Evaluation Dispute Resolution under Uncertainty: An Empirical Look at Bayes' Theorem and the Expected Value of Perfect Information

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ARTICLE

Evaluative Dispute Resolution Under Uncertainty: An Empirical Look at Bayes' Theorem and the Expected Value of Perfect Information

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I. INTRODUCTION

In 1996, Professor Leonard Riskin published an article in which he proposed a theoretical grid that could be useful in conceptualizing thoughts about styles employed by mediators.[1] Although Professor Riskin surely anticipated that his grid had pedagogical value,[2] he probably did not envision the extent of the rather heated debate that the work would inspire.[3] One dimension of Riskin's grid distinguishes a mediator's inclinations toward evaluative techniques from facilitative techniques.[4] Practitioners and academics alike immediately latched on to this distinction and began to classify themselves as either facilitative mediators[5] or evaluative mediators.[6] The facilitative "camp" fervently holds true to the classical model of mediation[7]—that of a process owned by the parties with mediators act-

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1. Leonard L. Riskin, *Understanding Mediators' Orientations, Strategies, and Techniques: A Grid For The Perplexed*, 1 HARV. NEGOT. L. REV. 7 (1996) [hereinafter Riskin, *Grid*].

2. *See* Richard Birke, *Evaluation and Facilitation: Moving Past Either/Or*, 2000 J. DISP. RESOL. 309, 309 [hereinafter Birke, *Either/Or*].

3. Leonard L. Riskin, *Symposium Forward*, 2000 J. DISP. RESOL. 245, 245 (characterizing his article as having "generated at least as much heat as light"). Other commentators agree. *See* Jeffrey W. Stempel, *The Inevitability of the Eclectic: Liberating ADR from Ideology*, 2000 J. DISP. RESOL. 247, 247 [hereinafter Stempel, *Inevitability*] (arguing that the categorization is a "useful organizational device for discussion and shorthand reference," but that it "creates a false dichotomy, erroneously suggesting that mediators must be in one 'camp' or another"). Note that Professor Riskin's article was not the first to raise the issue of varying mediator styles. *See, e.g.*, Kenneth Kressel et al., *The Settlement-Orientation vs. The Problem-Solving Style in Custody Mediation*, 50 J. SOC. ISSUES 67 (1994); Craig A. McEwen, *Pursuing Problem-Solving or Predictive Settlement*, 19 FLA. ST. U. L. REV. 77 (1991); Susan S. Silbey & Sally E. Merry, *Mediator Settlement Strategies*, 8 L. & POL'Y 7 (1986). Seemingly, his was the match set to a pile of extremely dry leaves.

4. Riskin, *Grid*, *supra* note 1.

5. *See, e.g.*, Kimberlee K. Kovach & Lela P. Love, *"Evaluative" Mediation is an Oxymoron*, 14 ALTERNATIVES TO HIGH COST LITIG. 31 (1996); Kimberlee K. Kovatch & Lela P. Love, *Mapping Mediation: The Risks of Riskin's Grid*, 3 HARV. NEGOT. L. REV. 71 (1998); Lela P. Love, *The Top Ten Reasons Why Mediators Should Not Evaluate*, 24 FLA. ST. U. L. REV. 937 (1997); Lela P. Love & Kimberlee K. Kovach, *ADR: An Eclectic Array of Processes, Rather Than One Eclectic Process*, 2000 J. DISP. RESOL. 295; Barbara A. Phillips, *Mediation: Did We Get It Wrong?*, 33 WILLAMETTE L. REV. 649 (1997); Joseph B. Stulberg, *Facilitative Versus Evaluative Mediator Orientations: Piercing the "Grid" Lock*, 24 FLA. ST. U. L. REV. 985 (1997) [hereinafter Stulberg, *"Grid" Lock*]; Zena Zumeta, *A Facilitative Mediator Responds*, 2000 J. DISP. RESOL. 335.

6. *See, e.g.*, Robert D. Benjamin, *Mediation: Taming of the Shrewd*, 15 COM. L. BULL. 8 (2000); John Bickerman, *Evaluative Mediator Responds*, 14 ALTERNATIVES TO HIGH COST LITIG. 70 (1996); Jonathan B. Marks, *Evaluative Mediation-Oxymoron or Essential Tool?*, AM. LAW., May 1996, at 48A [hereinafter Marks, *Essential Tool*].

7. This ideology is pervasive in mediation educational materials. *See, e.g.*, JOHN W. COOLEY, MEDIATION ADVOCACY (1996); ERIC GALTON, REPRESENTING CLIENTS IN MEDIATION (1994); DWIGHT GOLANN, MEDIATING LEGAL DISPUTES: EFFECTIVE STRATEGIES FOR LAWYERS AND MEDIATORS (1996); E. WENDY TRACHTE-HUBER & STEPHEN K. HUBER, ALTERNATIVE DISPUTE RESOLUTION: STRATEGIES FOR LAW AND BUSINESS (1996); NANCY H. ROGERS & CRAIG A. MCEWEN, MEDIATION: LAW, POLICY & PRACTICE (2d ed. 1994). *See also* ROBERT A. BARUCH BUSH & JOSEPH P. FOLGER, THE PROMISE OF MEDIATION: RESPONDING TO CONFLICT THROUGH

ing only as facilitators or guides.[8] The evaluative "camp," on the other hand, while not eschewing the importance of facilitation,[9] maintains that, in reality, successful mediators utilize evaluative processes that are actually preferred by the participants.[10] Some commentators go as far as to suggest that a mediator has a responsibility to be evaluative.[11] In the context of this debate, there has emerged a substantial middle ground that views mediation as a hybrid continuum in which both facilitation and evaluation should be employed in varying degrees, depending on, *inter alia*, the mediator's personality, the nature of the dispute, and the necessity of particular circumstances.[12] Much of the practitioner literature that advises participants on choosing a mediator recognizes the ability to use both styles effectively[13] as vital to mediator success.[14] While there is a critical dearth of empirical

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EMPOWERMENT AND RECOGNITION 96-97 (1994) (proposing a transformative model that is distinct from the facilitative model).

8. *See* Carrie Menkel-Meadow, *When Dispute Resolution Begets Disputes of its Own: Conflicts Among Dispute Professionals*, 44 UCLA L. REV. 1871, 1887 (1997) [hereinafter Menkel-Meadow, *Disputes of its Own*] ("'[P]ure' mediation advocates suggest that mediation involves no more than a third-party neutral facilitating communication between parties, never evaluating or judging cases.").

9. *See* Jeffrey W. Stempel, *Beyond Formalism and False Dichotomies: The Need for Institutionalizing a Flexible Concept of the Mediator's Role*, 24 FLA. ST. U. L. REV. 949 (1997) [hereinafter Stempel, *Beyond Formalism*]; Stempel, *Inevitability, supra* note 3; Stulberg, *"Grid" Lock, supra* note 5, at 995-96; Donald T. Weckstein, *In Praise of Party Empowerment - And of Mediator Activism*, 33 WILLAMETTE L. REV. 501 (1997).

10. *See* Stempel, *Inevitability, supra* note 3, at 251 n.17 (citing James J. Alfini, *Trashing, Bashing, and Hashing It Out: Is This the End of "Good Mediation?,"* 19 FLA. ST. U. L. REV. 47, 47-50, 73-74 (1991) (noting that while most mediators outwardly indicate that the best mediation style is entirely facilitative, a large percentage of them use evaluative processes)).

11. *See* Marks, *Essential Tool, supra* note 6. *See also* Donald Lee Rome, *Resolving Business Disputes: Fact-finding and Impasse*, 55 DISP. RESOL. J. 8 (2001) (advocating a fact-finding role for mediators).

12. *See* Josh A. Arnold, *Mediator Insight: Disputants' Perceptions of Third Parties' Knowledge and Its Effect on Mediated Negotiation*, 11 INT'L J. CONFLICT MGMT. 318 (2000); Birke, *Either/Or, supra* note 2; Dwight Golann, *Variations in Mediation: How - and Why - Legal Mediators Change Styles in the Course of a Case*, 2000 J. DISP. RESOL. 41 [hereinafter Golann, *Variations*]; John Lande, *How Will Lawyering and Mediation Practices Transform Each Other?*, 24 FLA. ST. U. L. REV. 839 (1997); John Lande, *Toward More Sophisticated Mediation Theory*, 2000 J. DISP. RESOL. 321; Barbara McAdoo & Nancy Welsh, *Does ADR Really Have a Place on the Lawyer's Philosophical Map?*, 18 HAMLINE J. PUB. L. & POL'Y 376 (1997) (suggesting that attorneys view mediation as an evaluative/facilitative hybrid); Menkel-Meadow, *Disputes of its Own, supra* note 8; Riskin, *Grid, supra* note 1; Stempel, *Beyond Formalism, supra* note 9; Jeffrey W. Stempel, *Identifying Real Dichotomies Underlying the False Dichotomy: Twenty-First Century Mediation in an Eclectic Regime*, 2000 J. DISP. RESOL. 371 [hereinafter Stempel, *Real Dichotomies*]; Stempel, *Inevitability, supra* note 3.

13. The notion of "effectiveness" can vary a great deal depending upon one's goals or philosophy. For example, many court-connected programs, where case diversion is often the primary goal, measure effectiveness by the frequency of settlement. On the other hand, community justice centers that are motivated by a philosophy of putting the dispute in the hands of the disputants would measure effectiveness by the extent to which disputants are active participants in the resolution of a dispute, motivated by transformative and facilitative techniques. Settlement would not necessarily be a metric of success.

14. *See, e.g.*, Peter J. Comodeca, *Ready . . . Set . . . Mediate*, 56 DISP. RESOL. J. 32 (2001) [hereinafter Comodeca, *Ready*] (offering advice regarding choosing a mediator and stating that an effective mediator must be able to use both evaluative and facilitative techniques); Karin S. Hobbs, *Attention Attorneys!: How to Achieve the Best Results in Mediation*, 54 DISP. RESOL. J. 43 (1999) (suggesting that mediator style should be a consideration in selecting a mediator and describing the reality of the hybrid model).

mediation research,[15] typical findings demonstrate that regardless of how media-
tors might characterize their styles, most do, in fact, employ evaluative tech-
niques.[16] Some of the supporters of an eclectic, flexible concept of the mediator's
role,[17] have even called for putting the debate to rest.[18]

In this Article, we table the evaluative/facilitative debate, at least temporarily,
and respond to the call for empirical research[19] by examining the manner in which
disputants in evaluative dispute resolution processes may value the informational
content that is the defining characteristic of such processes. Although the form of
the evaluative dispute resolution process may, in addition to evaluative mediation,
include early case evaluation, non-binding arbitration, and even more traditional
judicial settlement conferences,[20] all of these methods "share the feature that a
third party is involved who offers an opinion or communicates *information* about

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15. *See, e.g.*, Deborah R. Hensler, *Suppose It's Not True: Challenging Mediation Ideology*, 2002 J.
DISP. RESOL. 81 [hereinafter Hensler, *Suppose It's Not True*] (calling for empirical research to assess
the claim that Americans prefer mediation to the adversary process and adjudication). It is important
to acknowledge that some empirical research does exist. Many court-connected programs regularly
publish descriptive statistics. For a comprehensive, albeit somewhat dated, report of mediation re-
search programs, see KENNETH KRESSEL & DEAN G. PRUITT, MEDIATION RESEARCH: THE PROCESS
AND EFFECTIVENESS OF THIRD-PARTY INTERVENTION (1989). However, with some rare exceptions,
few researchers have been able to capture robust data on actual mediator behavior. *See* Golann, *Varia-
tions, supra* note 12. *See also* Lisa B. Bingham, *Why Suppose? Let's Find Out: A Public Policy Re-
search Program on Dispute Resolution*, 2002 J. DISP. RESOL. 101 [hereinafter Bingham, *Find Out*]
(calling for increased focus on these empirical efforts).

16. *See, e.g.*, ELIZABETH ELLEN GORDON, PARTICIPANT SATISFACTION SURVEY OF GEORGIA'S
COURT-CONNECTED ADR PROGRAMS (State Justice Institute Grant SJI-98-T-256, 2000) ("Thinking
differs on how much a mediator should inject his/her own opinions and suggestions into a mediation
session. Adopting an active posture, most mediators in this sample generated options for settlement."),
available at http://www.state.ga.us/gadr/pdfs/finalsji.pdf (last visited Nov. 24, 2003); Golann, *Varia-
tions, supra* note 12 (showing that effective mediators engage in a range of techniques from facilitative
to evaluative).

17. *See* Stempel, *Inevitability, supra* note 3.

18. *See* Birke, *Either/Or, supra* note 2, at 309 ("This [six] year-old split had educational value when
it was first announced, but the polarizing effect has eclipsed the educational value. The time has come
to put this debate to rest."); Stempel, *Real Dichotomies, supra* note 12, at 393-94 ("To the extent that
the facilitative-evaluative debate . . . diverts too much from [alternative ADR research] goals, the
debate should be 'put behind' us").

19. *See* Bingham, *Find Out, supra* note 15, at 102 (identifying a "larger complex of issues in dispute
resolution that cry out for systematic public policy analysis"); Hensler, *Suppose It's Not True, supra*
note 15, at 95 ("The question of whether (and when) people prefer dispute resolution based on public
legal norms to dispute resolution based on ad hoc privately negotiated norms unfortunately has not
been subjected to much investigation to date"); Stempel, *Inevitability, supra* note 3, at 250 ("[S]ound
empirical data is necessarily hard to obtain given the confidential nature of most mediation."); Stem-
pel, *Real Dichotomies, supra* note 12, at 389 ("But missing or underdeveloped in this mix is a real
knowledge of how well or poorly various ADR methods work in practice. . . . Again, a significant
amount of strong theoretical work has taken place, but relatively little empirical examination exists . .
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20. Indeed the debate regarding the propriety of evaluative techniques has also found its way into
judicial chambers. *See generally* E. Donald Elliot, *Managerial Judging and the Evolution of Proce-
dure*, 53 U. CHI. L. REV. 306 (1986); Owen M. Fiss, *Against Settlement*, 93 YALE L.J. 1073 (1984);
Judith Resnik, *Managerial Judges*, 96 HARV. L. REV. 374 (1982). *But see* Robert F. Peckham, *A
Judicial Response to the Cost of Litigation: Case Management, Two-Stage Discovery Planning, and
Alternative Dispute Resolution*, 37 RUTGERS. L. REV. 253 (1985); Robert F. Peckham, *The Federal
Judge as a Case Manager: The New Role in Guiding a Case From Filing to Disposition*, 69 CAL. L.
REV. 770 (1981).

the dispute to the disputants"[21]—information that should cause the parties to modify their subjective expectations regarding the possible outcome of litigation.[22] The authors' experience suggests that criticisms of many court-connected programs are rooted in a lack of substantive experience on the part of the neutrals. At the same time, evaluative mediation, often facilitated by mediators with substantial substantive experience, is increasingly sought after. One explanation for these phenomena is differing quality in the *informational* content of the two processes—a hypothesis that is a cornerstone of the research undertaken in this study. When thinking about the role that subjective expectations of litigation outcome might have on negotiation of a possible resolution, those familiar with the ADR literature may find it helpful to think of these expectations as the probabilistic component of a disputant's BATNA, the term made famous by Roger Fisher and William Ury in reference to a disputant's best alternative to a negotiated agreement.[23] Here, we focus on ex post[24] evaluative dispute resolution and explore a number of related research questions, including: 1) What are disputants willing to pay, relative to a theoretically rational maximum, the expected value of perfect information, in order to engage in evaluative dispute resolution and avail themselves of the reduced uncertainty that the advisory opinion may offer,[25] and 2) Once the decision to engage in the evaluative process has been made, and the evaluation rendered, to what extent is this new information integrated into the disputants' subjective estimates of litigation outcome, relative to a rationally optimal set of subjective probabilities-posterior probabilities in accord with Bayes' theorem?[26]

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21. *See* Steven Shavell, *Alternative Dispute Resolution: An Economic Analysis*, 24 J. LEGAL STUD. 1, 1 (1995) [hereinafter Shavell, *Economic Analysis*] (emphasis added).

22. For recent consideration of the informational content of evaluative mediation and its impact, see Robert P. Burns, *Some Ethical Issues Surrounding Mediation*, 70 FORDHAM L. REV. 691, 702 (2001) (considering possible power imbalances that can result from such information); Murray S. Levin, *The Propriety of Evaluative Mediation: Concerns About the Nature and Quality of an Evaluative Opinion*, 16 OHIO ST. J. ON DISP. RESOL. 267, 270 (2001) (expressing concern that evaluative mediation suppresses information sharing in such a manner as to bring about the pathologies often attributed to arbitration); Arden Siegendorf, *A False Premise Leads to a False Conclusion: A Reply to "Some Hazards of Mediators Providing Opinions and Advice,"* RESOL. REP., Jan. 1998, at 12, 13 (suggesting that such information sharing does not necessarily violate the principles of self-determination and impartiality).

23. *See* ROGER FISHER & WILLIAM URY, GETTING TO YES: NEGOTIATING AGREEMENT WITHOUT GIVING IN 97-145 (Bruce Patton ed., 2d ed., Penguin Books 1991) (1981).

24. By ex post, it is meant that ADR is not agreed to prior to the dispute arising, that is, ex ante, but that parties decide to utilize ADR only after the dispute is manifest. The ex post decision to engage in ADR may be either voluntary or compelled by a court. The incentives for ex ante ADR agreements are many, but "[p]arties who are in a dispute will [still] decide to make an ADR agreement if this will be to their mutual benefit." *See* Shavell, *Economic Analysis*, *supra* note 21, at 9. *See also* Richard M. Alderman, *Pre-Dispute Mandatory Arbitration in Consumer Contracts: A Call for Reform*, 38 HOUS. L. REV. 1237 (2001) (arguing in favor of post-dispute arbitration agreements); Martin H. Malin, *Privatizing Justice - But By How Much? Questions Gilmer Did Not Answer*, 16 OHIO ST. J. ON DISP. RESOL. 589, 599 (2001) (suggesting that post-dispute agreements can overcome some of the power imbalances often resulting in pre-dispute agreements). *But see* Samuel Estreicher, *Saturns for Rickshaws: The Stakes in the Debate Over Predispute Employment Arbitration Agreements*, 16 OHIO ST. J. ON DISP. RESOL. 559, 567 (2001) (arguing that post-dispute agreements are "illusory" and rarely negotiated).

25. *See infra* Part III.

26. *See infra* Part IV.

To begin, we review a standard model of litigation decision-making in Section I and propose an extension of this model to include ex post evaluative dispute resolution in Section II. Next, in Section III, we review the analytical concept of the expected value of perfect information as a means of placing a theoretical rational maximum on the value of the information provided by evaluative dispute resolution processes. In Section IV, we review Bayes' theorem and propose this as a rational benchmark for the integration of new information with previously existing subjective probabilities. In Section V, we offer a formal statement of the research questions suggested above, relegating the normative implications of the rational expectations models in favor of a positive analysis of systematic deviation from these rational norms in actual dispute resolution practice. In Section VI, we describe the experiment in some detail. Samples of the instruments utilized are located in the appendix. We discuss the results of our research in Section VII and offer suggestions for future research. In Section VIII, we investigate some heuristics and biases that affect human judgment under uncertainty and consider their applicability in providing explanation for the findings of our research. Finally, we conclude that human decision-making behaviors in negotiation settings do, indeed, conspire to systematically undervalue the informational content of evaluative dispute resolution processes and that, once this information is procured, it is systematically underutilized. Only then do we briefly return to the broader evaluative/facilitative debate, proposing that these findings have important implications that will contribute to the deliberation.

II. A REVIEW OF A STANDARD MODEL OF LITIGATION

For purposes of analysis, simplified models are often developed to conceptualize the role of information in a variety of decision-making contexts, including those decisions related to litigation and other forms of dispute resolution. One standard model of litigation behavior, as developed by Steven Shavell, is based upon the decision theory of risky choice.[27] "According to [this] standard model of litigation, the plaintiff first decides whether or not to bring suit, and then, if he does, he and the defendant either settle or proceed to trial."[28] See Figure One. Note that Shavell's model begins with a decision to file suit or not. Here, the modified model begins with a decision to pursue the dispute or not in order to explicitly provide for the possibility that alternative means of dispute resolution may be pursued *prior* to filing suit. In this model, "[T]he plaintiff will bring suit if and only if his expected judgment would exceed his trial cost."[29] That is, if the

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27. See LEONARD J. SAVAGE, THE FOUNDATIONS OF STATISTICS 69-104 (2d ed. 1972) and JOHN VON NEUMANN & OSKAR MORGENSTERN, THEORY OF GAMES AND ECONOMIC BEHAVIOR 15-30 (3d ed. 1953), for a general discussion of the statistical decision theory of risky choice and expected value. Legal practitioners and academics will remember, likely with some trepidation, that this expected value criteria forms the basis of the famous Hand formula for tort liability explicated by Judge Learned Hand in *United States v. Carroll Towing Co.*, 159 F.2d 169, 173 (2d Cir. 1947).

28. Shavell, *Economic Analysis, supra* note 21, at 10.

29. *Id.* It is extremely important to understand that the elements of this decision model should be thought of extremely broadly, encompassing considerations that include, but are not limited to, monetary benefits and costs. In essence, the potential benefit of litigation would include everything of utility related to the dispute—monetary judgments, injunctive relief, and precedential value, to name a

probability-discounted judgment amount exceeds his estimated costs. In a semi-nal paper from 1984, George Priest and Benjamin Klein first proposed this ra-tional model of the litigation-settlement decision, derived from earlier important contributions to the field.[30] "The most important assumption of the model is that potential litigants form rational estimates of the likely decision."[31] According to their model, "[T]he determinates of settlement and litigation are solely economic, including the expected costs to parties of favorable or adverse decisions, the *in-formation* that parties possess about the likelihood of success at trial, and the di-rect costs of litigation and settlement."[32] In plain terms, the plaintiff has some subjective estimation that the litigation will be successful, shown by the variable (p). The plaintiff also estimates the benefits that will derive from the litigation in the form of damage awards and injunctive relief, shown by the variable (b). And, of course, there are costs associated with the litigation, shown by the variable (c).
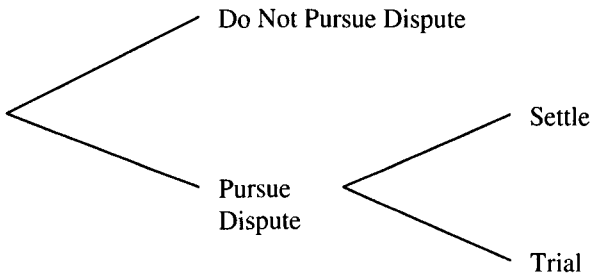

Do Not Pursue Dispute

Pursue Dispute

Settle

Trial

FIGURE ONE[33]
A STANDARD MODEL OF LITIGATION

Let:

p_π be the plaintiff's subjective probability of victory in litigation, and

p_Δ be the defendant's subjective probability of a plaintiff victory in litiga-tion.

Therefore, the expected value of trial for the plaintiff may be modeled as

$$E_\pi = p_\pi b - c_\pi . \tag{1}$$

Likewise, the expected cost of trial for the defendant may be modeled as

$$E_\Delta = p_\Delta b + c_\Delta . \tag{2}$$

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few. Likewise, cost would include, *inter alia*, actual monetary costs, temporal costs, emotional costs, and the risk associated with negative precedent.

30. *See* Richard A. Posner, *An Economic Approach to Legal Procedure and Judicial Administration*, 2 J. LEGAL STUD. 399 (1973); George L. Priest & Benjamin Klein, *The Selection of Disputes for Liti-gation*, 13 J. LEGAL STUD. 1, 4-5 n.16 (1984) [hereinafter Priest & Klein, *Selection of Disputes*] (citing William M. Landes, *An Economic Analysis of the Courts*, 14 J.L. & ECON. 61 (1971).

31. Priest & Klein, *Selection of Disputes, supra* note 30, at 4.

32. *Id.* at 4. (emphasis added).

33. *Adapted from* Shavell, *Economic Analysis, supra* note 21, at 10 (citing RICHARD A. POSNER, ECONOMIC ANALYSIS OF LAW 434-41 (2d ed. 1977); John P. Gould, *The Economics of Legal Con-flicts*, 2 J. LEGAL STUD. 279 (1973); William M. Landes, *An Economic Analysis of the Courts*, 14 J.L. & ECON. 61 (1971); Steven Shavell, *Suit, Settlement, and Trial: A Theoretical Analysis under Alterna-tive Methods for the Allocation of Legal Costs*, 11 J. LEGAL STUD. 55 (1982)).

Settlement will only occur when a settlement agreement exists that both disputants prefer to the expected outcomes at trial. It is clear that this can only be true when the plaintiff's minimum acceptable settlement is less than the maximum settlement that the defendant is willing to offer,[34] a condition that may be written as

$$p_\pi b - c_\pi < p_\Delta b + c_\Delta . \tag{3}$$

For example, suppose that the plaintiff estimates that she has an 80 percent likelihood of winning $10,000 at trial and that her trial costs would be $2,000. The expected value of trial for this plaintiff would then be

$$E_\pi = .8(\$10,000) - \$2,000 = \$6,000 . \tag{4}$$

Further suppose that the defendant estimates that the plaintiff only has a 60 percent likelihood of prevailing at trial, with the same $10,000 in judgments, and he expects trial costs of $2,000. The expected cost of trial for the defendant would be

$$E_\Delta = .6(\$10,000) + \$2,000 = \$8,000 . \tag{5}$$

Therefore following (3), because the plaintiff's minimum acceptable settlement ($6,000) is less than the defendant's maximum acceptable settlement amount ($8,000), the parties should settle.

$$.8(\$10,000) - \$2,000 < .6(\$10,000) + \$2,000 . \tag{6}$$

On the other hand, keeping the plaintiff's subjective estimations constant, suppose that the defendant estimates that the plaintiff has only a 20 percent chance of prevailing. The expected cost of trial for the defendant would now be

$$E_\Delta = .2(\$10,000) + \$2,000 = \$4,000 . \tag{7}$$

The condition in (3) no longer holds true,

$$.8(\$10,000) - \$2,000 > .6(\$10,000) + \$2,000 , \tag{8}$$

and, because the plaintiff's minimum acceptable settlement ($6,000) is no longer less than the defendant's maximum acceptable settlement amount ($4,000), the parties should proceed to trial.

> The general point is that differences of opinion—the relative optimism about winning—is what makes for trial. If the parties' beliefs are not too far apart, the savings in trial costs will lead them to settle. The more specific point is that the difference between the plaintiff's expected judgment and the defendant's expected judgment must exceed the sum of

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34. *See* Shavell, *Economic Analysis, supra* note 21, at 11. *See generally* Priest & Klein, *Selection of Disputes, supra* note 30. For applications of this generalized model to selections of employment disputes for litigation, see generally Gregory Todd Jones, *Testing for Structural Change in Legal Doctrine: An Empirical Look at the Plaintiff's Decision to Litigate Employment Disputes a Decade After the Civil Rights Act of 1991*, 18 GA. ST. U. L. REV. 997 (2002); Peter Siegelman, An Economic Analysis of Employment Discrimination Litigation (1991) (unpublished Ph.D. dissertation, Yale University) (on file with the authors); Peter Siegelman, The Influence of Macroeconomic Conditions on Plaintiff Win Rates in Unpublished Federal Employment Discrimination Cases (1990) (unpublished working paper) (on file with the authors). Again, these reservation points can be thought of in terms of the disputant's BATNAs. *See* FISHER & URY, *supra* note 23 and accompanying text. For an extensive discussion on Decision Tree Models, see ROBERT H. MNOOKIN ET AL., BEYOND WINNING: NEGOTIATING TO CREATE VALUE IN DEALS AND DISPUTES 109 (2000).

their trial costs for there to be a trial; otherwise, they will settle to save trial costs.[35]

Information informs each party's relative optimism. Such information may derive from many sources: independent research, consultants, lawyers, communication with other parties, and dispute resolution processes of various kinds, to name a few. "At various points in [a] case, a lawyer . . . will involve himself with legal procedures, collect further *information (sometimes investing substantially)* and communicate with the other party. As a result of any of these activities, a litigant may change his decisions about worth, acceptable range, and offer/demand."[36] Steven Shavell has suggested various reasons why ex post agreement to evaluative dispute resolution may be attractive to both parties.[37]

> The main reasons why ADR may appeal jointly to parties ex post is [sic]
> that it may constitute a cheap substitute for trial or that it may provide
> them with *information* about the trial outcome and make settlement more
> likely. In both ways ADR may serve to lower the expected costs of dis-
> pute resolution. ADR may also lower risk . . . .[38]

In this research, we focus on the informational content that may be offered by evaluative dispute resolution processes and the manner in which subjective estimates of litigation outcomes may be altered by this information. Additionally, we examine potential guidance for litigants as to rationally appropriate levels of investment in the pursuit of this information. Before turning to these specific questions, a bit more groundwork is apposite—a proposed model of litigation, which includes a decision whether to enter into an evaluative process, is considered next.

III. A PROPOSED MODEL INCLUDING EVALUATIVE DISPUTE RESOLUTION

The standard litigation model considered above[39] can be expanded to include a decision point at which an opportunity is available to engage in evaluative dispute resolution. A litigant may choose to pursue this course because ADR may be faster and cheaper than traditional litigation and because of the additional information regarding the likely outcome of the case that may be gleaned through a non-binding process.[40] The model proposed here, see Figure Two, is a truncated

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35. Shavell, *Economic Analysis, supra* note 21, at 11.

36. D. A. WATERMAN & MARK A. PETERSON, MODELS OF LEGAL DECISIONMAKING 6 (1981) [hereinafter WATERMAN, MODELS] (emphasis added).

37. Shavell, *Economic Analysis, supra* note 21, at 9.

38. *Id.* (emphasis added). *See also* WATERMAN, MODELS, *supra* note 36, at 7 n.15 ("[P]lea negotia-tion [has been described as] 'uncertainty reduction rather than convergence through simple haggling and bluffing in a sentence marketplace.' Since the tasks and problems faced by civil and criminal litigators are very similar, the behavior of both kinds of litigators should be similar.") (citing A. R. Matheny, *Negotiating and Plea Bargaining Models*, 2 L. & POL'Y Q. 267, 267-84 (1980); D. M. Engel & E. H. Steele, *Civil Cases and Society: Processes and Order in the Civil Justice System*, 1979 AM. B. FOUND. RES. J. 295, 295-346 (1979)).

39. *See supra* Part I, Figure One.

40. Some readers may be bothered by this choice model in light of the fact that many participants in ADR, particularly those in court-connected programs, do not voluntary choose ADR over litigation but

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form of Steven Shavell's economic model of alternative dispute resolution, which also included an alternative to pursue binding forms of ADR.[41] Although Shavell suggested that his is the "first economic model of ADR" that aims at reasonable comprehensiveness,"[42] he did cite to prior research that applies economic principles to certain aspects of ADR.[43] Richard Posner's work related to summary jury trials, "in essence [another] form of nonbinding ADR,"[44] "emphasizes that [these] summary jury trial[s] may promote settlement by promoting a convergence of beliefs of the litigants,"[45] and, as such, offers important parallels to the informational role of evaluative dispute resolution that we investigate in this Article.
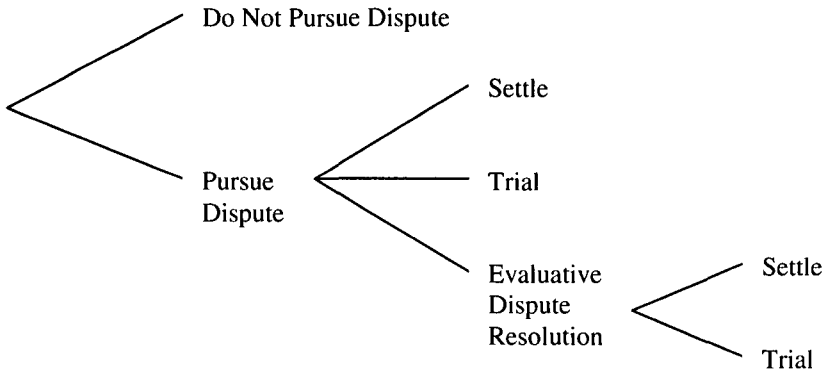

FIGURE TWO[46]
A PROPOSED MODEL OF LITIGATION

In this model, the litigants face two sequential decisions. Prior to deciding whether to settle or proceed to trial, the litigant first must decide whether to engage in evaluative dispute resolution. In Section III, we will consider a method of valuing this dispute resolution process to aid in this first decision. Here, however, we examine a proposed modification of the standard model of litigation previously reviewed[47] with conditional probabilities that inform the settlement decision. The conditional probabilities referred to are the subjective probabilities of the litigation outcome *conditioned* by the favorability of evaluative information obtained in ADR. That is, the litigants begin the process with prior subjective

are ordered to do so by the courts. While this is true, these programs are non-binding, and, as a result, the participation choice becomes one in which the disputant chooses either to participate meaningfully, or not. The impact on the outcome of the decision model, ignoring transactional costs such as that associated with time for the sake of simplicity, is the same.
    41. Shavell, *Economic Analysis, supra* note 21, at 9.
    42. *Id.* at 4 n.7.
    43. *Id.* (citing Richard A. Posner, *The Summary Jury Trial and Other Methods of Alternative Dispute Resolution: Some Cautionary Observations*, 53 U. CHI. L. REV. 366 (1986); Lisa Bernstein, *An Economic Analysis of Federal Court-Annexed Arbitration* (unpublished manuscript, Boston Univ. Law School 1993)).
    44. *Id.*
    45. *Id.*
    46. *Adapted from* Shavell, *Economic Analysis, supra* note 21, at 12.
    47. *See supra* Part I.

probabilities of the litigation outcome that are combined with the new information contributed by the evaluative information in a manner that we will more fully explore in Section IV.

Let:

$p_{\pi|w}$ be the plaintiff's subjective probability of victory in litigation conditioned on a favorable evaluation for a plaintiff outcome in ADR,

$p_{\pi|l}$ be the plaintiff's subjective probability of victory in litigation conditioned on a negative evaluation for a plaintiff outcome in ADR,

$p_{\Delta|w}$ be the defendant's subjective probability of a plaintiff victory in litigation conditioned on a favorable evaluation for a plaintiff outcome in ADR, and

$p_{\Delta|l}$ be the defendant's subjective probability of a plaintiff victory in litigation conditioned on a negative evaluation for a plaintiff outcome in ADR.

It is these new posterior subjective probabilities, taking into consideration *both* the prior subjective probabilities and the new information contributed by evaluative dispute resolution, which will influence the settlement decision. Combining with (3), if the evaluative information is favorable for the plaintiff, a settlement will occur only if

$$p_{\pi|w}b - c_\pi < p_{\Delta|w}b + c_\Delta. \tag{9}$$

Similarly, if the evaluative information is not favorable for the plaintiff, a settlement will occur only if

$$p_{\pi|l}b - c_\pi < p_{\Delta|l}b + c_\Delta. \tag{10}$$

Next we propose a normative standard for placing a value on this evaluative information.

IV. THE EXPECTED VALUE OF PERFECT INFORMATION

What is this additional information offered by evaluative dispute resolution worth? If the information gleaned from such a process is sufficiently valuable,[48] opposing viewpoints may converge into a range of possible agreement and the likelihood of settlement may be increased without relying on the generally more costly avenue of traditional litigation. However, dispute resolution processes are not free—there are costs involved that will essentially be in addition to litigation costs should the dispute not settle after the evaluative dispute resolution process.[49]

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48. By "valuable," it is meant that the information is useful in reducing the uncertainty of the litigation-related decisions. Note that "valuable" is *not* equivalent to "accurate." Evaluation from a third-party source can be equally valuable when it is known to be nearly always correct or when it is known to be nearly always wrong. To drive this point home, consider the following question: Would you prefer advance information about your favorite sports team's victory from Analyst A, who is historically accurate 50 percent of the time, or Analyst B, who is known to be wrong 100 percent of the time? We prefer to consult Analyst B and then place our bet on our favorite team's opponent.

49. It is important to note that this is not true of *all* costs incurred during dispute resolution. At least some of the costs associated with dispute resolution will overlap with cost of traditional litigation (i.e., case preparation, demonstrative exhibits, consulting experts, etc.). Therefore, there may be some economic benefit to dispute resolution that is not lost if the case proceeds to trial, but there is no ques-

Furthermore, there is no way of knowing the outcome of evaluative process in advance, and even if this were possible, advisory opinions do not always accurately reflect the outcome of litigation. It is therefore conceivable that a rational litigant may decide to forego evaluative dispute resolution and proceed directly to trial where the predictive ability of the dispute resolution process is insufficient to outweigh its additional cost. How can this decision be made?

One strategy is to consider the value of theoretically perfect information— information so probative as to allow the decision maker to proceed with certainty, in the case of a litigant, for example, knowing in advance whether litigation would be won or lost. While for practical matters, such perfect information is never available,[50] the ability to assign a value to this perfect information would at least establish a theoretical maximum value for any obtainable, albeit imperfect, information such as the evaluative information discussed above.

Imagine a litigant who has filed a suit and now must decide whether to attempt settlement or pursue trial. See Figure Three. Further, assume that the litigant's estimated subjective probability of winning $100,000 at trial is 80 percent and trial costs will total $20,000. An offer of settlement totaling $50,000 is pending.[51]

```
        Settle ─────────────── $50,000

                   Win .80  ──  $100,000 – $20,000 = $80,000

        Trial  <
                   Lose .20  ──  – $20,000
```
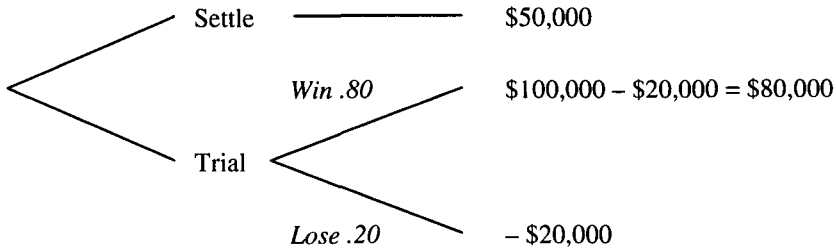
FIGURE THREE
A HYPOTHETICAL SETTLEMENT DECISION

The hypothetical litigant's expected value of trial is

$$EV = .80(\$80,000) + .20(-\$20,000) = \$60,000 \qquad (12)$$

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tion that the costs of dispute resolution should be viewed as positive marginal costs should trial be necessary.

50. Indeed, if it were, there would be no need for the litigation in the first place.

51. The litigant's expected value of trial is the sum of the products of the outcomes multiplied by their subjective probabilities, and can be generalized as

$$EV = \sum_{j=1}^{N} p(s_j)b_{ij} , \qquad (11)$$

where $p(s_j)$ is the subjective probability of outcome s_j ,

b_{ij} is the net benefit of outcome s_j given that strategy i has been selected, and

N is the number of possible outcomes

and she would rationally make the decision to litigate.[52] However, if her subjective probabilities are altered by consulting a lawyer with expertise in the area, or by securing negative information in evaluative dispute resolution, she may decide to accept settlement. For example, if new information reduces her subjective estimation of victory to, say, 60 percent, then her expected value of trial is

$$EV = .60(\$80,000) + .40(-\$20,000) = \$40,000 \qquad (13)$$

and it would be to her benefit to settle rather than pursuing trial.

How might the litigant determine the maximum rational budget for additional sources of information, such as lawyers, experts, and evaluative dispute resolution that may mitigate some of her uncertainty? First, she evaluates her decision as though operating under certainty. It is straightforward that if the litigant knew with certainty that she would win at trial, then trial would be the strategy she would pursue. Similarly, if she knew with certainty that she would lose at trial, it is clear that she would prefer settlement.

Unfortunately, however, the best strategy cannot be known until *after* the trial outcome is determined. Therefore, the benefit associated with these best strategies must be discounted by the subjective probability of each outcome. See Table One. Therefore, the expected value of this decision operating under certainty, or with perfect information, equals $74,000. Remembering that the expected value of the decision under uncertainty was $60,000, the computation of the expected value of perfect information requires only common sense and arithmetic. Clearly, if her current level of information offers an expected value of $60,000 and perfect information offers an expected value of $74,000, then she should be willing to spend an absolute maximum of $74,000 - $60,000, or $14,000 in pursuit of additional information that may moderate her uncertainty.[53] We now turn to a consideration of the manner in which new information is integrated with prior subjective probabilities, once the decision to incur the cost of obtaining the new information has been made.

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52. Keep in mind that when we place a value on benefits and costs, these values capture all relevant utilities for the decision maker, both monetary and non-monetary. *See supra* note 29 and accompanying text.

53. For additional treatment of information valuation specifically, and more generally, decision analysis and risk, see Francis J. Clauss, Applied Management Science (1996); Robert T. Clemen, Making Hard Decisions: An Introduction To Decision Analysis (1991); Jack Hirshleifer & John G. Riley, The Analytics Of Uncertainty And Information (1992). *See generally* Thomas R. Colosi, *The Principles of Negotiation*, Disp. Resol. J., Feb.-Apr. 2002, at 28 (describing the relationship between risk and conflict management); Comodeca, *Ready, supra* note 14 (suggesting the importance of objective risk analysis); Marjorie Corman Aaron, *Strategies, Tactics, and Techniques for Effective Evaluation: Conducting Risk Analysis with Parties*, General Skills Training Workshop at Conference of the American Bar Association Section of Dispute Resolution (Apr. 6-8 1999); *see also* Marjorie Corman Aaron, *ADR Toolbox: The Highwire Act of Evaluation*, 14 Alternatives To High Cost Litig. 62, 62 (1996). For recognition of the importance of decision analysis in ADR, see Christopher M. Thorne, *Preface*, 1 Harv. Negot. L. Rev. v (1996) (describing the motivation for the inaugural of the journal).

Outcome	Best Strategy	Net Benefit	Probability	Disc. Benefit
Win Trial	Litigate	$80,000	.80	$64,000
Lose Trial	Settle	$50,000	.20	$10,000

Expected value operating under certainty = $74,000

TABLE ONE
THE COMPUTATION OF EXPECTED VALUE OPERATING UNDER CERTAINTY

V. BAYES' THEOREM

If it were not considered important to seek information in hopes of reducing uncertainty associated with subjective probabilities, then experts, including lawyers, would never be consulted. On the other hand, in disputes where litigation is a consideration, lawyers and other substantive experts are, in fact, nearly always consulted. The information that these sources can provide is clearly considered important. This Article has proposed another source of information regarding the outcome of such a dispute—evaluative information offered in connection with some form of dispute resolution. Once, this information is obtained, how is it combined with prior subjective probabilities to create a more accurate prediction? One rational means of revising prior probabilities with new information involves the use of Bayes' theorem.[54] "The [new] information provides conditional probabilities or likelihoods and Bayes' theorem combines the prior probabilities and the conditional probabilities to give revised or posterior probabilities that reflect the [new] information."[55]

Imagine, again, a hypothetical litigant considering the likely outcome of a particular lawsuit. Let A denote the hypothesis that she will win at trial and $\bar{A}$ denote the opposite hypothesis that she will lose at trial. Further, as before, suppose that she holds subjective probabilities assigned to these outcomes: $P(A)$ to A and $P(\bar{A})$ to $\bar{A}$. The litigant has the opportunity to engage in evaluative dispute resolution that will provide additional information about the likely outcome of the case, call it B, that will alter her opinion toward the hypothesis A. By examining the substantive background of the proposed neutral, she estimates that 80 percent of the cases that have been won at trial have been correctly predicted as wins by the neutral's evaluation.[56] Therefore,

$$P(B \mid A) = .80 \tag{14}$$

She further finds that in cases that were *not* won at trial, the neutral issued a positive evaluation 10 percent of the time. Therefore,

$$P(B \mid \bar{A}) = .10. \tag{15}$$

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54. Named in honor of the English mathematician and reverend, Sir Thomas Bayes, 1702-1761.
55. COLLIN J. WATSON ET AL., STATISTICS FOR MANAGEMENT AND ECONOMICS 160 (1993).
56. We acknowledge that such information is nearly impossible to obtain, but propose that a rough equivalent is indicated by the neutral's reputation, if not for accuracy per se, then for substantive experience.

What the litigant is truly interested in, however, is $P(A \mid B)$, or the probability that she will win at trial, given a positive evaluation from the neutral. This is where she might effectively put Bayes' theorem to use. Bayes' theorem provides a method for ascertaining the posterior probability that she is looking for and is stated as,

$$P(A \mid B) = \frac{P(A) \times P(B \mid A)}{P(A) \times P(B \mid A) + P(\overline{A}) \times P(B \mid \overline{A})} \tag{16}$$

Now, suppose that the litigant's prior subjective probability of victory at trial, $P(A)$, is 30 percent. It follows that her estimated probability of loss, $P(\overline{A})$, would be 70 percent. Further, suppose that the litigant has participated in the evaluative dispute resolution process and has received information in her favor. How should this affect her subjective probability of victory? Utilizing Bayes' theorem,

$$P(A \mid B) = \frac{.3 \times .8}{(.3 \times .8) + (.7 \times .1)} = .77. \tag{17}$$

Therefore, her new posterior subjective probability of winning at trial should be 77%.

The proper integration of this information can have rather dramatic effects on settlement. For example, consider a settlement scenario similar to that presented above.[57] See Figure Four. What would be the minimum settlement that the litigant would accept based upon her prior subjective probabilities?

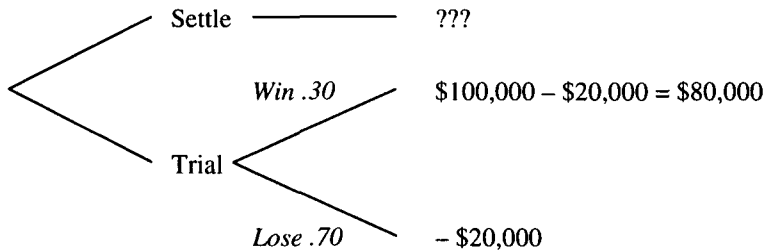$$EV = .30(\$80,000) + .70(-\$20,000) = \$10,000 \tag{18}$$

FIGURE FOUR
A HYPOTHETICAL SETTLEMENT DECISION

Given the scenario presented in Figure Four, the litigant would rationally be willing to accept any settlement offer in excess of $10,000. However, now suppose that she has engaged in the evaluative dispute resolution process and has received positive information.
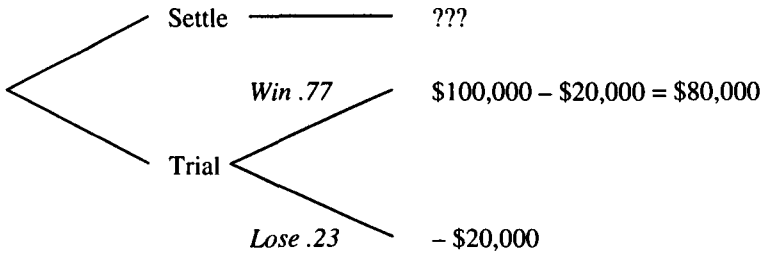
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57. *See supra* Part III.

FIGURE FIVE
A HYPOTHETICAL SETTLEMENT DECISION

In these circumstances, her subjective probabilities have been altered by the new information and a settlement offer in excess of $57,000 would be required to prevent her from pursuing trial.[58]

$$EV = .77(\$80,000) + .23(-\$20,000) = \$57,000 \tag{19}$$

With the groundwork laid of describing a model including evaluative dispute resolution, this Article now turns to a consideration of the use of these rational decision making tools (both the expected value of perfect information[59] and Bayes' theorem[60]) in evaluative dispute resolution-based experimental settings.

VI. RESEARCH QUESTIONS

In the proceeding Sections,[61] we have explicated theories of litigation and dispute resolution that are best understood in the context of standard economic principles. Gary Becker's account of these principles is characteristic:

> [A]ll human behavior can be viewed as involving participants who (1) maximize their utility (2) from a stable set of preferences and (3) accumulate an optimal amount of *information* and other inputs in a variety of markets.[62]

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58. Indeed, evaluative dispute resolution has the potential of "backfiring" in that a positive advisory opinion can empower a party in such a manner that litigation, rather than settlement, is encouraged. *See generally* Steven J. Brams et al., *Arbitration Procedures*, in NEGOTIATION ANALYSIS 47 (1991). Note that this "backfiring" presumes that the goal of the ADR program under evaluation is settlement, which may not be the case. *See supra* note 13 and accompanying text.

59. *See supra* Part III.

60. *See supra* Part IV.

61. *See supra* Parts I-IV.

62. Christine Jolls et al., *A Behavioral Approach to Law and Economics*, in BEHAVIORAL LAW & ECONOMICS 13, 14 (Cass R. Sunstein ed., 2000) (citing GARY S. BECKER, THE ECONOMIC APPROACH TO HUMAN BEHAVIOR 14 (1976) (emphasis added)).

Economists acknowledge that these principles are normative—that they suggest an approach to decision-making that is not necessarily employed by real people, but instead by a super-human rational man.[63] And yet, the primary concern of our research is a positive investigation of the manner in which *real* people *actually* behave in dispute resolution contexts. How do litigants actually value sources of information such as evaluative dispute resolution? How do they actually process the information should they choose to procure it? How do these litigants differ from *homo economicus*? In doing so, we examine four research questions that are designed to "draw into question the central ideas of utility maximization, stable preferences, rational expectations, and optimal processing of information."[64]

> I. How do litigants' estimates of acceptable settlement amounts compare with settlement amounts determined using rational expectation models of litigation?[65]

> II. Is there a relationship between litigants' estimates of the maximum value of evaluative dispute resolution and the maximum value determined using a rational expectations model—the expected value of perfect information?[66]

> III. Once new information is acquired via an evaluative dispute resolution process, is this new information fully integrated into subjective probabilities to the extent indicated by a rational expectations model such as Bayes' theorem?[67]

> IV. Is there a relationship between the extent to which litigants' misestimate acceptable settlement amounts prior to dispute resolution and the extent to which they misestimate acceptable settlement amounts after the integration of the information provided by evaluative dispute resolution, assuming that they misestimate acceptable settlement amounts at all?

In the next two sections, we detail the operationalization of these questions and the experiment by which they were subjected to empirical investigation.

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63. In fact, researchers like Amos Tversky and Daniel Kahneman have shown that there are systematic deviations from the outcomes predicted by the rational expectations model. Amos Tversky & Daniel Kahneman, *Judgment Under Uncertainty: Heuristics and Biases, in* JUDGEMENT UNDER UNCERTAINTY: HEURISTICS AND BIASES 32 (Daniel Kahneman et al. eds., 1982). Specific heuristics and biases will be considered further in Part VIII as possible explanations for these deviations.

64. Jolls et al., *supra* note 62, at 13, 14 (citing Richard H. Thaler, *Doing Economics Without* Homo Economicus, *in* FOUNDATIONS OF RESEARCH IN ECONOMICS: HOW DO ECONOMISTS DO ECONOMICS? 227, 233-35 (Steven G. Medema & Warren J. Samuels eds., 1996)).

65. *See supra* Part I.

66. *See supra* Part III.

67. *See supra* Part IV.

VII. THE EXPERIMENT

A. The Instruments[68]

The instruments were constructed so that each respondent was presented with different randomized variables[69] that characterized the scenario that they faced. The randomized variables included:

1. Damages - randomly selected from a uniform distribution with a range from $0 to $100,000,

2. Trial Costs - randomly selected from a uniform distribution with a range from $0 to $20,000 and conforming to the constraint that plaintiff costs would not exceed damages,

3. Probability of Plaintiff Win at Trial - randomly selected from a uniform distribution with a range from 0 to 100 percent,

4. Proposed Settlement - randomly selected from a uniform distribution with a range from 0 to $50,000 and conforming to the constraint that defendant proposals would not exceed damages,

5. Cases That Have Been Won at Trial Correctly Predicted As Wins By Evaluative Dispute Resolution $P(B \mid A)$ - randomly selected from a uniform distribution with a range from 0 to 100 percent,[70] and

6. Cases That Have Been Lost at Trial Correctly Predicted As Losses By Evaluative Dispute Resolution $P(\overline{B} \mid \overline{A})$ - randomly selected from a uniform distribution with a range from 0 to 100%.[71]

The instruments presented respondents with three queries.[72] First, with damages,[73] trial costs, and a prior subjective probability of plaintiff success provided,

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68. *See infra* Appendix.

69. The magnitude and range of the randomized variables in this experiment were not matters under investigation. As such, parameters were chosen that would result in plausible scenarios and would promote an ease of interpretation. Future research, possibly taking into account the effect of marginal utilities, might vary these parameters within broader ranges, treating magnitude and range as possible additional explanatory variables.

70. *See supra* Part IV. Note that $P(B \mid \overline{A})$ was not randomized as it in fact depends upon $P(B \mid A)$.

71. *See supra* Part IV. Note that $P(\overline{B} \mid A)$ was not randomized as it in fact depends upon $P(\overline{B} \mid \overline{A})$.

72. Questions one, two, and four on the instruments. *See infra* Appendix. The third question on the instruments was used merely as a vehicle for delivering historical information regarding a specific neutral. Responses to this question were not utilized in this research.

73. Following Shavell, uncertainty with regards to the adjudication process was regarding liability, not damages. *See* Shavell, *Economic Analysis, supra* note 21, at 13; *infra* Appendix. As with Shavell, this assumption was made for the sake of simplicity, however, "if there were uncertainty over not just liability but also the judgment amount, the results would be similar." *See* Shavell, *Economic Analysis, supra* note 21, at 15 n.21.

respondents were asked to make their best estimate of a settlement offer—plaintiffs were asked for the minimum settlement that they would accept and defendants were asked for the maximum settlement that they would offer. There were equal numbers of plaintiffs, (N = 54), and defendants, (N = 54).

Second, each respondent was presented with a settlement offer from the opposing side and the opportunity to engage in evaluative dispute resolution for the purpose of gathering more information about the outcome of the case at trial. Respondents were asked to indicate the maximum dollar amount that they would be willing to pay for the services of such dispute resolution. At this point, they were not given any indication of previous predictive ability of the dispute resolution process.

Finally, the respondents were given historical information, $P(B \mid A), P(B \mid \overline{A})$, $P(\overline{B} \mid \overline{A})$, and $P(\overline{B} \mid A)$, about a specific proposed neutral. It was indicated to respondents that they had engaged the services of the specific neutral proposed and that an·evaluation had been issued. One half of the instruments (N = 54) reported a predicted plaintiff win, and one half (N = 54) reported a predicted plaintiff loss. Respondents were asked to use this new information to modify their minimum or maximum settlement offer reported in the first question.

The instruments were coded so that they could be matched back to normative benchmarks based upon rational expectations models that were calculated for each instrument depending on the randomized values of the variables discussed above.

B. Collecting the Data

The experiment was conducted with undergraduate and graduate business students. Respondents were paired into plaintiff-defendant pools, and although some information such as damage amounts, the neutral's success rate in accurately predicting outcomes at trial, and the neutral's evaluation overlapped, each respondent was given their own instrument and provided information in isolation from their respective opposing party. Processing of the data resulted in a database table with one record per respondent that included the variables found in Table Two.

Variable	Definitions
Settle1	Respondent's proposed settlement from Question 1 of the instrument
NSettle1	The normative settlement proposed by the rational expectations model in the context of the particular instrument's variable values
Max	Respondent's maximum value for evaluative information from Question 2 of the instrument
NMax	The normative maximum value for evaluative information – the expected value of perfect information in the context of the particular instrument's variable values
Settle2	Respondent's proposed settlement after receiving the evaluative information from Question 4 of the instrument
NSettle2	The normative settlement after receiving the evaluative information proposed by the rational expectations model in the context of the particular instrument's variable values
AChange	The actual change between the respondent's two settlement offers
NChange	The normative change between the two settlement offers proposed by the rational expectations model in the context of the particular instrument's variable values
DeltaS1	The difference between the respondent's first settlement offer and the normative settlement proposed by the rational expectations model in the context of the particular instrument's variable values
DeltaS2	The difference between the respondent's second settlement offer and the normative settlement proposed by the rational expectations model in the context of the particular instrument's variable values

TABLE TWO
VARIABLE DEFINITIONS

VIII. RESULTS & DISCUSSION

Table Three reports a variety of descriptive statistics for each of the paired samples under analysis.[74] Table Four reports the Pearson correlation coefficients[75] for each pair of samples under analysis. Table Five reports the five paired sample *t* tests, including the mean difference measures, 95 percent confidence intervals, *t* statistics, and associated levels of statistical significance.

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	SETTLE1	41129.69	108	25583.82	2461.80
	NSETTLE1	32829.20	108	25963.29	2498.32
Pair 2	MAX	5714.94	108	6779.16	652.32
	NMAX	40789.68	108	38522.96	3706.87
Pair 3	SETTLE2	33084.82	108	23758.58	2286.17
	NSETTLE2	29773.91	108	25961.13	2498.11
Pair 4	ACHANGE	-541.49	108	23373.83	2249.15
	NCHANGE	10873.15	108	10581.46	1018.20
Pair 5	DELTAS1	8300.48	108	27951.34	2689.62
	DELTAS2	3310.92	108	30007.29	2887.45

TABLE THREE
DESCRIPTIVE STATISTICS

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74. It is important to note that the means associated with Pair 4: ACHANGE and NCHANGE are not meaningful in standard interpretation. This is due to the fact that the *direction* of the normative change, and not merely its absolute value, was important to the analysis. For example, if the prescribed normative change was +10 and the respondent actually changed +15, then the difference measure, 15 − 10 = 5, clearly indicates that the respondent over utilized available information (assuming that utilization occurs at all) by 5. However, assume that the prescribed normative change was −10 and the respondent actually changed +5. Then the difference measure, 5 − (-10) = 15, would incorrectly indicate that the respondent had over utilized the information by 15 when, in fact, the respondent had changed in the opposite direction of the normative recommendation and therefore had *under* utilized the available information. This was corrected algorithmically for the purpose of completing the paired sample analysis so that the difference measures would be correct, but in doing so, the signs of the individual values, and their associated means were necessarily altered.

75. The Pearson correlation coefficient measures the strength and direction of a linear relationship between two variables.

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	SETTLE1 & NSETTLE1	108	.412	.000
Pair 2	MAX & NMAX	108	.386	.000
Pair 3	SETTLE2 & NSETTLE2	108	.274	.004
Pair 4	ACHANGE & NCHANGE	108	-.041	.670
Pair 5	DELTAS1 & DELTAS2	108	.690	.000

TABLE FOUR
STATISTICAL CORRELATIONS

Paired Samples Test

| | | Paired Differences | | | | | | | |
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
Pair 1	SETTLE1– NSETTLE1	8300.48	27951.34	2689.62	2968.63	13632.34	3.086	107	.003
Pair 2	MAX-NMAX	-35074.74	36448.62	3507.27	-42027.49	-28121.98	-10.001	107	.000
Pair 3	SETTLE2- NSETTLE2	3310.92	30007.29	2887.45	-2413.12	9034.95	1.147	107	.254
Pair 4	ACHANGE- NCHANGE	-11414.64	26053.53	2507.00	-16384.48	-6444.80	-4.553	107	.000
Pair 5	DELTAS1- DELTAS2	4989.56	22888.95	2202.49	623.38	9355.75	2.265	107	.026

TABLE FIVE
SUMMARY OF STATISTICAL RESULTS

A. Research Question I: Litigant's Acceptable Settlement Amount versus Rational Estimate

A paired sample t test was conducted to evaluate whether there was a difference between the litigants' expressed acceptable settlement amount and the settlement amount that would comport with a rational expectations model. The results indicated that the mean litigant's estimate (Mean = 41129.69, Std. Dev. = 25583.82) was significantly greater than the mean estimate conforming to the rational expectations model (Mean = 32829.20, Std. Dev. = 25963.29), $t(107) = 3.086$, $p = .003$. See Figure Six. As a whole, litigants tend to overestimate the expected outcomes of potential litigation.
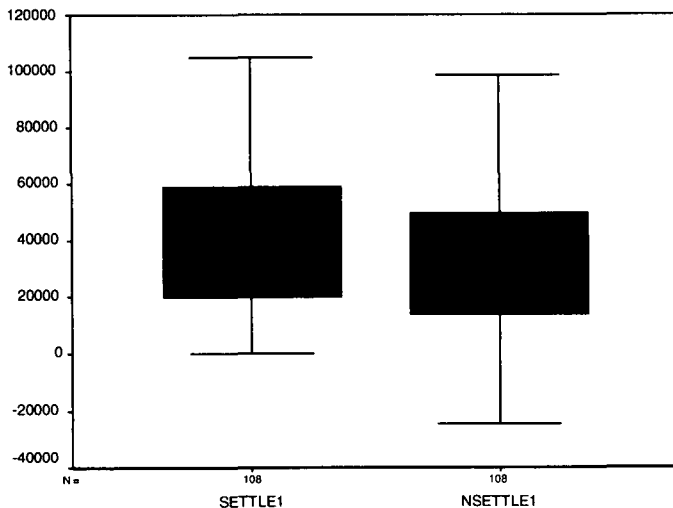
FIGURE SIX
A COMPARISON OF THE LITIGANT'S ACCEPTABLE SETTLEMENT ESTIMATE
(SETTLE1) WITH THE NORMATIVE SETTLEMENT (NSETTLE1) BASED ON RATIONAL
EXPECTATIONS MODEL[76]

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76. Note that the randomized instruments produced a few instances where the expected value of trial for the plaintiff was negative. In such instances, the rational expectations model would propose that a plaintiff may actually accept a negative settlement offer—a proposition that on its face, seems at the very least implausible, as the plaintiff would then exercise the available choice of not bringing the suit at all. To verify that this condition would not affect the results presented in this Article, an additional paired sample t test was completed using normative settlements that were strictly non-negative. As the results below indicate, this cautionary measure had essentially no impact on the results of the analysis. $t(107) = 2.882, \ p = .005$.
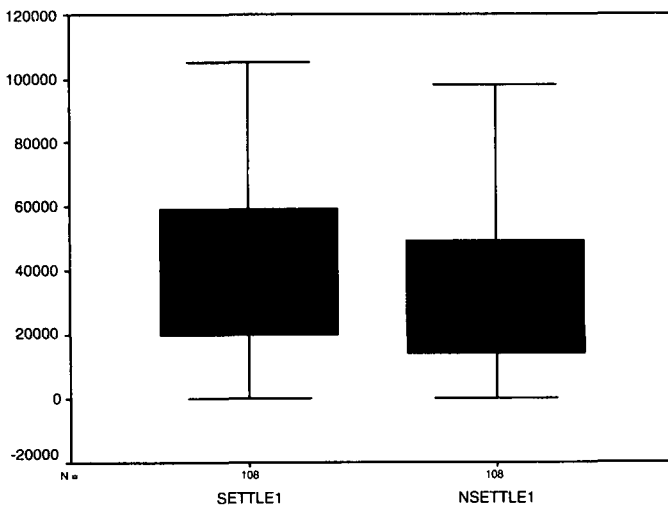
B. Research Question II: Litigant's Maximum Value for Evaluative Information versus Rational Estimate

A paired sample *t* test was conducted to evaluate whether there was a difference between the litigants' expressed maximum value for the information derived from evaluative dispute resolution and the maximum value that would comport with a rational expectations model—the expected value of perfect information. The results indicated that the mean litigant's maximum value (Mean = 5714.94, Std. Dev. = 6779.16) was significantly less than the mean maximum conforming to the rational expectations model (Mean = 40789.68, Std. Dev. = 38522.96), $t(107) = -10.001$, $p = .000$. See Figure Seven. Litigants tend to underestimate the value of evaluative information.

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	SETTLE1	41129.69	108	25583.82	2461.80
	NSETTLE1	32829.20	108	25963.29	2498.32

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	SETTLE1 & NSETTLE1	108	.408	.000

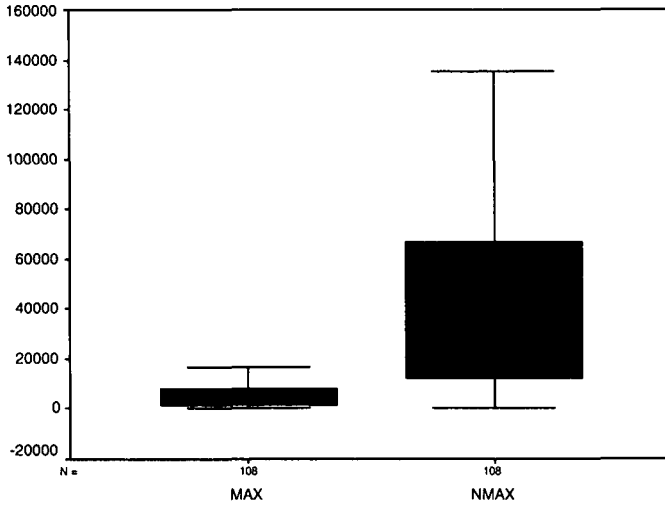|		Mean	Std. Dev.	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
Pair 1	SETTLE1- NSETTLE1	7602.44	27414.13	2637.93	2373.06	12831.81	2.882	107	.005

FIGURE SEVEN
A COMPARISON OF THE LITIGANT'S MAXIMUM VALUE FOR EVAULATIVE DISPUTE
RESOLUTION (MAX) WITH THE NORMATIVE MAXIMUM (NMAX) BASED ON
RATIONAL EXPECTATIONS MODEL

C. Research Question III: Litigant's Posterior Subjective Probabilities versus Bayes' Theorem

A paired sample t test was conducted to evaluate whether there was a difference between the litigants' posterior subjective probabilities associated with trial outcome and posterior subjective probabilities that would comport with a rational expectations model—Bayes' theorem. The results indicated that the mean change between the litigant's prior and posterior settlement estimates (Mean = -541.49, Std. Dev. = 23373.83) was significantly less than the mean change conforming to the rational expectations model (Mean = 10873.15, Std. Dev. = 10581.46), $t(107)$ = -4.553, p = .000. See Figure Eight. Once evaluative information is obtained, litigants tend to significantly underutilize that information.
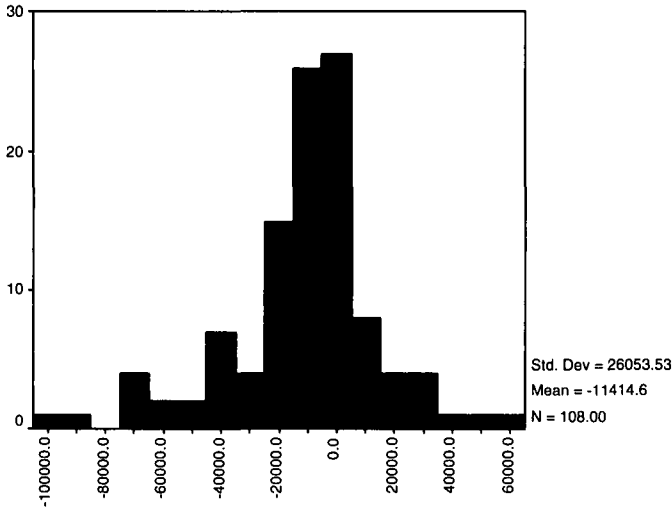
Std. Dev = 26053.53
Mean = -11414.6
N = 108.00

FIGURE EIGHT[77]

DIFFERENCES BETWEEN THE ACTUAL CHANGE IN SETTLEMENT ESTIMATES
AND THE NORMATIVE CHANGE BASED ON RATIONAL EXPECTATIONS MODEL

D. Research Question IV: Litigant's Prior Misestimate versus Litigant's Posterior Misestimate

A paired sample t test was conducted to evaluate whether there was a difference between the litigants' misestimate of prior subjective probabilities associated with trial outcome, if a misestimate occurred, and the litigant's misestimate of posterior subjective probabilities associated with trial outcome. The results indicated that the mean litigant's misestimate of prior probabilities (Mean = 8300.48, Std. Dev. = 27951.34) was significantly greater than the mean misestimate of posterior probabilities (Mean = 3310.92, Std. Dev. = 30007.29), $t(107) = 2.265$, $p = .026$. See Figure Nine. Although litigants misestimated the likely outcome of trial both before receiving evaluative information and after receiving evaluative information, the magnitude of the misestimation was significantly less after receiving the evaluative information.

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77. It was not particularly meaningful to display these differences in the same manner as the other figures because the direction of underutilization depends on whether the disputant is a plaintiff or a defendant. *See supra* note 74 and accompanying text. Instead, a distribution of differences is displayed, the primary message of which is that the mean is significantly negative.
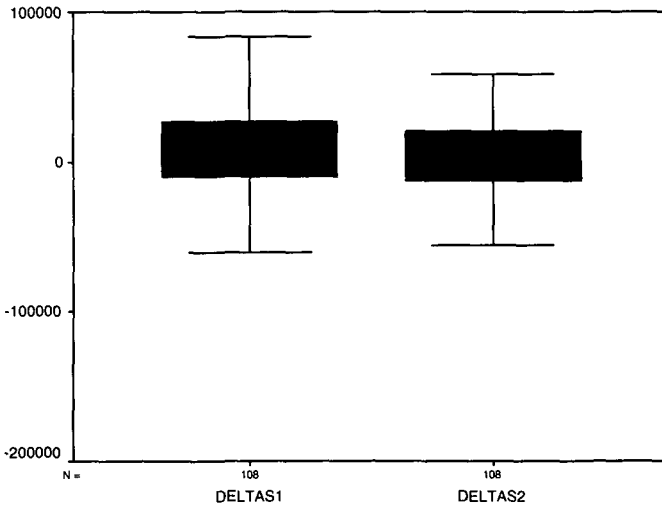
FIGURE NINE
A COMPARISON OF THE DIFFERENCE BETWEEN LITIGANT'S SETTLEMENT
ESTIMATE BASED ON PRIOR PROBABILITIES AND THE SETTLEMENT BASED ON
RATIONAL EXPECTATIONS MODEL (DELTAS1) WITH THE DIFFERENCE BETWEEN
LITIGANT'S SETTLEMENT ESTIMATE BASED ON POSTERIOR PROBABILITIES AND
THE SETTLEMENT BASED ON RATIONAL EXPECTATIONS MODEL (DELTAS2)

E. Summary of Results

The result of the paired samples test comparing initial settlement offers with normative offers safely allows rejection of the null hypothesis that there is no difference between the two samples in favor of the alternative that there is a statistically significant difference between initial offers and their normative counterparts. In fact, in the experimental setting where the mean of damage amounts was $50,000; on average cross all parties, the expected value of the outcome of the case at trial was overvalued by $8,300.48. Clearly, these expected values, and the associated settlement proposals,[78] are being misestimated—suggesting that the parties may benefit from additional information, in the form of evaluative dispute resolution, or from other sources, that may reduce some of the uncertainty associated with these estimates.

Yet, the result of the paired samples test comparing the litigant's maximum value assigned to evaluation information with normative values also safely allows rejection of the null hypothesis that there is no difference between the two samples,[79] and the mean difference, $-35,074.74, indicates that the parties are *dramatically* underestimating the potential informational value of evaluative dispute resolution. Further, once the evaluative information is obtained, it is significantly underutilized. The result of the paired samples test comparing the litigant's

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78. *See supra* Parts I and II.
79. In favor of the alternative that there is a significant difference between the litigant's valuations and normative valuations.

change in settlement offers after obtaining the evaluative information with norma-
tive changes definitively allows rejection of the null hypothesis that there is no
difference between the two samples,[80] and the mean difference, $-11,414.644,
indicates that the parties are failing to integrate the informational value of evalua-
tive dispute resolution in a manner that results in settlement misestimates of more
than 20 percent, on average, of the mean damages of $50,000.

Particularly disturbing in light of these settlement misestimates is evidence
that the additional information offered by evaluative dispute resolution has a posi-
tive effect on subsequent settlement offers. A comparison of difference measures
between the first settlement offers and normative settlements and between the
second settlement offers and normative settlements safely allows rejection of the
null hypothesis that there is no difference between the two samples.[81] As the
mean difference in the first settlement offers is $8,300.48 and the mean difference
in the second settlement offers is $3,310.92, evidence is provided that the evalua-
tive information did, in fact, improve the quality of the settlement estimates.[82]

So, the litigants failed to make rational estimates of the values of their cases.
Even so, they dramatically undervalued the potential informational value of
evaluative dispute resolution. To the extent that the information was taken into
consideration, it provided for better settlement estimates in the second round of
settlement offers. However, the informational content of the evaluative dispute
resolution process was significantly underutilized. These results are certainly
encouraging in the promise that decision theory and behavioral economics have
much to offer the study of law and alternative processes of dispute resolution.[83]
Which leads to the next question: What might be causing these deviations from
rational norms?

IX. HEURISTICS & BIASES

Almost thirty years ago, two psychologists, Amos Tversky and Daniel Kah-
neman, published a groundbreaking article that proposed a number of cognitive
heuristics, or shortcuts, as possible explanations for decision-making behavior that

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80. In favor of the alternative that there is a significant difference between the litigant's posterior
settlement offers and normative offers.

81. In favor of the alternative that there is a significant difference between the litigant's prior mises-
timation and posterior misestimation.

82. Examination of Figure Nine also suggests that the range of estimates narrowed in the second
settlement offers. Further, a comparison of the second settlement offers (SETTLE2) with normative
offers (NSETTLE2) does NOT allow rejection of the null hypothesis that there is no difference be-
tween the two samples. $t(107) = 1.147$, $p = .254$. The confidence interval, in fact, captures a possible
difference of zero. This suggests the possibility, at least, that the sample of actual estimates and their
associated normative estimates could have been drawn from the same population.

83. Even so, merely reporting these results suggests a number of additional possibilities for future
research. While the notion of problem framing (the manner in which a problem or question is linguis-
tically structured to emphasize a change in utility as a loss or a gain) has been explored in a wide
variety of decision-making contexts, including negotiation, it would be interesting to explore possible
interactions between information valuation and the side of the dispute that one maintains. Clearly,
given that respondents in this research dramatically undervalued the potential of evaluative ADR, an
examination of methods of valuing *imperfect* information in dispute resolution contexts is warranted.
Investigation of possible interaction effects with confirmation bias would also likely be fruitful.

deviated from rational norms.[84] The stream of behavioral decision theoretic re-
search that has followed Tversky and Kahneman's lead has been significant, leav-
ing virtually no social scientific discipline untouched.[85] Indeed, a search of recent
legal scholarship reveals the pervasive influence of Tversky and Kahneman in
every thing from litigation decision-making to tort, from constitutional law to
securities regulation.[86] A narrower scope search finds relatively well-developed
theoretical literature that focuses on the impact of these heuristics on the efficacy
of dispute resolution procedures.[87] When these heuristics are used appropriately,

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84. Tversky & Kahneman, *supra* note 63, at 35.

85. For two excellent compilations of this research, see Tversky & Kahneman, *supra* note 63 and
CHOICES, VALUES, AND FRAMES (Daniel Kahneman & Amos Tversky eds., 2000).

86. *See, e.g.*, UNIF. MEDIATION ACT § 9(g) cmt. 5, 7A U.L.A. 111 (Supp. 2003) (expressing con-
cerns regarding the effects of heuristics and biases on the viability of the Act); Victor Brudney & Allen
Ferrell, *Corporate Charitable Giving*, 69 U. CHI. L. REV. 1191, 1212 (2002) (exploring the effects of
framing on levels of charitable giving); Scott Burris, *Disease Stigma in U.S. Public Health Law*, 30 J.
L. MED. & ETHICS 179, 186 (2002) (considering the impact of the availability heuristic on public
opinion regarding health information); Peter Diamond, *Integrating Punishment and Efficiency Con-
cerns in Punitive Damages for Reckless Disregard of Risks to Others*, 18 J.L. ECON. & ORG. 117
(2002) (advocating the use of debiasing in policy analysis and presentations to juries); Kathleen C.
Engel & Patricia A. McCoy, *A Tale of Three Markets: The Law and Economics of Predatory Lending*,
80 TEX. L. REV. 1255, 1358 (2002) (describing the role of individual risk profiles in consumer behav-
ior in predatory lending); Samuel Estreicher, *Human Behavior and the Economic Paradigm at Work*,
77 N.Y.U. L. REV. 1 (2002) (describing behavioral studies as not in contradiction with traditional law
& economics, but as a "richer account" of how people actually make decisions); Dwight Golann, *Is
Legal Mediation a Process of Repair - or Separation? An Empirical Study, and Its Implications*, 7
HARV. NEGOT. L. REV. 301, 324 (2002) (explaining irrational mediation behavior in terms of the
certainty effect); Robert A. Hillman & Jeffrey J. Rachlinski, *Standard-Form Contracting in the Elec-
tronic Age*, 77 N.Y.U. L. REV. 429, 444 (2002) (suggesting the effect of the availability heuristic on
the overestimation of the likelihood of particularly salient events); Samuel Issacharoff, *The Content of
Our Casebooks: Why Do Cases Get Litigated?*, 29 FLA. ST. U. L. REV. 1265, 1275 (2002) (applying
decision heuristics to understanding the selection of cases for litigation); Dora W. Klein, *Trial Rights
and Psychotropic Drugs: The Case Against Administering Involuntary Medications to a Defendant
During Trial*, 55 VAND. L. REV. 165, 206 (2002) (discussing the tendency for beliefs to become highly
resistant to change); Daryl J. Levinson, *Framing Transactions in Constitutional Law*, 111 YALE L.J.
1311, 1314 (2002) (noting the connection between framing effects and the problem of framing transac-
tions in constitutional law); Clarisa Long, *Patent Signals*, 69 U. CHI. L. REV. 625, 661-62 (2002)
(positing overestimation bias as a possible explanation for errors in patentees estimation of value);
Timothy F. Malloy, *Regulating by Incentives: Myths, Models, and Micromarkets*, 80 TEX. L. REV.
531 (2002) (applying prospect theory to microeconomic theory of regulation); Robert Prentice,
Whither Securities Regulation? Some Behavioral Observations Regarding Proposal for Its Future, 51
DUKE L.J. 1397, 1483-89 (2002) (describing the role of anchoring and adjustment bias in securities
regulation); Christine M. Reilly, *Achieving Knowing and Voluntary Consent in Pre-Dispute Manda-
tory Arbitration Agreements at the Contracting Stage of Employment*, 90 CAL. L. REV. 1203, 1230
(2002) (discussing the role of optimistic bias in the voluntariness of mandatory arbitration agree-
ments); Deborah L. Rhode, *Legal Scholarship*, 115 HARV. L. REV. 1327, 1345-46 (2002) (voicing
concerns about the effects that the availability bias may have on narrative legal scholarship); Hillary A.
Sale, *Judging Heuristics*, 35 U.C. DAVIS L. REV. 903 (2002) (proposing a number of heuristics that
may effect judicial decision-making); Susan J. Stabile, *The Behavior of Defined Contribution Plan
Participants*, 77 N.Y.U. L. REV. 71 (2002) (using prospect theory to describe pension plan behavior);
Cass R. Sunstein, *Switching the Default Rule*, 77 N.Y.U. L. REV. 106 (2002) (employing the endow-
ment effect to explain the resistance to change with regard to default rules); Note, *Responding to
Terrorism: Crime, Punishment, and War*, 115 HARV. L. REV. 1217 (2002) (explaining the escalation
of response to terrorism using the availability heuristic).

87. *See generally* MAX H. BAZERMAN & MARGARET A. NEALE, NEGOTIATING RATIONALY (1992);
MARGARET A. NEALE & MAX H. BAZERMAN, COGNITION AND RATIONALITY IN NEGOTIATION
(1991) [hereinafter NEALE & BAZERMAN, COGNITION]; HOWARD RAIFFA, THE ART AND SCIENCE OF
NEGOTIATION 235 (1982). *See also* Lee Ross, *Reactive Devaluation in Negotiation and Conflict*

increased cognitive efficiency and improved decision making effectiveness re-
sult.[88] However, the inappropriate use of these cognitive heuristics can result in
bias, or systematic deviation, from rational norms.[89] This Section will focus on
three particular sources of bias that offer some explanation for the deviation from
normative behavior found in the experiment conducted for this Article: overconfi-
dence, anchoring, and reactive devaluation.

A. Overconfidence

It has been widely demonstrated that decision makers tend to demonstrate un-
justifiable confidence in their judgment abilities.[90] The consequences for negotia-
tion in a evaluative dispute resolution context are apparent. An overconfident
disputant is less likely to fully incorporate any evaluation offered by the neutral
into their subjective probabilities associated with the outcome of the litigation. As
such, even when there is a positive bargaining zone available, this disputant's
reservation point is more extreme and the risk of impasse is increased.

B. Anchoring

One possible explanation for this overconfidence is offered by Tversky and
Kahneman.[91] They contend that when decision makers are asked to estimate out-
comes by using information to modify some initial value, they are *anchored* by
this initial value in a manner that results in underadjustment.[92] This phenomena
has been found to be very robust, even when the anchor has been determined to be
irrelevant or even arbitrary.[93] In fact, this explanation is completely in line with
the results of the experiment conducted for this Article. Here, the disputants ap-
pear to be anchored by their prior probabilities associated with a litigation out-

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Resolution, in BARRIERS TO CONFLICT RESOLUTION 26, 38-42 (Kenneth J. Arrow et al. eds., 1995);
Daniel Kahneman & Amos Tversky, *Conflict Resolution: A Cognitive Perspective, in* BARRIERS TO
CONFLICT RESOLUTION 44 (Kenneth J. Arrow et al. eds., 1995); Robert H. Mnookin, *Why Negotia-
tions Fail: An Exploration of Barriers to the Resolution of Conflict,* 8 OHIO ST. J. ON DISP. RESOL.
235 (1993).

88. *See* NEAL & BAZERMAN, COGNITION, *supra* note 87, at 43.
89. *Id.*
90. *See generally* Baruch Fischhoff, *Latitudes and Platitudes: How Much Credit Do People De-
serve?, in* DECISION MAKING: AN INTERDISCIPLINARY INQUIRY (Gerardo Ungson & Daniel Braunstein
eds., 1982); Max H. Bazerman & Margaret A. Neale, *Improving Negotiation Effectiveness Under Final
Offer Arbitration: The Role of Selection and Training,* 67 J.APPLIED PSYCHOL. 543 (1982); Hillel J.
Einhorn & Robin M. Hogarth, *Confidence in Judgment: Persistence of the Illusion of Validity,* 85
PSYCHOL. REV. 395 (1978); Baruch Fischhoff et al., *Knowing With Certainty: The Appropriateness of
Extreme Confidence,* 3 J. EXPERIMENTAL PSYCHOL.: HUM. PERCEPTIONS & PERFORMANCE 552
(1977); Margaret A. Neale & Max H. Bazerman, *The Role of Perspective-taking Ability in Negotiating
Under Different Forms of Arbitration,* 36 INDUS. & LAB. REL. REV. 378 (1983). For treatment of
overconfidence in legal negotiation contexts, see George Loewenstein et al., *Self-Serving Assessments
of Fairness and Pretrial Bargaining,* 22 J. LEGAL STUD. 135 (1993); Jeffrey J. Rachlinski, *Gains,
Losses, and the Psychology of Litigation,* 70 S. CAL. L. REV. 113, 124 (1996).
91. *See* Tversky & Kahneman, *supra* note 63.
92. *Id.*
93. *See id.;* Paul Slovic & Sarah Lichtenstein, *Comparison of Bayesian and Regression Approaches
to the Study of Information Processing in Judgment,* 6 ORGANIZATIONAL BEHAV. & HUM.
PERFORMANCE 649 (1971).

come and seem to systematically underutilize the evaluation information provided by the dispute resolution process.

C. Reactive Devaluation

Disputants have the tendency to devalue information offered by an adversary simply because it was offered by the adversary.[94] A number of explanations have been offered for this phenomenon, including opposition signaling,[95] an increase in the disputant's aspirations based upon the opponent's "concession" of information,[96] and the mere fact that the information came from a source that is viewed as negative.[97] Assuming that a third party is viewed as neutral, and not the opposition, then reactive devaluation may not effect any evaluation information provided by this neutral. However, such tendencies would most certainly effect information that a neutral elicits from the other disputant and would therefore influence appropriate strategies for the neutral. The neutral will need to work harder to mitigate the mismatch of subjective estimates demonstrated in our experimental results when information offered in negotiation by either side is subject to a reactive devaluation. Further, evaluative neutrals must be extremely careful that these strategies do not create an atmosphere of impartiality so that reactive devaluation does not reduce the effectiveness of their efforts.

X. CONCLUSION

It has been suggested that "differences in preferences, relative valuations, predictions about the future, and risk preferences"[98] hold the potential for creating joint value for participants in dispute resolution processes. Yet there are well-known decision-making heuristics that tend to bias estimates of subjective probabilities related to decisions made under uncertainty.[99] For example, a broad tendency to under-adjust prior probabilities after receiving new information, such as an evaluation in dispute resolution, has been demonstrated in a wide variety of contexts.[100] Even more troublesome, decision makers tend to arrive at subjective probabilities that express significant overconfidence when compared to objective outcomes.[101]

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94. *See* NEALE & BAZERMAN, COGNITION, *supra* note 87, at 75.

95. *Id.*

96. *See generally* S. SIEGEL & L. FOURAKER, BARGAINING AND GROUP DECISION MAKING: EXPERIMENTS IN BILATERAL MONOPOLY (1960).

97. *See* Leigh Thompson, *The Influence of Experience on Negotiation Performance*, 26 J. EXPERIMENTAL SOC. PSYCHOL. 528 (1990); Max Bazerman et al., *Integrative Bargaining in a Competitive Market*, 35 ORGANIZATIONAL BEHAV. & HUM. DECISION PROCESSES 294 (1985).

98. Ronald J. Gilson & Robert H. Mnookin, *Foreward: Business Lawyers and Value Creation for Clients*, 74 OR. L. REV. 1, 8 (1995).

99. *See generally* Tversky & Kahneman, *supra* note 63.

100. *See id.* at 14.

101. *See generally* Marc Alpert & Howard Raiffa, *A Progress Report on the Training of Probability Assessors, in* JUDGMENT UNDER UNCERTAINTY: HEURISTICS AND BIASES 294, 294 (Daniel Kahneman et al. eds., 1982); Stuart Oskamp, *Overconfidence in Case-Study Judgments, in* JUDGMENT UNDER UNCERTAINTY: HEURISTICS AND BIASES 287, 287 (Daniel Kahneman et al. eds., 1982).

We have demonstrated that these deviations from normative decision-making models affect settlement offers in such a manner that may inhibit the parties' ability to find a range of settlement. While mediators, and other neutrals, serve to attempt to mitigate these irrational positions and beliefs, there must be a willingness on the part of the parties to participate in the process and to then fully leverage the informational value offered by the process, in order to maximize dispute resolution effectiveness at locating common ground.

In addition, these results suggest strategies for neutrals that can help to alleviate the effects of the cognitive heuristics. Lichtenstein, Fischhoff, and Phillips have proposed strategies for debiasing or overcoming the inhibitory effects of anchoring and overconfidence.[102] The effects of the bias can be reduced by offering disputants feedback regarding possible overconfidence in the context of their particular judgments.[103] Simply trying to minimize the importance of early offers can prevent disputants from anchoring on these premature valuations. Further, asking for explanations and offering advice, or "reality checks," with regard to why their judgments might be faulty due to overconfidence tends to cause disputants to evaluate possible contradictions in their reasoning and reduces the impact of anchoring.[104] In other words, *evaluation* tends to reduce the effects of these biases. It follows that it is entirely possible that purely facilitative mediation strategies can result in impasse where evaluation would have identified a viable settlement zone.[105] To the extent evaluative mediation techniques may be criticized on the grounds that they undercut party autonomy or disempower the parties, one could conclude from our research that rather than violating autonomy, the evaluation actually empowers parties to act more rationally by helping them overcome disabling heuristics. Further, while reactive devaluation is not likely to affect evaluations offered by third parties that remain effectively neutral, such bias will certainly effect information elicited from the opposing party and may ultimately require further neutral intervention.

Our results also serve to inform the manner in which neutrals should perform their function. This research indicates that respondents are sensitive to the extent to which neutrals have correctly evaluated outcomes at trial.[106] In most jurisdictions, neutrals sometimes render judgments that may not resemble judgments that would have been made in a more formal judicial context and when these judgments are binding, there is little, if any, oversight in the form of appeal. Still, this research indicates that dispute resolution that is most sensitive to the legal environment affecting disputants and therefore predicts more accurately the outcome of matters at trial, will motivate the use of dispute resolution processes by maximizing informational value relative to costs.

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102. *See* Sarah Lichtenstein et al., *Calibration of Probabilities: State of the Art to 1980, in* JUDGMENT UNDER UNCERTAINTY: HEURISTICS AND BIASES, *supra* note 101, at 306.

103. *Id.*

104. *See* Asher Koriat et al., *Reasons for Confidence*, 6 J. EXPERIMENTAL PSYCHOL.: HUM. LEARNING & MEMORY 107 (1980).

105. Keeping in mind that the identification of a viable settlement zone may not necessarily be the goal.

106. This may explain the popularity of retired trial judges as neutrals. Further, this issue raises the question of whether lawyers make "better" mediators. This may be true if disputants are best served by an evaluative form of dispute resolution. This is an important issue that warrants further attention in future research.

We have presented empirical evidence of decision-making behavior in the context of evaluative dispute resolution that sheds light on the information-based interaction between parties and the third party neutral. We are certainly cognizant that what we have offered is only a simplified model and that, by definition, all models are imperfect. For example, the model cannot take into account the effect of a multitude of personality variables, mediator and negotiator techniques, moves, and dynamic interactions which may mollify the heuristics exposed in these experiments. Nonetheless, modeling can help to redefine the parameters associated with the construction of new theory. At the very least, we have provided empirical support for deviations from the Priest and Klein model[107] that inform developing theories of dispute resolution in extremely important ways. Although we have not attempted to make normative judgments regarding the relative merits of the different dimensions of Riskin's grid,[108] we have reached some useful conclusions about how evaluative forms of dispute resolution may work and how barriers to their effectiveness may be addressed. While it is certain that the evaluative/facilitative debate is far from resolved, this research provides a tangible definition of dispute resolution dynamics that should make all mediators, facilitative and evaluative alike, more effective in helping parties to find amity.

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107. *See supra*, note 30 and accompanying text.
108. *See supra*, notes 1-4 and accompanying text.

XI. APPENDIX: SAMPLE INSTRUMENTS

YOU ARE THE PLAINTIFF IN A PENDING LAWSUIT.

1) The damages are not in dispute—both sides agree that they are $100,000.

If you proceed to trial, your costs, win or lose, will be $20,000.

Currently, you estimate your chance of winning at trial to be 80 percent.

Taking this information, and only this information, into account what is the minimum settlement offer that you would accept from the defendant?

2) The defendant has offered a settlement of $50,000.

While considering the defendant's offer, you are offered the opportunity to engage in an evaluative dispute resolution process. The neutral will hear the facts of the case and offer information regarding who should prevail. While this opinion is not binding, it does give both parties some idea as to the outcome of the case should it proceed to trial. But, of course, there are costs associated with this process.

What is the MAXIMUM amount that you would be willing to pay for the services of *any* neutral who could offer you this additional information regarding the likely outcome of your case?

3) You gather information about the proposed neutral and discover the following statistics about her batting average:

Trials won that neutral predicted as wins - 90%

Trials lost that neutral predicted as wins - 10%

Trials won that neutral predicted as losses - 10%

Trials lost that neutral predicted as losses - 90%

Given these new findings, what would you be willing to pay for the services of *this* neutral?

4) You decide to engage the services of the neutral and the neutral returns an evaluation predicting a loss for the plaintiff.

Now, taking all available information into account, what is the minimum settlement offer that you would accept from the defendant?

YOU ARE THE DEFENDANT IN A PENDING LAWSUIT.

1)   The damages are not in dispute—both sides agree that they are
$100,000.

If you proceed to trial, your costs, win or lose, will be $20,000.

Currently, you estimate the plaintiff's chance of winning at trial to be 30
percent.

Taking this information, and only this information, into account what is
the maximum settlement offer that you would be willing to offer the
plaintiff?

2) The plaintiff has proposed a settlement of $50,000.

While considering the plaintiff's offer, you are offered the opportunity to
engage in an evaluative dispute resolution process. The neutral will hear
the facts of the case and offer information regarding who should prevail.
While this opinion is not binding, it does give both parties some idea as
to the outcome of the case should it proceed to trial. But, of course, there
are costs associated with this process.

What is the MAXIMUM amount that you would be willing to pay for the
services of *any* neutral who could offer you this additional information
regarding the likely outcome of your case?

3) You gather information about the proposed neutral and discover the
following statistics about her batting average:

Trials won that neutral predicted as wins - 90%

Trials lost that neutral predicted as wins - 10%

Trials won that neutral predicted as losses - 10%

Trials lost that neutral predicted as losses - 90%

Given these new findings, what would you be willing to pay for the ser-
vices of *this* neutral?

4) You decide to engage the services of the neutral and the neutral returns
an evaluation predicting a loss for the plaintiff.

Now, taking all available information into account, what is the maximum
settlement offer that you would be willing to offer the plaintiff?