mixed view).

<sup>160</sup> See, e.g., JEROME FRANK, COURTS ON TRIAL: MYTH AND REALITY IN AMERICAN JUSTICE, at 86; Landsman, *Reforming the Adversary Procedure: A Proposal Concerning the Psychology of Memory and the Testimony of Disinterested Witnesses*, at 554-555. (similar).

<sup>161</sup> FRANK, COURTS ON TRIAL, at 86.

<sup>162</sup> *C.f.*, Landsman, *Reforming the Adversary Procedure: A Proposal Concerning the Psychology of Memory and the Testimony of Disinterested Witnesses*, at 550 n8.

<sup>163</sup> Landsman, *Reforming* at 550 n8.

<sup>164</sup> See *supra* Part I.A.

<sup>166</sup> Gershman, *Witness Coaching*, at 829-830.

implicitly asked to believe that the disinterested witness is somehow caught up—albeit “unconsciously”—in a kind of team spirit that makes her want to win the case for the first attorney who happens to have contacted her—a team spirit that however ungrounded in personal interest, and however spontaneously generated, cannot be reversed or counterbalanced by subsequent contact with the other side.

The second distinguishing characteristic of this article’s approach to witness preparation is its explicit recognition that witness preparation cannot simply be eliminated by fiat. Privately conducted,<sup>166</sup> rarely discussed in public,<sup>167</sup> and yet reportedly ubiquitous,<sup>168</sup> witness preparation would be no less difficult to prevent than excessive carelessness, inefficient breach, or crime. Why, for that matter, should we think that witness preparation would not be as great a challenge in prosecuting witness preparation as it is in prosecuting other wrongs? The unavoidable fact that witnesses *will* prepare for their testimony is part of what makes litigation a “problem of the second best.”

In fact, under the approach taken in this article, several reasons become apparent why it may well be possible to learn to live with (and even love) witness preparation. Thus, the third distinguishing characteristic of the present approach is its focus on differences, rather than levels. Accordingly, brought to the fore is the fact that witness preparation helps *both* sincere and insincere witnesses. In contrast, the existing literature’s focus on how witness preparation facilitates the credible depiction of false memories—whether mistakes or lies—leads away from the recognition that what is most important is not the absolute level of difficulty for the insincere of lodging a creditable performance, but the extent to which creditable performance is *more* difficult for the insincere than for the sincere. Doubtless, witness preparation lowers the cost of creditable performance for the insincere; prepared lies are usually easier to get away with. But preparation also lowers the cost for the sincere, as memories may be more accurately and fully accessed, and their presentation more effectively laid out.<sup>170</sup> The ultimate question for the efficacy of process is this: for which type of witness is the difficulty lowered more? If, in particular, witness preparation lowers the cost of a creditable performance for the sincere more than it

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<sup>167</sup> Gershman, *Witness Coaching*, at 829-830.

<sup>168</sup> Applegate, *Witness Preparation*, at 278, 279. *But see* Silver, *Witness Preparation*, at 1387 (claiming that witness preparation is infrequent). This dispute regarding the frequency of witness preparation may be resolvable in the same manner as similar disputes concerning the extent of discovery. The incidence of discovery—and possibly by analogy witness preparation—is concentrated in high stakes cases. See sources cited *infra* note 274. Hence, it may be simultaneously true that there is extensive witness preparation and yet that few cases have significant witness preparation.

<sup>170</sup> For specific reasons why this is so, see, *infra* Part III.D.2.

lowers the cost for the insincere, then it is on balance a benefit not a detriment.

Fourthly, aside from its effects on the cost of performance, it must be recognized, as it is herein, that witness preparation does not just change the cost of lodging a creditable performance, but *is itself a cost* thereof. Thus, occasions where a party has paid extensive costs to prepare its witnesses and has thereby been able to fool the fact finder into thinking her witness's testimony is sincere, ought not automatically to be regarded as instances of system failure. While successful preparation may well make victory more likely for the witness's proponent, that victory will be hollow to the extent that the party incurred substantial costs in securing it. What does it profit the plaintiff when her recovery is less than what she paid to win it? What does it profit the defendant to avoid liability and pay as much in litigation preparation?<sup>171</sup>

The fifth difference between the usual approach to witness preparation and the approach taken in this paper concerns the character of adversary process, and perhaps lends some new operational content to that underspecified, overused phrase. The litigation system fails by any standard if witness preparation provides an inexpensive means of making credible performance easy for the insincere. But the adversary nature of process implies that this situation is unlikely to obtain. The amount of preparation required to launch a creditable performance is not exogenous, but rather determined by the adversary's level of counter-preparation. To the extent that what the plaintiff wins is tied to what the defendant loses, each side has a strong interest in making sure that creditable performance is not so easy to come by for its rival. Each side thus sees and raises its rival's witness preparation with its own counteracting preparation for cross-examination or rebuttal witnesses, which in turn dampens the impact of the rival's preparation. The result is a kind of arms race, where, preparation

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<sup>171</sup> That said, it is apparent that truth finding *per se* does suffer when false witnesses are well-prepared; the fact finder sees only the performance and not the rehearsal. But truth finding is at best a proxy for the ultimate goals of litigation. And these other goals themselves will not suffer.

To expand upon the point made in this paragraph, let us consider, first, the ultimate goal of providing primary activity incentives—i.e., incentives to take care, keep promises, refrain from criminal activity. These depend on the connection between parties' primary activity choices and their anticipated net litigation payoffs. In calculating net litigation payoffs, the cost of witness preparation must be subtracted. From this perspective, therefore, even if the system would be fooled by a well prepared witness, it still does its job if that preparation would be sufficiently expensive, for the preparation costs will themselves act as a tax on bad primary activity behavior.

Similarly, consider the alternative ultimate goal of retribution—the idea that it is right, in and of itself to punish those who commit wrong. To the extent that what is important is the actual magnitude of the punishment suffered by the wrong doer, as opposed to what that punishment is publicly perceived to be, the same appeal to net litigation payoffs applies. The defendant who pays through the nose to win the case is thus punished.

being met with opposing preparation, there is no easy way to beat the system.<sup>172</sup>

Keeping these general comments in mind, we now turn to a detailed comparison of the preparation tasks for a hypothetical pair of sincere and insincere witnesses.

## ***B. Story Construction***

### **1. For the Insincere**

In preparing for testimony the first challenge for the insincere witness is to construct a story. In so doing, the insincere witness is caught in the vice of detail and consistency.

#### **a) Detail**

Perjury, obstruction, contempt, and the subpoena power probably do little to inspire witnesses to be forthcoming with contradictable detail. The classic “I don’t recall” or “I don’t know” are practical safe havens under these strictures.<sup>173</sup>

Rather the witness’s motivation to go out on a limb is more likely to come from how the test of testimony is scored. The insincere witness who withholds detail for fear of contradicting herself is like the student that leaves her blue book blank so as not to give an incorrect answer, or the figure skater who attempts no difficult jumps so as not to fall on the ice. All three see their scores suffer for playing it safe. Thus, whenever the witness answers that she “doesn’t recall” what she should remember or “doesn’t know” what she ought to know, points are deducted. All of us having the experience of genuine memory—indeed on a second by second basis throughout our lives—we have some sense of what would and would not be known or remembered regarding a given event or condition. When the witness falls short of these expectations, we suspect that she is failing to take a position for fear of being contradicted. And we judge that akin to contradiction itself.<sup>174</sup>

Thus, David Boies, commenting on his deposition of Microsoft Chair, William H. Gates, reports that he was pleased to see, as the

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<sup>172</sup> Of course, to some extent the analysis here folds back on itself. For again we have to be careful about the fact that counter preparation raises the cost for both the sincere and insincere witnesses. And again it is the differential not the absolute levels that matter.

<sup>173</sup> cite

<sup>174</sup> See, e.g., Paul Milgrom & John Roberts, *Relying on the Information of Interested Parties*, 17 RAND J. ECON. 18, 30 (1986) (providing a game theoretic analysis of evidence in which agents cannot lie, but may omit to say all they know; finding that the full truth will be revealed when the fact finder (credibly) interprets ambiguities in the agent’s testimony in a light most unfavorable to the agent; relying, however, on the assumption that the fact finder can always tell when the agent does is not saying all that she knows).

deposition got underway that Gates was feigning ignorance. “You want to get as much of that as you can. If you have a witness that says ‘I don’t know,’ you want to get him to say ‘I don’t know’ a thousand times...”<sup>175</sup>

## b) Consistency

At the same time, the more detail the insincere witness provides, the more difficult it is for her to remain consistent.<sup>176</sup> Consistency may be parsed into internal and external components.

### (1) *Internal Consistency*

Testimony is internally consistent when it does not contradict itself. The antitrust deponent who asserts in the morning that she has never even met her competitor’s CEO and in the afternoon that their relationship is strictly social can expect to have her testimony on this point discounted—at the fervent suggestion of the other side. The same goes for the suspect whose alibi places her in Seattle at noon and Los Angeles at 12:15 PM.

Each added narrative feature sprouts its own logical implications, and insuring that the tendrils do not cross draws substantial cognitive load. Consider in this regard that elements of a constructed story will typically interact in dauntingly complicated ways. The conjunction of a comparatively small number of narrative details may produce a surprisingly large set of implications, any of which may contradict. The entire field of mathematics, after all, can be built up from a relatively short list of axioms,<sup>177</sup> and mathematicians devote careers to finding yet undiscovered implications. Similarly, though on a smaller scale, identifying and drawing out the logical implications of what one plans to say in testimony is also serious cognitive challenge. The difficulty of meeting this challenge adds to the liar’s difficulty.

### (2) *External Consistency*

If the deponent says he took the train to West Chester at 10:00 AM there must have been a train around that time on that day. If the trial witness says she saw the accident at the intersection as she was coming out of the diner down the street, there must have been an unobstructed view of the corner from the sidewalk at that time of year. In comparison with an internally consistent story, which does

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<sup>175</sup> JOEL BRINKLEY & STEVE LOHR, U.S. v. MICROSOFT 14 (2001).

<sup>176</sup> VRIJ, DETECTING LIES, at 224.

<sup>177</sup> ALFRED N. WHITEHEAD & BERTRAND RUSSELL, PRINCIPIA MATHEMATICA (1927) (providing axiomatic system from which much of mathematics may be derived) (summarized in JAMES DUGUNDJI, TOPOLOGY 17-21 (1970)). *But see* Kurt Gödel, *Über Formal Unentscheidbare Sätze der Principia Mathematica und Verwandter Systeme, I.* 38 MONATSHEFTE FÜR MATH. U. PHYSIK 173-198 (1931) (within a large class of axiomatic systems, any system that is “consistent,” in the sense that no proposition is simultaneously true and false, is “incomplete,” in the sense that the truth or falsity of some propositions that may be stated within the system cannot be determined).

not contradict itself, an *externally* consistent story does not contradict what the fact finder can otherwise ascertain about the world—aided by an ever vigilant litigation opponent.<sup>178</sup>

In constructing a story that furthers her interests, the liar runs an obstacle course of external facts. Each additional facet of her story will beget logical implications whose relationship to what the opponent can otherwise prove may be difficult for her to discover or comprehend. Yet she must scale over, duck under, and steer around these fixed objects if her testimony is to further her interests.

The difficulty is enhanced even further by the fact that this obstacle course must be run largely in the dark. Much of what the other side can use to contradict the liar’s account may not be known to her until she runs headlong into it at trial or on deposition. Doubtless many of these obstacles may be illuminated and avoided with enough preparation. But “enough” may be a lot. And as we have said, expensive and time consuming preparation must be tallied as a component of punishment and deterrence.<sup>179</sup>

## 2. For the Sincere

While the insincere witness must mindfully construct a detailed and consistent story from scratch, the same is largely accomplished for the sincere witness by the task of retrieving her memory of actual events. Because her memory is, by hypothesis, genuine, she is likely to remember the level of detail that we would expect from a person in her position. Moreover, internal and external consistency are built in to her truly remembered account by virtue of the fact that the reported events really did unfold in time and space, and thus are automatically in accord with the laws of chemistry and physics.

If the myriad details of the story are genuine, then none of their logical implications will conflict, no matter how many there are, no matter how complex their weave. If the witness has really never met the CEO, then no other truth she utters will contradict her statement to this effect. If the defendant really was first in Seattle at one time and then in Portland at another, the timing of the trip will be physically feasible.

Similarly, details in the sincere witness’s testimony will tend not to conflict with whatever fixed objects in the world can be established by the other side. There is no need for the sincere witness to second

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<sup>178</sup> A lie always contradicts some fact about the world; otherwise it is not a lie. In this sense, the liar’s tale is always “externally inconsistent.” As we are using that phrase here, however, the issue is not merely whether those contradicted facts exist, but whether they are ascertainable by the opposition and ultimately the fact finder.

<sup>179</sup> See *supra* Part III.A.

guess what these objects might be. If the witness really did take the train at that time, then the train really did run at that time. If the witness really did see the corner from the diner, then the corner really was visible from that point.

### 3. Potential Qualifications

There are certainly qualifications to this happy analysis. But these need to be placed in perspective lest they swallow that which they are meant to qualify.

First, it is no doubt true that a sincere witness can be mistaken and so contradict her own testimony. Similarly, a sincere witness's testimony can be made to seem internally inconsistent, even though it is not. These are the kinds of points that populate the existing literature on witnesses, to the near exclusion of other issues. They are relevant and important in context. But in isolation, as they are usually presented, they neglect the fact that differences, not levels, are of paramount importance. While it may be difficult for the sincere witness to seem consistent, it is yet more difficult for the insincere. Thus, given the same level of preparation and cognitive ability, the sincere witness is more likely to seem consistent to the fact finder than the insincere. And conversely, attaining a given level of evident consistency—though it requires costly preparation for both sincere and insincere witness—requires less costly preparation for the sincere than for the insincere.

Secondly, regarding external consistency, it is doubtlessly possible for the opposition to put on insincere “second order” witnesses who testify to external “facts” that contradict the sincere witness. Similarly, these second order witnesses may provide true facts that only *seem* to contradict the first order witness. But this qualification too neglects the point that contradicting the insincere witness with external facts is easier and more likely. Moreover, this qualification suffers from the additional problem of assuming that second order witnesses will have no problem presenting fabricated contradictory external facts. The test of testimony works—indeed must work—in infinite regress. Second order witnesses will themselves have a more difficult time of lodging a creditable performance if their account of contradictory external facts is insincere. This, in turn, will be so in part because it is also true for third order witnesses etc...<sup>180</sup>

Thirdly, there is no doubt an important sense in which the retrieval of memories is itself a task of story construction. Analogizing memory retrieval to pulling information off of a shelf is, of course,

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<sup>180</sup> The infinite regress is in some circumstances cut off by prohibiting impeachment on “collateral matters.” See *supra* note \_\_\_\_.

not satisfactory for the purpose of cognitive science. And pointing out these nuances of memory while remaining wary of their implications is, of course, a valid exercise in the study of witness testimony. Nevertheless, it is an exercise that risks taking the spotlight off of the main show. However much memory is subconsciously constructed, this pales in comparison to the degree to which lies must be consciously constructed. However much memory is not really like a shelf, this nuanced distinction is overwhelmed by the greater distinction in the degree of applicability of the shelf analogy to memory retrieval versus “memory” fabrication.

### *C. Contingent Thinking*

#### **1. For the Insincere**

The liar’s list of things to do in preparation for deposition or testimony includes more than just drawing out a single dimensional story line. Such preparation might produce an impressive performance on direct examination. But the witness can count on the opponent<sup>181</sup> to explore spurs off the main narrative path during cross examination. Anticipating this, the witness will want to do what she can to insure that her story is robust to antagonistic probing.<sup>182</sup>

The kind of contingent thinking required to shore up one’s fabricated account against cross examination is even more difficult than it seems at first glance. Certainly, the witness must try to anticipate questions and have detailed and consistent answers at the ready. But even if she could complete this task—which she most probably cannot—the witness’s work would hardly be done. The witness must also try to anticipate how her answers to these first order questions will lead to follow up second order questions, as well as how her answers to second order questions will themselves be followed up with third order questions, and so on. The number of contingent questions to consider increases exponentially as we progress through each layer of follow up questioning. Imagine conservatively, for example, that each answer has three possible follow up questions and each question has three possible answers. Then even if the witness were certain that questioning would not go beyond three rounds, there would be  $3^6 = 729$  potential sequences of questions and answers to consider,<sup>183</sup>

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<sup>181</sup> More specifically, I refer here to the opponent of the witness’s proponent.

<sup>182</sup> Part IV.B.3 *infra* discusses the extent to which current law fosters surprise.

<sup>183</sup> There are *three* possible first round follow up questions (starting from an initial answer) each with *three* possible first round follow up answers, each with *three* possible second round follow up questions, each with *three* possible second round follow up answers, each with *three* possible third round follow up questions, each with *three* possible third round follow up answers. Thus we have *three* times *three* times *three* times *three* times *three* times *three*.

and  $3 + 27 + 243 = 273$  potential questions to which answers must be devised.<sup>184</sup>

The exponential speed at which contingent inquiries beget their own contingencies seriously taxes the capability of the human mind. A similar form of contingent thinking is required for games like chess, wherein each player must anticipate not just how her opponent will react to her current move, but also how she herself will counter-react to each of her opponent's possible reactions, as well as how her opponent will counter-counter-react to each of her of possible counter-reactions, and so on. Cognitive psychological research on chess indicates that even world class chess players, who, we may suppose, play chess nearly every waking hour nearly every day, are able to look only several moves ahead.<sup>185</sup> Lying witnesses, who play a far less structured game, as a sidebar to their main careers, will likely not do as well.

## 2. For the Sincere

The necessity of anticipation for the *insincere* witness derives mostly from the difficulty of spontaneously crafting answers to unanticipated questions in a way that is both detailed and consistent—difficulties of “performance” that we explore in more detail in the next Part, IV. Such difficulties of spontaneous construction in performance do not so plague the sincere witness, who on facing an unanticipated question achieves detail and consistency by retrieving memories rather than fabricating answers. Largely immune from the performance difficulties that necessitate it, therefore, the sincere witness is equally insulated from the preparation difficulties of anticipating questions.

## 3. Potential Qualifications

Once again, this is not to say that the sincere witness, who nonetheless has interests to pursue, would not do well to anticipate the questions she is likely to face. Such anticipation will help her to transform memories into language so as to make her performance more impressive. It will also help her to adorn her answers with favorable nuance and spin.

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<sup>184</sup> This is the tally of questions in the list in *supra* note 183.

<sup>185</sup> Fernand Gobet, *Chess, Psychology of*, in MITECS: THE MIT ENCYCLOPEDIA OF THE COGNITIVE SCIENCES (Frank Keil Robert Wilson ed., 1999). Indeed, even world class chess-playing *computers* are unable to follow all contingencies to the end of the game, the number of contingencies in chess being greater than the estimated number of stars in the universe. AVINASH K, DIXIT & BARRY NALEBUFF, THINKING STRATEGICALLY: THE COMPETITIVE EDGE IN BUSINESS, POLITICS, AND EVERYDAY LIFE \_\_\_ (1993).

But the necessity of anticipating questioning born from these considerations is an order of magnitude less serious than that faced by the insincere witness. And in any event, the insincere witness also has to be concerned with articulateness and spin. What creates a sizable cost differential is the fact that the insincere witness's primary concern must be substance, not style.

#### 4. Witness Exclusion

Federal Rule of Evidence 615 provides that the court may exclude nonparty, nonessential<sup>186</sup> witnesses from trial “so that they cannot hear the testimony of other witnesses.”<sup>187</sup> Given exclusion rules of this nature, the preparatory exercise of anticipating questions is all the more imperative when a set of insincere witnesses testifies in cahoots.

Nearly insurmountable consistency problems arise with respect to the external consistency of each witness when members of the group are individually asked a question that the group did not anticipate, and whose answer it, therefore, did not coordinate.<sup>188</sup> A single insincere witness has at least some chance of coming up with a consistent answer to an unanticipated question. But given the infinity of consistent answers that might be chosen, even if all witnesses answer consistently, the possibility that two or more witnesses will chose the *same* consistent answer is extremely unlikely.

Anticipation is not so imperative for a group of sincere witnesses. Their answers to unanticipated questions will tend to be automatically consistent by virtue of the fact that they all described what actually occurred. Again, this is not to say that they will not have differing opinions and perceptions. It is only to say that discrepancies will be far less likely to arise, far less severe, and far easier to explain, than those produced by the on-the-spot answers of a group of witnesses that have failed to fully coordinate their fabricated account.

The fact that the necessity of anticipation is multiplied along with the number of witnesses is perhaps some part of the reason that corroborated testimony is given greater weight than the testimony of a single witness.<sup>189</sup> The alternative explanation, merely analogizing greater numbers of witnesses to larger samples sizes, is inapt. It founders on the fact that insincere witnesses can coordinate their

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<sup>186</sup> FED. R. EVID. 615(1)-(3). Witnesses who have a statutory right to be present—e.g., in certain cases, victims—cannot also not be excluded. FED. R. EVID. 615(4).

<sup>187</sup> FED. R. EVID. 615.

<sup>188</sup> Thus, another “bad”—the problem of coordination among individuals—becomes a “good” when applied to evidentiary process. See *supra* note **Error! Bookmark not defined.**

<sup>189</sup> In addition to this general practice, specific rules requiring or more heavily weighting multiple witnesses do exist. See, e.g., U.S. CONST., art. III §3 (“No person shall be convicted of treason unless on the testimony of two witnesses to the same overt act, or on confession in open court.”); 18 U.S.C. 1621 (perjury statute, interpreted to require two witnesses to prove offense).

preparation. Given this, the sample of witness testimony would not be independent were all questions anticipated. A greater sample size would just be more of the same, as additional witnesses repeated the same collectively rehearsed story. Only when it is recognized that cognitive bounds prevent the group of witnesses from anticipating all the questions they may face, does the greater weight accorded to corroborated testimony make sense.

Thus, the logic of witness exclusion is intimately connected with the exploitation of cognitive limitations—namely the limited capacity of the mind to anticipate contingencies.

#### *D. Testimony from Memory*

Imagine the following scene. An alleged eyewitness, called to the stand, comes forward with computer case in hand. After swearing in, she sits down, pulls out her laptop, opens the lid, and turns it on. A few moments later, she looks up from behind the screen ready to answer questions, her fingers poised on the keyboard.

A ridiculous image. But why so, precisely? If truth is what we are after and—taking the approach of much of the existing literature on cognition and evidentiary process—we assume that we have before us a disinterested witness, why should we rely on what that witness happens to be able to recall right here, right now? If we are as sure in the context of real process as we apparently are in the context of existing research, that the witness has the best of intentions, why not let her read from notes<sup>190</sup>—notes that she may well have recorded while the event was fresh in her mind, notes that she has had a chance to contemplate, question, and revise? Indeed, why not allow the witness to use notes in answering the cross-examiner's questions? Why for that matter not permit the use of software programs—which would undoubtedly develop were they allowed<sup>191</sup>—to help the witness anticipate cross examination, so that as each question is asked she types in keywords and receives back a response vetted for coherence and consistency?

Perhaps the explanation lies in the fact that in organic litigation, as opposed to experiments of our own design, we are far from certain that the witness is sincere, and we believe implicitly that one way to tell the liar from the truth-teller is to exploit the cognitive shortcomings that make lying a markedly more difficult task than

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<sup>190</sup> See also the discussion of present recollection refreshed at *infra* Parts III.D.2, III.D.3, and III.F.

<sup>191</sup> Consider the wide array of litigation software packages to help attorneys prepare and conduct questioning, as discussed *infra* at Part V.A.3.b).

truth-telling. Implicitly focused on the signal cost differential,<sup>192</sup> we recognize that testimony from memory, while it certainly also hampers the sincere witness, hampers the insincere even more.

### 1. For the Insincere

The insincere witness must create afresh new long term memories. She constructs her story in “working memory.”<sup>193</sup> Somewhat like RAM on a computer, working memory is relatively easy to access, but small in capacity and quick to dissipate.<sup>194</sup> Thus, having constructed her account, the insincere witness must transfer it from working memory to long term memory, which is more difficult to access, but more permanent.<sup>195</sup> Although this transfer happens repeatedly in daily life, it is relatively difficult to control, requiring time and attention.<sup>196</sup>

### 2. For the Sincere

The sincere witness, in contrast, is called upon to retrieve only that which is already stored. Despite the emphasis in the existing literature on the foibles of witness memory, refreshing the memory, however difficult in absolute terms, is probably among the easiest of cognitive tasks. The chief source of difficulty is finding “retrieval paths” to the particular location in long term memory where sought after information is stored. When the right retrieval path is found, memory unfolds in a mysteriously effortless, largely automatic process.<sup>197</sup> Remembering is a highly leveraged task. One bites into the right sort of cake, and volumes of remembrance ensue.<sup>198</sup>

Notwithstanding recent scholarship, evidence law comports with this view of the relative facility of memory retrieval. The leveraged nature

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<sup>192</sup> Regarding present recollection refreshed and FED. R. EVID. 612, see also Part II.A.6, *supra* and Part III.D.3, *infra*.

<sup>193</sup> BADDELEY, WORKING MEMORY *supra* note 2 at 64-72.

<sup>194</sup> Murray Glanzer & Anita R. Cunitz, *Two Storage Mechanisms in Free Recall*, 5 J. VERBAL LEARNING & VERBAL BEHAV. 351, 351 (1966)

<sup>195</sup> See, e.g., Fergus I. Craik & Robert S. Lockhart, *Levels of Processing: A Framework for Memory Research*, 11 J. VERBAL LEARNING & VERBAL BEHAV. 671 (1972) (depth of encoding determines durability).

<sup>196</sup> See, e.g., Murray Glanzer & Anita R. Cunitz, *Two Storage Mechanisms in Free Recall*, 5 J. VERBAL LEARNING & VERBAL BEHAV. 351 (“recency” effect dissipates with brief filled delay between hearing and recalling).

<sup>197</sup> See generally George Mandler, *Hypermesia, Incubation, and Mind Popping: On Remembering without Really Trying*, in ATTENTION AND PERFORMANCE XV 1 (Carlo Umiltà ed., 1994) (reviewing literature on hypermesia and related phenomena)

<sup>198</sup> *Fanelli v. United States Gypsum Co.*, 141 F.2d 216, 217 (2<sup>nd</sup> Cir. 1944), J. Jerome N. Frank, (“Common experience, the work of Proust and other keenly observant literary men, and recondite psychological research, all teach us that memory of things long past can be accurately restored in all sorts of ways.”); *Baker v. State*, 35 MD. APP. 593, 603 n11 (1977) (“Marcel Proust, in his monumental epic *In Remembrance of Things Past*, sat, as a middleaged man, sipping a cup of lime-flavored tea and eating a madeleine, a small French pastry. Through both media, two long-forgotten tastes from childhood were reawakened. By association, long forgotten memories from the same period of childhood came welling and surging back. Once those floodgates of recall were opened, seven volumes followed.)

of memory refreshment grounds the most familiar rationale for the common law principle of “present recollection refreshed,” as codified with modification in Fed. R. Evid. 612.<sup>199</sup> This is the rule that allows the stumped witness to consult written materials on the stand to help jog her memory. The same principles apply to jogging memory before taking the stand as the sincere witness prepares for testimony. Apparent Proust fans, the writers of the classic evidence treatises wax particularly eloquent on this miracle of remembering. Consider McCormick’s famous passage:

It is abundantly clear from everyday observation that the latent memory of an experience may be revived by an image seen, or a statement read or heard...The recall of any part of a past experience tends to bring with in the other parts that were in the same field of awareness...The effect of reminder, encountered in reading a newspaper or in the conversation of a friend, which gives us the sensation of recognizing as familiar some happening which we had forgotten, and prompts our memory to bring back associated experience, is a frequently encountered process...The interviewing of witnesses by counsel whom will examine them in court is a necessary step in preparing for trial. It is at this stage that the memory of the witness can best be refreshed about the facts of the case, by giving her the opportunity to read her own written statements previous made, or the letter, maps. or other documents in the case.<sup>200</sup>

Cognitive psychologists have confirmed the efficacy of a series of common techniques designed to systematically locate retrieval paths and thus produce the flourish of relevant memories that McCormick and Proust intuitively describe. The result can be what is termed “hypermnnesia:” remembering what was forgotten (as opposed to, *amnesia*: roughly, the forgetting of what was remembered).<sup>201</sup> Time is a key ingredient in the application of these techniques.<sup>202</sup> One waits until the effect of the prior unsuccessful retrieval paths has left working memory so that a new approach has full sway and is not side-tracked.<sup>203</sup> Forgetting, is thus, an important part of remembering. Anyone who has returned to a crossword puzzle knows this well, as answers often become apparent only after one forgets the wrong approach that one has been taking up to that point.

The possibility that the passage of time and repeated attempt helps memory retrieval is a specific reason why witness preparation is more complicated normatively than some have taken it to be. The existing literature warns of the dangers of undue influence by the interviewing

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<sup>199</sup> See also Part III.F, *infra*.

<sup>200</sup> MCCORMICK at § 9.

<sup>201</sup> See generally George Mandler, *Hypermnnesia, Incubation, and Mind Popping: On Remembering without Really Trying*, in ATTENTION AND PERFORMANCE XV 1 (Carlo Umiltà ed., 1994) (reviewing literature on hypermnnesia and related phenomena)

<sup>202</sup> *Id.* at 1.

<sup>203</sup> *Id.*

attorney.<sup>204</sup> While it is true that witness coaching may put ideas into the heads of well meaning witnesses, and while it is true that the insincere witness benefits from coaching and preparation, so does the sincere witness. Again the key is the differential. The policy issue is not whether witness coaching helps the insincere witness in absolute terms, but whether it helps the insincere more than the sincere and so closes the differential between the difficulties of the respective cognitive tasks.

The *relative* ease of memory retrieval in the full array of cognitive tasks does not take away from the fact that memory retrieval is never simple and pure. As is well-documented in the existing literature on evidentiary process and cognition, refreshing the memory is hardly an error free enterprise. Yet for several reasons, this vast literature regarding the foibles of witness memory is likely to distract attention from the main story: the fact that the memory task for the sincere witness is much easier than that for the insincere.

Focusing on the differential leads us to recognize that whatever the difficulties of memory retrieval in general, the *insincere* witness has at least as much memory to retrieve as the sincere. In the first place, the insincere witness's task of maintaining external consistency will require retrieving a store of knowledge about how the world works and what it looks like.<sup>205</sup> Furthermore, the insincere witness must remember as much as the sincere about what *really* happened in order to weave her story around the observable manifestations of real events. Constructing an alibi, for example, requires remembering where one really was around the time in question so as not to contradict what can be established about real events. If the witness says she was in Miami on Thursday at the time of the murder, but the druggist in Seattle remembers fulfilling a prescription for her on Wednesday, and the witness can produce no record of airline travel, the witness has a problem. In constructing her story, then, the witness must remember where she was and who she saw earlier in the week. And her inability to retrieve all of these memories is a benefit to the task of uncovering her lie. Thus, any difficulty for the sincere witness in memory retrieval largely cancels out with similar difficulties for the insincere, and we are left with a differential that is occupied chiefly by the fact that the insincere must construct and memorize.

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<sup>204</sup> See Part III.A, *supra*.

<sup>205</sup> *cite*

### 3. Present Recollection Refreshed<sup>206</sup>

The requirement of memorized testimony is implicit in, as much as it is softened by, the doctrine of present recollection refreshed.<sup>207</sup> Fed. R. Evid. 612, for example, codifies this common law practice of allowing a witness to consult written records while testifying, but only for the purpose of refreshing the memory. The idea is that glancing at a written record will jog the witness's memory and enable her to continue testifying therefrom. Importantly, after examining the record, she does not then testify from the record *per se*, but rather from the memories that it has jogged.<sup>208</sup> The judge will not let the witness proceed unless she is satisfied that this will be the case. These and other special requirements<sup>209</sup> that must obtain before a witness may refer to notes or other records point implicitly to the law's general preference for memorized testimony. The explicit exception for present recollection refreshed indicates the presence of the implicit general rule.<sup>210</sup>

But, one may object, the witness is after all allowed to refresh her memory with the notes. Does not this abrogate the importance of memorization? It does and it does not. Although the Rules do not outright prohibit the use of written records while testifying, when they allow it, they charge a price. If the witness uses written records to "refresh her memory," the other side may inspect these notes, cross examine the witness thereon, and introduce relevant portions

<sup>206</sup> Present recollection refreshed is also discussed in Parts III.F and V.A.3.a), *infra*.

<sup>207</sup> Present recollection refreshed has received little scholarly attention. For an exception see Thomas M. Tomlinson, *Note: Pattern-Based Memory and the Writing Used to Refresh*, 73 TEX. L. REV. 1461, 1478 (1995) ("two ways that a writing used to refresh skews testimony: It makes a witness appear more confident, and it suggests testimony to the witness.")

<sup>208</sup> *Thompson v. U.S.*, 342 F.2d 137, \_\_\_ (5th Cir. 1965), *cert. denied*, 381 U.S. 926 (1965) (Noting requirements that witness's memory be exhausted and that writing refresh it); *NLRB v. Federal Dairy Co.*, 297 F.2d 487, 488-89 (1st Cir. 1962) ("witness should first testify, if there is objection, that the paper does in fact have that effect [of refreshing memory]. If it does not, he cannot use it. Equally important, the witness, unless opposing counsel waives it, should not refresh his recollection until he has been examined without leading, if it is direct examination, and has testified that his recollection is exhausted. Prerequisites in prompting a witness, such as exhaustion of memory, are so axiomatic that they are rarely referred to except in passing."); *U.S. v. Weller*, 238 F.3d 1215 (10th Cir. 2001) ("court has the discretion to withhold any writing from a witness where the judge believes that the document will be a source of direct testimony rather than the key to refreshing the witness' independent recollection.")

<sup>209</sup> See Part III.F, *infra*.

<sup>210</sup> Courts do occasionally explicit state the rule. *See, e.g., NLRB v. Federal Dairy Co.*, 297 F.2d 487, 489 ("Not to say that when recollection is exhausted a witness may not be shown a paper. But he should not bring into court specially prepared extensive testimonial notes to use over objection instead of the original records. One may well ask why there should be strictures against leading questions if a witness is free to have a prepared answer before him in any event."); *Hall v. American Bakeries, Co.*, 873 F.2d 1133 (8th Cir. 1989) (finding error in allowing witness to testify from notes that he had prepared days before trial, where notes were not used to refresh memory but were themselves source of testimony.)

Conventional explanations for this implicit general rule are facially unsatisfying. We read that notes are discouraged or forbidden to ensure that the fact finder hears the witness's testimony in the witness's own words. 3 JOHN HENRY WIGMORE, *EVIDENCE IN TRIALS AT COMMON LAW* §758 (J. Chadbourne rev. ed. 1974) [hereinafter WIGMORE, 1974 EDITION] ("Since the Narrative...should represent actual Recollection, it becomes necessary to forbid the use of various artificial written aids capable of misuse so as to put into the witness' mouth a story which is in effect fictitious and corresponds to no actual Recollection."); *NLRB v. Federal Dairy Co.*, 297 F.2d 487, 488 n3 (1st Cir. 1962) (quoting this passage from Wigmore). This explanation fails to explain why is it any more or less the witness' own story if she is reading from her own notes.

into evidence.<sup>211</sup> The result is that there is effectively a prohibition against refreshing memory by records that one would not want one's opponent to see. This is likely to help sincere witnesses more than insincere, a point to which we return below in Part III.D.3.

#### 4. Leading Questions on Direct

The preference for memorized testimony also helps elucidate the reason why leading questions are disfavored on direct examination. FED. R. EVID. 611(c), for example, states that leading questions—questions that suggest their answer—“should not be used on the direct examination of a witness.”<sup>212</sup> Thus, the plaintiff's lawyer cannot ask the passenger witness, “And then you saw the defendant's car weave into oncoming traffic, is that right?” Rather the lawyer must ask something on the order of, “And then what happened next?” and the witness must recall the answer.

The conventional explanation for the rule against leading questions on direct is that leading questions put words into the mouth of the witness. This explanation is compelling in certain settings—such as where a child is being interviewed for the first time about a possible incident of molestation.<sup>213</sup> But in the typical case, the sponsoring party needn't wait until the witness is on the stand to put words into her mouth. That is what “witness coaching” is for—at least according to the same literature.<sup>214</sup>

More likely, the best reason for prohibiting leading questions on direct is that doing so requires that whatever witness coaching there was, be recalled by the witness, not merely recognized under strong suggestion. Recall is more difficult than unaided recognition—a short-answer question is more difficult than the same question in

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<sup>211</sup> Fed. R. Evid. 612 (“Writing Used to Refresh Memory. ...[I]f a witness uses a writing to refresh memory for the purpose of testifying...while testifying...an adverse party is entitled to have the writing produced at the hearing, to inspect it, to cross-examine the witness thereon, and to introduce in evidence those portions which relate to the testimony of the witness.”). We discuss *infra* at Part III.F another provision of the rule under which the court may in its discretion allow the same treatment for writings used to refresh memory *before* testifying. *Id.*

Note that FED. R. EVID. 612 is specifically made subject to the Jencks Act, as codified in part, and extended in part, in FED. R. CRIM. P. 26.2. See MCCORMICK §97.

<sup>212</sup> Exceptions include situations wherein leading questions are necessary to develop testimony or when the witness is hostile. The advisory committee's note to Fed. R. Evid. 611 makes clear that this a suggestion for the trial judge rather than a command. Fed. R. Evid. 611 advisory committee's note (“The matter clearly falls within the area of control by the judge over the mode and order of interrogation and presentation and accordingly is phrased in words of suggestion rather than command.”) But the practice of disallowing leading questions on direct is thought to be well ensconced. And in practice courts will generally sustain an objection to this effect from the other side.

<sup>213</sup> Despite the fact that findings for the special setting of child witnesses are not readily transferable to most of evidentiary process, these results tend to get broad play in the literature on cognition and evidentiary process. See, e.g., Vrij, DETECTING LIES AND DECEIT, at 113-115. (discussing the truth finding technique of “Statement Validity Assessment,” initially designed for child witnesses).

<sup>214</sup> See Part III.A, *supra*.

<sup>216</sup> *Antitrust Case is Highlighting Role of Email*, NEW YORK TIMES, November 2, 1998, 67-69.

multiple choice format—and it is certainly more difficult than prodded recognition.

Thus as for witness exclusion, the exploitation of cognitive limitations plays an essential role in justifying the general prohibition against leading questions on direct.

### ***E. The Witness's Prior Out of Court Statements***

Internal consistency, as it was discussed above, concerns contradiction within the four corners of the witness' current testimonial performance. But, of course, a witness may also contradict her own prior statements made outside the context of the current testimonial performance. For example, in *U.S. v. Microsoft* the government alleged that Microsoft met in June 1995 with its rival Netscape to present a plan to divide up the internet browser market between them, with the inducement that Microsoft would invest in Netscape. When Microsoft Chair, William H. Gates was asked about this on deposition, he stated only that a subordinate had broached the possibility of Microsoft's investing in Netscape, but that he "didn't see that as something that made sense."<sup>216</sup> The government then introduced an email from Gates' sent prior to the June 1995 meeting in which Gates proposed attempting to collude with Netscape, using Microsoft's investment to coax Netscape to accept the arrangement.<sup>217</sup>

The contradiction of statements made outside of current testimony raises *both* internal and external consistency issues.

#### **1. External Consistency**

The inconsistency is external to the extent that we view the witness's prior statement as fixed. As such, preparing around one's own prior statements is similar in character to preparing around external facts established by the statements of other witnesses.<sup>218</sup>

Just as one may not know what the other side can prove about the world, one may not know what the other side can prove about one's own prior statements. And to the extent, that one does indeed know about one's prior statements, they constrain one's testimony and increase the difficulty of story construction. Thus, although it is true that prior inconsistent statements may not generally be used for the

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<sup>217</sup> *Antitrust Case is Highlighting Role of Email*, N. Y. TIMES, November 2, 1998, at 67-69.

<sup>218</sup> The impact may differ as a matter of degree, however, for the fact that the "other" witness is the same as the current witness, and therefore the contradiction is less likely accidental or excusable.

truth of what they assert,<sup>219</sup> such statements do have substantive effect. They bound what the witness will choose to assert on the stand, which of course may be used substantively.

## 2. Internal Consistency

Alternatively, we can view prior statements made outside of current testimony as endogenous, the choice of what to say outside of court being part of the same preparatory task as the choice of what to say at trial or on deposition. On this account, preparation for testimony is not just a matter of remembering what one has already said, but also remembering what and what not to say well before suit is filed, perhaps even before a dispute arises.<sup>220</sup>

Like other more direct tasks of preparation that take place on the eve of trial, such proto litigation activities are cognitively daunting. Indeed, given the necessity of looking farther forward in time, the presence of greater uncertainty as to what evidence will end up being decisive in litigation,<sup>221</sup> the typically longer time span over which this kind of “preparation” must be consistently kept up, and the greater necessity of multitasking with one’s daily activity, this form of preparation is likely to be even more difficult than preparation on the eve of testimony.<sup>222</sup>

The specific difficulties of contingent thinking, as discussed above in Part III.C, likewise affect the crafting of out of court statements. In fact, it seems probable that individuals are rarely successful at avoiding the creation of all potentially damaging statements as they go about their daily activities. As most cases enter litigation, the field is likely strewn with prior statements that either effectively bound the witness’s current testimony or may be used to discredit it. The fact that prior statements—outside current testimony—are a chief mode of impeachment points in this direction.<sup>223</sup>

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<sup>219</sup> Exceptions include when such statements are made by a party, or in a judicial proceeding or deposition and are inconsistent with current testimony. See, e.g., FED. R. EVID. 801(d)

<sup>220</sup> The general point here, that preparation may extend beyond that undertaken on the eve of trial also holds for contradiction by purely external facts, which are also, but to a much lesser extent, subject to manipulation before the definite prospect of litigation arises.

<sup>221</sup> Sanchirico, *Evidence Tampering* at Part V (emphasizing importance for the regulation of evidence tampering of uncertainty about what evidence will be decisive in litigation).

<sup>222</sup> But see *infra* note 223 discussing other difficulties that would befall even the perfectly rational.

<sup>223</sup> See Part II.B.3, *supra*. Cognitive limitations are not the only source of difficulty here. Difficulties are also caused by uncertainty per se, which plagues the perfectly rational as well as the ordinarily irrational. There is only some chance that one’s current statement will be decisively damaging in later litigation. And sometimes the risk is rationally taken. Sanchirico, *Evidence Tampering*, DUKE L. J. (forthcoming 2003) (manuscript at Part V, on file with author).

Similarly, some part of the prevalence of contradictable prior statements is due to unavoidable trade-offs between effectively proceeding in the primary activity task and avoiding the generation of an evidentiary trail—again a difficulty plaguing all degrees of rationality. One has to communicate instructions, for example, and doing this effectively may require sending emails that are later damaging

More specific cognitive biases, said to spring from the kind of general cognitive shortfall that we are discussing,<sup>224</sup> may also play a positive role here. We read that individual decision makers tend to underestimate small probabilities.<sup>225</sup> This can certainly cause havoc when the under-estimators are uninsured consumers, or even impartial fact finders. But when the under-estimator is a potentially insincere witness this is good news. For it means that potential future witnesses will disregard the small probability that their current statements will come back to haunt them, bounding their current testimony, and/or discrediting it when it steps outside such bounds.<sup>226</sup>

### 3. Prior Statements of a Witness

Despite the difficulty of anticipating how current statements will later be used, prior statements are a factor in witness preparation, broadly defined. And an important, though largely unrecognized aspect of the rules concerning the use of both prior inconsistent and prior consistent statements are illuminated by viewing prior statements as such.

It is fairly clear that the importance of remembering what *not* to say is enforced by liberal<sup>227</sup> rules for impeachment by prior inconsistent statements. But what about the importance of remembering to make affirmative statements? One's first impression might be that such affirmative pronouncements would fall under the proponent's admission of prior *consistent* statements. But various restrictions on the admission of prior consistent statements largely prevent this kind of deployment.<sup>228</sup>

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in litigation. See note **Error! Bookmark not defined.** regarding the double negative of coordination problems.

<sup>224</sup> See *supra* note 17.

<sup>225</sup> See, e.g., Jeffrey J. Rachlinski, *The "New" Law and Psychology: A Reply to Critics, Skeptics, and Cautious Supporters*, 85 CORNELL L. REV. 739, 758 (2000).

<sup>226</sup> This probability is even smaller for the fact that what matters is not the possibility of contradiction, but the smaller possibility that such contradict is decisive in the case. Sanchirico, *Evidence Tampering*, DUKE L. J. (forthcoming 2003) (manuscript at Part V, on file with author). E.g., commentators argued that Gates' contradictions were not decisive in the Microsoft case because the government could not prove consumer harm.

<sup>227</sup> See, e.g., *Harris v. N.Y.*, 401 U.S. 222 (1971) (allowing impeachment of accused by prior inconsistent statements that were barred from substantive use by *Miranda*); FED. R. EVID. 613 (laying out procedures)

<sup>228</sup> Bolstering—or supporting the witness's credibility before it has been attacked is generally disallowed. MULLER & KIRKPATRICK, EVIDENCE §6.49. Rehabilitation—supporting the witness's credibility after it has been attacked—is allowed but several special restrictions have emerged regarding rehabilitation specifically by prior consistent statement. In *U.S. v. Tome*, 513 U.S. 150 (1995) the Supreme Court held inadmissible a child's prior statements, consistent with current testimony, that her father had sexual abused her. (The precise issue was whether they were exempted from the definition of hearsay under 801(d)(1)(B). On this, see the discussion below.) The court laid down the general rule that such prior consistent statements would be admissible only when they were made before the motive to fabricate had arisen. In the *Tome* case, there was some reason to believe that the child had been enlisted in her mother's campaign to strip the father of child custody rights. The child's prior statements were made after such plan would have been formulated. The *Tome* case concerned the substantive rather than rehabilitative use of prior consistent statements—the statements were offered to prove the truth of the

Such restrictions do not, however, imply that there is little sense in remembering to make corroborating statements ahead of time. For impeachment by *inconsistent* statements plays a role here also. It is well established that prior silence and omission may count as *inconsistent* with affirmative statements made later during testimony.<sup>229</sup> Avoiding inconsistency with prior silence requires remembering to make affirmative statements early on. The impetus for making such corroborating statements is largely preventative, but no less powerful.

The justification for allowing impeachment by prior unnatural omission, while broadly disallowing corroboration by prior consistent statements implicates again the law's exploitation of cognitive shortcomings. It is easy to remember to make a corroborating statement *at some point*. It is more difficult constantly to keep in mind the necessity of making corroborating statements whenever a situation arises where one would have done so.

### ***F. Writings Used to Prepare***

When people encounter difficult mental tasks—such as preparing for testimony—their natural inclination is to take notes.<sup>230</sup> Note-taking is an example of how the human mind makes use “cognitive artifacts” to leverage its limited ability.<sup>231</sup> Notes not only aid the memory, they also facilitate reasoning.<sup>232</sup> We have already discussed limits on the witness's ability to use notes *while* engaged in the difficult task of testifying, pointing out that the existence of these limits add memorization to the list of preparatory tasks for the insincere.<sup>233</sup> This section discusses witnesses use of notes, not in the course of testimony, but in preparation therefor.

The use of notes and other cognitive artifacts would be of great assistance to the insincere witness, lowering for her the cost of providing a detailed, consistent, and robust account. Notes would be helpful, first, in constructing the story and its contingencies. The witness could graph out the main story line and all its spurs. Notes aid thinking essentially by substituting for working memory, thus freeing that up for additional reasoning—much like writing to the hard drive frees up RAM for additional calculations. Secondly, notes would be helpful in memorizing the story that is settled on. Notes

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matter asserted, rather than to rebut a charge that the child was fabricating on the stand, no such charge having been leveled by the defendant. But these rules may well be applied to prior consistent statements when used solely for a rehabilitation purpose. WEINSTEIN §607.09[2](b) (“[Prior] trend towards flexibility was dealt a mortal blow in Tome”).

<sup>229</sup> WEINSTEIN §607.07[3](c).

<sup>230</sup> Donald A. Norman, *Cognitive artifacts*, in DESIGNING INTERACTION 20, (John M. Carroll, ed. 1991); WEINSTEIN §612.03 (“witnesses often testify after pretrial reviewing of notes and reports.”)

<sup>231</sup> Norman, *Cognitive Artifacts* at 20.

<sup>232</sup> *Id.*

<sup>233</sup> See *supra* Part I.A.1.

fix the content while it is being lodged in long term memory and are a convenient tool for repeated rehearsal.

Yet the legal landscape governing the use of notes in preparing for testimony has two prominent features that limit the extent to which the insincere witness can make use of this cognitive aid. Both of these features serve to make the cognitive task of preparation more difficult for the insincere without making it also more difficult to a comparable degree for the sincere.<sup>234</sup>

## 1. Embarrassing Notes

We have already remarked that when the witness uses notes to “refresh her memory,” those notes may be viewed by the opposing attorney, who may ask the witness about them, and potentially have them admitted into evidence.<sup>235</sup> Codifying an incipient shift in the common law,<sup>236</sup> FED. R. EVID. 612 extended this treatment to writings used to refresh memory *before* testifying,<sup>237</sup> when such treatment is in the “interests of justice.”<sup>238</sup>

In the often cited case of *Julian v. Raytheon*,<sup>239</sup> for instance, Raytheon learned that counsel for Julian had prepared a briefing binder for use by Julian’s principals, officers and employees in preparing for their respective depositions.<sup>240</sup> Julian’s witnesses did not make use of the binder during the deposition,<sup>241</sup> but testified from memory. Raytheon argued that this binder should be disclosed under FED. R. EVID. 612. The court agreed. Indeed, it did so after first finding that the binder was attorney work product.<sup>242</sup> FED. R. EVID. 612 was held to trump the usual protections for such materials.<sup>243</sup> Other courts have found similarly with regard to attorney client privilege.<sup>244</sup>

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<sup>234</sup> One may also fail to focus on the differential in thinking that witness preparation is always good. Alfreda Robinson, *Duet or Duel: Federal Rule of Evidence 612 and the Work Product Doctrine Codified in Civil Procedure Rule 26(b)(3)*, 69 U. CIN. L. REV. 197, 236 (2000). (“It seems intuitively true that if witnesses are not prepared thoroughly with documents, questionable verdicts are more likely because less facts will be discovered.”)

<sup>235</sup> See *supra* Part III.D.

<sup>236</sup> FED. R. EVID. 612 advisory committee’s note.

<sup>237</sup> FED. R. EVID. 612(2).

<sup>238</sup> The “interests of justice” proviso, however vague, was added by Congress and did not appear in the advisory committee’s proposed rule. cite

<sup>239</sup> *Julian v. Raytheon*, 93 F.R.D. 138 (D. De 1981)

<sup>240</sup> *Julian*, 93 F.R.D. at 144. FED. R. EVID. 612, like most Federal Rules of Evidence, applies to depositions in federal civil procedure. FED. R. CIV. P. 30(e); WEINSTEIN §612.02.

<sup>241</sup> *Julian*, 93 F.R.D. at 145 (D. De 1981).

<sup>242</sup> *Julian*, 93 F.R.D. at 144 (D. De 1981). See also *Berkey Photo, Inc. v. Eastman Kodak Co.*, 74 F.R.D. 613 (S.D.N.Y. 1977) (holding generally that if attorney shows work product to lay or expert witness prior to deposition, then work product becomes discoverable).

<sup>243</sup> *Julian*, 93 F.R.D. at 144. Not all courts have taken this “Strict Waiver” approach. See WEINSTEIN § 612.05 for a discussion of alternative approaches, including the “Balancing Approach” adopted by some courts.

<sup>244</sup> WEINSTEIN § 612.06[1] (“When a witness has refreshed his or her recollection with privileged materials before testifying, most courts...appear to hold that use of the material constitutes waiver of the privilege. Likewise, when a witness consults a writing embodying his or her own communication to

Even broader disclosure rights apply to materials used solely in preparation by expert witnesses.<sup>245</sup> FED. R. EVID. 705, for example, states that a testifying “expert may be required to disclose the underlying facts and data [upon which her opinions or inferences are based] on cross examination.”<sup>246</sup> And FED. R. CIV. P. 30(c) makes clear that this rule applies to depositions in civil cases. The upshot is that testifying experts in civil cases are routinely required to disclose any notes they may have made in writing their required reports<sup>247</sup> or preparing for depositions and trial testimony. This includes any early, perhaps less favorable drafts of their report and even any scribbles they may have made in the margins of the references they consulted.

In seeking the differential effect of these provisions it is, of course, not enough to look at their mere words. Rather they must be examined in the context of other rules and the broader strategic interests of the parties. The real question is: what is their *effective incremental* impact?

These rules give the opponent the *right* to see a preparatory writing and the *option* to offer that item into evidence. The opponent’s right to see the writing has effect only if seeing it would help her assemble her case. Similarly, the opponent’s option of offering the item into evidence has effect only if the item is useful to the opponent’s case (so that the option is indeed exercised) and the opponent would not otherwise be able to admit the evidence.

Putting all this together, we see that these rules have greatest effect when the witness’s preparatory writings are damaging to her proponent’s case. This, in turn, implies that these rules are less of a threat to the sincere than to the insincere. The sincere witness is far more likely to prepare with writings that are not only not damaging, but possibly even helpful to her proponent’s case—writings like hearsay correspondence or reports that corroborate her story.<sup>248</sup> The preparatory writings of the insincere—more precisely, the preparatory writings that the insincere *would like to* draft and compile, and would do so, but for the risk that they would turn up in her opponent’s file or in the jury room—are likely to be of a different flavor. Her notes might show trial and error in graphing out a story line. Her preparatory binder might include potentially contradictory information that she needed to craft her story around.

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counsel, and the testimony discloses a significant part of the communication, most courts find that the attorney-client privilege has been waived.”)

<sup>245</sup> See generally WEINSTEIN §612.04. (discussing other avenues for obtaining preparation materials when the witness is an expert.)

<sup>246</sup> FED. R. EVID. 705

<sup>247</sup> FED. R. CIV. P. 26(a)(2)(B),

<sup>248</sup> See, e.g., *Banker’s Trust Co. v. Publicker Industries, Inc.*, 641 F.2d 1361 (2<sup>nd</sup> Cir 1981) (In action by investment bank to recover fee, vice president of bank testified using a chronology of events, which the other side inspected, asked her about, but then declined to introduce into evidence).

## 2. Oral preparation

FED. R. EVID. 612 applies only to writings,<sup>249</sup> not to oral preparation. To some extent, this may be a matter of feasibility. Oral preparation would simply be too hard to police and prevent. With preparation by written records, by contrast, there is an evidentiary trail to pursue.

The fact that the law favors oral over written preparation is likely to induce witnesses and their proponents to do the same.<sup>250</sup> Professor Applegate suggests that substitution into oral preparation—with its greater potential for error—is a perverse and harmful effect of allowing opponent access to written preparation materials.<sup>251</sup> But the omission of oral preparation from rules like FED. R. EVID. 612 gains justification in light of the differing tasks faced by the sincere and insincere witness and the recognition that the differential between them is what gives testimony efficacy. Oral preparation is helpful to both the sincere and insincere. But it is likely to have a much more positive effect on the sincere witness's preparation than the insincere. The sincere needs only to find the retrieval path for her memory of the event, and oral preparation is often sufficient for this task. The insincere witness, on the other hand, must construct a story from scratch and play out as many of its logical implications as possible, all the while keeping track of what the other side can prove about the external world. Following construction, the insincere witness must memorize her story. The insincere witness could make good use of a war room, let alone a notepad.

### *G. Summary*

Preparing for testimony can be difficult and costly for any witness. But for the insincere witness of bounded cognitive capacity, the amount of time and effort required to prepare consistent, detailed, and robust testimony is likely to be particularly daunting. In fact, no amount of rehearsal could fully prepare the witness for all contingencies, which makes performance—as opposed to preparation—an independent challenge, one that we take up in the next part.

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<sup>249</sup> WEINSTEIN §612.02

<sup>250</sup> *Jos. Schlitz Brewing Co. v. Muller & Phipps (Haw.), Ltd.*, 85 F.R.D. 118, 120 n.2 (W.D. Mo. 1980). (“Adoption of a waiver theory seems dubious as a matter of policy, moreover, in that it would encourage the sophisticated prospective witness to avoid refreshing recollections prior to testifying, or to use a “coach” who has examined the documents, rather than the documents themselves.”); John S. Applegate, *Witness Preparation*, 68 TEX. L. REV. 277, 345 (1989).

<sup>251</sup> John S. Applegate, *Witness Preparation*, 68 TEX. L. REV. 277, 345 (1989) (“Oral description of documents is the worst possible type of witness preparation for the legal system to encourage.”). *See also*, *Jos. Schlitz Brewing Co. v. Muller & Phipps (Haw.), Ltd.*, 85 F.R.D. 118, 120 n.2 (W.D. Mo. 1980) (“It seems likely that truthful and accurate testimony by a prospective witness will be assisted by reviewing files, and the Court believes the useful discipline of such examination probably outweighs the danger of fabrication and mistake caused by reliance on undisclosed writings.”)

## IV. Performing Testimony: Live Testimony and Cross Examination

### A. Existing scholarship

When it comes to the performance of testimony, much existing scholarship and case law labors in the shadow of the classic assertion that the law has a “preference for live testimony.”<sup>252</sup> But precisely what is it about being “live” that makes it so important? After all, a well rehearsed soliloquy can be performed “live,” and a spontaneous free-for-all can be prerecorded. Do either of these fit the bill?

As some consideration of such questions indicates, live testimony is a multi-faceted concept, and the importance of any one its facets is far from self-explanatory. Before translating this amorphous “preference” into solid policy, therefore, the concept of “live” must be deconstructed and its vital co-ingredients identified.

Existing attempts to rationalize the law’s “preference for live testimony” commonly fall back on two subsidiary tenets. The first, despite Wellborn’s influential article to the contrary,<sup>253</sup> is the importance of observing witness demeanor. As we have seen,<sup>254</sup> however, observing witness demeanor is of questionable utility. At the very least, casual reference to the concept, with nothing more, is inadequate.

And in any event, there is always the question how observing demeanor is related to the concept of “live.” Why couldn’t demeanor be recorded for playback? Why for that matter couldn’t it be reported by hearsay witnesses along with the matter asserted by the declarant? We would unquestioningly rely on the witness’s memory of the declarant’s demeanor were that demeanor somehow at issue. Why not so rely when demeanor plays only an ancillary role?

The second tenet typically proffered to justify the law’s preference for “live” testimony is the efficacy of cross examination. *De rigueur* here is quotation of Wigmore’s superlative—perhaps the most quoted phrase in evidentiary process—that cross examination is “the greatest legal engine ever invented for the discovery of truth.”<sup>255</sup> But

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<sup>252</sup> This phrase is most often used in connection with justifying the general prohibition against hearsay (*see, e.g.*, FED. R. EVID. 801) and in giving content to the Confrontation Clause of the U.S. Constitution (*see, e.g.*, *White v. Illinois*, 502 U.S. 346, 356 (1992)).

<sup>253</sup> See Part II.A.3, *supra*.

<sup>254</sup> See Part II.A.3, *supra*.

<sup>255</sup> 5 WIGMORE, 1974 EDITION §1367, at 32. Quoted, *e.g.*, in *White v. Illinois*, 502 U.S. 346, 356 (1992).

like “the law’s preference for live testimony,” this phrase too is analytically unsatisfying on closer inspection.<sup>256</sup>

In the first place, even if we accept cross examination’s efficacy on faith, precisely how it implicates “live testimony” is again inadequately explained. For example, is there something about cross examination that could not be accomplished by multiple rounds of interrogatories crossing in the mail?

Secondly, and relatedly, the question of what cross examination is and how it works is too rarely examined. Resort to Wigmore’s sound bite does little to bring the concept into focus. To assert that cross examination is “the greatest legal engine ever invented for the discovery of truth” is not to explain how that engine works, or even to inventory its moving parts.

Given its historical context, Wigmore’s choice of metaphor is telling in this respect. His assertion first appears in 1904,<sup>257</sup> seven years after the invention of the gasoline-powered automobile (the greatest combustion engine event invented for the transportation of humanity?), two years after such automobiles were first mass produced, and four years before the first Model-T rolled off the line. To call something an “engine” at the dawn of the 20<sup>th</sup> century was likely to accord it power (a word Wigmore uses three times in that

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<sup>256</sup> Others have also been dissatisfied with this assertion, though for somewhat different reasons.

Several scholars focus on cross examination’s potential for “false positives:” wherein truthful witnesses are discredited. Professors Langbein and Damaska, for example, both warn of the possibility that cross examination will make the truthful witness look like a liar. Mirjan Damaska, *Presentation of Evidence and Factfinding Precision*, 123 U. PA. L. REV. 1083, 1094 (1975) (“Even with the best of intentions on the cross-examiner’s part, reliable testimony may easily be made to look debatable, and clear information may become obfuscated.”); Langbein, *The German Advantage in Civil Procedure*, at 833-834. (“[B]ecause cross-examination allows so much latitude for bullying and other truth-defeating stratagems, it is frequently the source of fresh distortion when brought to bear against truthful testimony.”). Wigmore, himself, also suggested this possibility, but viewed the problem as soluble. 5 WIGMORE, 1974 EDITION §1367, at 32 (“[Cross examination] may make the truth appear like falsehood. But this abuse of its power is able to be remedied by proper control.”).

It may be worth emphasizing that the bare fact that cross-examination exhibits false positives is in and of itself no indictment. Only perfect evidence is free from error, and perfect evidence does not exist. Furthermore, in judging the efficacy of cross examination, one must consider not only false positives, but also *true* positives: the extent to which *liars* are discredited. The fact that one must consider both false positives and true positives in judging cross examination is another way of pointing out the importance of focusing on the differential, rather than either of its components in isolation. (Note that false negatives are the complement of true positives).

Another recent position on cross examination emphasizes the lack of empirical evidence. This position is well represented in the writings of Professor Roger C. Park. Roger C. Park, Reasoning About Hearsay Reform Using Social Science Studies and “Anecdotal Evidence.” Presented at the Visions of Rationality Conference, April 4-5 (2003); Park, *Interrogation of Trial Witnesses*. Park recognizes that the discrepancy between Wigmore’s optimism and modern skepticism is an empirical matter. And he maintains neutrality given the dearth of empirical evidence for either side. Park, *Interrogation of Trial Witnesses*, at 162. (Reviewing a famous practice guide on cross examination, as well as systematic empirical work and concluding that “no one has come close to doing a definitive study [of cross examination], and one could argue that no one has even made a good start.”). See also Applegate, *Witness Preparation*, at 311. (“While the adversary system touts the effectiveness of cross-examination for revealing the truth, there is little empirical support for this conclusion.”). Empirical evidence is certainly lacking and ultimately necessary. But what must first be supplied, as has been lacking since Wigmore, is a precise account of the hypotheses to be tested.

<sup>257</sup> JOHN HENRY WIGMORE, A TREATISE ON THE SYSTEM OF EVIDENCE IN TRIALS AT COMMON LAW §1367 (1904) [Hereinafter, WIGMORE, 1904 EDITION].

<sup>259</sup> WIGMORE, 1904 EDITION at §1367.

same “legal engine” paragraph<sup>259</sup>) and also mystery.<sup>260</sup> To Wigmore’s reader, perhaps to Wigmore himself, the engine was likely as much a matter of amazement as of understanding. Correspondingly, amazement without understanding is largely what Wigmore delivers on cross examination, for there is little in his multivolume treatise to explain what makes this legal engine go.<sup>261</sup>

Almost exactly a century later, it is perhaps time we looked under the hood.<sup>262</sup> In that spirit, the present section investigates some of the mechanics of the performance of testimony, inclusive of cross examination. The focus is on how these institutions run off of the difference in cognitive load faced by sincere and insincere witnesses. As such, the section identifies a number of specific features about that performance that—whether by conscious design or not—exploit this differential load.

### *B. Unanticipated Questions*

In our treatment of preparation, we have already discussed the manner in which anticipating questions increases the cognitive load of preparing for testimony. And in doing so, we remarked that it was unlikely that the witness would ever be able to anticipate all the questions she might face in testifying, let alone at reasonable cost. Now, in discussing performance, we consider the difference in cognitive tasks facing the sincere and insincere witness on being presented with the probable unanticipated question.

That unanticipated questions are associated with a large differential in difficulty as between sincere and insincere witnesses begins to give some content to what we mean by, and what is important about, the “live” presence of the witness. “Live,” in this particular sense, means potentially unrehearsed.

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<sup>260</sup> Steam engines had already been in use for several decades. But the engine was likely still at the edge of the technological consciousness, much like computer processing or nuclear power are today, despite their similarly having been around for several decades.

<sup>261</sup> WIGMORE, 1974 EDITION §1368 (“What is the theory of [cross examination’s] efficiency? Upon this we commonly reflect but little.”) Wigmore then goes on in §1368 at 36-38 to reflect just a little more. He emphasizes that cross examination “extract[s] the remaining qualifying circumstances known to the witness but hitherto [on direct] undisclosed by him,” *Id.* at 37, as well as “facts which diminish the personal trustworthiness or credit of the witness [which also] have remained undisclosed on the direct examination,” *Id.*, all this with the drama of immediately succeeding direct and forcing the witness to supply his own refutation. *Id.* at 38. Wigmore does not explain, however, how these extractions occur or why a witness’s cross examination should be believed any more than her direct. Wigmore also provided a series of examples of cross examination in litigation, as well as extensive excerpts from writings of earlier evidence scholars.

<sup>262</sup> Park, *Interrogation of Trial Witnesses*, at 162. (“Unfortunately for the author of this chapter, no one has come close to doing a definitive study [of the helpfulness of cross (or the harmfulness of substituting hearsay evidence, which is the same question)], and one could argue that no one has even made a good start.”) Perhaps the closest that experimental research has come is Peter Miene, Roger C. Park, Eugene Borgida, *Juror Decision Making and the Evaluation of Hearsay Evidence*, 76 MINN. L. REV. 683 (1992) (one of the few hearsay experiments with real eyewitnesses to a staged incident and actual cross examination by participating attorneys).

## 1. For the insincere

### a) Internal Consistency

The challenges for the insincere witness of maintaining internal consistency are many times multiplied when her first cognitive encounter with a question is at trial or on deposition.

The first set of challenges involves internal consistency with prepared testimony. Likely the witness's "plan A" in this regard will be to fit the answer into her prepared story without altering that story. As her mind runs through each possible answer to the present question, she must unfold its salient implications and instantaneously search her memory for potential conflicts with the story she has prepared. A computer would be able to search quickly through its memory to check consistency with what has been or will be said. The human witness, however, possesses a far less impressive search engine. Moreover, even a computer would have difficulty with the spontaneous creativity necessitated by the task of adding additional fabrication to an already fabricated story.

Should no answer that is fully consistent with prepared testimony come to mind, the witness will likely resort to "plan B," spontaneously altering her prepared story to fit the answers that she *has* been able to think of. This is likely plan B rather than plan A because it requires more than just remembering a prepared story. The witness must also keep straight what of her prepared story she has already told and what she has yet to tell, the former being effectively unalterable. Moreover, going forward, she must remember how she has altered her prepared story in answering the present question. These new memories will compete with the older, presumably more well established, memories of her prepared story, and confusion is likely to ensue.

But ensuring that her answer to an unanticipated question fits with her prepared testimony is probably not even the hardest task the witness faces with regard to internal consistency. A second, more difficult task is to maintain consistency with answers to *other* unanticipated questions. For after the witness provides a spontaneous answer, it becomes part of her story of record. And what she says from thereon must be consistent with it as well. In particular, the next time she faces an unanticipated question, the witness must vet potential answers not only against her prepared story, but also against the answers she gave to past unanticipated questions. This means that, as the questioning proceeds, the insincere witness must not only be spontaneously creating answers and vetting them against the story of record, but also spontaneously transferring those answers from her working memory to her long

term memory—a task that is difficult when one has time to rehearse, and yet more difficult on the run.

### **b) External Consistency**

Maintaining *external* consistency also presents serious cognitive challenges to the insincere witness who finds it necessary to improvise. First, there are difficult feats of memory. The feeble human search engine must rifle through its understanding of what the other side is likely to know. More than this, if the answer is given on deposition, the other side will have the specific opportunity to investigate her answer to check its external consistency. Therefore, the witness is well advised to search her entire store of knowledge being sure not to contradict what can be commonly discovered.

Second, there are feats of knowledge accumulation, as opposed to knowledge retrieval. Obviously, there is no opportunity for research in spontaneous performance, as there is in preparation. If the witness is spontaneously making up a new part of the story that involves taking the train, for example, she must have in her head when the trains run. This implicates not just her ability to retrieve existing memories on the spot, but also the size of her general knowledge store. The bounds on her knowledge base—one part of her general cognitive limitations—make her task all the more difficult.

## **2. For the sincere**

For the sincere witness, answering an unanticipated question is at base a single task: memory retrieval. There is no real creativity involved. There is no need to remember prepared testimony, or past answers to other unanticipated questions. There is no need to instantaneously memorize the current answer for future reference. Each question may be attacked individually. Consistency across questions is automatically ensured by sticking with what is actually in memory. Obviously, spontaneous memory retrieval is not always easy. But just as obviously, it is easier than the set of tasks facing the insincere witness in the same position.

## **3. The Law of Surprise**

One response to this analysis of unanticipated questions is to challenge the importance it has placed on the element of surprise. Thus, some might say that our system, having evolved beyond Perry Masonic proto-process, has learned to loathe “surprise,” eschewing “the old sporting theory of justice [for] a more enlightened policy of putting the cards on the table and keeping surprise tactics down to a

minimum.”<sup>263</sup> Yet a peak behind this veil of civility, reveals that our system still thrives on catching witnesses off guard.

Consider that “surprise” is definitively not one of the items in the comparatively detailed list of grounds for excluding relevant evidence under Fed. R. Evid. 403—the catchall provision allowing the exclusion of evidence found to be more “prejudicial” than probative, and the place where “unfair surprise” would be generally proscribed.<sup>264</sup> Nor does surprise appear in a similar place in the evidentiary codes of forty nine states.<sup>265</sup> This is not for lack of suggestion and advocacy. Such a prohibition does appear in like provisions of several *model* codes and was explicitly and systematically advocated at the time of the adoption of the Fed. R. Evid. 403.<sup>266</sup> But it was also explicitly and systematically rejected.<sup>267</sup> In the interim, courts and commentators have continued to paid heed to this clear legislative history.<sup>268</sup>

Consider also FED. R. EVID. 613, governing the procedure by which a witness may be examined concerning her prior statements, including those of which she is presently unaware. FED. R. EVID. 613 abolished certain ritualistic aspects of impeachment by prior inconsistent statements, “useless impediments to cross examination,”<sup>269</sup> according to the advisory committee,<sup>270</sup> which had the effect of reducing the element of surprise.<sup>271</sup> For instance, under the old Rule in *Queen Caroline’s Case*,<sup>272</sup> the cross examiner was required to give the witness a moment to examine her prior statement in writing before questioning her about it. The rule is replaced in FED. R. EVID. 613(a) by the weaker requirement that the

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<sup>263</sup> Clark v. Pennsylvania R.R. Co., 328 F.2d 591, 594 (2d Cir. 1964). See also, U.S. v. Filani, 74 F.3d 378, 384-385 (2<sup>nd</sup> Cir. 1996) (“Our court has never embraced the so-called sporting theory of the common law.”); U.S. v. Agurs, 427 U.S. 97, 108 (1976) (describing express rejection of “sporting theory of justice” as rationale for *Brady* rule that prosecutor must upon request turn over exonerating evidence to accused, as provided in *Brady v. Maryland*, 373 U.S. 83, 87 (1963)). Cf. WIGMORE, 1974 EDITION Discovery §1845 (describing “sportsmanlike instincts” and the “game of litigation” in describing old common law’s aversion to discovery).

<sup>264</sup> FED. R. EVID. 403. Other rules of evidence do require pretrial disclosure. See, e.g., FED. R. EVID. 404(b), 413, 609 (requiring disclosure of intent to use prior act evidence for various purposes including state of mind, propensity to commit sex offenses, and impeachment.)

<sup>265</sup> The exception is KAN. STAT. ANN. §60-445.

<sup>266</sup> Project of a Committee of New York Trial Lawyers, 25 (June 1, 1970); International Association of Insurance Counsel (1970).

<sup>267</sup> FED. R. EVID. 403 advisory committee’s note.

<sup>268</sup> See, e.g., *Green Constr. Co. v. Kansas Power & Light Co.*, 759 F. SUPP. 740, 745 (U.S. Dist. , 1991) (“KPL next contends that it was unfairly prejudiced by the surprise introduction of two exhibits, [which were] not produced to KPL until the Friday of the week preceding the commencement of trial. ...The court finds that KPL’s contentions in this regard are without merit. [Among other reasons,] surprise is not generally a recognized ground for excluding evidence under the Federal Rules of Evidence.”)

<sup>269</sup> FED. R. EVID. 613 advisory committee’s note.

<sup>270</sup> There are advisory committees for each of the several federal rules. When it is obvious from context which advisory committee I am referring to, I will not so specify in the text.

<sup>271</sup> WEINSTEIN §613.02[2](b) (“Rule 613 gives greater weight to surprise than to warning as a technique for ferreting out the truth.”)

<sup>272</sup> *The Queen’s Case*, 2 BR. & B. 284, 129 ENG. REP. 976 (1820).

written statement need only be simultaneously disclosed to opposing counsel out of the sight of the witness.

It is worth noting that were real witnesses as sincere and impartial as those populating the laboratories of the cognition and evidence literature, we would probably want to give them ample time to prepare every one of their answers. We would be reluctant to submit our truth finding enterprise to the vagaries of spontaneity with its potential for error, omission, and miscommunication. Perhaps the reason we are willing to tolerate these evident drawbacks of surprise is that we are not so sure whether the witness is telling the truth, and we believe that the difference in the cognitive load faced by sincere versus insincere witnesses in answering unanticipated questions with detail and consistency provides one way to tell.

One counter response to *these* arguments is that proscribing surprise at trial is superfluous anyway, at least in civil cases, given the device of modern discovery.<sup>273</sup> This claim is easy to exaggerate. First, many civil cases have little or no discovery.<sup>274</sup> Secondly, much of what would produce surprise in a witness—including interviews with other witnesses, notes thereon, and investigative reports prepared in anticipation of litigation—would be protected as work product, and so be only exceptionally discoverable, if at all.<sup>275</sup>

Thirdly, even if discovery reduces surprise at trial,<sup>276</sup> it does little to reduce surprise *in discovery*. And the issue is not whether there is surprise at trial *per se*. The issue is whether witnesses are surprised somewhere along the way, and whether, when they are, their forced unguarded responses form part of the basis on which future rulings are made.

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<sup>273</sup> See, e.g., WEINSTEIN §403.02 (“The development of discovery practice and pretrial procedure has reduced the possibility of surprise in many civil cases.”). See Park, *Interrogation of Trial Witnesses*, at 165-166 for a discussion of the impact of depositions on cross examination.

<sup>274</sup> The extent of discovery is sensitive to the size of the stakes of the case. Most cases are apparently too small to warrant extensive discovery. James S. Kakalik, Deborah R. Hensler, Daniel McCaffrey, Marian Oshiro, Nicholas M. Pace, and Mary E. Vaiana, *Discovery Management: Further Analysis of the Civil Justice Reform Act Evaluation Data*, 39 B.C. L. REV 613, 638 (1998); James S. Kakalik, Terence Dunworth, Loral A. Hill, Daniel McCaffrey, Marian Oshiro, Nicholas M. Pace, and Mary E. Vaiana, *An Evaluation of Judicial Case Management Under the Civil Justice Reform Act*, RAND, MR-802-ICJ (1996); Thomas E. Willging, Donna Stienstra, John Shapard & Dean Miletich, *An Empirical Study of Discovery and Disclosure Practice Under the 1993 Federal Rule Amendments*, 39 BC L Rev 525, 527, 532 (1998).

<sup>275</sup> See, e.g., FED. R. CIV. P. 26(b)(3) [Trial Preparation: Materials] (documents and tangible things prepared in anticipation of litigation discoverable only on showing of substantial need and practical inability to obtain materials by other means; even when discovery of these materials allowed, mental impressions, conclusions, opinions, legal theories still protected); *Hickman v. Taylor*, 329 U.S. 495, 511-513 (1947) (codified in part in FED. R. CIV. P. 26(b)(3), but also explicitly protecting against disclosure of mental impressions etc... even if not in connection with discovery of documents and tangible things.)

<sup>276</sup> Contrary to this conditional, the leading treatise on evidentiary tactics suggests that discovery can itself be a tool in creating trial surprise. Surprise, after all, is a matter of upsetting expectations. And formal discovery is the perfect setting in which to create expectations that can later be dashed at trial. 1-5 FED. EVID. TACTICS §5.01.

It is important in this respect to recognize that even if those early unguarded responses are not, by virtue of hearsay rules, admissible for the truth of the matter asserted,<sup>277</sup> they will still constrain later answers by their potential impeachment value in pointing out inconsistency.<sup>278</sup> In any event, under the Federal Rules of Evidence<sup>279</sup> deposition transcripts are indeed admissible at trial for their substantive content, if the witness says something inconsistent at trial and is available for cross examination regarding the prior statement.<sup>280</sup> Indeed, if the witness is a party, all her prior statements, whether or not made on deposition, are admissible against her at trial.<sup>281</sup> Moreover, the court will regard a witness's deposition transcript as an indication of her prospective trial testimony for the purpose of ruling on summary judgment,<sup>282</sup> an increasingly utilized early exit along the highway to trial.<sup>283</sup> And of course, the anticipated impact of deposition testimony on summary judgment and trial will be reflected back on settlement negotiations.<sup>284</sup>

In criminal cases, police questioning plays a role similar in this respect to civil discovery. Assuming conformity to the procedural requirements of *Miranda* and its (largely erosive) progeny,<sup>285</sup>

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<sup>277</sup> This would be the case, for example, if they were inadmissible hearsay. See, e.g., FED. R. EVID. 801-804. This, of course, assumes that the distinction between substantive and impeachment use is clear and operable to the fact finder. Limiting instructions may be somewhat helpful in this regard. See, e.g., FED. R. EVID. 105. Furthermore, the distinction may have real effect in determining whether there is sufficient substantive evidence to send the case to the jury.

<sup>278</sup> C.f., Park, *Interrogation of Trial Witnesses*, at \_\_\_\_.

<sup>279</sup> The Federal Rules of Evidence have been adopted by many states. Cite.

<sup>280</sup> See, e.g., 801(d)(1) [Prior Statement by Witness].

<sup>281</sup> See, e.g., 801(d)(2) [Admission by Party-Opponent].

<sup>282</sup> FED. R. CIV. P. 56(e) (deposition transcripts may supplement supporting or opposing affidavits). But note, in ruling on summary judgment, the court will consider only such deposition testimony as would be admissible at trial were it there recited. *Visser v. Packer Engineering Assoc.*, 924 F.2d 655, \_\_ (7th Cir. 1991) (affidavits not to be considered in ruling on summary judgment because violating the personal knowledge requirements for lay witnesses under FED. R. EVID. 602)

<sup>283</sup> See, e.g., ABA Litigation Section, SYMPOSIUM ON THE VANISHING TRIAL, held in San Francisco, California, December 12-14, 2003.

<sup>284</sup> One might respond here that required initial disclosures (e.g., FED. R. CIV. P. 26(a)), and requests to produce documents and things (e.g., FED. R. CIV. P. 34; FED. R. CIV. P. 45) may give the deponent (via her proponent) important clues about the content of her deposition. But in fact, this is not so clear.

First, such devices also provide the other side with fodder for surprising the witness. Thus, the deponent William H. Gates was, in a sense, surprised by emails that Microsoft's own lawyers had turned over to the Justice Department.

Second, with respect to required initial disclosures, the federal rules treat information used solely for impeachment differently. FED. R. CIV. P. 26(a)(1)(A) exempts from required "initial disclosures" the contact information of individuals likely to have discoverable information, if that information is to be used solely for impeachment. FED. R. CIV. P. 26(a)(1)(B) treats initial disclosures of documents and tangible things similarly. And FED. R. CIV. P. 26(a)(3) extends the same treatment to "pretrial disclosures," required to be made a month before trial. (That said, much information useful for impeachment may as well have substantive use, and is thereby not protected from required disclosure by these provisions.)

Third, the judge often has great discretion under rules like FED. R. CIV. P. 16 regarding how to schedule discovery. And she will often take her cues from the parties. This affords some leeway in structuring discovery so as to maximize deponent surprise, when that is helpful in separating truthful from untruthful testimony.

<sup>285</sup> *Miranda v. Arizona*, 384 U.S. 436 (1966) (requiring procedural safeguards in in-custody interrogation to render effective suspect's privilege against self-incrimination; establishing right to counsel prior to questioning and during interrogation; allowing for waiver of these rights), as *qualified in*, e.g., *N.Y. v. Quarles*, 467 U.S. 649 (1984) ("public safety" exception), *Illinois v. Perkins*, 496 U.S. 292 (1990) (not applicable where suspect makes voluntary statement to someone that he does not realize is a law

statements made to police by the accused are substantively admissible against her.<sup>286</sup> And even in cases where the requirements for substantive use are lacking, the accused's in-custody statements (or silence) may often be used to impeach her trial testimony.<sup>287</sup> Again, though such statements, in and of themselves, have no substantive effect,<sup>288</sup> they constrain what the accused may credibly assert at trial, wherein her assertions do, of course, have substantive effect.<sup>289</sup> For witnesses who are not the accused, this impeachment use—with its indirect substantive effect—is similarly available. Indeed, nonparty witness enjoy none of the Constitutional protections accorded in this respect to the accused.<sup>290</sup>

### C. Closed-loop Control of Questioning<sup>291</sup>

While the importance of unanticipated questions rationalizes and defines the “live” presence of the witness, it does little to justify the “live” presence of the *questioner*. The questioner could always choose and record her questions in secret and then have these read *in seriatim* to the witness. Some of these questions would be unanticipated, and spontaneous answers would be required. In fact, roughly speaking, such a device exists: the deposition upon written questions.<sup>292</sup> Compared to the more familiar deposition upon oral questions,<sup>293</sup> it is rarely used.

The live presence of the questioner is in part explained by the efficacy of *closed-loop control* in the choice of questions. Under closed-loop control, the questioner uses the witness's prior answers as

enforcement officer); *Harris v. N.Y.*, 401 U.S. 222 (1971) (exclusionary rule not applicable to impeachment use of custodial statement)

<sup>286</sup> See, e.g., FED. R. EVID. 801(d)(2) [Admission by Party-Opponent]

<sup>287</sup> See, e.g., FED. R. EVID. 613 (implicitly allowing impeachment by prior inconsistent statement); FED. R. EVID. 801(c) (limiting hearsay prohibition to statements “offered...to prove the truth of the matter asserted”); *Harris v. N.Y.*, 401 U.S. 222 (1971) (exclusionary rule not applicable to impeachment use of custodial statement, even if statement goes to historical merits of the case, and is not “collateral”). See also *Jenkins v. Anderson*, 447 U.S. 231, 240-241 (1980) (“use of *prearrest* silence to impeach a defendant's credibility does not violate the Constitution.” [emphasis added]). *But see*, *Doyle v. Ohio*, 426 U.S. 610 (1976) (*post* Miranda warning silence may not be used to impeach the accused).

<sup>288</sup> But see discussion in note 277, *supra*.

<sup>289</sup> To be sure, prosecutors have a Constitutional obligation to turn over exculpatory evidence to the accused upon request. *Brady v. Maryland*, 373 U.S. 83, 87 (1963). Seth F. Kreimer & David Rudovsky, *Double Bind, Double Bind: Factual Innocence and Postconviction DNA Testing*, 151 U. PENN. L. REV. 547, 577-587 (2002) (discussing Brady and its progeny in arguing for a right to post conviction DNA evidence).

Court rules allow criminal discovery beyond the dictates of the “Brady Rule.” See, e.g., FED. R. CRIM. P. 16, 12.1, 26.2 (provisions touching on discovery).

But the impact of these disclosure requirements on surprise—as it relates to the exploitation of cognitive weakness—is similar to that of discovery in civil cases. These rules do not limit the impeachment use of statements made to police before any exculpatory evidence is turned over. Thus, the insincere accused, who may not even yet be a suspect, may be forced to craft her alibi before knowing what exculpatory evidence she can use to corroborate her story.

<sup>290</sup> For example, *post* Miranda warning silence may not be used to impeach the accused. *Doyle v. Ohio*, 426 U.S. 610 (1976). This protection is inapplicable to nonparty witnesses.

<sup>291</sup> This topic is further discussed *infra* at Part V.A.2.

<sup>292</sup> See, e.g., FED. R. CIV. P. 31.

<sup>293</sup> See, e.g., FED. R. CIV. P. 30.

feedback in choosing the next question. Under *open-loop control*, in contrast, the questioner would choose her questions and their sequence ahead of time, once and for all.<sup>294</sup>

The questioner's closed-loop control of questioning exacerbates the cognitive difficulties faced by the insincere witness. Consider how much worse off the insincere witness is than the student who has to prepare for a conventional examination: an example of open-loop questioning. The conventional exam is not specifically adjusted on the run based on the student's prior answers in an effort to probe the topics that the student does not know well. But this is essentially the predicament of the witness. If a deponent, for example, appears to have a good story about a certain component of the case, the questioner moves on to other items, continuing to probe and retreat, until she finds what appears to be a weakness in the witness's testimony. As a result, the witness is less able than the student to play the odds that the exam will cover what she knows well. Rather, the witness can be assured that if she knows one bit better than the rest, it will not be covered extensively, whereas if she knows it less well, it will be. Thus, to match the student's odds, the witness has to prepare across the waterfront, learning it all in depth—which in turn increases the cognitive load of preparation. Moreover, to the extent that the questioner will see more capacity for damage where preparation is lacking, unanticipated questions will not be random hits, as they might be in a student exam. Rather, the questioner will be essentially targeting issues and areas that the witness did not anticipate.<sup>295</sup>

All told, therefore, closed-loop questioning lowers the efficacy of any given amount of preparation (or equivalently, raises the cost of attaining a given level of efficaciousness), and increases the importance of unanticipated questions.

### *D. Fatigue*

To spontaneity, feedback, and follow-up must be added the potential for fatigue as a crucial device specially aggravating the difficulties faced by the insincere witnesses—and thus also giving content to the law's preference for "live." Part of what is imperfect about the information processor that is human cognition is the fact that its battery is fairly quick to run down. Certain cognitive tasks that it could easily accomplish when fresh, become enormously difficult when tired. Mistakes are made. Pretenses erode.

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<sup>294</sup> ROBERT N. BATESON, INTRODUCTION TO CONTROL SYSTEM TECHNOLOGY Chap. 2 (2001).

<sup>295</sup> Thus the "bad" of uncertainty can be a "good" in evidentiary process. See Sanchirico, *Evidence Tampering* at Part V, and *supra* note **Error! Bookmark not defined.**

Consider the witness in the seventh hour of her deposition. The lawyer that had opened the questioning seven hours earlier, takes over again, refreshed.<sup>296</sup> He begins by asking the witness questions, consistent answers to which would require the witness to remember her answers to other questions posed hours earlier. Perhaps these new questions are disguised versions of the same questions. Perhaps they are not even disguised. There is no “asked and answered” objection on deposition. The witness must remember what she said six hours ago. If those were prepared answers, that may be feasible. If those were unanticipated that is likely to be quite difficult. This is especially so if the prior question had been posed *three* hours into the deposition, when the witness was already fatigued and therefore hampered in transferring her answer at that time from working to long term memory for future reference.

But don’t all witnesses fatigue, sincere and insincere alike? Certainly they do. But just as different computer operations wear down a laptop battery more or less quickly, mental fatigue impacts different cognitive tasks to differing extents. Remembering your name and phone number, for instance, is unlikely to be seriously affected. More generally, performance on tasks involving only the retrieval of long term memory remains relatively high. Tasks involving working memory, on the other hand, suffer more greatly.<sup>297</sup> Doing mathematical calculations in one’s head, for example, becomes increasingly difficult, because one is less and less able to perform the kind of on-the-spot storage and retrieval necessary for the task. On the continuum with remembering one’s name on the one end, and continuing to remember the digit in the 10’s place as one carries the two to the 10,000ths place, on the other end, the sincere witness’s task of retrieving actual memories sits closer to the former, and the insincere witness’s task of spontaneously vetting and then memorizing fabricated answers lies closer to the latter.

Fatigue’s important role as a wedge between sincere and insincere testimony has important implications for discovery reform. The recent trend has been toward limiting the length of depositions.<sup>298</sup> This certainly has benefits. It prevents an arms race of escalating litigation expenses, and it is merciful to deponents. But we should also be mindful of its costs, one important component of which is

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<sup>296</sup> For more on this comparison see *infra* Part V.A.4.

<sup>297</sup> Holding, *Fatigue* at 152 (“It appears that the visual and auditory tasks showing declines in sensitivity are those which present a high event rate, with stimuli occurring every 2 or 3 seconds, and which demand an ability to make rapid perceptual comparisons involving memory.”); *Id.* (reviewing “Cambridge Cockpit” studies: “Attention began to be reserved for items of central importance, like the course heading and speed indicators, while peripheral items like the fuel gauge were neglected.”). *Id.* at 159-160 (reviewing COPE tests: “We can be virtually certain that, other things being equal, fatigued subjects will choose to exert less effort...implying a tendency toward carelessness or ‘cutting corners’”).

<sup>298</sup> E.g., FED. R. CIV. P. 30(d)(2) was amended in 2000 to limit a deposition upon oral questions to one seven-hour day, unless the court otherwise orders or the parties otherwise stipulate. See generally FEDERAL PRACTICE AND PROCEDURE §2104.1 (describing deposition time limits in more detail).

that shorting depositions allows less latitude for fatigue, and therefore hampers the successful exploitation of that cognitive limitation in evidentiary process.

### *E. Forced answers*

In ordinary social interaction, those who face questions with damaging answers can often avoid the dilemma of either sustaining the damage or floating a lie, by feigning a good reason to avoid the question. They can answer a different question, pretending to have misunderstood. They can say nothing at all in a roundabout way. They can change the topic, feigning spontaneous compelling interest in something of which the question has reminded them. They can suddenly notice someone or something else that needs immediate tending to. In all this, they may perhaps count on the questioner's losing her train of thought, or believing that her question was indeed ambiguous, and/or feeling constrained by norms of social interaction from following up.<sup>299</sup> And if the questioner is boorish enough to persist, they can always cite privacy, as a sort of blanket social privilege, asking the questioner whether he really thinks it's any of his business.

Such tactics are largely infeasible at trial or on deposition. In the first place, the social norm at trial is adversarial; skeptical probing is hardly unexpected or out of place. To *fail* to probe, is to fail to conform. Secondly, except to avoid self incrimination, it is not up to the witness whether she will answer the question. If the question conforms with evidentiary and procedural law, she must answer it.<sup>300</sup> This is especially true on deposition, where privilege is effectively the only excuse for declining to answer—short of stopping the deposition to attempt to obtain a protection order from the court.<sup>301</sup> And even where the witness has a colorable claim of privilege, it is the court not the witness who decides whether that privilege is valid.<sup>302</sup> Thirdly, the questioner almost always has a strong motivation to follow up. With a specific and tangible verdict at stake, she is likely to have honed her understanding of the issues and therefore is less likely to become confused. Similarly, she is unlikely to find the inquiry more trouble than it's worth. Fourth, the

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<sup>299</sup> VRIJ, DETECTING LIES, at 211. (“Eloquence can help them to get out of awkward situations. People who usually use many words to express themselves are in an advantageous position. They can commence by giving a long-winded response, which in fact does not answer the question. Meanwhile, they can think about the appropriate answer. Or they can use their eloquence to fool the observer, by giving a response which sounds convincing but which, in fact, does not provide an answer to the question. Some politicians are very good at this.”)

<sup>300</sup> See, e.g., 18 USC §401 [criminal contempt].

<sup>301</sup> See, e.g., FED. R. CIV. P. 30(d) (“A person may instruct a deponent not to answer only when necessary to preserve a privilege, to enforce a limitation directed by the court, or to present a motion under Rule 30(d)(4) [protective order]”)

<sup>302</sup> See, e.g., FED. R. EVID. 105(a).

questioner has a far greater opportunity to follow up. Again this is especially true on deposition. No one else stands ready to interrupt with his own concerns. The floor is hers. Fifth, a witness who starts answering a different question will likely be stopped in her tracks, with the classic interruption “just answer the question, Ms. Smith.” Similarly, a witness who starts in on a long-winded response is likely to be interrupted with “Just ‘yes’ or ‘no,’ please.” Backing all this up is the subpoena and contempt powers of the court.<sup>303</sup> A witness who simply refuses to take the test of testimony may find herself in jail or subject to a substantial fine.

Of course, the witness can always feign memory loss or ignorance. But that’s different from feigning a good reason to avoid the question, one plausibly unrelated to what would be the content of one’s answer. Avoiding the question, is like having a good excuse to miss the exam. Feigning memory loss or ignorance is like taking the exam and leaving the answer sheet blank.

## V. The *Contest of Testimony*

The primary object of this article is to help shift the inertial focus of scholarship on evidentiary process and cognitive psychology. As such, the primary emphasis is on how the system exploits, rather than suffers from the cognitive shortcomings of (potentially) bad actors. Nevertheless, as stated at the outset, this is not the full story of cognitive limits and law. Nor is it the full story of this article’s treatment of testimonial evidence. The complete picture in both cases concerns a competition of imperfections, one that takes place in several different arenas.

In the first arena, the mind of the insincere competes against the minds of those who attempt to take advantage of its shortcomings. After all, the imperfect mind can only be exploited by minds that are also imperfect. Rivals for the deceptive mind in this arena include, first and foremost, the “meta actors” who design the system—i.e., advisory committees, judicial conferences, and legislators. Such rivals also include on-the-ground participants: the attorneys, investigators, and interrogators, who go head-to-head with the deceptive actor in the hopes of exposing her deception.

In the second arena, the imperfections of the insincere actor vie with the well established imperfections of truly disinterested witnesses.<sup>304</sup> Every measure designed to make lying more difficult must not also

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<sup>303</sup> See, e.g., 18 USC §401 [criminal contempt]; FED. R. CIV. P. 45 [subpoena in civil cases]; FED. R. CRIM. P. 17 [subpoena in criminal cases].

<sup>304</sup> See sources cited *supra* note 10.

increase the difficulty of truth telling by even more. And every measure that uncovers more liars must not also mistakenly “uncover” as many or more truth tellers, whose cognitive capacities are equally limited.

In the third arena, the cognitive limits of the insincere compete with those of impartial fact finders. Relying on cognitive limits to distinguish good information from bad works only if the fact finder is not itself so cognitively limited as to fail to pick up on the distinctions.

And the fourth arena is contained within the mind of the potentially deceptive actor. The cognitive ability of the deceptive actor cannot be so imperfect that she fails to recognize the magnitude her own cognitive shortcomings, and consequently, fails to comprehend that successful evidentiary evasion is of high cost. A too irrational actor not only fails to deceive others, but also deceives herself into thinking that she will easily succeed. The potentially deceptive actor must have enough of a sense of the high cost of successful evidentiary evasion that compliance seems like a more viable alternative. Some amount of knowledge of self and circumstance is required.

If all of these cognitive imperfections compete against each other, what justifies the claim that cognitive imperfection is on balance beneficial for system design? The reason lies in the fact that the system is consciously structured, not randomly determined. By design, the playing field can be tilted to dull the effect of harmful cognitive limitations and amplify the effects of beneficial. Indeed, the manner in which the law of evidentiary process does just this is a largely untapped source of explanatory and prescriptive power. The utility of this new source is the second major theme of this article.

Several of the aforementioned competitions have already been implicitly analyzed. The question of how the law tilts the playing field in favor of the sincere witness and against the insincere is coincident with the question of how the law exploits cognitive shortfall. Similarly, the design of the law itself concerns the competition between potentially deceptive actors and meta-actors.

In addition, it seems clear that the cognitive load required to understand that testimony is difficult to fabricate successfully is far less than the load required actually to fabricate it successfully. One can, by way of analogy, be smart enough to understand not to bet one’s house on a game of chess, and yet not be smart enough to win the game.

That leaves two questions regarding the contest of testimony: how the law tilts the playing field in favor of questioners and fact finders, respectively. These are the questions taken up in this Part.

### ***A. Witness versus questioner***

Perhaps the same cognitive shortcomings that potentially limit the ability of the insincere witness to produce detailed and consistent testimony also limit the opposing side's ability to make such testimony actually difficult to produce. If, for example, it is challenging for the witness to know whether and where her story is externally consistent, isn't it also difficult for the questioning attorney to know precisely whether and where it is not? Similarly, if it is difficult for the witness to anticipate questions, isn't it also difficult for opposing counsel to figure out which questions are unanticipated?

Thus, it may seem that the exploitation of cognitive shortcomings in evidentiary process is nothing more than a tug of war—the cognitive pulling strength required from the witness for successful testimony being just that of opposing counsel, and the test's efficacy being thereby limited to situations in which the attorney happens to have greater pulling power.<sup>305</sup> But this assumes that the game goes off on level ground. In fact, several aspects of evidentiary process tilt the playing field so that the insincere witness pulls uphill while opposing counsel pulls down. This section reviews these features of the law in this light.

## **1. The Battle over Consistency**

### **a) External Consistency**

Consider to start just how unfair the contest is over external consistency. In the first place, the witness has what might be called a “first-mover *disadvantage*.”<sup>306</sup> In the initial encounter between questioner and witness—be that via interrogatory, deposition, interrogation, or interview—the witness answers the questions posed by the questioner with little sense of what the questioner knows and can prove about the world.<sup>307</sup> The questioner is rarely, if ever, required to show his cards before the witness herself chooses what answer to “play.” And even though the questioner's contradicting knowledge may become apparent as she begins to probe potential

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<sup>305</sup> Even were this true, testimony would still be more difficult for the insincere than the sincere on average. However, the degree of correlation would be reduced. The test of testimony would become as well a test of relative cognitive capacity as between the questioned and the questioner. Those witnesses who “passed” the test would be either truthful *or* smarter than their questioner.

<sup>306</sup> In many strategy settings moving first is an advantage. [cite to Stackelberg etc...].

<sup>307</sup> See the discussion of surprising *viz.* deposition at *supra* Part IV.B.3.

external contradictions, this revelation comes too late to help the witness. The blind move that the witness has already made in providing an initial answer is largely irreversible, recorded as it is in the record for ready use in impeaching the witness should she later deviate from it.<sup>308</sup>

Secondly, the questioner's opportunity for subsequent consideration and investigation makes the asymmetry even more severe. Early encounters with the witness do not box in the questioner in the same way that they box in the witness. The questioner needn't know at the time she first encounters the witness what external facts she will use to contradict the witness's story. Rather, the witness having essentially committed to her story, the questioner then has the opportunity to conduct a targeted investigation and analysis of whether that story is in fact consistent with what can be discerned about the world. Thus, the questioner ponders the witness's answer, processing it consciously and subconsciously. She tacks flash cards to the wall, wakes up with new ideas, takes enlightening showers. She seeks out other potential witnesses that are likely to have information about each turn in the witness' tale. She visits each location where key events allegedly occurred. Her target fixed, her deadline distant, she systematically and efficiently aims her investigative efforts at what she now knows to be the precise coordinates of the witness's story.

And throughout the investigative/analytical process, the questioner has essentially no obligation to inform the witness about what she is discovering,<sup>309</sup> so as to give the witness time to patch or extend her story, to the extent this is possible. The first time the witness learns what the questioner has been up to may well be while she is sitting in the witness' box repeating her original story in an attempt to maintain *internal* consistency.

This is not to say that preparing to contradict a witness with external facts does not impose costs on the questioner and her client. Nor is it to say that the witness can do nothing by way of preparation to prevent damage from external contradiction. The point, rather, is that because of the strategic imbalance between the questioner and the questioned, preparation resources are far more efficiently spent by the questioner, who is given a precise target and a fixed task for her efforts at finding contradictions, than by the insincere witness, who must mentally conduct the questioner's investigation many times over in testing the potential for contradiction of each candidate story,

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<sup>308</sup> As we have seen, a witness's prior inconsistent statement may be offered to impeach her credibility, and in certain cases may be offered for the truth of what is asserted in the statement. See the discussion at *supra* Parts III.B.1.b)(1) and III.E.

<sup>309</sup> *But see*, FED. R. CIV. P. 26(e) (duty to supplement disclosures under FED. R. CIV. P. 26(a), which, however, does not apply to information used solely for impeachment)

and who is likely to find herself having to spontaneously conduct such an investigation in response to a question that she has failed to anticipate.

### b) Internal Consistency

A similar asymmetry characterizes the contest over internal consistency, especially in the case that the witness faces a question she has not anticipated. The deponent, having just taken in the unexpected question, must instantaneously review her mental transcript of prior testimony, including her responses to other anticipated questions, and answer on the spot in a manner consistent with what she has already said. Opposing counsel, on the other hand, may review the *actual* transcript usually with ample time to search for any inconsistencies.

## 2. Anticipation and closed-loop questioning

We have already pointed out that the questioner's ability to make use of closed-loop control in choosing questions exacerbates the difficulties faced by the insincere witness. It must now be pointed out that the questioner's ability to choose questions as he goes greatly simplifies the task that the *questioner* faces.

To be sure, in a world of perfectly rational actors<sup>310</sup> there is no real difference between closed-loop and open loop control. Imagine that you are playing a game of chess. You might think that having to set out your strategy ahead of time is a distinct disadvantage relative to being able to make use of the feedback you would get from observing how your opponent actually moves on each turn. But on an ideal plane, this is a false distinction. Your chess strategy can be fully contingent. You do not need to see what your opponent has done on her first ten moves, if your strategy is complete enough to give instructions for what to do in the case that you observe the history of play that has led up to the current move. In fact, if your strategy is fully contingent, you don't even need to be there. Like the programmer of Deep Blue, or some other chess playing program, you can leave the instructions with someone (or something) else, and later find out the result.

Of course, the ideal plane is not the playing field of litigation. Litigation proceeds in a world that is very much informed by the limitations of the human mind. One of the key manifestations of these limitations, as already discussed,<sup>311</sup> is the difficulty of contingent thinking. Conceivably, the questioner *could* construct one massive

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<sup>310</sup> In particular, I refer here to rational actors who are cognizant of the full state space. This does not mean that they have perfect information, only that they know all the possibilities.

<sup>311</sup> See *supra* Part IV.B.

contingent set of interrogatories, much like a contingent chess playing program. Every question but the first would begin with “if-then” clauses: “if you answered *X* to question *n* then skip to question *m*; if you answered *Y*,...” But in order for this to be equivalent to choosing questions under closed-loop control—whereby the questioner receives and considers prior answers before deciding on the next question—all potential answers from the witness to each question at all levels of contingency would have to be anticipated by the questioner. To the extent that witnesses ever give answers that the questioner did not expect, closed-loop questioning is far more advantageous than open-loop questioning from the perspective of the questioner. Closed-loop control is, in short, far more forgiving of the questioner’s very human inability to fully anticipate witness responses.

It should also be noted that in many settings the witness’s unexpected answer does not require that the questioner follow up spontaneously. Rather, in accord with the discussion above regarding consistency, the questioner will often have the opportunity to mull over the witness’s unexpected response and prepare for further probing. This might occur in several ways. In the first place, the questioner may have another opportunity on another day to return to this issue with the witness.<sup>312</sup> But even if not, the questioner can continue to rephrase and re-ask her follow up question throughout the day. The questioner can think more about her approach during breaks or lunch. Or (apropos of a point made below) the questioner can parallel process with an colleague, having her retire to another conference room simultaneously to devote *her* cognitive efforts to developing a new line of questioning based on the unexpected response. Again, while the witness’s answer is irreversible, the questioner may repeatedly assay the same line of questioning.

### 3. Cognitive artifacts

#### a) Work product v. writings for witness preparation

As already noted, when humans encounter difficult mental tasks they reach for tools that can leverage their limited capacity. We have discussed note-making in this regard, pointing out that the witness’s limited capacity to use notes in testimonial performance adds memorization to her list of preparatory tasks.<sup>313</sup> We have also noted that the witness’s opponent’s ability to inspect and place in evidence

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<sup>312</sup> *But see*, FED. R. CIV. P. 30(a)(2)(B) (requiring the written stipulation of the parties or leave of the court to depose the same person more than once); FED. R. CIV. P. 30(d)(2) (deposition limited to one day of seven hours, but “court must allow additional time...if needed for fair examination of deponent.”)

<sup>313</sup> See Part III.D, *supra*.

any notes she uses to prepare for testimony, curtails to some extent her use of notes in that regard.<sup>314</sup>

Contrast the law's wary treatment of notes used by witness's in answering questions with its protective attitude toward notes used by representatives of the opposing side in framing questions.<sup>315</sup> The latter are not only immune from opponent disclosure rights under rule like FED. R. EVID. 612,<sup>316</sup> but are specifically protected as "work product."<sup>317</sup> Thus, when the witness graphs out a plan for answering the questions of opposing counsel, she may well be required to turn this over to opposing counsel. If it is damaging enough to the witness's credibility, the opponent may press to have it placed before the jury. When, on the other hand, opposing counsel graphs out a plan for *questioning* the witness, this is protected from disclosure by a near absolute ban.<sup>318</sup> Says Professor Tigar

I know a lawyer named Michael Kennedy. He plans cross-examination by making a decision tree. His notes mark a beginning point. If the witness zigs in a certain way, Kennedy will follow with a certain form of counterattack.<sup>319</sup>

Absent waiver, Kennedy's notes are for his eyes only. But if the witness he is questioning has made a similar "decision tree" regarding how to react to Kennedy's questions, this might well end up in Kennedy's hands. Aside from making hay of any choice tidbits in the notes, Kennedy could be expected to pointedly question—before the fact finder—what use a truthful witness would have for such a complicated decision tree, when a truthful witness's simple, blanket decision rule, applicable to any question she receives, would be to "tell the whole truth and nothing but the truth."

### b) Litigation software

Recent years have seen the advent of a vibrant market in litigation software, including such products as *Summation*<sup>320</sup> and *Trial Director*.<sup>321</sup> Such programs provide counsel with an efficient means of "searching, organizing, and analyzing testimony documents and other disparate information underlying a case."<sup>322</sup> "Suppose," posits the

<sup>314</sup> See Part III.F, *supra*.

<sup>315</sup> The comparison here drawn should be contrasted with the separate issue of whether using work product to refresh a witness's memory waives the protection. See, e.g., Alfreda Robinson, *Duet or Duel: Federal Rule of Evidence 612 and the Work Product Doctrine Codified in Civil Procedure Rule 26(b)(3)*, 69 U. CIN. L. REV. 197 (2000).

<sup>316</sup> FED. R. EVID. 612 applies only to witnesses. This discussion assumes there is no waiver, and that the notes are not used by the opposing side's own witnesses.

<sup>317</sup> Hickman, 329 U.S. at 511-513; FED. R. CIV. P. 26(b)(3).

<sup>318</sup> Hickman, 329 U.S. at 511-513; FED. R. CIV. P. 26(b)(3) (even when it does order discovery of materials prepared in anticipation of litigation, "court shall protect against disclosure of the mental impressions, conclusions, opinions, or legal theories of an attorney.")

<sup>319</sup> Michael E. Tigar, *Habeas Corpus and the Penalty of Death*, 90 COLUM. L. REV. 255, 256 (1990).

<sup>320</sup> www.summation.com (last visited Jan. 11, 2004)

<sup>321</sup> www.trialdirector.com (last visited Jan. 11, 2004)

<sup>322</sup> www.summation.com, online demo, first panel, (last visited Jan. 11, 2004)

*Summation* online demo, “that you want to prepare for the deposition of Mr. Merkin by reviewing prior testimony as well as previously produced documents.”<sup>323</sup> You simply search the term “Merkin” and up pops every mention of this name in all transcripts of prior depositions or cases, and in every scanned letter, memo or email message obtained in discovery or located in your own files. Even more, if you’re sitting in Merkin’s deposition, and he mentions the Millwater deal, your associate searches “Millwater within 10 words of Merkin,” conferencing with you *sotto voce* after scanning the results.

But can’t the witness or her proponent also use such software to her own benefit? Can’t Merkin’s proponent do the same searches? Two reasons, related to what has already been said, prevent the witness from taking full advantage of this powerful form of cognitive artifact.

First, in the midst of testimony or deposition, the witness is generally required to answer solely from memory, without the aid of writings, recording, or computer software.<sup>324</sup> The performance, *per se*, of testimony has been largely insulated from technological advances in information processing. At the same time that the way we think, remember, and compose has been radically transformed by personal computing, the performance *per se* of testimony has remained essentially the same as it was a century ago. Perhaps this is the conscious result of Luddite tendencies in the law of evidentiary process. But even if so, an unconscious justification resides in the role accorded to the exploitation of cognitive shortcomings in the test of modern testimony.

That said, witnesses, in cahoots with their proponents, can of course use litigation software to *prepare* for testimonial performance. But even here, the witness lacks the same latitude as opposing counsel. While the attorney’s software and data is protected Work Product, what data and software the witness uses in preparing for testimony may, in the court’s discretion, be subject to disclosure and potential admission.<sup>325</sup> This much seems clear from the *Julian* case described above.<sup>326</sup> There appears to be no reason to distinguish between the manner in which the binders in *Julian* organized the hard copy material in that case,<sup>327</sup> and the manner in which a software program organizes electronic data.

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<sup>323</sup> www.summation.com, online demo, third panel, describing “case explorer” (last visited Jan. 11, 2004).

<sup>324</sup> See *supra* Part III.D.

<sup>325</sup> FED. R. EVID. 612.

<sup>326</sup> See *supra* Part III.F.

<sup>327</sup> See *supra* III.F. Much of the content of the binders in *Julian* was available to the other side. Yet the particular choice and organization of these materials in the binders made them work product. *Julian*, 93 F.R.D. at 144.

But note, there may be some question as to whether computer data is a “writing” for purposes of FED. R. EVID. 612.

It is especially telling in this regard to examine how litigation software was recently used by the Justice Department against Microsoft.

[W]hen the videotape rolled in court and...Gates...testified that he knew nothing of a Microsoft 'hit team' to attack IBM, the Justice team was there with just the right E-mail, culled from millions of pages of documents, to refute his testimony....results that Justice...got from [its] database package...that helped [it] piece together the most damaging bits of video',<sup>328</sup>

Doubtless, Microsoft and its Chair know more than most about how software might be used to testimonial advantage. Conversely, the Justice Department, a ponderous governmental organ, is not necessarily known for its software savvy. And yet—other weaknesses in its case notwithstanding—Justice had the upper hand in the contest of testimony. The disparity in knowledge across the two parties of how to use the tool of litigation software was overwhelmed by the differing extent to which the tool could potentially be employed.

#### 4. Fatigue and Tag-team Questioning

When the witness gets tired and begins to forget her prepared story, or finds it increasingly difficult to field unanticipated questions, there is no one to whom she can pass the baton. It's just *her* memory that she's reporting, and she is generally expected to soldier through. As we have noted, fatigue specially exacerbates the difficulty of successful testimony for the insincere witness whose cognitive enterprise requires higher order processing.<sup>329</sup>

But should the *questioner*, on the other hand, sense that exhaustion is beginning to dull her comprehension and creativity, she merely turns the task over to a well rested colleague. In fact, with some well-honed team work—and especially in large and/or multiple party suits—it need not even get to this point. The attorneys can divide up the tasks and rotate on and off through the sixteen hours of deposition in one hour shifts. Each attorney takes an hour to probe the witness on a particular issue, then has several hours to recuperate and ponder whatever might have been unexpected about the witness's testimony, before returning fresh to the witness, who may at this point remember little of what she said in their last interaction.

Thus, while the witness runs a marathon, opposing counsel, with a modicum of coordination, run a relay. In this way fatigue is allowed to operate on the witness, separating the sincere from the insincere,

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<sup>328</sup> Steve Hamm, *Justice's Secret Weapon against Microsoft: Software*, *Lead prosecutor David Boies has a database to die for*, BUS. WEEK (March 15, 1999)

<sup>329</sup> See *supra* Part IV.D.

while not also affecting the questioners who, in order to fully exploit that fatigue, must not themselves be as subject to it.

### 5. The Sincere Witness's Strategy

To a certain extent *sincere* witnesses are also hurt by the tilt of the playing field in favor of questioners. No doubt the competitive advantages given to the questioner increase the chance that a truthful witness will be nonetheless discredited. But merely pointing out this possibility is analytically incomplete. No beneficial effect is without negative byproduct. The issue is whether the benefits outweigh the detriments.

And here this is likely to be the case. The advantages accorded to questioners apply largely when the higher order cognitive processes of questioner and witness are pitted against each other. When the witness opts to tell the truth, a task which in the main does not implicate the same high level of cognitive processing, she effectively opts out of that competition. Reporting what she actually remembers, she is not engaged in second guessing what the questioner knows or can later find out about the world, she is undaunted by the questioner's ability to go back and check the transcript, she is happy to have the questioner probe more deeply into any of her answers. Her chief cognitive task is merely to retrieve truthful answers from long term memory, and if she does this, detail and consistency will fall into place.

Thus, so long as the witness retains a tight grasp on the fixed object of truthful memory, the questioner will have serious difficulty pulling her across the line in their tug of war, regardless of the fact that the questioner pulls downhill. This cognitive advantage of being able to anchor on true memory outweighs the other cognitive advantages accorded to the questioner, as just described.

#### ***B. Fact finder v. witness v. questioner***

As with many competitions, it is more complicated to win the contest of testimony than it is to judge who has won. A spectator may understand that White is in checkmate, and yet not understand the clash of strategies that brought the game to that point. Similarly, a fact finder may understand that the witness could not have been in two places at once, and yet have no understanding of, nor ability to engage in the undercurrent of second guessing and cognitive maneuvering that produced that contradiction. Thus, the cognitive limitations of the fact finder are not implicated in the same way as those of the witness, or even the questioner. And while it is certainly true that fact finders are prone to cognitive errors, these are of a

lower order of magnitude in their impact on litigation than the cognitive challenges facing the insincere witness.

### 1. Accommodation from Attorneys

We can add to this the fact that in discerning a witness's lack of detail or consistency, the fact finder has in the opposing attorney something of an ally. If she is good at what she does, the opposing attorney is well aware of the fact finder's cognitive limitations and fully ready to accommodate them.

Professor Mauet's leading guide for trial lawyers contains a chapter on the psychology of persuasion, a fair portion of which is devoted, not to misleading jurors per se, but rather to making them understand the basics of one's case in light of their limited cognitive capacity.<sup>330</sup> The advocate, says Mauet, "must employ strategies that quickly and easily help jurors understand,...must make the trial vivid and visual,...must be efficient, move the story forward, and make...points quickly before boredom sets in and jurors tune out."<sup>331</sup> Mauet notes that jurors, accustomed to television and film "expect to get everything quickly, in simple, digestible sound bites. Anything less and you've violated the 'boring rule,' and jurors will quickly change channels."<sup>332</sup> Thus, when the losing lawyer complains "'The jury just didn't understand the case,' that is a lawyer problem, not a jury problem."<sup>333</sup> These ideas are repeated throughout Mauet's guide. For example, in his discussion of closing arguments, Mauet advises returning to the memorable words and phrases that encapsulate the case,<sup>334</sup> using exhibits and visual aids,<sup>335</sup> and generally understanding the limits of one's audience:

Your closing argument must be efficient. Keep in mind that most persons can maintain a high level of attention for only 15 to 20 minutes. Therefore, your argument cannot overload the jury. Instead, it should focus on the themes, the key evidence, and the law, and it should strip away the peripheral information. Key ideas should be repeated, since repetition is so important for retention.

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<sup>330</sup> THOMAS A. MAUET, TRIAL TECHNIQUES 13-29 (Fifth edition 2000).

<sup>331</sup> MAUET, TRIAL TECHNIQUES, at 23.

<sup>332</sup> MAUET, TRIAL TECHNIQUES, at 24.

<sup>333</sup> MAUET, TRIAL TECHNIQUES, at 24. See also Mauet, TRIAL TECHNIQUES, at 25. (suggesting the use of themes—"memorable words and phrases that encapsulate the essence of your case" and labels—"tags you put on people, events, and things in the case...[to] convey images."); Mauet, TRIAL TECHNIQUES, at 26. (advising use emphasis on human element, including motivations); Mauet, TRIAL TECHNIQUES, at 26-27. (advising tapping into the instinct of story telling to "organize, humanize, and dramatize"); Mauet, TRIAL TECHNIQUES, at 26. (advising the use of "gripping visual aids"); Mauet, TRIAL TECHNIQUES, at 28. ("an advocate grabs and holds the juror's attention").

<sup>334</sup> Mauet, TRIAL TECHNIQUES, at 406-407.

<sup>335</sup> Mauet, TRIAL TECHNIQUES, at 409-410.

Compare this to the plight of the witness in the midst of her testimonial performance. The questioner not only fails to accommodate the witness's inability to remain focused for more than 15 or 20 minutes, but uses this inability against the witness: exhaustion is the object, not the pitfall. Questions are repeated, not prepared answers. And the point of repetition is not to etch an answer into the witness's memory, but to expose inconsistencies in a falsely memorized account.

## 2. Accommodation from Judge

When the fact finder is specifically a jury, it is to some extent aided by the presiding judge.

In many jurisdictions, in instructing the jury, the judge may add her summary of the evidence to what the jury has just heard from each side in its closing argument.<sup>336</sup> The federal system, moreover, goes somewhat beyond this in allowing the judge to comment to a limited extent on the weight of evidence and the credibility of witnesses when instructing the jury.<sup>337</sup>

Judge Weinstein maintains that this power allows the judge to comment on the evidence as trial proceeds, rather than having to wait until after the parties have rested.<sup>338</sup> Case law support for this extension backward in time from the point of instruction is not entirely airtight.<sup>339</sup> But the extension forward in time to jury deliberations is clearly supported:

After the jury retires, if members of the jury ask the judge for an explanation of some part of the evidence or to hear part of the testimony over again, the judge has discretion to grant or deny their request. Trial judges rarely deny such requests. In fact, when it appears that the jury is confused over an important element of the case, it may

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<sup>336</sup> [cite to jurisdictions not allowing]

<sup>337</sup> *Quercia v. U.S.*, 289 U.S. 466, 469 (1933) (“In charging the jury, the trial judge is not limited to instructions of an abstract sort. It is within his province, whenever he thinks it necessary, to assist the jury in arriving at a just conclusion by explaining and commenting upon the evidence, by drawing their attention to the parts of it which he thinks important; and he may express his opinion upon the facts, provided he makes it clear to the jury that all matters of fact are submitted to their determination,” but all within limits); *U.S. v. Filani*, 74 F.3d 378, 385 (2<sup>nd</sup> Cir. 1996) (“trial court may actively participate and give its own impressions of the evidence or question witnesses, as an aid to the jury, so long as it does not step across the line and become an advocate for one side.”); WEINSTEIN §107.22 (“comment on the credibility of witnesses may take one of two forms. First, the judge has the authority to advise the jury on what factors to consider when evaluating a witness' credibility. Second, there is some authority to the effect that the judge may express his or her own views as to the believability of a witness. However, most courts have held that those comments should be strictly avoided.”)

<sup>338</sup> WEINSTEIN §107.03[2].

<sup>339</sup> WEINSTEIN'S chief case in support of this proposition, *Geders v. U.S.*, 425 U.S. 80 (1976), is of questionable relevance. WEINSTEIN also cites *Quercia v. U.S.*, 289 U.S. 466, 469 (1933). But *Quercia* talks about these powers of the judge “in charging the jury.” And when the court in that case says that it is “within [judge's] province, *whenever he thinks it necessary*, to assist the jury in arriving at a just conclusion by explaining and commenting upon the evidence,” it is unclear whether “whenever” means “whenever during the trial of a particular case” or “in whichever case, at the end thereof.”

be reversible error for a judge to refuse their request for further information.<sup>340</sup>

### 3. Cognitive Artifacts

Like questioners, and unlike witnesses, juries benefit from the use of cognitive artifacts. Whether juries may take notes while trial proceeds is in most jurisdiction left up to the discretion of the trial judge.<sup>341</sup> Many judges do indeed permit it<sup>342</sup> and many jurors apparently avail themselves of that permission.<sup>343</sup> The arguments for permitting juror notetaking invoke precisely the kind of cognitive benefits that we have seen are generally denied to the witness:

The obvious and strongest argument in favor of allowing [juror] note-taking is that, when done properly, it is a valuable method of refreshing memory. In addition, note-taking may help focus jurors' concentration on the proceedings and help prevent their attention from wandering.<sup>344</sup>

Furthermore, while deliberating, the jury, of course, has access to all the cognitive artifacts that have been admitted into evidence. A review of common hearsay exceptions is enough to indicate that these could be quite helpful as cognitive artifacts. Such exceptions specifically encompass: records of regularly conducted activity (including memoranda, reports, records, or data compilation in any form of acts, events, opinions, or diagnoses),<sup>345</sup> public records and reports (including in some cases, interpretive reports),<sup>346</sup> records of vital statistics,<sup>347</sup> market reports and commercial publications,<sup>348</sup> and learned treatises.<sup>349</sup> Other more general hearsay "exceptions," such as party admissions<sup>350</sup> and prior statements of a witness,<sup>351</sup> might apply to correspondence and deposition transcripts. Should the jury wish to have some portion of a oral witnesses testimony read back to them, this also is within the discretion of the trial judge, and is often

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<sup>340</sup> WEINSTEIN §107.03.

<sup>341</sup> *U.S. v. Maclean*, 578 F.2d 64, 64-65 (3rd Cir. 1978) ("unanimous view of federal appellate courts that have decided the issue: Whether or not to allow note-taking by jurors is a matter committed to the sound discretion of trial judges.... At least one state has a rule prohibiting note-taking. Most states, however, leave the question to the discretion of the trial judge").

<sup>342</sup> In the Eastern District of Pennsylvania, for example, of the 13 judges who indicate either way in their "Judge's Procedures" whether they permit jury notetaking, 10 say they do, three decide on a case by case basis, and one says she generally does not. (This tally does not include senior judges.) See <http://www.paed.uscourts.gov/us08001.asp> (last visited January 7, 2004).

<sup>343</sup> Judge Stewart Dalzell, Judge's Procedures, ("jurors have availed themselves of that opportunity [to take notes] in every case."). <http://www.paed.uscourts.gov/documents/procedures/dalpol1.pdf>. (last visited January 4, 2004).

<sup>344</sup> *U.S. v. Maclean*, 578 F.2d 64, 66 (3rd Cir. 1978).

<sup>345</sup> See, e.g., FED. R. EVID. 803(6).

<sup>346</sup> See, e.g., FED. R. EVID. 803(8).

<sup>347</sup> See, e.g., FED. R. EVID. 803(9).

<sup>348</sup> See, e.g., FED. R. EVID. 803(17).

<sup>349</sup> See, e.g., FED. R. EVID. 803(18).

<sup>350</sup> See, e.g., FED. R. EVID. 801(d)(2).

<sup>351</sup> See, e.g., FED. R. EVID. 801(d)(1).

allowed.<sup>352</sup> Indeed, it is within the judge’s discretion to supply the jury with a copy of the pleadings or indictment, even though these are not evidence.<sup>353</sup>

## VI. Real Evidence

Up to this point the article has focused on how legal process makes use of human cognitive limitations in the context of testimonial evidence. But the efficacy of *non*-testimonial evidence—i.e., “real evidence”—is also dependent upon the limits of human reason and memory. This part of the article emphasizes two respects in which this is true. First, the artifacts<sup>354</sup> that individuals use in everyday life to bolster unaided cognition often end up generating important evidence. Second, clearing the evidentiary environment of these cognitive artifacts, as well as other “evidentiary emissions” not related to cognition, is a daunting task for the limited mind—one itself requiring additional cognitive artifacts, which are themselves potential evidence.

### *A. The Creation of Cognitive Artifacts*

The strategies we use to leverage our limited cognitive capacity frequently have their own evidentiary emissions. We make notes to remember phone numbers, names, and addresses, to plan activities. We record oral communications, or communicate in writing to remember and prevent misunderstanding. We make packing lists and to do lists. We keep instructions on how to use or clean tools, underlining what is important, making notes in the margins. We dog-eat manuals. We purchase how-to books. We keep maps, circling important locations so we can go right to them on the next unfolding. We draw diagrams to help us visualize a complicated building or space. We scratch down complicated calculations. We keep calendars of our appointments. We backup our hard drives and our email servers. We label the backups so we can find them later.

Real evidence is frequently drawn from this litter of devices that humans use to compensate for their cognitive shortcomings. These devices are the tangible manifestations of thoughts and deliberations

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<sup>352</sup> See, e.g., Chief Judge James T. Giles, Judge’s Procedures, (In civil cases, “If the jurors are specific in their request to have testimony read back, Judge Giles will arrange to have it read. He will allow the replaying of tape recordings and videotapes if requested by the jury.”) <http://www.paed.uscourts.gov/documents/procedures/gillpol.pdf>. (last visited January 4, 2004).

<sup>353</sup> See, e.g., *U.S. v. Silverstein*, 732 F.2d 1338, 1347 (7<sup>th</sup> Cir. 1984) (“indictment...given to the jury with the usual instruction that it was not evidence.”)

<sup>354</sup> Cognitive artifacts are introduced and discussed in *supra* Parts I.A.1, III.F, and V.A.3.

that, formulated in the private enclosure of the mind, would emit little or no evidence. Thus, these devices are largely unnecessary for the hypothetical creature whose working and long term memories are unlimited. But for the actual creature that we are, they are essential. Thus, we backup our computer because if we lost key documents, we wouldn't remember their contents. We write down our appointments so that they don't slip our minds. We keep maps because it would take too much effort to commit the lay of the land to long term memory. We scribble out calculations, because it's hard to remember what digit is in the 10's place while carrying the 2 to the top of the 1000's column. We plan complicated activities on paper because otherwise we'll forget the details of step 3 as we're thinking of the best approach to step 9.

## 1. Two Case Studies

### a) The Friday Night Bank Robber

So far are we from being capable of conducting our affairs entirely in our heads, that even the most cognitively proficient among us may eventually be caught by the cognitive crutches they employ. Carl Gugasian,<sup>355</sup> who, depending on one's definition, may be the most "successful" bank robber in U.S. history,<sup>356</sup> was recently convicted precisely by these means.<sup>357</sup> A bachelor's degree in Electrical Engineering, a master's degree in System's Analysis, doctoral work in Statistics and Probability,<sup>358</sup> reported native cleverness,<sup>359</sup> a special agility with numbers,<sup>360</sup> training in weapons, survival, self-defense, and map reading with the Army special forces,<sup>361</sup> uncommon mental and physical discipline<sup>362</sup>—none of this changed the fact that Carl

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<sup>355</sup> Before being apprehended, Gugasian was known as the "Friday night bank robber," for his proclivity to strike at closing time on Friday. Joseph A. Slobodzian, *The Mask Comes Off*, PHILADELPHIA INQUIRER, January 4, 2004, M 1, 4-5, M1, M4.

<sup>356</sup> Slobodzian, *The Mask Comes Off*, at M1, M4. ("without doubt the most prolific, successful bank robber in U.S. history: scores of heists, all on Fridays, going back three decades, netting him about \$2 million."); Bob Laylo, *Thief Who Rivals Dillinger for Most Bank Heists is Jailed; He Out-Plundered the Most Infamous, Hit Vaults in the Region*, MORNING CALL (Allentown, PA), December 10, 2003 (National), A, at 1, A1. ("Gugasian may well be the most prolific bank robber this nation has ever known," said Assistant U.S. Attorney Linwood C. Wright Jr.).

There is always the possibility that another bank robber, yet to be apprehended or even linked namelessly to a string of robberies, is more successful. And, of course, the bare number of successful bank robberies may not be the appropriate statistic. Executing a single robbery for \$5 million ought to make one more successful than Gugasian, who netted \$2 million with much time and effort.

<sup>357</sup> Slobodzian, *The Mask Comes Off*, at M1.

<sup>358</sup> Slobodzian, *The Mask Comes Off*, at M4.

<sup>359</sup> Laylo, *Thief Who Rivals Dillinger for Most Bank Heists is Jailed; He Out-Plundered the Most Infamous, Hit Vaults in the Region*, at A1. (quoting Retired Pennsylvania State Trooper John Mauro: "one of the most clever criminals I investigated... one of your true professionals.")

<sup>360</sup> Laylo, *Thief Who Rivals Dillinger for Most Bank Heists is Jailed; He Out-Plundered the Most Infamous, Hit Vaults in the Region*, at A1. (attributing assessment to FBI agent Raymond J. Carr)

<sup>361</sup> Slobodzian, *The Mask Comes Off*, at M4. (weapons, survival, self-defense); Laylo, *Thief Who Rivals Dillinger for Most Bank Heists is Jailed; He Out-Plundered the Most Infamous, Hit Vaults in the Region*, at A1. (map reading).

<sup>362</sup> Slobodzian, *The Mask Comes Off*, at M4. ("Health-food fanatic, devotee of yoga and meditation, third-degree black belt in karate, Gugasian is a lean, muscular 5-foot-9 in superb condition."); Laylo, *Thief Who*

Gugasian couldn't keep it all in this head. Instead, he needed to draft and store "detailed surveillance notes"<sup>363</sup> on the banks he intended to rob, needed to obtain and keep topographical maps to plan surveillance and escape,<sup>364</sup> and needed to keep instructions about how to clean the firearms he used in his robberies.<sup>365</sup> And even though he was smart enough to hide these firearms—as well as his various masks, and even his surveillance notes—in more than a dozen bunkers spread throughout the woods of northeastern Pennsylvania, he had to make hand drawn diagrams of those woods<sup>366</sup> to help him relocate the stores.<sup>367</sup> These cognitive artifacts were the clues that the FBI used to link him to multiple bank robberies after two teenagers stumbled upon his "gateway" bunker, the one closest to his home, containing among other things, diagrams leading to his other bunkers, and eventually to him. Fittingly, when he was arrested, based in part on these cognitive artifacts, this occurred outside the Philadelphia Free Library where he was headed to photocopy yet more topographical maps as part of his planning for future robberies. Now incarcerated, he acts as a "consultant" to the FBI on bank robbery techniques.<sup>368</sup>

### b) Martha Stewart

The civil<sup>369</sup> and criminal<sup>370</sup> actions against Martha Stewart and her stockbroker, Peter Bacanovic provide another salient example of the evidentiary role of cognitive artifacts. As 2002 came to a close, the biopharmaceutical company ImClone Systems Inc. was betting heavily on FDA approval of a new cancer drug. After ImClone's application failed at a preliminary stage in the FDA review process—but before this fact was publicly announced—ImClone's CEO<sup>371</sup> began dumping shares in the company through his brokerage firm, Merrill Lynch. Bacanovic, a Merrill Lynch employee, allegedly got wind of these sell orders and informed his client, Stewart, who sold

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*Rivals Dillinger for Most Bank Heists is Jailed; He Out-Plundered the Most Infamous, Hit Vaults in the Region*, at A1. (frequently jogged street clothes wearing a backpack)

<sup>363</sup> Slobodzian, *The Mask Comes Off*, at M4.

<sup>364</sup> Slobodzian, *The Mask Comes Off*, at M5.

<sup>365</sup> Slobodzian, *The Mask Comes Off*, at M5.

<sup>366</sup> Laylo, *Thief Who Rivals Dillinger for Most Bank Heists is Jailed; He Out-Plundered the Most Infamous, Hit Vaults in the Region*, at A1.

<sup>367</sup> Slobodzian, *The Mask Comes Off*, at M4; Laylo, *Thief Who Rivals Dillinger for Most Bank Heists is Jailed; He Out-Plundered the Most Infamous, Hit Vaults in the Region*, at A1.

<sup>368</sup> Slobodzian, *The Mask Comes Off*, at M4.

<sup>369</sup> Complaint, *SEC v. Stewart*, 03 CV 4070 (NRB) (SDNY June 4, 2003) (for civil fines and injunctive relief under §17(a) of the Securities Act of 1933, 15 U.S.C. §77q(a), §10(b) of the Securities Exchange Act of 1934, 15 U.S.C. §78j(b), and Rule 10b-5, 17 C.F.R. §240.10b-5, thereunder.)

<sup>370</sup> Superceding Indictment, *U.S. v. Stewart*, S1 03 Cr. 717 (MGC) ([Date] SDNY) (charging *inter alia* violations of 18 USC §1621 (False declarations before grand jury or court [including ancillary proceedings]); 18 USC §1505 (Obstruction of proceedings before departments, agencies, and committees)).

<sup>371</sup> His daughter also did the same. Complaint, *SEC v. Stewart*, 03 CV 4070 at 1 (NRB) (SDNY June 4, 2003)

her own ImClone holdings on the eve of the public announcement of FDA rejection.<sup>372</sup>

Two important pieces of evidence in the case against Stewart and Bacanovic are artifacts of the otherwise prudent choice of these defendants not to rely on fallible human memory. One is an entry made by Stewart's assistant in a computer phone log the day before ImClone announced the FDA's negative decision. The entry reads: "Peter Bacanovic thinks ImClone is going to start trading downward."<sup>373</sup> This record corroborates the prosecution's theory that Bacanovic called, left a message, and had his assistant (an unindicted co-conspirator) fill Stewart in when she returned the call a few hours later. More than this, the phone log boxed in the range of alternative stories that Stewart and Bacanovic could have devised—if fabrication rather than truth was in fact the source of their defense.

A verdict being some months off as of this writing,<sup>374</sup> let us assume for purposes of argument that Stewart and Bacanovic are indeed fabricating their account. In so doing, they needed a story consistent with Bacanovic's phone message. What they came up with was that Stewart had instructed Bacanovic to sell ImClone, if it fell below \$60 per share. Ostensibly, this works well with some of the other external facts. At the time of the phone message, ImClone was trading slightly above \$61,<sup>375</sup> and Stewart, who was about to go on vacation, would plausibly not have wanted to be bothered when it hit \$60 precisely.

But the problem with this story is that it runs into difficulty jiving with a second source of cognitive artifact evidence.<sup>376</sup> A broker to many clients with many holdings, Bacanovic, quite naturally, kept notes—in the form of a printed "worksheet"—about current and planned actions with regard to Stewart's holdings at the time of the alleged insider trading.<sup>377</sup> Bacanovic also made notes in pen in the margins of this printed worksheet. Prosecutors have made hay of the fact that neither the worksheet nor its marginal notes contain any

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<sup>372</sup> Complaint, *SEC v. Stewart*, 03 CV 4070 (NRB) at 1,2 (SDNY June 4, 2003)

<sup>373</sup> Superseding Indictment, *U.S. v. Stewart*, S1 03 Cr. 717 (MGC) at 8 ([Date] SDNY) ("On December 27, 2001, at approximately 10:04 a.m. (EST), within minutes after being informed of the sale and attempted sale of the Waksal Shares, Peter Bacanovic called Martha Stewart. After being told that Stewart was in transit and unavailable, Bacanovic left a message, memorialized by Stewart's assistant, that 'Peter Bacanovic thinks ImClone is going to start trading downward.'")

<sup>374</sup> Martha Stewart and Peter Bacanovic were convicted of obstruction of justice and other charges on March 5, 2004. Eric McClam, *Martha Stewart Guilty on All Counts*, ASSOC. PRESS, March 5, 2004, available at <www.news.findlaw.com> (last visited 3/9/04)

<sup>375</sup> Superseding Indictment, *U.S. v. Stewart*, S1 03 Cr. 717 (MGC) at 8 ([Date] SDNY)

<sup>376</sup> See the discussion on external consistency at *supra* Part III.B.1.b)(2).

<sup>377</sup> Superseding Indictment, *U.S. v. Stewart*, S1 03 Cr. 717 (MGC) at 16 ([Date] SDNY)

(genuine) indication of Bacanovic was supposed to sell ImClone at \$60.<sup>378</sup>

For our purposes here, it is worth asking the obvious question: why does Martha Stewart keep a phone log? Against the baseline of perfect cognition, the main reason must be that this phone log compensates for the limited capacity of human memory: it compensates for her assistant's memory limitations, in the time before Stewart gets the message,<sup>379</sup> and for Stewart's own, in the days, weeks and months to follow.

Similarly, why did Bacanovic keep worksheets on which he jotted handwritten notes? Because Bacanovic understood the limits of his own mind. If Bacanovic could have kept in his head the ever changing current holdings, ever changing prices, and complicated sell orders of his long and ever changing list of clients, he would not have kept a worksheet, nor had any need to make handwritten notes in the margins of any document.

## 2. The Special Efficacy of Cognitive Artifact Evidence

The foregoing examples concerning Stewart and Gugasian also illustrate what it is about cognitive artifact evidence that makes it so useful to the opposition and the fact finder.

First, this kind of evidence is relatively easy to interpret. Certainly, when an individual writes notes to another person, these have to convey information about an event or condition in a way that the recipient of the note can understand. And if the event or condition is communicated to the recipient, presumably it is also communicated to anyone else who uses the same language. Similarly, when an individual writes notes to *herself*, it is almost as if she is communicating to someone else. In a sense, she is communicating with the other that is her future self. And she has to account for the possibility that her future self may no longer have access to her current memory of the subject event or condition, in much the same way that an actual other would also not have that event or condition in memory, having not observed it.

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<sup>378</sup> Superseding Indictment, U.S. v. Stewart, S1 03 Cr. 717 (MGC) at 16 ([Date] SDNY) (“[One week before the phone message, Bacanovic] printed a “worksheet” that listed each of the stocks held by Martha Stewart at Merrill Lynch, including ImClone, as well as, among other things...Bacanovic made handwritten notes in blue ballpoint ink on the Worksheet concerning transactions and planned transactions in Stewart’s account...Bacanovic made no notes on the [w]orksheet regarding any purported decision to sell Stewart’s ImClone shares at \$60 per share.”)

<sup>379</sup> This is again related to a problem of coordination. See *supra* note **Error! Bookmark not defined.**

We have all had the experience, as students, of returning to class notes that are now undecipherable. Despite the required exertion, we eventually learn to take notes almost as if we are writing them to someone else, so that when the someone else that is us during reading period returns to them, we can readily understand what they mean without counting on recourse to whatever memory we may have of the lecture from months before. As such our class notes would probably be of some help to a third party who wanted to know or corroborate other evidence about the event or condition that was the early class session.

Thus from Gugasian's gateway bunker the police extracted a note describing the location of a bank that had been robbed near closing time on a Friday night. Near the name and location of the bank was the notation "F-7."<sup>380</sup> This bank closed at 7pm on Fridays. Similarly, the hand drawn maps left in the gateway bunker were intelligible enough to lead police to Gugasian's other bunkers in the woods of Pennsylvania.

Of course, an individual can encrypt her notes. But then she has to remember the key. If the key is simple, the code will be broken. (Encryption will be some indication to the opponent that the effort to decipher the note is warranted.) If the key is complicated, remembering it may require yet another set of notes. Perhaps these second order notes themselves can be encrypted with a second order code. But this also would have to be remembered, and if not easily deciphered, might require a third order set of notes. We could conceivably continue this regress. But it cannot be infinite. Just as Gugasian had to have a gateway bunker, eventually, there will have to be backstop notes in the "natural language," a language that the individual is confident not to forget because it is refreshed on a daily basis as she communicates with others.

The second especially useful feature of cognitive artifact evidence is self-multiplying character. Humans have devised many ways to accurately reproduce cognitive artifacts, in the process of cross referencing, storing, and communicating. Thus often there are many essentially identical versions of the same artifact lying around, where only one will suffice for evidence. This too contributes to the efficacy and prominence of cognitive artifact evidence.

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<sup>380</sup> Slobodzian, *The Mask Comes Off*, at M4. See also the news photograph of readily intelligible notes listing bank names and their hours at Slobodzian, *The Mask Comes Off*, at M1.

## ***B. Control and Destruction of Real Evidence***

### **1. Cognitive Artifact Evidence**

A month after Bacanovic left his phone message and shortly after the FBI asked to speak with her, Martha Stewart allegedly went into her assistant's computer phone log and changed the message from "Peter Bacanovic thinks ImClone is going to start trading downward" to "Peter Bacanovic re ImClone."<sup>381</sup> Similarly, sometime after Stewart sold her ImClone shares, and after learning that the FBI wanted to see the relevant worksheets for Stewart's account, Bacanovic allegedly found a pen of matching color and made the after-the-fact note "@60" in the margin near the entry for ImClone.<sup>382</sup>

But, perhaps worried about backups or untrackable hardcopies, Stewart later allegedly instructed<sup>383</sup> her assistant to return the phone message to its original wording. Moreover, the FBI has asserted that the ink used to mark "@60" is "scientifically distinguishable" from ink used for the other marginal notes on Bacanovic's worksheet.<sup>384</sup> In addition to civil fines under the Securities Acts, both Bacanovic and Stewart face criminal obstruction of justice charges for these activities.

With more foresight, Bacanovic and Stewart's evidentiary environment might not have been so cluttered with unfavorable cognitive artifacts to begin with, nor would their efforts at clean up have been so unavailing. Bacanovic might have thought to ask Stewart's assistant that this particular message not be recorded, or that it be recorded in a particularly erasable way. Bacanovic might have come up with the sell-at-60 story earlier on and noted "@60," just before or after calling Stewart, with the same pen, around the same time as the other notations. Stewart might have instituted a program of "routinely" deleting after two weeks time all phone messages not specifically marked for saving.<sup>385</sup> Or she might simply

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<sup>381</sup> Superseding Indictment, *U.S. v. Stewart*, S1 03 Cr. 717 (MGC) at 12-13 ([Date] SDNY) ("On or about January 31, 2002, after learning that the FBI and the U.S. Attorney's Office had requested an interview with her, and immediately following a lengthy conversation with her attorney, Martha Stewart accessed the phone message log maintained on computer by her assistant and reviewed the phone message that Peter Bacanovic had left for her on December 27, 2001. In furtherance of the conspiracy, and knowing that Bacanovic's message for Stewart was based on information regarding the sale and attempted sale of the Waksal Shares that Bacanovic subsequently caused to be conveyed to her, Stewart deleted the substance of Bacanovic's phone message, changing the message from 'Peter Bacanovic thinks ImClone is going to start trading downward,' to 'Peter Bacanovic re imclone.'")

<sup>382</sup> Superseding Indictment, *U.S. v. Stewart*, S1 03 Cr. 717 (MGC) at 18 ([Date] SDNY) ("Bacanovic added the notation "@ 60" near the entry for ImClone.")

<sup>383</sup> Superseding Indictment, *U.S. v. Stewart*, S1 03 Cr. 717 (MGC) at 12-13 ([Date] SDNY) ("After altering the message, Stewart directed her assistant to return the message to its original wording.")

<sup>384</sup> Superseding Indictment, *U.S. v. Stewart*, S1 03 Cr. 717 (MGC) at 18 ([Date] SDNY) ("Bacanovic altered the Worksheet, using ink that was blue ballpoint, but was scientifically distinguishable from the ink used elsewhere on the Worksheet.")

<sup>385</sup> Many corporations have "document retention policies" to similar effect. See, Sanchirico, *Evidence Tampering* at Part III.B.2.c.

have specifically deleted the message in question before learning of the FBI investigation, thus possibly avoiding obstruction charges.<sup>386</sup>

The problem, as also encountered with respect to unanticipated questions on cross examination, is that humans aren't always good at foresight. This is especially so with regard to cognitive artifacts of activities that are themselves complex, like running an unrelated business that requires one's full capacity for prospective thinking, or simultaneously dealing with many clients and many stocks with constantly shifting prices.

Our everyday actions spew evidentiary emissions at every turn, most of which are invisible unless we are specifically paying attention to them. And these emission do not just sit there in a puddle. They multiply in unpredictable and untraceable ways. Phone logs are printed out several times, copies are distributed, copies are made of the copies. Worksheets are backed up, are emailed, are printed from the email, are photocopied from the print out, scanned back in electronic form, and emailed out again. By the time one finally has the opportunity to focus on the cognitive artifacts of the noncompliant act, those artifacts may have already propagated well beyond one's practical control.

Thus, effectively eliminating cognitive artifacts can be as cognitively challenging as working without them in the first place. And this is yet another sense in which the law of evidentiary process takes advantage of cognitive limits.

## 2. Other Real Evidence

There are, of course, many types of real evidence aside from cognitive artifacts. But the story for these evidentiary emissions is similar with regard to clean up or spill prevention. Minding all the evidentiary emissions of a wrongful activity, while also perpetrating the central activity itself can be cognitively challenging. Both memory and knowledge are implicated. Among many other aspects of the crime, the murderer must remember to check the car for hair and fiber. And the murder must have adequate knowledge about science and police work to understand what sorts of things might be used to tie her to the crime.

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<sup>386</sup> Sanchirico, *Evidence Tampering* at Part III.A.1.

## VII. Conclusion

For most jurists and legal scholars the fact that individuals are limited in their capacity to process information is a pure negative. It subtracts from their ability to avoid accidents at minimal cost, to contract around remote contingencies, to perceive and recall events, to give evidence the weight it deserves. But what jurists and scholars have largely failed to notice is that individuals' deficiencies in information processing also subtract from their ability to foil the legal system in its own task of processing information. And to subtract from a subtracter is to add.

Recognizing the double negative of cognitive limits casts new light on several fundamental features of evidentiary procedure. Consider, for example, the law's posture toward cognitive artifacts—a posture that crosscuts many of the topics discussed in this Article.<sup>387</sup> Certainly, the law understands that the human mind relies on notes, calendars, memos, contact lists, software packages, and the like to extend the reach of its limited ability. Such artifacts are often an actual or potential source of evidence in litigation, as discussed in Part VI. And yet, even though the law expects to benefit from access to the speaker's notes from her presentation to the corporate board, it typically will not allow the same speaker to read from notes when she "presents" to the fact finder from the witness stand or the deposition table. Part III explains this general prohibition as an attempt to make the cognitive task of presenting creditable testimony more difficult for the insincere than for the sincere. The sincere witness retrieves what is already in memory. The content of her testimony tends to be consistent by virtue of its occurrence in real time. The insincere must construct her false story around what is likely known about the world and then commit that story to memory. Both witnesses would benefit from access to cognitive artifacts while testifying, but much more so the insincere witness, whose task draws greater cognitive load.

Even when the law allows the use of notes—either to refresh memory while testifying or in preparing for testimony—the price it exacts for this leniency weighs more heavily on the insincere. The opponent gains access to the cognitive aid and is given the option to admit it into evidence, an option that will be exercised when exposing the aid detracts from the witness's testimony.<sup>388</sup> The result, in effect, is a prohibition on cognitive artifacts that belie the witness's testimony, a prohibition that has less impact on witnesses who tell the truth.

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<sup>387</sup> See *supra* note 34 for the definition of this term.

<sup>388</sup> See Parts III.D.3 and III.F for a more detailed description of these provisions.

At the same time that the law strips the witness of the cognitive tools that would make feasible the difficult mental task of providing creditable insincere testimony, it goes out of its way to protect use of the same kind of tools by the individuals who are largely responsible for creating that difficulty, namely opposing counsel. While the witness's notes, when permitted at all, are laid bare, the questioner's notes are specially protected as work product. While software packages to aid the witness in forming an answer are definitively prohibited, software packages to aid the examiner in forming the question are allowed as a matter of course. By this asymmetric treatment of cognitive artifacts the law helps ensure that questioners' own mental imperfections do not prevent them from systematically exploiting the mental imperfections of insincere witnesses.

These points about cognitive artifacts are but a few examples of how recasting cognitive limits as instruments, rather than obstacles, brings to the fore central aspects of system design that have heretofore languished largely unnoticed in the gray background of evidentiary process. But an expanded view of cognitive limitations also helps to provide much needed background structure to topics that have always been at the forefront of discourse. The fact that it is especially difficult for the insincere witness to answer consistently on the fly justifies requiring witnesses to provide immediate answers to potentially unanticipated questions. The fact that humans tire, and that fatigue has a greater impact on the higher cognitive requirements of insincere testimony, explains why the law typically conducts questioning in continuous session. The ability of the questioner to adjust her line of questioning on the spot based on what the witness appears to have failed to prepare goes a long way toward explaining why it is important that the examiner be able to pose her questions with the benefit of real time feedback from witness answers. All told, the manner in which these features differentially impede the insincere witness lends both content and justification to the premium that the law places on "live" testimony. Moreover, recognizing the interaction between these features and human cognitive limitations takes us a step closer toward answering that question about cross examination that Wigmore once begged: what makes this "greatest legal engine" go?

All of these points about the positive role of cognitive shortcomings reside within the field of evidentiary process. Yet it is important to note that their impact extends far beyond the topical boundaries of that hybrid field. Without information, the substantive law would be limited to rules that apply uniformly, or perhaps randomly, across all individuals and circumstances. Unable to differentiate among varying events and conditions, it would be largely ineffectual. Thus, evidentiary process—essentially the study of how the law differentiates—is not restricted to a particular subset of human

endeavor, like tort or contract or property, but rather ranges across the full span of the legal system. The same is therefore true of the beneficial role that cognitive limitations play in the context of evidentiary process. The utility of mental shortcomings is not an exception to a general rule or a special quirk of a specific field, but an essential feature of the law and an integral part of what cognitive psychology has to say about the legal system.