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## ARTICLES

### ECONOMIC RATIONALES FOR MEDIATION

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#### INTRODUCTION

MUCH of the economic literature on Alternative Dispute Resolution (“ADR”) displays a surprising failure to differentiate between types of dispute resolution devices. Often when economists purport to examine the efficiency of ADR, they focus exclusively on arbitration or other forms of private adjudication.<sup>1</sup> Mediation—negotiation facilitated by a neutral third party—has received far less attention than arbitration in the economic literature. The neglect of mediation is particularly surprising because mediation is more “alternative” than arbitration. Arbitration (in

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<sup>1</sup> For examples of articles that purport to discuss alternative dispute resolution in general, but in fact focus on private adjudication, see Lisa Bernstein, *Understanding the Limits of Court-Connected ADR: A Critique of Federal Court-Annexed Arbitration Programs*, 141 U. Pa. L. Rev. 2169 (1993); Steven Shavell, *Alternative Dispute Resolution: An Economic Analysis* (1992) (unpublished manuscript, on file with the Virginia Law Review Association).

both its binding and nonbinding forms) asks the arbitrator to replicate the decision of a court.<sup>2</sup> A mediator, by contrast, stops short of recommending how the dispute should be resolved.<sup>3</sup> By focusing on arbitration when they examine ADR, economists have failed to provide a coherent rationale for mediation.

The ADR literature has succeeded in fleshing out noneconomic explanations for mediation. Robert Mnookin and Lee Ross, for example, have suggested several ways in which a mediator might overcome psychological barriers to conflict resolution, but they have not explained how a mediator might overcome the barriers created by the strategic interaction of two rational, self-interested negotiators.<sup>4</sup> We agree that mediators are valuable in helping parties overcome a broad variety of psychological barriers. The goal of this Article, however, is to identify how mediation also could increase the efficiency of bargaining from an economic or strategic perspective.

This Article explores how mediators (acting specifically as mediators, rather than as adjudicators or advisors) can create value in negotiations between rational actors. Mediators in practice provide a number of services.<sup>5</sup> Many of these services, however, could

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<sup>2</sup> Binding arbitration simply attempts to replace a public adjudicator with a lower-cost private adjudicator. See Shavell, *supra* note 1, at 12. In some cases, parties to an arbitration may supply the arbitrator with a rule different from the one a court would apply, but the basic act of adjudicating the case according to a preexisting, external standard replicates a court's adjudicative function. And while the private parties are at liberty to ignore the decision in nonbinding arbitration, the arbitrator's task there also is often to replicate the decision (although not the process) of a court.

<sup>3</sup> See Gerald W. Cormick, *The "Theory" and Practice of Environmental Mediation*, 2 *Env'tl. Prof.* 24, 27 (1980) (quoting the Office of Environmental Mediation's definition of mediation as a "'voluntary process in which those involved in a dispute jointly explore and reconcile their differences. The mediator has no authority to impose a settlement.'"); Roberta S. Mitchell & Scot E. Dewhirst, *The Mediator Handbook: A Training Guide to Mediation Techniques and Skills* 3 (1990) (describing mediation as "organized negotiation," a "voluntary dispute resolving process in which a third-party facilitates and coordinates the negotiations of disputing parties") (emphasis omitted).

<sup>4</sup> See Robert H. Mnookin & Lee Ross, Introduction, *in* *Barriers to the Negotiated Resolution of Conflict* 1 (Kenneth Arrow, Robert H. Mnookin, Lee Ross, Amos Tversky & Robert Wilson eds., forthcoming 1994); see also Robert Mnookin, *Why Negotiations Fail: An Exploration of Barriers to the Resolution of Conflict*, 8 *Ohio St. J. on Disp. Resol.* 235, 248-49 (1993) (discussing how mediation can overcome psychological barriers without specifically addressing rational, self-interested parties).

<sup>5</sup> See Stephen P. Doyle & Roger S. Haydock, *Without the Punches: Resolving Disputes Without Litigation* 88-92 (1991) (stating that mediators can use a variety of tactics and

be performed by advocates, advisors or neutral third-party adjudicators. For example, commentators often note that an important function of the mediator is to serve as a "reality check" or "agent of reality" who impresses upon the parties the costs of failing to reach a negotiated agreement.<sup>6</sup> But such a function could be performed equally well by a nonbinding arbitrator working with public information (and performing a reality check in the presence of both parties) or by an expert advisor working with private information (and delivering the bad news privately). We believe that mediators create value by providing reality checks and other services, but that these services are not uniquely mediative and thus do not adequately explain mediation.

We focus instead on how mediators resolve disputes by "caucusing" privately with the individual disputants.<sup>7</sup> Sequential caucusing

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techniques during a mediation, including the following: determining the needs, interests, and values of each party; identifying issues; probing positions; caucusing with the parties; engaging in "shuttle" diplomacy; exchanging information; maintaining civility; establishing an agenda; encouraging communication; retaining confidential information; providing a different perspective; suggesting strategic and tactical approaches; exploring options; proposing an innovative remedy; offering opinions regarding the issues; seeking joint gains; declaring an impasse; and imposing a cooling off period); Howard Raiffa, *The Art and Science of Negotiation* 108-09 (1982) (stating that "third-party intervention" can assist negotiators by: bringing the parties together; establishing a constructive ambience for negotiation; collecting and judiciously communicating select confidential material; helping the parties clarify their values and derive responsible reservation prices; deflating unreasonable claims and loosening commitments; seeking joint gains; keeping negotiations going; and articulating the rationale for agreement); Linda R. Singer, *Settling Disputes: Conflict Resolution in Business, Families, and the Legal System* 20 (1990) (stating that "[a]n impartial umpire may be able to get negotiations back on track" by: "soothing ruffled feelings"; "acting as a neutral discussion leader and ensuring that all the parties have ample opportunity to speak"; "helping to distinguish interests from positions"; "working with the parties to devise creative solutions for meeting their needs"; "earning enough of the parties' trust that they will share confidential information about their interests and alternatives"; "communicating selected information back and forth, often translating it from negative to positive language"; "serving as an agent of reality, helping the parties to be more realistic about their alternatives to agreement"; "keeping negotiations going when the parties are ready to give up"; and "acting as a scapegoat when things go wrong").

<sup>6</sup> See, e.g., Doyle & Haydock, *supra* note 5, at 91; Nancy H. Rogers & Craig A. McEwen, *Mediation: Law, Policy, Practice* 9 (1989); Singer, *supra* note 5, at 20.

<sup>7</sup> A "caucus" is a private meeting between the mediator and one of the parties that takes place at some point in the course of the mediation. The purposes of caucusing have been variously described:

They are used to: provide an opportunity for a party to vent and cool down when emotions flare; encourage candor and get to the root of the dispute; clarify an issue; spend time along [sic] with a party to build trust; provide time to review the issues

is uniquely mediative: arbitrators generally do not conduct *ex parte* meetings with the parties and negotiation necessarily requires the parties to meet together. By shuttling back and forth between meetings with individual disputants, mediators can collect and distribute private information. An economic rationale for mediation centers on caucusing because it is here that the mediator most clearly *controls* the flow of information between the disputants. Although our title refers to "economic rationales for mediation," probably a more illuminating description would be "economic rationales for mediative caucusing."<sup>8</sup>

ADR theory, however, has been particularly unhelpful in explaining how caucusing creates value. Although psychological explanations are offered for caucusing, no one has ventured an economic or strategic justification for the practice. Why, for instance, would rational disputants disclose private information to a mediator that they would not disclose directly to the other side? And what should mediators do with this information? Mediators and analysts often claim that the mediator should maintain the confidentiality of all private communications learned in the caucus. If confidentiality is scrupulously maintained, however, the mediator is doing nothing more than what an advisor individually retained by each party could do. This extreme form of "Chinese wall" caucusing thus seems not only a poor example of mediation, but also an activity that could be more cheaply accomplished by independent advisors concerned only with one side of the dispute.

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and alternatives; encourage movement when a party is unyielding; help a party determine if a position is realistic; remind a party of the consequences of not reaching agreement; get information that may help generate or shape new alternatives; check whether a party has thought through the potential consequences of a probable agreement or separate one party from the threatening or intimidating conduct of the other.

Nancy H. Rogers & Richard A. Salem, *A Student's Guide to Mediation and the Law* 37 (1987); see also Walter A. Maggiolo, *Techniques of Mediation* 151-52 (1985) (outlining rules for when a caucus may be useful); Christopher W. Moore, *The Mediation Process: Practical Strategies for Resolving Conflict* 263-71 (1986) (discussing caucusing). One mediation training manual states that the best cases for caucusing are those "where a confidential and analytical review of the dispute may cause a party to change his position on matters crucial to a resolution of the issues." Mitchell & Dewhirst, *supra* note 3, at 75.

<sup>8</sup> Indeed, it is much more difficult to construct *economic* rationales for face-to-face mediation. If rational actors are speaking directly to each other, it is difficult to explain how mediators could create value without alleviating psychological barriers.

In practice, however, mediators often do make disclosures of private information, if only indirectly. By caucusing, for example, the mediator might “determine whether a zone of agreement exists”<sup>9</sup> or “figure out a set of trades that will bring the participants as close to agreement as they can possibly get.”<sup>10</sup> Revealing that there are gains from trade or that a particular set of trades might be acceptable to the other side has the effect of indirectly disclosing to each party some of the mediator’s private discussions with the other side. The ADR literature has often failed to acknowledge the tension between the mediator’s duty of confidentiality and the need for indirect disclosure.<sup>11</sup> Indeed, generally when ADR scholars have written about confidentiality, the focus has been on whether the mediation will be privileged from discovery by outsiders, rather than on the extent to which one party’s caucus information can be disclosed to the other side.<sup>12</sup> Knowing, however, how a mediator is allowed to transmit caucus information is not only important in assessing the ethics of a particular mediator’s behavior, but also determines whether private parties will disclose information and whether that disclosure will be truthful.<sup>13</sup>

This Article’s thesis is that mediators can create value by controlling the flow of private information (variously eliminating, translating, or even creating it) to mitigate adverse selection and moral hazard. Adverse selection is caused by hidden information that distorts the terms of a contract; because of adverse selection,

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<sup>9</sup> William A. Hancock, *Alternative Dispute Resolution Techniques* § 4.008 (1992).

<sup>10</sup> Lawrence Susskind & Jeffrey Cruikshank, *Breaking the Impasse: Consensual Approaches to Resolving Public Disputes* 146 (1987).

<sup>11</sup> Susskind and Cruikshank, for example, suggest:

A skilled intermediary can, in private meetings with the other participants, explore whether they would be willing to give up Y and Z in exchange for X. This might be phrased, “What if I could get them to give up X? Would you trade Y and Z?” Of course, the neutral already knows that such a trade is possible. He or she must phrase the question, though, in a what-if format to protect the confidentiality of the information secured earlier.

*Id.* at 147. Yet if disputants know how mediators use private information, the use of the what-if format will not stop disputants from drawing at least broad inferences about what the other side disclosed.

<sup>12</sup> See, e.g., Jonathan M. Hyman, *The Model Mediator Confidentiality Rule: A Commentary*, 12 *Seton Hall Legis. J.* 17 (1988) (analyzing confidentiality issues solely in terms of outsiders).

<sup>13</sup> See *infra* text accompanying notes 89-92 (discussing the effect of mediation process on the quality and quantity of private disclosure).

for example, unhealthy people are more likely than healthy people to opt for life insurance.<sup>14</sup> Moral hazard is caused by hidden conduct; because of moral hazard, insured people are more likely than uninsured people to take risks.<sup>15</sup> Thus, adverse selection problems involve hidden precontractual information; moral hazard problems involve hidden postcontractual conduct. Both adverse selection and moral hazard are caused by the disputants' ability to hide information about themselves<sup>16</sup> or their conduct. Adverse selection can create inefficiency in negotiation when parties hide information about their valuation or other characteristics prior to agreement.<sup>17</sup> Moral hazard can create inefficiency when one or both parties take hidden actions after an agreement that reduce the joint gains from trade. Moral hazard in the ADR setting is a problem of coordination,<sup>18</sup> because the parties' inability to directly observe each other's postcontractual conduct makes it difficult for the parties to coordinate their performance.

Sequential caucusing is particularly adept at responding to informational problems because it is a uniquely mediative way to elicit and channel private information. This Article shows how mediators can reduce adverse selection in three ways:

- (1) by committing parties to break off negotiations when private representations to a mediator indicate that there are no gains from trade;
- (2) by committing parties to equally divide the gains from trade; and
- (3) by committing to send noisy translations of information disclosed during private caucuses.

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<sup>14</sup> See David M. Kreps, *A Course in Microeconomic Theory* 577 (1990) ("A classic example [of adverse selection] is life insurance, where the insuree may know things about the state of her health that are unknown by the insurer.").

<sup>15</sup> See *id.* ("A classic example [of moral hazard] is fire insurance, where the insuree may or may not exhibit sufficient care while storing flammable materials.").

<sup>16</sup> As the economic literature does generally, we refer to this ability to hide information as the creation of "informational asymmetries" or "asymmetric information."

<sup>17</sup> See Peter C. Cramton, *Bargaining with Incomplete Information: An Infinite-Horizon Model with Two-Sided Uncertainty*, 51 *Rev. Econ. Stud.* 579, 581 (1984).

<sup>18</sup> Game theorists have formally analyzed "coordination" games in which the parties have a common interest in coordinating their behavior in order to increase their individual payoffs. See Drew Fudenberg & Jean Tirole, *Game Theory* 18-23 (1991).

Each of these commitments allows a mediator to increase the amount and accuracy of disclosure and thus decrease the impact of the parties' private information. Our third conclusion—that mediators can enhance communication by adding imprecision (or “noise”) to privately disclosed information—is especially illuminating. Although adding noise would seem to degrade the quality of information communicated, this result is only true if one mistakenly assumes that the amount of information disclosed is unaffected by the mediator's commitments. When a mediator commits to translate imprecisely the private disclosures of one party, the mediator may induce that party to make more precise disclosures to the mediator, because the mediator's imprecise translation reduces the ability of the other side to use the disclosure to the detriment of the disclosing party. We also show that noisy (but correlated) signals can help mediators mitigate the inefficiencies of moral hazard.

We reach these conclusions with a series of five game-theoretic models of mediation that we refer to for convenience as:

1. “solicit offer” mediation;<sup>19</sup>
2. “imprecise translation” mediation;<sup>20</sup>
3. “job selection” mediation;<sup>21</sup>
4. “battle of the sexes” mediation;<sup>22</sup> and
5. “joint venture” mediation.<sup>23</sup>

These models are admittedly reductive and simplistic. Mediators will never observe situations adhering precisely to the assumptions we adopt. Most importantly, parties to a mediation rarely behave in a purely rational way; overcoming psychological barriers to negotiation will always be an important part of the mediator's function. Nonetheless, our hope is that these models will demonstrate that the mediator can overcome both psychological barriers and economic inefficiency in negotiation. Although some law and economics scholars have been skeptical about how mediation could create value, these stylized models show how mediation commit-

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<sup>19</sup> See *infra* Part I.A.2.

<sup>20</sup> See *infra* Part I.B.1.

<sup>21</sup> See *infra* Part I.B.2.

<sup>22</sup> See *infra* Part II.A.

<sup>23</sup> See *infra* Part II.B.

ments can reduce the strategic inefficiencies of adverse selection and moral hazard.

The Article also has implications for practitioners and lawmakers. The models suggest innovative mediation strategies that practitioners must now weigh against alternative mechanisms. For example, we show that mediators can increase the expected gains from trade not only by indirectly or imprecisely disclosing the parties' private information, but even by committing to misrepresent private information a certain proportion of the time. We provide examples showing how mediators in different contexts can productively control the flow of information between the parties by filtering or inserting noise into their private disclosure. Contrary to the standard claims that mediators need to keep all privately disclosed information confidential, we show that some form of controlled disclosure is central to any economic rationale for mediation.

Because credible commitments to particular forms of disclosure are crucial to the effectiveness of mediators, our analysis has implications for how mediation agreements should be drafted and negotiated. In particular, we propose that courts enforce mediation agreements that allow mediators to disclose private information in indirect ways or even break off negotiations. We also tentatively suggest that courts should enforce, in the absence of contrary language, an implicit provision requiring strict mediator confidentiality—to encourage more explicit contracting about how mediators will use caucus information.<sup>24</sup>

Our economic analysis also suggests the proper contours for legally mandated mediation. We argue that mediation should not be legally mandated when the process aims at mitigating moral hazard, but that mandatory mediation may be necessary to overcome barriers to resolution caused by adverse selection. Legally mandated mediation may be necessary to mitigate adverse selection because the private information that causes the adverse selection may also impede parties from voluntarily adopting the efficient form of mediation. We show, however, that there are no such strategic barriers to resolving moral hazard through voluntary

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<sup>24</sup> See *infra* Part III.B.

mediation, which suggests that private mediation contracts should be sufficient to respond to problems of moral hazard.

The Article has three Parts. Part I shows how mediation can mitigate the inefficiencies of adverse selection. Part II shows how mediation can mitigate the inefficiencies of moral hazard. And Part III discusses the implications of our analysis for lawmakers and practitioners.

### I. MITIGATING THE INEFFICIENCIES OF ADVERSE SELECTION

Adverse selection causes many inefficiencies in negotiations and the resolution of disputes. Potential buyers and sellers, for example, often have private information about how much they individually value a particular good or service.<sup>25</sup> Because each party's reservation price<sup>26</sup> (or BATNA)<sup>27</sup> is not publicly known, each party has "hidden information" that can give rise to adverse selection.

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<sup>25</sup> While we describe negotiations between a buyer and seller, our analysis might be applied to other dispute resolution contexts. For example, a defendant's settlement offer can be interpreted as an offer to buy the plaintiff's claim. Notwithstanding this analogy, distinctions between the settlement of a tort claim and the formation of a sales contract can, in some contexts, be significant. See generally Douglas G. Baird, Robert H. Gertner & Randal C. Picker, *Game Theory and the Law* 292-93 (forthcoming 1994) (noting that in a litigation context, imperfectly informed negotiators are striving to uncover the common expected value of litigation; in other bargaining outcomes the valuations of buyer and seller might be more independent); Frank E.A. Sander & Jeffrey Z. Rubin, *The Janus Quality of Negotiation: Dealmaking and Dispute Settlement*, 4 *Negotiation J.* 109 (1988) (noting the differences between negotiation to resolve a dispute and that which is more forward looking, focused on the formation or governance of an ongoing relationship).

Robert Gertner and Geoffrey Miller have written an excellent article that suggests how mediative caucusing could create gains of trade in the litigation context as well. See Robert H. Gertner & Geoffrey P. Miller, *Settlement Escrows* (Jan. 25, 1994) (unpublished manuscript, on file with the Virginia Law Review Association). Gertner and Miller show that privately reporting valuations to an "escrow agent" (who does not reveal these private reports unless the offers constitute an enforceable contract) may create gains of trade. The escrow agent in their model is extremely analogous to a mediator who solicits private reports of value in our "solicit offer mediation." Their example shows that mediation can mitigate adverse selection inefficiency even when—as in litigation—the parties have private information about a common value and even when the mediator cannot commit to breaking off further negotiation. In their model, as in ours, the censoring of private reports "reduces, but does not eliminate, the adverse inferences about the strength of the offeror's case." *Id.* at 1.

<sup>26</sup> The reservation price is the maximum amount that the buyer is willing to pay and the minimum amount that the seller is willing to accept. See Raiffa, *supra* note 5, at 37-38.

<sup>27</sup> BATNA (Best Alternative To a Negotiated Agreement) is the more qualitative term Roger Fisher and William Ury coined to describe a concept similar to—and in some cases

If parties had complete information about each other, bargaining would be much less costly. First, knowing each other's reservation price, they would immediately know whether there were gains from trade to bargain over.<sup>28</sup> Second, if the parties knew their relative bargaining power,<sup>29</sup> they would be more likely to avoid the inefficiencies of bargaining by quickly agreeing how to divide the gains from trade.<sup>30</sup>

However, when the buyer and the seller have private information about their valuations or their costs of bargaining, the parties need to communicate—at least indirectly—something about their private information in order to determine whether there are in fact gains from trade.<sup>31</sup> The parties' reports of information can take the form of either direct representations concerning the buyer's or seller's reservation price or, more commonly, the use of offers and counteroffers to signal indirectly one's own valuation.<sup>32</sup>

The parties might strategically withhold or misrepresent the private information, however, in order to increase their private

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the same as—the quantitative “reservation price.” BATNA sometimes conveys a broader set of information than reservation price. For example, a buyer's BATNA might be the status quo or an alternative purchase, the value of which the buyer must try to determine in order to set the reservation price for the product at issue in the negotiation. See Roger Fisher & William Ury, *Getting to Yes: Negotiating Agreement Without Giving In* 104 (Bruce Patton ed., 1981).

<sup>28</sup> Gains from trade occur, as the name suggests, whenever an exchange would be productive; that is, whenever the buyer values the object more than the seller.

<sup>29</sup> In economic models of negotiation, bargaining power is often determined by the relative costs of bargaining (e.g., each party's hourly cost of negotiating, or impatience). If the parties' costs of bargaining are common knowledge, the first offer to divide the gains from trade is often accepted. See Ariel Rubinstein, *Perfect Equilibrium in a Bargaining Model*, 50 *Econometrica* 97 (1982).

<sup>30</sup> The ADR literature often suggests that bargaining power can be a function of a party's BATNA. See Fisher & Ury, *supra* note 27, at 106 (arguing “the better your BATNA, the greater your power” and “the relative negotiating power of two parties depends primarily upon how attractive to each is the option of not reaching agreement”). Although the term “BATNA” is at times used almost interchangeably with the term “reservation price,” the economics literature usually distinguishes a party's reservation price from his or her bargaining power. For economists, the BATNAs of each side would represent whether there were gains of trade, and the relative bargaining power of the parties would determine how the gains are split. See Kreps, *supra* note 14, at 551.

<sup>31</sup> See Cramton, *supra* note 17, at 579 (“Since the bargainers are uncertain about whether trade is desirable, they must communicate some of their private information before an agreement can be reached.”).

<sup>32</sup> Offering to sell a good at, say, \$50 indirectly communicates that the seller's value is some amount less than or equal to \$50.

returns.<sup>33</sup> When the parties have private knowledge of their own reservation prices, sellers will have an incentive to overstate their valuations in order to negotiate a higher price and buyers will have an incentive to understate their valuations in order to negotiate a lower price.<sup>34</sup> Strategic misrepresentations of this kind and the contracts that result from them provide an important example of adverse selection. Just as sick people have an incentive to convince insurance companies that they are healthy when negotiating an insurance premium, high-valuing buyers have an incentive to convince sellers that they are low-valuing when negotiating the contract price. In both cases, the asymmetric information gives the party with private information an incentive to pretend to be a different type in negotiating a contract.<sup>35</sup>

Adverse selection can consume a large percentage of the potential gains from trade.<sup>36</sup> Strategic misrepresentation of value can induce parties to waste time bargaining when there are no gains from trade, and to bargain to impasse at times when there are gains. And even when agreement is reached, real resources are

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<sup>33</sup> See Ian Ayres & Robert Gertner, *Filling Gaps in Incomplete Contracts: An Economic Theory of Default Rules*, 99 *Yale L.J.* 87, 94 (1989).

<sup>34</sup> According to Cramton:

In [bargaining] games with incomplete information, players typically have an incentive to hide their private information. Thus, the seller would like to tell the buyer, "my valuation is high, so you better expect to pay a high price", regardless of whether or not the seller's valuation is in fact high. The buyer, of course, is aware of the seller's incentive to deceive and hence will not believe statements that are not backed up by actions.

Cramton, *supra* note 17, at 581; see also Gerald B. Wetlaufer, *The Ethics of Lying in Negotiations*, 75 *Iowa L. Rev.* 1219, 1221 (1990) (arguing that "lying in negotiations is instrumentally effective and . . . most such lies are ethically impermissible"); James White, *Machiavelli and the Bar: Ethical Limitations on Lying in Negotiation*, 1980 *Am. B. Found. Res. J.* 926, 927 (examining the ethical aspect of lying in negotiation and noting that "[t]he critical difference between those who are successful negotiators and those who are not lies in this capacity both to mislead and not to be misled").

<sup>35</sup> See Paul Milgrom & John Roberts, *Economics, Organization and Management* 143-47 (1992).

<sup>36</sup> See Fisher & Ury, *supra* note 27, at 6 (asserting that "positional" bargaining is inefficient because it interferes with "reaching a settlement promptly").

consumed in the “negotiation dance”<sup>37</sup> that might have been retained if the parties’ valuations were public knowledge.<sup>38</sup>

In this Part, we suggest that mediation can mitigate the inefficiencies of strategic misrepresentation in three different ways. First, mediation can increase the costs of strategic misrepresentation by committing the parties to break off bargaining if their representations to the mediator suggest that there are no gains from trade. Commitments not to bargain (when there are in fact gains from trade) are inefficient *ex post* but can be efficient *ex ante* because of their tendency to induce more truthful revelation of valuation.<sup>39</sup>

Second, mediation might reduce the inefficiency of strategic misrepresentation by committing the parties to divide the reported gains from trade more or less equally. Disempowered bargainers may be particularly reluctant to disclose their valuations if doing so will adversely affect the terms of trade.<sup>40</sup> Commitments to types of mediation that foster equal division of the gains from trade can induce weaker negotiators to be more forthcoming because they will be assured that their disclosures will not be used against them later when the parties settle upon the terms of trade.

Third, mediation might reduce strategic misrepresentations by allowing a party to send noisy or censored signals about its reservation price to the other side. In particular, parties may be induced to represent their values more truthfully to mediators if mediators promise to disclose only whether there are gains from trade (and not how much is on the table). If mediation can produce more cost-effective information about whether there are gains of trade, it can avoid costly negotiation when no such gains exist. Because asymmetric information is an important cause of bargaining inefficiency, any feature of mediation that can move the parties toward

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<sup>37</sup> For a description of the “negotiation dance,” see Raiffa, *supra* note 5, at 47-48.

<sup>38</sup> The primary wasted resource is the value of each negotiating party’s time in attempting to estimate the other side’s reservation price. For an anecdotal illustration of the point, see *id.* at 35-38.

<sup>39</sup> See *infra* text accompanying notes 67-68 for a discussion of the concepts of *ex ante* and *ex post* efficiency.

<sup>40</sup> See Jason S. Johnston, *Strategic Bargaining and the Economic Theory of Contract Default Rules*, 100 *Yale L.J.* 615, 629 (1990) (cited with approval in Ian Ayres & Robert Gertner, *Strategic Contractual Inefficiency and the Optimal Choice of Legal Rules*, 101 *Yale L.J.* 729, 736 & n.26 (1992)).

symmetric information has the potential for increasing the expected gains from trade.

*A. Mediators Can Facilitate Commitments to Break Off Negotiation and Equally Divide Gains From Trade*

Our conclusion that mediators might want to commit the parties to break off negotiation—even when there are potential gains from trade—is particularly at odds with certain strains of current ADR theory. Mediators in practice usually try to facilitate trade—even striving to place parties in a better situation to resolve their disputes independently should the mediation fail.<sup>41</sup> And many mediators are reluctant to let the parties walk away as long as there might be unrealized gains from trade on the table.

The expected gains from trade can at times be increased, however, if the parties commit not to trade when their private reports of value to the mediator are not overlapping. This Section shows that by helping parties to break off negotiation when they have privately indicated that there are no gains from trade, mediation can mitigate the strategic inefficiencies of bargaining. A commitment not to bargain when the seller's reported valuation is higher than the buyer's reported valuation gives both the buyer and the seller a greater incentive to tell the truth about their reservation prices. Commitments to break off bargaining increase the cost of lying—because every dollar by which a seller falsely inflates (and a buyer deflates) her valuation increases the chance that no gains of trade will be realized. The threat that the mediator will end further negotiations thus creates a countervailing incentive for each party not to misrepresent his or her type. And inducing more truthful revelation can reduce the various costs of bargaining.<sup>42</sup>

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<sup>41</sup> See Rogers & Salem, *supra* note 7, at 39 (asserting that even when the mediation fails to produce an agreement, the parties “may have learned to negotiate better and may, in fact, settle unresolved issues themselves later”); Christopher Honeyman, *Five Elements of Mediation*, 4 *Negotiation J.* 149, 152 (1988) (finding that, in a case study of five mediators, “three were primarily interested . . . in getting the settlement[, while] two were more concerned with the parties’ long-term relationship”).

<sup>42</sup> Countervailing incentives of this kind make it less costly to induce truth-telling and efficiency. See Tracy R. Lewis & David E.M. Sappington, *Countervailing Incentives in Agency Problems*, 49 *J. Econ. Theory* 294 (1989); Tracy R. Lewis & David E.M. Sappington, *Inflexible Rules in Incentive Problems*, 79 *Am. Econ. Rev.* 69 (1989); Giovanni Maggi & Andrés Rodríguez-Clare, *On Countervailing Incentives* (1993)

1. *A Simple Model of Bargaining With Asymmetric Information About Reservation Price*

To illustrate how mediation can mitigate the inefficiencies of adverse selection, we begin by considering a simple (but much studied) model of unmediated bargaining with asymmetric information.<sup>43</sup> In this model, a (potential) buyer has private information about how much it values a single nondivisible good and a (potential) seller has private information about its cost of manufacture. Each side only knows that the other side's reservation price is uniformly (and independently) distributed between \$0 and \$100.<sup>44</sup>

The private information in this model inevitably leads to adverse selection inefficiency. Even though it is efficient for trade to take place whenever the buyer's valuation is higher than the seller's cost, the parties' incentive to misrepresent their private information prevents some efficient contracting from taking place. In particular, when the actual zone of agreement is small (because the buyer's reservation price is only slightly higher than the seller's), then the incentive to misrepresent or conceal private information will often cause buyers to offer less than sellers.

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(unpublished manuscript, on file with the Virginia Law Review Association); Eric Talley, *Contract Renegotiation and the Liquidated Damages Rule: Vindication for the Just Compensation Principle?* (1993) (unpublished manuscript, on file with the Virginia Law Review Association).

<sup>43</sup> For studies of this model, see Kalyan Chatterjee & William Samuelson, *Bargaining Under Incomplete Information*, 31 *Operations Res.* 835 (1983); Peter C. Cranton, *Strategic Delay in Bargaining with Two-Sided Uncertainty*, 59 *Rev. Econ. Stud.* 205 (1992); Roger B. Myerson, *Analysis of Two Bargaining Problems with Incomplete Information*, in *Game-theoretic Models of Bargaining* 115, 116-30 (Alvin E. Roth ed., 1985); Roger B. Myerson & Mark A. Satterthwaite, *Efficient Mechanisms for Bilateral Trading*, 29 *J. Econ. Theory* 265 (1983).

<sup>44</sup> In this example, the seller's reservation price will equal its cost and the buyer's reservation price will equal its valuation. The assumption that the reservation prices are uniformly distributed means that there is an equal probability that a reservation price will be any amount between \$0 and \$100. Accordingly, there is a 30% chance that the buyer will have a valuation higher than \$70. Often a disputant will believe that the probability distribution of the other side's reservation price will have the more traditional bell shape. Howard Raiffa, for example, describes a negotiation for a halfway house in which the buyer estimated that there was a 50% chance that the seller's reservation price was between \$275,000 and \$475,000; a 25% chance that the reservation price was between \$100,000 and \$275,000; and a 25% chance that the reservation price was above \$475,000. See Raiffa, *supra* note 5, at 35-38.

The amount of adverse selection inefficiency (and the division of the gains from trade), however, can be dramatically affected by the particular procedural rules that govern the negotiation.<sup>45</sup> To begin with, consider a negotiation where the seller is assumed to make a single take-it-or-leave-it offer to the buyer. Giving the seller the power to make a take-it-or-leave-it offer affords the seller a great deal of bargaining power.<sup>46</sup> We begin by showing how mediation can mitigate the adverse selection inefficiencies of this particular game and then show how mediated games dominate several other unmediated types of negotiation.

In the unmediated take-it-or-leave-it game, if the seller knows the buyer's valuation or "type," there would be no strategic inefficiencies.<sup>47</sup> In this stylized model, a seller who knows the buyer's type would simply make a take-it-or-leave-it offer that was slightly lower than the buyer's reservation price. The parties would then always contract, because they will contract whenever there are gains from trade (that is, whenever the buyer valued the good more than the seller's costs of production).

By contrast, when buyers have private information, high-valuing buyers can protect themselves from such exploitation by keeping

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<sup>45</sup> In the words of United States Representative John Dingell, "I'll let you write the substance . . . and you let me write the procedure, and I'll screw you every time." Regulatory Reform Act: Hearings on H.R. 2327 Before the Subcomm. on Administrative Law and Governmental Relations of the House Comm. on the Judiciary, 98th Cong., 1st Sess. 312 (1983) (statement of Rep. John D. Dingell) (quoted in Janet C. Alexander, *Unlimited Shareholder Liability Through a Procedural Lens*, 106 *Harv. L. Rev.* 387, 387 (1992)).

<sup>46</sup> Game theory suggests that this game allows the seller to capture virtually all of the gains from trade if the buyer's reservation price is common knowledge. Experimental evidence suggests, however, that college students often split the gains from trade. See, e.g., Richard H. Thaler, *Anomalies: The Ultimatum Game*, *J. Econ. Persp.*, Fall 1988, at 195, 196-97 (observing this phenomenon in an ultimatum game, where one party makes a take-it-or-leave-it offer about how a fixed sum should be split between two players; if the ultimatum is rejected, neither of the players receives any money).

In games with asymmetric information, the take-it-or-leave-it offer gives the seller a substantial share of the gains of trade, but some buyers may earn "rents" on their private information. See Johnston, *supra* note 40, at 628-29.

<sup>47</sup> An empirical caveat to this theoretical result is again found in some college experiments. See Daniel Kahneman, Jack L. Knetsch & Richard H. Thaler, *Fairness and the Assumptions of Economics*, 59 *J. Bus.* S285, S289-92 (1986); Thaler, *supra* note 46, at 196-97.

their valuations secret.<sup>48</sup> In this situation, the profit-maximizing strategy for the seller (as derived in the Appendix) is to offer a price that is the average of the seller's cost (*c*) of producing the good and the maximum possible buyer value of \$100. Algebraically, the seller will offer the buyer the price (*p*):

$$p = \frac{c+100}{2} \quad (1)$$

Buyers whose valuation (*v*) is greater than *p* will accept this offer; all others will reject it. The seller's price is unvaryingly inflated above its cost and therefore is inefficient because it precludes some socially profitable trades (even though it allows some buyers to capture some of the gains from trade). Hence, buyers' private knowledge causes adverse selection inefficiency.

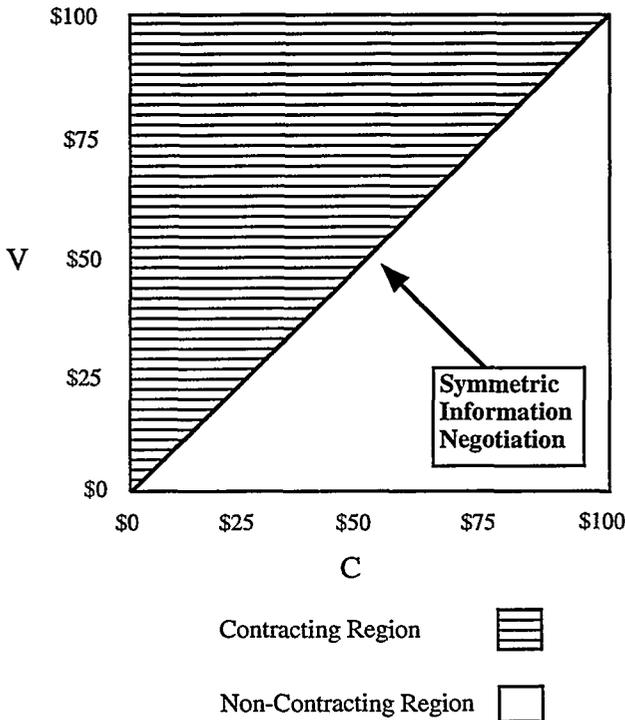
Figure 1 depicts the symmetric information equilibrium. The horizontal axis represents possible seller reservation prices, *c*; the vertical axis represents possible buyer reservation prices, *v*. The forty-five-degree symmetric information line divides the contracting and noncontracting regions. In the upper left-hand corner, the buyer's valuation exceeds the seller's cost of manufacture and contracting and hence induces the seller to offer a price just below the buyer's reservation price. In the lower right-hand corner, the seller refuses to offer to sell because there are no potential gains from trade. This figure shows the results of efficient bargaining because the parties are able to contract whenever there are gains from trade.

The inefficiencies of asymmetric relative to symmetric information are shown in Figure 2. The unmediated asymmetric negotiation line similarly divides the contracting and no contracting regions, but now under the assumption that the sellers do not know the buyers' reservation prices. This line is simply the function in Equation 1 that relates a seller's cost to its optimal offer. When the

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<sup>48</sup> Low-valuing buyers priced out of the market might at times have an incentive to strategically reveal their valuations to foster a lower selling price. But even if low-valuing buyers could credibly convey their value it would do them little good because the seller would simply charge a price only slightly lower than their revealed value.

FIGURE 1  
EFFICIENT CONTRACTING WITH SYMMETRIC  
INFORMATION



seller's cost is zero, the seller maximizes profits by offering all buyers \$50;<sup>49</sup> sellers with higher costs make progressively higher offers.

The buyer's private information about its reservation price causes an adverse selection inefficiency that significantly reduces the contracting region in Figure 2 (in comparison with efficient trade when there is symmetric information). Not being able to distinguish between high- and low-valuing buyers, the seller finds it profitable to charge prices that forego many transactions where there are potential gains from trade. This inefficiency is depicted in Figure 2 by the horizontal difference between the symmetric and asymmetric information lines. The seller's inability to price-discriminate among different types of buyers causes the seller to

<sup>49</sup> From Equation 1, when  $c = 0$ ,  $p = (c + 100)/2 = (0 + 100)/2 = 50$ .

exploit its market power with a single, crude high price.<sup>50</sup> The points of trade included under symmetric information but excluded under asymmetric information represent foregone gains from trade caused by adverse selection. In this example, the inefficiencies of adverse selection sacrifice 25% of the potential gains from trade.<sup>51</sup>

## 2. *An Example of Solicit Offer Mediation*

In this Section, we show how mediators can mitigate this adverse selection inefficiency. The dispute resolution technique described is characteristically “mediative”: the mediator does not adjudicate by proposing terms of trade (as with binding and nonbinding arbitration), but instead elicits private offers during sequential caucuses with individual disputants. We examine a particular mediation process (which we refer to as solicit offer mediation) in which the mediator solicits from each party two private submissions:

- (1) a representation about her reservation price; and
- (2) an offer to transact at the average of the reported prices, provided that the buyer’s reported valuation is higher than the seller’s.

We will refer to the buyer’s and seller’s reported reservation prices as  $r_B$  and  $r_S$ , respectively—so that the offers would be to transact at a price:  $p = (r_S + r_B)/2$  provided that  $r_B > r_S$ . If either of the parties refuses to make submissions of this form or if the seller’s reported reservation price is above the buyer’s reported reservation price, then the mediator prohibits any further attempts to trade.<sup>52</sup> If the parties do participate and if the buyer’s reported value is greater than the seller’s, then the mediator reveals that the two submitted offers constitute a legally enforceable contract under the Uniform Commercial Code to trade at the average reported valuation.<sup>53</sup>

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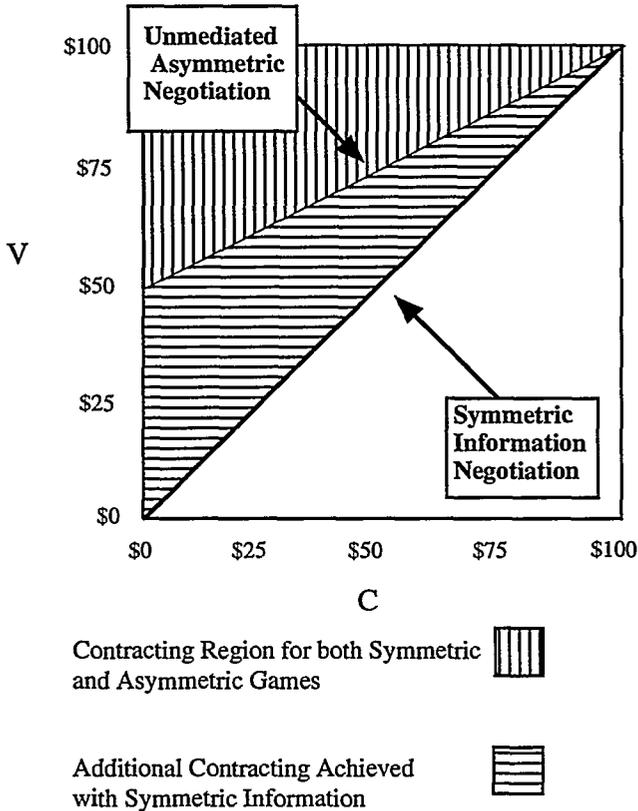
<sup>50</sup> This inefficiency is of course the “deadweight loss” of standard antitrust analysis. See F.M. Scherer, *Industrial Market Structure and Economic Performance* 16-18 (2d ed. 1980).

<sup>51</sup> The expected gains from trade are derived explicitly in Equation 12 of the Appendix. The unmediated take-it-or-leave-it game produces expected gains from trade of \$12.50, which is 25% less than the potential gains from trade of \$16.66 if there were symmetric information.

<sup>52</sup> We discuss later whether and how mediators might help parties break off negotiations. See *infra* Part I.A.4.

<sup>53</sup> The offers themselves are mirror images of each other, but do not specify an explicit price. Under the Code, however, the communication of these offers with their associated

FIGURE 2  
COMPARISON OF CONTRACTING REGIONS IN SYMMETRIC AND  
ASYMMETRIC INFORMATION NEGOTIATIONS



An equilibrium exists in which the optimal strategies for solicit offer mediation correspond to the traditional strategies of bargainers: the seller has an incentive to overstate its reservation price,<sup>54</sup>

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reservation prices would easily pass the standards for contract formation. See U.C.C. §§ 2-204(1), (3), 2-206, 2-305 (1990).

<sup>54</sup> The seller's optimal strategy is to report:

$$r_s = \frac{2}{3}c + 25$$

which in equilibrium is always greater than *c*. See Chatterjee & Samuelson, *supra* note 43.

and the buyer has an incentive to understate its reservation price.<sup>55</sup> Because of this incentive to misrepresent, the buyer's and seller's *reported* values will only reflect a gain from trade ( $r_B > r_S$ , the prerequisite for mediated trade) when the buyer's *actual* value ( $v$ ) exceeds the seller's *actual* value ( $c$ ) by at least \$25:<sup>56</sup>

$$v > c + 25. \quad (2)$$

Mediation thus does not eliminate all adverse selection inefficiency. Buyers who value the good \$20 more than the seller will not buy because the buyer and seller have strategic incentives to misrepresent their reservation prices.

This solicit offer mediation does, however, reduce the strategic misrepresentation caused by adverse selection in two ways. First, the mediator's ability to prohibit trade when the initial reports do not overlap increases each party's incentive to tell the truth because misrepresentations reduce the chance that any trade will take place. Without the mediator's commitment to break off negotiation, the parties correctly perceive that reporting biased reservation prices might lead to a more favorable contract price. When the mediator is involved, however, each party must weigh this price effect against the countervailing tendency of an inflated (or deflated) reservation price to foreclose any possibility of trade.

The mediator's ability to prohibit further negotiation thus plays a crucial role in making the buyer's and seller's representations part of a stable equilibrium. Because either side can infer the actual reservation price from the reported price, buyers and sellers at times will have incentives to continue bargaining. For example, if the buyer reports a reservation price of \$60 and the seller reports a reservation price of \$70, the mediator will try to prevent further

<sup>55</sup> The buyer's optimal strategy is to report:

$$r_B = \frac{2}{3}v + \frac{25}{3}$$

which in equilibrium is always less than  $v$ . See *id.*

<sup>56</sup> Substituting into this condition from the buyer and seller equations in notes 54 and 55, we find that:

$$\begin{aligned} r_B &> r_S \\ \frac{2}{3}v + \frac{25}{3} &> \frac{2}{3}c + 25 \\ 2v + 25 &> 2c + 75 \Rightarrow v > c + 25 \end{aligned}$$

bargaining. But if the mediator announces to the parties what the reported valuations were,<sup>57</sup> the buyer should be able to deduce that the seller's true cost is \$57.50 and the seller should be able to deduce that the buyer's true valuation is \$77.50.<sup>58</sup> Both sides would know that there are potential gains from trade (of \$20). After the solicit offer mediation fails, the parties accordingly may have an incentive to continue negotiating to capture these additional gains.

However, the prospect of additional negotiation undermines the parties' initial incentive to limit their initial misrepresentation. If, for example, the seller knew that it would be able to continue bargaining even after a failed mediation, the seller would have an incentive to inflate its reported valuation even more severely—just to find out (by inference) what the buyer's true reservation price is. Knowing this, the buyer will even more severely deflate its reported price. The possibility of continued negotiation destroys the relationship between reported value and true value and can induce more extreme forms of adverse selection. Thus, the mediator's ability to make credible commitments to break off bargaining can prevent some inefficiency in the bargaining that does take place.<sup>59</sup>

The mediation process also produces additional gains from trade by limiting the seller's ability to exploit the reported information. In the unmediated game in which the seller made a take-it-or-leave-it offer, the high-valuing buyer would be particularly reluctant to reveal its reservation price because the seller might use that knowledge to charge a higher price. The mediator's commitment

<sup>57</sup> The mediator's commitment not to pass on the privately reported valuations can facilitate the parties' commitment to break off negotiations if their reported reservation prices do not overlap. If the mediator does not indicate how close they were to making a deal, this can chill the parties' incentive to continue bargaining. See *infra* text accompanying note 85.

<sup>58</sup> From the equations in notes 54 and 55, we can derive that:

$$c = (r_s - 25) \frac{3}{2} \text{ \& } v = \frac{3r_B - 25}{2},$$

which implies that  $v = 77.5$  when  $r_B = 60$  and  $c = 67.5$  when  $r_S = 70$ .

<sup>59</sup> See also Christine M. Jolls, *Contracts as Bilateral Commitments: A New Concern About Contract Modification* (Harv. L. Sch. Program in Law & Econ. Discussion Paper No. 128, 1993) (arguing that binding commitments not to modify a contract *ex post* may enhance *ex ante* gains from trade).

to convey only offers that split any reported gains from trade<sup>60</sup> prevents the seller from taking advantage of this information. This commitment reduces the buyer's reluctance to reveal its reservation price.<sup>61</sup>

Solicit offer mediation does not eliminate adverse selection, but it does significantly reduce (by more than one third) the inefficiency of the unmediated bargaining. This example of solicit offer mediation produces expected gains from trade of \$14.06; the unmediated take-it-or-leave-it offer game produces expected gains from trade of only \$12.50.<sup>62</sup>

Solicit offer mediation produces higher expected gains from trade than not only the take-it-or-leave-it offer game, but also many other unmediated forms of negotiation. The effectiveness of mediation to mitigate adverse selection inefficiency in different bargaining contexts is summarized in Table 1. When the parties are symmetrically informed, there is no adverse selection inefficiency; but with asymmetric information, as much as 43% of the potential gains from trade can be consumed by strategic attempts to misrepresent or hide private information. Mediation does not completely eliminate the adverse selection, but it can increase the expected social surplus from bargaining.

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<sup>60</sup> As emphasized already, see *supra* text accompanying notes 52-53, the mediator is not setting a price, because the parties agreed to, and offered each other, a formula that would set a price splitting the gains from trade.

<sup>61</sup> The solicit offer mediation game has been generalized to allow different divisions of the gains from trade. See Chatterjee & Samuelson, *supra* note 43. When the solicited offers require that the seller receive virtually all the reported gains from trade, the buyer's and the seller's optimal strategies change. Under this new form of mediation, the buyer perversely reports her actual reservation price—even though she receives none of the gains from trade. The buyer's incentive to understate her valuation usually balances the effect on price against the effect on the probability of trade. See Cramton, *supra* note 43, at 208. Under the "seller take all" form of mediation, however, the price is fixed at the seller's initial offer and the buyer's reported price only affects the probability of trade.

<sup>62</sup> This result is derived explicitly in the Appendix.

TABLE 1: RELATIVE ADVERSE SELECTION FOR DIFFERENT GAMES

Different Bargaining Procedures	Expected Social Gains From Trade	Adverse Selection Inefficiency
Symmetric Information Bargaining	\$16.66	0%
<i>Mediated Bargaining</i>		
"Solicit Offer" Mediation	\$14.06	16%
<i>Unmediated Bargaining</i>		
Seller Take-It-Or-Leave-It Offer	\$12.50	25%
Seller Repeated Offers <sup>63</sup>	\$11.33	32%
Alternating Buyer and Seller Offers <sup>64</sup>	\$ 9.37	43%

<sup>63</sup> This type of bargaining pressure is described in Cramton, *supra* note 17, at 579-81. In the game, buyer and seller both had private information about their reservation prices. The seller is allowed to make an infinite series of offers. If the buyer accepts any offer, the game is over and trade takes place. And even though the bargaining could extend indefinitely, delaying agreement reduces the potential gains from trade—so that both the buyer and the seller have an incentive to come to an early agreement. *Id.* at 579. The 32% inefficiency reported in the text, see *id.* at 591, represents a best case scenario—by assuming equal bargaining power. If the bargaining power is unequally divided, the expected gains from trade can be even smaller.

<sup>64</sup> See Cramton, *supra* note 43, at 211. In this game, the bargainers again have private information about their own reservation prices. The seller and buyer alternate making offers and each can decide how long to wait before making a counter offer (if the previous offer is not acceptable). *Id.* at 208-09. Even though the players are allowed to bargain indefinitely, the potential gains from trade decrease over time so that both bargainers prefer reaching an agreement quickly. *Id.* at 208.

As the discount rate approaches zero, the bargaining inefficiency approaches 100%—consuming all the potential gains from trade. Peter C. Cramton, *The Role of Time and Information in Bargaining* (1984) (unpublished Ph.D. dissertation, Stanford University). This result represents an interesting inversion of the Coase Conjecture. See Ronald H. Coase, *Durability and Monopoly*, 15 *J.L. & Econ.* 143 (1972). Ronald Coase conjectured that the durable good monopolists would not be able to exploit their monopoly, because they would not be able to credibly commit not to subsequently lower their price. The inability to commit in the extreme could mean that no one would buy above the competitive price. See Kreps, *supra* note 14, at 315-16.

Game theorists found an analogue to the Coase conjecture in symmetric bargaining games. As the time between offers becomes arbitrarily small and when the buyer and seller have symmetric information, the seller making repeated offers cannot commit to sell at any price above its known costs. See Fudenberg & Tirole, *supra* note 18, at 401-03. The Coase conjecture in this context again suggests that as the time between periods becomes small, the inefficiencies from bargaining can vanish.

When the parties are *asymmetrically* informed, however, the efficiencies may not vanish. Indeed, because the seller wants to avoid the zero return that results after the buyers deduce the seller's cost, the seller may be willing to bargain for increasingly long and

These stylized results regarding solicit offer mediation represent an important economic rationale for mediation. The mediator in this process is able to mitigate the adverse selection inefficiencies of asymmetric information without either mandating or suggesting a price (as with binding and nonbinding arbitration). And what's more, the mediator is able to create value for supremely rational and self-interested disputants. The mediator's role is rather minimal—collecting the parties, communicating reports about their reservation prices, committing the parties to break off negotiation when their reported reservation prices do not overlap, and informing the parties when their private offers constitute a contract—but the mediation is nonetheless effective.

### 3. *Resisting Efficient Mediation*

Mediated bargaining produces a higher expected social surplus than a number of different types of unmediated bargaining games—including games where sellers have the ability to make an unlimited number of offers or where the parties alternate making offers.<sup>65</sup> The superiority of solicit offer mediation to an alternating offer negotiation is particularly important, both because alternating offer games closely resemble real world bargaining and because alternating offer games allow different divisions of the bargaining power.

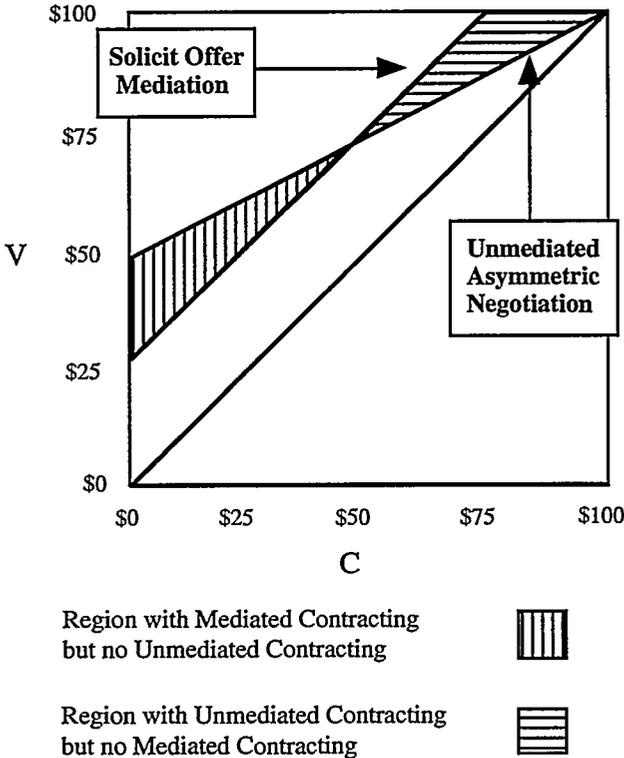
Even though solicit offer mediation increases the expected gains from random pairs of buyers and sellers, nonrandom pairs of buyers and sellers may resist committing to this form of negotiation. In particular, some sellers may expect to earn less under solicit offer mediation than under the “take-it-or-leave-it” game and accordingly will resist this form of mediation. The diverging inter-

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inefficient amounts of time (to avoid revealing its type). Thus, as the discount rate approaches zero, the seller's bargaining approaches an indefinite postponement of trade.

<sup>65</sup> Other mediated games that include commitments not to bargain have also been shown to increase the expected gains from trade. For example, Joseph Farrell and Robert Gibbons have analyzed a “cheap talk” game. See Joseph Farrell & Robert Gibbons, Cheap Talk Can Matter in Bargaining, 48 J. Econ. Theory 221 (1989). In “cheap talk” mediation, the mediator simply solicits a dichotomous (yes/no) signal about whether the disputants are eager to trade. The unverifiable communications to a mediator can increase the expected values only if the mediator can break off negotiations if the parties' subsequent offers do not overlap. See *id.* at 223 n.1 (“For those who miss the lawyers, consider the commitment necessary to play even this simple game . . .”).

FIGURE 3  
COMPARING MEDIATED AND UNMEDIATED CONTRACTING REGIONS



est of different players is shown in Figure 3. This figure compares the contract region for the solicit offer mediation with the unmediated, asymmetric-information negotiation (in which the seller makes a take-it-or-leave-it offer).<sup>66</sup>

A comparison of the contract regions for the mediated and unmediated games indicates why parties who know their reservation prices might resist participating in the mediation. The mediation game produces more trade when both the seller and buyer have relatively low reservation prices, but the unmediated (take-it-or-leave-it) game produces more trade when the buyer and seller

<sup>66</sup> The symmetric information region in Figure 3 is the same as in Figure 1 and Figure 2.

both have relatively high reservation prices. In particular, sellers who know that their reservation prices are greater than \$75 would never want to participate in solicit offer mediation, because the mediation would prevent these sellers from making some trades that would occur under the unmediated procedure.

Because incentives of sellers with different reservation prices diverge, economists evaluate the efficiency of negotiation under three alternative assumptions about the disputants' knowledge. The three evaluations are commonly referred to as *ex ante*, *interim*, and *ex post* efficiency. Evaluations of *ex ante* efficiency assume that the bargainers do not yet know either party's reservation price; evaluations of *interim* efficiency assume that each bargainer knows her own reservation price (but not the other player's); and evaluations of *ex post* efficiency assume that both players' reservation prices are common knowledge.<sup>67</sup> Because parties have different types of knowledge in different dispute contexts, a particular standard to evaluate negotiation efficiency will only be appropriate if the disputants have the assumed type of knowledge.

Although the *ex post* efficient result is for trade to occur whenever the buyer's reservation price exceeds the seller's, we have shown that the presence of private information precludes this outcome. Thus, even if the buyer's and seller's valuations become known after a negotiation (*ex post*), the *interim* asymmetry of information creates a strategic barrier to efficient trade—even in a world with costless contracts. The criterion of *interim* efficiency takes this asymmetric information into account by analyzing what is efficient, given that the negotiators will try to earn rents on their private information.<sup>68</sup>

A major problem for policymakers is that many different types of negotiation are *interim* efficient in the Pareto sense.<sup>69</sup> That is, changing from one bargaining procedure to another often decreases the returns of some of the players. Figure 3 illustrates

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<sup>67</sup> Peter C. Cramton, *Sequential Bargaining Mechanisms*, in *Game-theoretic Models of Bargaining*, *supra* note 43, at 149, 163.

<sup>68</sup> Just as lessors try to earn rents on real property, individuals who possess other kinds of property—including possession of valuable information—will often try to earn an economic rent as a condition of trade. See Ayres & Gertner, *supra* note 40, at 750.

<sup>69</sup> Pareto efficiency requires that no other allocation can improve the payoffs of some players without reducing the payoffs of others. See Kreps, *supra* note 14, at 153.

how more than one type of negotiation procedure can be interim efficient. Even though solicit offer mediation increases the expected ex ante gains from trade (for players who don't yet know their valuations) over unmediated take-it-or-leave-it negotiation, the mediation reduces the expected gains for some buyers and sellers who know their reservation prices. Thus, from an interim perspective, neither solicit offer mediation nor the unmediated take-it-or-leave-it negotiation dominates the other.<sup>70</sup>

Evaluating alternative negotiation mechanisms from the ex ante perspective (*before* the parties know their valuations), in contrast, we have shown that the solicit offer mediation dominates the unmediated take-it-or-leave-it game. Because the total expected gains from solicit offer mediation are greater, it is in the seller's and buyer's mutual interest to commit to this mediation—if they have the opportunity to commit before learning their individual values.<sup>71</sup> There is an economic analogy here to John Rawls' *A Theory of Justice*,<sup>72</sup> because “behind the veil of ignorance” it is easier for the players to voluntarily agree to the negotiation procedure that will maximize the gains from trade. Indeed, Roger Myerson

<sup>70</sup> Each of these bargaining procedures reduces the expected returns for identifiable players.

<sup>71</sup> As shown in the Appendix, the expected ex ante payoff from the solicit offer mediation is \$7.03 each for the buyer and seller. The expected ex ante payoff from the seller take-it-or-leave-it game is \$4.16 for the buyer and \$8.34 for the seller. Because the expected gains from trade are higher in the mediated game ( $\$14.06 = \$7.03 + 7.03 > \$12.50 = \$4.16 + 8.34$ ), the buyer should be willing to pay the seller between \$1.31 and \$2.86 to agree to mediation.

Indeed, if the parties were able to commit to any negotiation strategy before knowing their type, they could achieve ex post efficiency by contracting with a third party to provide “negotiation insurance.” For example, each party might pay one-twelfth of \$100 (\$8.33) to a negotiation insurer who promises to pay the buyer  $[(r_b)^2/4]$  and promises to pay the seller  $[(100 - r_s)^2/4]$  whether or not trade takes place. It can be shown that this form of insurance mitigates the buyer's incentive to understate its value and the seller's incentive to overstate its costs, and thus induces both the buyer and the seller to offer their true reservation prices in the solicit offer mediation game. With this insurance, trade takes place whenever the buyer's reservation price is higher than the seller's (ex post efficiency). The third-party bargaining insurer expects to break even because the expected payout of the insurance equals the total premium received (\$16.66). This result is only possible, however, if a competitive insurance market exists. Besides traditional impediments to competitions, third-party insurers may worry that the bargainers will collude to inflate the size of the payoffs. Because of these problems in offering efficient insurance, bargainers behind the veil of ignorance may not be able to do better than solicit offer mediation. It yields the highest ex ante payoff without involving a third-party insurer.

<sup>72</sup> John Rawls, *A Theory of Justice* (1971).

and Mark Satterthwaite have proven that the solicit offer mediation produces the highest expected ex ante surplus of any possible interim efficient game.<sup>73</sup>

However, because the parties often do not have an opportunity to commit to a specific type of negotiation (bargain over the bargaining procedure)<sup>74</sup> until after they have learned their types, the privately informed parties will often resist mediation procedures that would increase the expected gains from trade: "the players know their private information before they begin negotiations, and therefore would be unable to agree on an ex ante-efficient mechanism, because the players are concerned with their *interim* utilities . . . rather than their *ex ante* utilities."<sup>75</sup> The reluctance of some negotiators to voluntarily agree to participate in value-enhancing mediations provides a powerful rationale for considering legally

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<sup>73</sup> See Myerson & Satterthwaite, *supra* note 43. They were able to show that the equilibrium in the solicit offer mediation game is the same as the equilibrium produced by a mediation process in which the mediator again solicits reservation prices and offers, but the offers to trade must now be at a new price ( $p'$ ):

$$p' = \frac{r_B + r_S + 50}{3} \text{ if } r_B > r_S + 25$$

*Id.* at 277. The authors showed that this mediation process gives the buyer and seller the incentive to truthfully report their reservation prices (so that  $r_B = v$  and  $r_S = c$ ). Intuitively, the mediator's refusal to allow trade unless the reported reservations are more than \$25 apart accomplishes the exaggeration that the private parties would have done for themselves in the original solicit offer mediation.

This revised mediation process is an example of the "revelation principle," which shows that for every game in which parties make reports about their private information, there exists a game that produces the same equilibrium payoffs for the players but in which the players choose to speak truthfully. See Kreps, *supra* note 14, at 700-03. Economists refer to these games in which truth-telling is optimal as "direct mechanisms." Because every game (in which parties have to make reports about private information) has an equivalent direct mechanism, theorists searching for optimal forms of mediation can restrict their attention to the class of direct mechanisms. Myerson and Satterthwaite's seminal article was able to prove that the foregoing direct mechanism, which is equivalent to solicit offer mediation, produced greater gains from trade than any other game that satisfies the constraints for interim efficiency. See Myerson & Satterthwaite, *supra* note 43, at 274-78.

This mechanism design approach is a powerful new tool for analyzing optimal legal rules in strategic contexts. It is just now beginning to be used by law and economics scholars. See Jason S. Johnston, *Bargaining and Form* (1991) (unpublished manuscript, on file with the Virginia Law Review Association); Talley, *supra* note 42.

<sup>74</sup> See Fisher & Ury, *supra* note 27, at 89-91 (presenting examples which illustrate that even when parties cannot agree about substance, they can agree to a particular procedure to resolve their dispute).

<sup>75</sup> Cranton, *supra* note 67, at 167.

mandated mediation. As discussed more fully below,<sup>76</sup> the same private information that creates adverse selection inefficiencies can also create barriers to voluntary adoption of efficient forms of mediation. Mandating mediation to respond to the problems of adverse selection could, at least at the theoretical level, increase the gains from trade.

#### 4. *Methods for Making Credible Commitments to Break Off Negotiations*

The effectiveness of solicit offer mediation turned particularly on the ability of the mediators to end negotiations if the buyer's stated valuation revealed in the sequential caucusing was not higher than the seller's valuation. But we have not addressed how mediators could credibly break off negotiations where (the parties' misrepresentations notwithstanding) there may in fact be an economic incentive to trade. This Section analyzes the commitment problem and suggests particular methods that would help the mediator to end negotiations.

One of the biggest obstacles to implementing this form of mediation may come from mediators themselves. Often, mediators and those who train them focus too much on ex post efficiencies. A mediation is defined as a success if it brings the parties closer to agreement, or creates a more conciliatory atmosphere in which the parties might be able to conduct further negotiations on their own.<sup>77</sup> Thus, it runs strongly counter to mediators' instincts to end negotiations, especially when the buyer may ultimately have a higher value than the seller. The current practice tends to ignore how continued bargaining can distort the initial incentives to tell the truth. As in other legal contexts, the focus on ex post outcomes undermines the ability to enhance ex ante returns.<sup>78</sup>

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<sup>76</sup> See *infra* text accompanying notes 158-59.

<sup>77</sup> See sources cited *supra* note 41; see also Peter A. Veglahn, *Education by Third Party Neutrals: Functions, Methods, and Extent*, 28 *Lab. L.J.* 20, 20-21 (1977) ("Mediation and other forms of intervention, beyond attempting to help the parties resolve their differences, seek to increase the maturity of the collective bargaining relationship," and "[t]he mediator, by using a variety of tactics, can help the parties develop habits of agreement.").

<sup>78</sup> See, e.g., Frank H. Easterbrook, *Foreword: The Court and the Economic System*, 98 *Harv. L. Rev.* 4, 19-21 (1984) (discussing the extent to which Supreme Court jurisprudence takes into account how rules affect future behavior).

Mediators, however, occasionally do impose time limits on negotiations. For example, a mediator might demand that after a certain time on a certain date, the mediation will terminate no matter what the parties want at that time. The mediator might make this announcement realizing that she runs the risk of terminating a potentially productive negotiation between parties on the verge of agreement. In individual cases, the mediator realizes, this strategy could be inefficient—preventing resolution of a case through negotiation. In the long run, however, if the mediator's threat to terminate is credible, the parties may be induced to seriously negotiate earlier in the process and save substantial time and money.<sup>79</sup>

The occasional practice of placing time limits (drop-dead dates and the like) on negotiation provides some proof that negotiators have some power to prevent disputants from continuing negotia-

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<sup>79</sup> Indeed, in a training videotape produced by the American Arbitration Association, the mediator does just this. He gives the parties a strict deadline for the termination of the mediation. *A Mediation of a Construction Dispute* (A.A.A. 1989) (on file with authors).

The distinction between *ex post* and *ex ante* analysis also informs an ADR practitioner's use of final offer arbitration. In final offer arbitration, each party submits a settlement figure to the arbitrator, who must choose one or the other. The arbitrator cannot "split the baby" or depart in any way from the two offered amounts. Knowing that the arbitrator will choose either its figure or the opponent's, each party is thought to be motivated to propose a more reasonable figure. As the offers become more reasonable, the probability of settlement increases. Ideally, the arbitration portion of the process can be obviated altogether if the parties settle. See Stephen B. Goldberg, Frank E.A. Sander & Nancy H. Rogers, *Dispute Resolution: Negotiation, Mediation, and Other Processes* 223-25 (1992); Thomas A. Kochan & Harry C. Katz, *Collective Bargaining and Industrial Relations* 278-89 (1988); John Kennan & Robert Wilson, *Bargaining With Private Information*, 31 *J. Econ. Literature* 45, 88 (1993). Just as the "penalty" of having the arbitrator choose the opponent's offer drives a party to make more reasonable offers in final offer arbitration, so too the "penalty" of walking away from a profitable deal could motivate a party to give the mediator a more accurate report about its reservation price.

Stephen Goldberg, Frank Sander, and Nancy Rogers also employ some *ex ante* analysis in their discussion of "med-arb" (the ADR process in which the mediator becomes a binding arbitrator of a dispute, if the mediation fails to produce agreement). They note that arbitration following a failed mediation can chill the parties' disclosures to the neutral in the mediation phase of the process, because the parties fear that information they disclose might be used against them if the dispute reaches the arbitration phase. The threat of arbitration thus may lead parties to produce less information in mediation, and because the med-arb neutral has less information at her disposal, she may be less likely to reach settlements than a "pure" mediator. See Goldberg, Sander & Rogers, *supra*, at 226-27; see also Lon L. Fuller, *Collective Bargaining and the Arbitrator*, in *Collective Bargaining and the Arbitrator's Role: Proceedings of the Fifteenth Annual Meeting, National Academy of Arbitrators* 8, 26-33 (BNA 1962) (discussing related issues and problems of having the same person perform both the role of mediator and arbitrator in a dispute).

tions. The current efforts of mediators to break off negotiation, however, are normally triggered by the passage of time, whereas our model of solicit offer mediation suggests that pessimistic caucus disclosures might be sufficient to trigger interruption. The parties may be willing to accept a mediator's time limitation and discontinue negotiations because the passage of time itself may be independently sufficient to convince the parties that there are no potential gains from trade. Revelation-based interruptions (as mandated by the solicit offer mediation), on the other hand, may be harder to enforce—especially when parties have a strong inkling that gains from trade exist. Giving mediators the ability to force parties to walk away from a few value-creating transactions can facilitate the creation of value more generally. But mediators may need to take additional steps to force parties away from a table that is not empty.

With this introduction, let us briefly discuss four ways that a mediator might enforce the commitment to break off negotiations: by contracting; by taking a hostage; by concealing caucus information; and by fomenting enmity.

*a. Contract*

The most straightforward commitment device might be a contract. The two disputants might simply commit contractually to terminate negotiations if directed to do so by their mediator. Adverse selection, however, may again prevent the parties from entering into such an agreement once they know their valuations.<sup>80</sup> Moreover, even if the parties had committed to this type of mediation contract *ex ante*, it may be difficult to prevent them from modifying their contractual commitment *ex post*—especially if they can infer that trade is mutually advantageous.<sup>81</sup> Under traditional contract law, the mediator would not have standing to contest such a modification unless the mediator were explicitly made a third-party beneficiary.<sup>82</sup> And although it might be in the parties' (*ex ante*)

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<sup>80</sup> See *supra* Part I.A.3.

<sup>81</sup> For example, a buyer may have misrepresented her reservation price but know (with certainty) that there are gains from trade, because her actual valuation is higher than the seller's reported value (which if anything was overstated).

<sup>82</sup> See Edward J. Murphy & Richard E. Speidel, *Studies in Contract Law* 1335 (4th ed. 1991). Even if the mediator does have standing to sue and the ability to deter continued

interest to give the mediator such standing, common law courts might have difficulty finding the mediator to have a cognizable interest in the termination of negotiations.

*b. Taking a Hostage*

These contractual limitations might be overcome, however, if the mediation contract is structured to give the mediator some kind of economic "hostage."<sup>83</sup> The hostage could be a bond posted by the parties which would be forfeited if they continued to negotiate. Alternatively, the mediator might require that at least one of the parties disclose a trade secret which the mediator could reveal if the parties negotiated after the mediator called for a termination.<sup>84</sup>

*c. Concealing Caucus Information*

The mediator might also facilitate the parties' commitment not to bargain further by refusing to disclose information about the parties' reported values, especially when those values are close. Disclosing the privately reported reservation prices can undermine the mediator's injunction to break off negotiations. Each party knows its true value, and if the reported values are close the parties may be able to determine or infer that there are gains from trade.<sup>85</sup>

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negotiations, the parties might have a joint incentive to bribe the mediator to waive her contractual entitlement to block further negotiation.

<sup>83</sup> An economic hostage is an asset that is forfeited if the granting party fails to abide by the terms of an implicit or explicit agreement. See Oliver E. Williamson, *Credible Commitments: Using Hostages To Support Exchange*, 73 *Am. Econ. Rev.* 519, 519 (1983).

<sup>84</sup> Note that holding a trade secret from either party will give the mediator leverage to prevent further negotiation, because the party who owns the trade secret will have incentives to refuse to negotiate further with the other side.

The trade secret approach might be superior to the requirement that the parties post a bond, because the mediator could hold the information indefinitely—insuring continued enforcement of the commitment—without impeding the party's use of the information. If a trade secret was not available for use as a hostage, the parties might post a bond in the form of a letter of credit, which would reduce the parties' opportunity cost of indefinitely posting capital with the mediator.

Another problem with the bond, however, is that it would create incentives for the mediator to claim that the bond is forfeit because the parties were negotiating. The trade secret information, on the other hand, would be more valuable to the party who owns it than to the mediator. Thus the mediator could use it as leverage but would have little incentive to falsely accuse the parties of negotiating further.

<sup>85</sup> See *supra* text accompanying notes 57-58 (giving an example of parties inferring true gains of trade from reported value); *supra* note 81 (explaining more direct deduction).

If, however, the mediator refuses to disclose the reported reservation prices and tells them simply that they do not overlap, the mediator can reduce the parties' incentive to continue bargaining. Not knowing how close they are to agreement, the parties will be less likely to expend resources when there may ultimately be no zone of agreement. Concealing the caucus information may be one of the simplest methods of facilitating solicit offer mediation.

*d. Fomenting Enmity*

Finally, mediators may adopt a truly "perverse" strategy, one that shows how economic rationales for mediation may contradict the psychological rationales that dominate current practice.<sup>86</sup> To reinforce the mediator's position as a necessary intermediary to any negotiation, the mediator might actively foment (rather than diffuse) enmity between the parties to the negotiation. If the parties are hostile toward each other, it is less likely that they will be able to directly negotiate without the mediator's assistance. This strategy can make more credible the mediator's threat that negotiations will cease if the parties' reported reservation prices do not overlap. This of course runs directly counter to the belief that one of the mediator's chief purposes is to diffuse hostility between parties and effect a general improvement in their relations.<sup>87</sup> This strategy would be ill advised if the negotiation did not involve an extremely discrete transaction, because rancor could interfere with any type of relational performance.<sup>88</sup>

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<sup>86</sup> By suggesting that mediators can induce passion among the parties, we are momentarily suspending our assumption that the parties to the mediation are rational actors.

<sup>87</sup> See Lon L. Fuller, *Mediation—Its Forms and Functions*, 44 S. Cal. L. Rev. 305, 325 (1971) (describing the central quality of mediation as "its capacity to reorient the parties toward each other, not by imposing rules on them, but by helping them to achieve a new and shared perception of their relationship, a perception that will redirect their attitudes and dispositions toward one another"); accord Doyle & Haydock, *supra* note 5, at 74 (stating that effective mediators can "diffuse hostilities and deal with emotions between the parties"); Singer, *supra* note 5, at 20 (stating that a mediator may work by "soothing ruffled feelings"); Center for Dispute Settlement, *Mediation Training Manual* 10 (1988) (asserting that mediation "decreases the hostility that might result from litigation").

<sup>88</sup> For a discussion of relational contracting see Charles J. Goetz & Robert E. Scott, *Principles of Relational Contracts*, 67 Va. L. Rev. 1089 (1981); Alan Schwartz, *Relational Contracts in the Courts: An Analysis of Incomplete Agreement and Judicial Strategies*, 21 J. Legal Stud. 271 (1992).

*B. Mediators Can Mitigate Adverse Selection By Sending Noisy Translations*

In the last Section we explored how solicit offer mediation enabled a mediator to use substantive commitments (conveying only offers that equally divided reported gains) and procedural commitments (breaking off negotiations) to induce more accurate disclosure of the parties' private valuations and thus mitigate adverse selection inefficiency. In this Section, we explore an additional, value-creating commitment even more directly tied to accurate disclosure: a mediator's commitment to collect information in sequential caucuses and send noisy translations of it to the other side.

The focus on noisy translation is at odds with much of the rhetoric of mediation practitioners but at the same time more faithful to actual practice, in which mediators inevitably make indirect and imprecise disclosures of caucus information.<sup>89</sup> The ADR literature talks of the need not only to preserve the confidentiality of private communications, but also to offer more precise translations of the parties' public statements by filtering out needlessly provocative or confusing messages.<sup>90</sup> We show, however, that it may be in both parties' interest for the mediator to commit to imprecise or noisy disclosure of information obtained during sequential caucuses.

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The success of this strategy also turns on the ability of the mediator to create a particular type of rancor. In the negotiation context, it is important to distinguish between "associational" and "consequential" animus. Associational animus causes parties to dislike associating with each other. Consequential animus is a form of interdependent utility, whereby one party receives extra pleasure when another party is disfavored. Associational animus might help reinforce the commitment to negotiate exclusively through a mediator, but consequential animus can create significant barriers to dispute resolution, as each side might hold out for a larger share of the pie in order to disadvantage the other side. See Ian Ayres & Peter Siegelman, *Race and Gender Discrimination in Bargaining For a New Car* (1992) (unpublished manuscript, on file with the Virginia Law Review Association) (discussing consequential and associational animus and estimating whether new car dealers are motivated by either).

<sup>89</sup> As discussed, if a mediator assiduously refuses to make any indirect disclosures of information gleaned during sequential caucuses (by constructing an informational "Chinese wall"), see *supra* text accompanying notes 7-10, then the mediator ceases to perform a core mediative function.

<sup>90</sup> See Doyle & Haydock, *supra* note 5, at 74 (stating that the mediator serves as "diplomat, translator, interpreter"); Shiger, *supra* note 5, at 20 (maintaining that the mediator can "get negotiations back on track . . . [by] communicating selected information back and forth, often translating it from negative to positive language").

Our provocative conclusion is that commitments to add imprecision to the privately disclosed information can improve the quality and increase the quantity of the information ultimately communicated. Even though it seems that adding noise would decrease the amount of information communicated, this result is only true if one mistakenly assumes that the amount and quality of the information disclosed to the mediator remains constant. Commitments by a mediator to imprecisely translate the private disclosures of one party can induce that party to make more precise disclosures to the mediator.<sup>91</sup>

As with the commitment to pass on only offers that equally divide reported gains, the commitment to noisy translation can reduce the ability of the stronger bargainer to exploit the newly disclosed information. For example, a seller with take-it-or-leave-it market power will respond to precise information about the buyer's valuation by extracting all the gains from trade, but cannot so effectively exploit a less precise report of the buyer's valuation. Without the mediator's precommitment to add noise, the privately informed parties may find it in their self-interest to disclose less information. We show that without the commitment to make imprecise translations, the disputant with private information may refuse to make any disclosure to the other side.

The mediated equilibrium with imprecise information can easily dominate an unmediated equilibrium with no disclosure. For example, inducing more information about each side's reservation price can reduce the expense of "wasted" bargaining when there are in fact no gains from trade.<sup>92</sup> We show the effectiveness of noisy translation both when the mediator omits information and when

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<sup>91</sup> This ability of noisy translation to enhance disclosure is also suggested by "randomized response" survey technique. See Jennifer G. Brown, *Competitive Federalism and the Legislative Incentive to Recognize Same-Sex Marriage* (1994) (unpublished manuscript, on file with the Virginia Law Review Association). If researchers are concerned that survey respondents may be reluctant to answer certain types of sensitive question truthfully, they may ask respondents to follow a randomized response procedure: Respondants (who, for example might be asked if they are gay) would be instructed to privately flip a coin and to respond "yes" if the coin comes up heads and to respond truthfully only if the coin comes up tails. The randomization allows any individual respondent to hide whether she is gay but allows researchs to infer what proportion of the population is gay.

<sup>92</sup> The expectation of enhanced information about the other side's reservation price might also reduce the incentive of each side to expend resources trying to investigate and

the mediator inserts inaccuracy. A precise disclosure to a mediator, for example, regarding one party's reservation price ("My reservation price is \$40") could be made less precise if the mediator either makes a less precise true statement ("Her reservation price is some amount less than \$50") or commits to making precise but probabilistically untrue statements ("I represent that her reservation price is \$20, but remember that under my mediation contract I misrepresent her value 25% of the time"). We show how both types of noisy translations can induce better disclosure in two different contexts: reservation price information and information about an applicant's job preferences.

*1. Noise by Omission: An Example of "Imprecise, But True" Translation Concerning Reservation Price*

In the solicit offer mediation, we suggested that the mediator should avoid revealing the amount by which reported values might fail to overlap in order to reinforce the parties' commitment to break off negotiations.<sup>93</sup> Even when there is no commitment to break off bargaining, however, a mediator may enhance the gains from trade by revealing only *whether* there are reported gains from trade—not the size of these reported gains. By sending the parties an imprecise signal about the size of the gains from trade, the mediator can balance the parties' individual interest in concealing their valuations and their joint interests in avoiding costly negotiations when there is no zone of agreement.

To capture this intuition, we modify the unmediated take-it-or-leave-it negotiation by including a bargaining cost of \$4 each time a seller makes an offer to a potential buyer. As shown in the Appendix, this transaction cost does not affect the profit-maximizing price of those sellers who make offers, but dramatically affects the number of sellers willing to make any offers.

The seller's inability to distinguish between high- and low-valuing buyers forces a seller to incur the cost of many "wasted" offers. High-cost sellers calculate that the probability of buyer acceptance is too low to justify spending \$4 to make an offer. The magnitude

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estimate this figure. See Raiffa, *supra* note 5, at 37 (discussing negotiation in which such estimates were made).

<sup>93</sup> See *supra* Part I.A.4.c.

of this resulting inefficiency is fairly dramatic, as 40% of the sellers (those with costs greater than \$60) find it unprofitable to make any offers.<sup>94</sup>

This additional inefficiency of asymmetric information is depicted in Figure 4. As before,<sup>95</sup> the asymmetric information line is taken from Equation 1 and divides the contracting and no contracting regions when the seller does not know the buyer's reservation price—as long as the seller's cost does not exceed \$60. Where the seller's cost is greater than \$60, the seller will not make an offer and a large area thus becomes a no-contracting region.

The buyer's private information about its reservation price now causes an additional form of adverse selection inefficiency. As before, the profit-maximizing seller chooses to use its imperfectly informed market power by charging a single supracompetitive price that excludes many buyers even when there are potential gains from trade. This inefficiency is depicted in Figure 4 by the horizontal difference between the symmetric and asymmetric information lines.

Moreover, with the \$4 transaction cost, the sellers' incomplete information chills the willingness of many sellers even to bear the relatively small costs of making offers. It is understandable that sellers whose production costs ( $c$ ) are greater than \$96 will refuse to make offers when the  $\mu = 4$  (because the total costs of transacting are greater than any seller will be able to collect from a buyer). This result is depicted in Figure 4 by the symmetric information line intersecting the top of the Figure at  $c = \$96$ .<sup>96</sup> Yet when the seller has incomplete information, the inefficiencies caused by a \$4 cost of making offers are much more extreme. Sellers with production costs greater than \$60 will decline to make any offers, rather than bear the cost of making \$4 offers when many buyers will

<sup>94</sup> As shown in the Appendix, if the cost of bargaining ( $\mu$ ) is \$4 per offer, sellers will not make offers when:

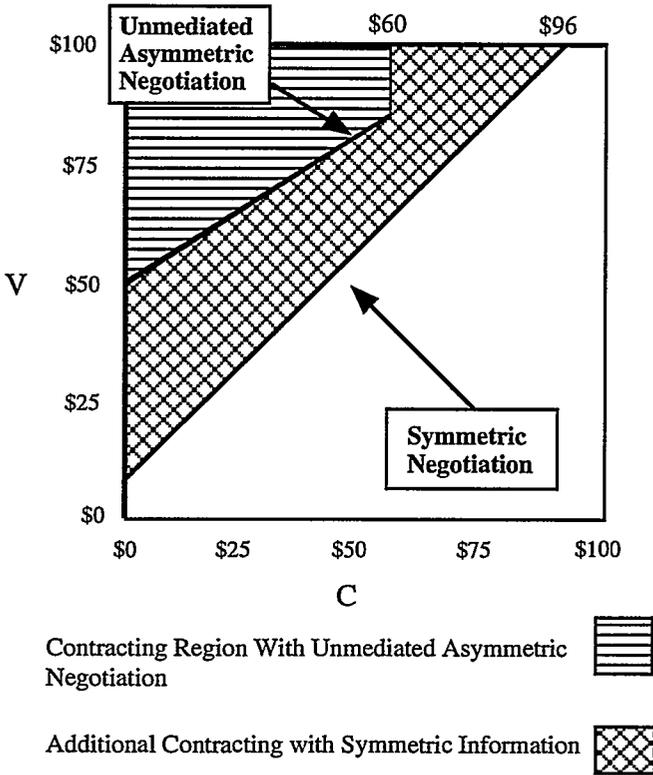
$$c > 100 - 20\sqrt{\mu} ,$$

which simplifies to  $c > 60$  when  $\mu = 4$ .

<sup>95</sup> See *supra* Figure 2.

<sup>96</sup> The symmetric information line in Figure 4 is the same as in Figure 2 except that it is shifted up \$4. Because the seller must pay \$4 per offer, trade will only take place when the buyer's value is higher than the seller's total cost (including the offering cost). Given this transaction cost, the symmetrically informed equilibrium, which contains no adverse selection inefficiency, still represents the first-best benchmark.

FIGURE 4  
COMPARISON OF CONTRACTING WITH UNMEDIATED  
ASYMMETRIC AND SYMMETRIC NEGOTIATIONS



refuse to trade.<sup>97</sup> With symmetric information, a \$4 offering cost deters 4% of sellers from making any offers; but with asymmetric information the same \$4 cost deters 40% of the sellers from partici-

<sup>97</sup> A seller whose cost of production is \$60 maximizes profit by offering to sell at \$80. But at this price, the seller can only expect to sell to 20% of the buyers (those having a reservation price between \$80 and \$100). Accordingly, sellers can expect a \$20 profit 20% of the time. But this ignores the seller's \$4 cost of making an offer. Because the seller does not know the buyer's reservation price, if the seller chooses to make an offer it runs the substantial risk that the buyer will reject the offer. When the offer is \$80 there is an 80% chance of rejection. Hence, when the seller's cost is \$60, the expected profit net of contracting cost is  $\$20(.2) - \$4 = 0$ . Sellers with manufacturing cost greater than \$60 find that it is unprofitable to make offers to any buyer.

pating in the market. Moreover, even for those sellers who choose to make offers, a large proportion of the gains from trade are consumed by “wasted” offers that go unaccepted.<sup>98</sup> This inefficiency is depicted in Figure 4 by the vertical portion of the asymmetric information line.

Mediators can mitigate this “wasted offer” inefficiency by sending noisy translations of privately disclosed reports to the other party. Consider a process in which the mediator asks each buyer for his or her precise reservation price, but only tells the seller whether that reported reservation price is greater or less than \$50.<sup>99</sup> If the buyer’s reported offer is greater than \$50, the mediator allows the seller to make a take-it-or-leave-it offer.<sup>100</sup> The commitment to send imprecise, but true translations induces the buyers to reveal more information and allows the sellers to more coherently target the costly offers.

As described in the Appendix, this rather minimalist mediation process can produce an equilibrium in which buyers truthfully report their precise reservation price: Truth-telling is an optimal strategy for both high-valuing buyers (because it preserves an opportunity to trade) and low-valuing buyers (because take-it-or-leave-it sellers would never offer a price below \$50 in any case).<sup>101</sup> If the mediator tells the seller that the buyer’s reported reservation

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<sup>98</sup> As can be derived from Equation 12 in the Appendix, this additional transaction cost reduces the expected social surplus of the unmediated take-it-or-leave-it offer game from \$12.50 to \$11.70 for randomly selected buyers and sellers.

<sup>99</sup> This form of mediation is analogous to the mechanism analyzed by Farrell & Gibbons, *supra* note 65.

<sup>100</sup> This mediation, like the solicit offer mediation, empowers the mediator to terminate negotiations, but with an even cruder trigger. Because the mediator is only soliciting reports of valuation from the buyer, this mediation process is even more likely to terminate negotiations when there are gains from trade. The mediation process is also simpler than solicit offer mediation because the mediator does not solicit binding offers from the parties.

For this stylized example, we assume that the mediation is costless. While this unrealistic assumption certainly biases our model toward finding an efficiency, it allows us to highlight how mediation can mitigate the “wasted offer” inefficiency. In the real world, mediators would need to balance the “wasted offer” cost against the mediation costs themselves.

<sup>101</sup> As emphasized in the Appendix, this game has other equilibria that produce lower gains from trade. Mediators may be able to play powerful roles in influencing which equilibrium evolves. Law and economic analysis often looks to other disciplines for assistance in this inquiry. See Ian Ayres, *Playing Games with the Law*, 42 *Stan. L. Rev.* 1291, 1310-15 (1990) (book review).

price is above \$50, the seller's profit maximizing strategy in this mediated game is still to use the same pricing formula as in the unmediated game (Equation 1) in offering to sell at a price ( $p_M$ ) equal to:

$$p_M = \frac{c+100}{2} \quad (3)$$

The mediation process, however, induces more sellers to make offers. In the unmediated game, sellers with reservation prices above \$60 refused to make offers, but as shown in Figure 5, mediation increases the contracting region by inducing sellers with reservation prices up to approximately \$72 to make offers.<sup>102</sup>

The intuition behind this change is straightforward. In the unmediated game, buyers are reluctant to disclose their precise reservation price to a seller who can make individualized take-it-or-leave-it offers. Even low-valuing buyers lack an incentive to come forward and reveal their types, because doing so still allows the seller to respond by extracting virtually all of the gains from trade.<sup>103</sup> Because of the buyers' hidden information, sellers who decide to make offers have to make them to an undifferentiated mass of high- and low-valuing buyers. The seller bears a cost of \$4 per offer, but knows that at least half of these offers would be rejected.<sup>104</sup> In the unmediated negotiation, the seller's profits are thus dramatically reduced by the substantial probability that any offer would be made to a low-valuing buyer.

The mediator's commitment to a noisy translation can induce the buyers to reveal more information than is produced when sellers make unmediated take-it-or-leave-it offers. Mediation communicates to the sellers which buyers have reservation prices above \$50

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<sup>102</sup> As shown in the Appendix, in the mediated game sellers will make offers when:

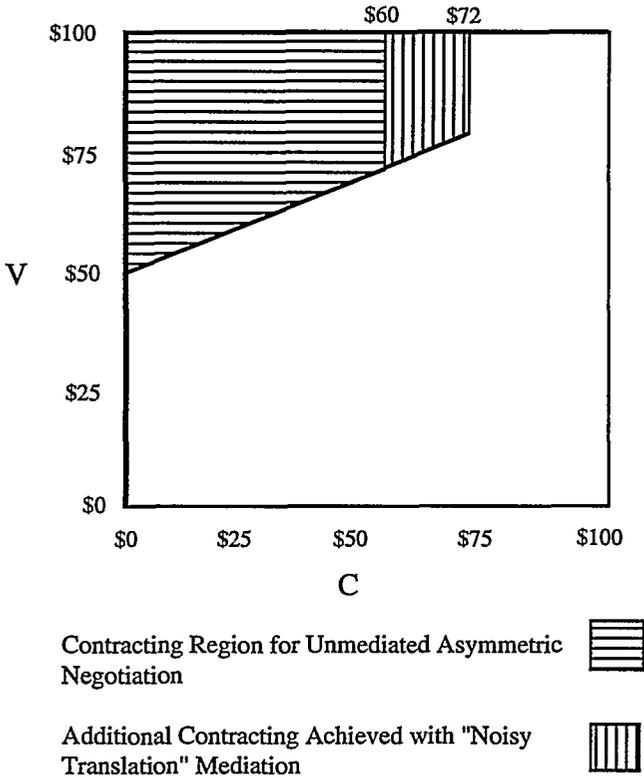
$$c < 100 - \sqrt{200\mu} ,$$

which simplifies approximately to  $c < 71.7$ , when  $\mu = 4$ .

<sup>103</sup> Thus, if buyers incurred a small fixed cost of coming forward and credibly establishing their low value, they would strictly prefer to conceal their information.

<sup>104</sup> In the unmediated game, the probability that a seller's offer would be rejected would simply equal the seller's price ( $p$ ) divided by 100. As noted in Equation 1, the seller's optimal pricing strategy in the unmediated game is  $(c+100)/2$ . Thus a seller whose production cost is \$40 would optimally charge \$70  $((100 + 40)/2)$  and realize that 70% of the buyers would reject this offer.

FIGURE 5  
EFFECTS OF MEDIATION ON EQUILIBRIUM CONTRACT REGION



and thus identifies an enriched pool of potential buyers. Reducing the probability of wasted offers induces more sellers (with higher cost) to make offers. Moreover, expected profits are greater even for those sellers who made offers in the original game, because all sellers reduce the probability of wasted offers.<sup>105</sup>

<sup>105</sup> This extremely stylized form of mediation is Pareto superior to the unmediated games because none of the buyer types are worse off and some are made better off by the mediation process. As shown in Figure 5: (1) buyers with reservation prices below \$50 never contract in either game; (2) buyers with payoffs between \$50 and \$80 have the same opportunity to contract in either game (buyers in this range would never be able to take advantage of the additional offers made by the higher cost sellers, because these offers

2. *Noise by Commission: An Example of "Precise, But Probabilistically False" Translation Concerning Job Selection*

In the foregoing examples, private information about reservation prices induced inefficiencies due to adverse selection. High-valuing buyers act as if they have low values, low-valuing sellers act as if they have high costs. But adverse selection can also occur when buyers or sellers have private information about other aspects of the deal.

In this Section, we consider a type of adverse selection caused by an employee's private information about her innate abilities and preferences (or "type"). Mediators are able to mitigate the inefficiencies of adverse selection by caucusing with the employee privately and then transmitting a noisy signal about the employee's type to the employer. In the previous example, the mediator conveyed a true, but imprecise translation of the buyer's reservation price. In this job selection game, we show how mediators might also commit to imprecise translation by conveying precise but probabilistically false statements about the employee's type. Because the listener (the employer in this example) knows that the precise statement is false a certain percentage of time, the imprecision restrains her from exploiting the information. As before, the commitment to imprecise translation induces more disclosure and thus mitigates adverse selection.

This type of noisy transmission of information from one party to another captures an important feature of sequential caucusing. Value creation through mediation turns crucially on the way the mediator translates private reports. Imprecision is a necessary element. If the mediator precisely restates what was revealed during a caucus, the mediator accomplishes nothing that could not be

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would be greater than \$80); and (3) buyers with reservation prices above \$80 are strictly better off with mediation because they have additional opportunities to contract profitably.

The simple mediation process of this model provides a mechanism by which sellers can reduce the costs of making offers when there are no gains from trade, as it screens out low-valuing buyers. Not only does this mechanism increase the payoffs for the active sellers in the unmediated game, but it permits *new* types of sellers to enter the market, which in turn increases the payoffs of both buyers and sellers with higher reservation prices. Sellers with reservation prices between \$60 and \$71 and buyers with reservation prices above \$80 increase their expected payoffs. See *supra* note 102 and accompanying text.

accomplished by unmediated communication between the parties. And as we stressed in the Introduction, mediators who erect a “Chinese wall” and commit not to reveal private information—directly or indirectly—cannot add value as mediators.

Consider the following job selection game.<sup>106</sup> An employer must decide whether to hire a job applicant and, if so, whether to give her one of four possible jobs. Job applicants are either “geeks” or “poets”—that is, either mathematically or verbally inclined. The payoffs for the game are summarized in Table 2:

TABLE 2: JOB SELECTION GAME PAYOFFS

	Job 1	Job 2	No Job	Job 3	Job 4
Poet	6,10	10,9	0,7	4,4	3,0
Geek	3,0	4,4	0,7	10,9	6,10

[The first number in each box represents the payoff to the applicant and the second number represents the payoff to the employer, for that particular job and employee type.]

A poet produces higher profits for the employer in job 1, because that job most fully exploits the poet’s verbal skills; but a poet prefers job 2 because it is more varied (and therefore more interesting). Jobs 3 and 4 require increasing levels of mathematical sophistication for which a poet is poorly suited—especially job 4 which requires technical specialization.<sup>107</sup> A geek’s preferences are

<sup>106</sup> This game was developed in Françoise Forges, *Equilibria With Communication in a Job Market Example*, 105 Q.J. Econ. 375, 378-79 (1990). See generally Kennan & Wilson, *supra* note 79 (describing other game-theoretic bargaining models).

<sup>107</sup> Forges provides two alternative characterizations for these payoffs:

[L]et the candidates be engineers with either technical skills or managerial, leadership skills. In a first approach, these abilities—or tastes—can be considered as mutually exclusive: an engineer interested in developing new technologies does not like to spend time with the workers and needs to work alone; an engineer interested in running a factory, concerned with social problems, will delegate the creative part of the job. The “technologist” will look first at the quality of the products; while the “manager” will also take human factors into account, giving the right incentives to the workers. In this example let type 1 represent the “technologist” and type 2, the “manager”; jobs 1 and 2 are “technical” jobs, job 1 (say, “laboratory”) being more technical than job 2 (say, “new technologies investigation”); job 3 can be taken as “factory running” and job 4 “administrative management” (“organization”). Jobs 2 and 3 are the favorite ones of type 1 and type 2, respectively, because they

ordered conversely: the geek would like to use her mathematical abilities—but prefers job 3 which has more variety than the more monotonous job 4.

The joint gains from trade are maximized if poets can be assigned to job 2 and geeks can be assigned to job 3. But the parties may have significant difficulties contracting for the first-best outcome.<sup>108</sup> If an employer believes that it is equally likely that the applicant is a geek or a poet, the employer's optimal strategy is to offer no job<sup>109</sup>—which yields both types of applicants their lowest possible payoff. To induce a job offer, therefore, the applicant must be willing to communicate—or at least hint at—her type.

The job applicant is reluctant to reveal her abilities, however, because the employer could take advantage of this information and assign the employee to an overly specialized job. If an applicant announces that she is a geek, the employer will be induced to offer job 4. (Likewise, if an applicant announces that she is a poet, the employer will offer job 1). The applicant would like to give the employer *some* information about her abilities (to induce a job offer), but would like to retain some mystery about her true type. In game-theoretic terms, the applicant would like to send a “noisy signal.” Noisy signals benefit applicants because they can induce

correspond to their skill but also require some of the ability of the other type, to make the job more interesting.

The example can arise in other contexts. Take the case where the informed player is an important broker, knowing whether inflation (type 1) will occur or not (type 2). The uninformed player is an investor who can invest in the following sectors: real estate, stocks, bonds, or cash, corresponding to jobs 1 to 4, respectively. Here a no-job decision corresponds to a change of broker. The broker's preferences are obviously explained by the fact that he makes profits with investments in stocks or bonds but wants to give good advice to keep his client.

Forges, *supra* note 106, at 378-79.

<sup>108</sup> This makes the strong assumption that poets cannot offer to take a pay cut of “2” if assigned to job type 2—changing the wage would change job 2 payoffs to (8,11), which would induce first-best efficiency. Although this incentive to negotiate for a different wage could in many contexts remove the strategic inefficiency, costs of making and enforcing contracts could preclude these kinds of bargains. The point of this model is to show that mediation might be a *lower* cost method of enhancing efficiency. For a mathematical proof of this assertion, see *id.* at 389-90.

<sup>109</sup> The employer obtains a certain return of 7 (by offering the job to another applicant) which is strictly larger than the expected payoff of offering the more specialized jobs to possibly unqualified applicants. The employer's expected payoff from assigning jobs 1 or 4 is 5  $((10+0)/2)$ , whereas the expected payoffs from offering jobs 2 or 3 is 6.5  $((9+4)/2)$ . See *id.* at 378.

employers to offer jobs 2 and 3. As already stated, if an employer thinks it is equally likely that an applicant is a poet or a geek, the employer will not offer a job. If the employer knows for sure that the employer is a poet or a geek, jobs 1 or 4 will be offered. But if the employer only is convinced that there is a 75% probability that the applicant is a poet, the employer maximizes expected profits by offering job 2.<sup>110</sup> Correspondingly, the employer will offer job 3 if the employer believes there is a 75% chance that the applicant is a geek. Thus, when the employer is not certain about the applicant's identity, jobs 2 or 3 can dominate because the employer would prefer to avoid the zero payoff that they receive if they misassign jobs 1 or 4.

Applicants therefore would like to commit to sending such a noisy signal—for example, by telling employers that they falsely report their type one-quarter of the time. However, applicants will have difficulty committing to this type of “mixed strategy” by themselves.<sup>111</sup> An applicant would like to free ride on the “lying” reputation of other applicants, but no applicant would like to lie herself (and run the risk of being assigned a low payoff job).<sup>112</sup> Employers, realizing this, will accordingly ignore “I might be lying” statements and assign job 1 to any applicant who indicates that she might be a poet (and job 4 to any applicant who indicates that she might be a geek).

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<sup>110</sup> If the employer believes that there is a 75% probability that the applicant is a poet, the expected profits from each possible assignment are:

Job 1	7.5	=	(10 x .75 + 0 x .25)
Job 2	7.75	=	( 9 x .75 + 4 x .25)
No Job	7	=	( 7 x .75 + 7 x .25)
Job 3	5.25	=	( 4 x .75 + 9 x .25)
Job 4	2.5	=	( 0 x .75 + 10 x .25).

Job 2 is the optimizing employer assignment if the employer believes the probability that applicant is a poet is between 60% and 80%. Job 3 will be assigned if the employer believes the probability that the applicant is a poet is between 20% and 40%. See *id.* at 380-81.

<sup>111</sup> In game-theoretic terms, the “mixed” strategy is not “credible.” See Kreps, *supra* note 14, at 407-09.

<sup>112</sup> The mixed strategy is not a stable (Nash) equilibrium, because individual applicants would do better by telling the truth. Indeed, applicants have an incentive to bribe the mediator not to lie, so that the applicant could receive the job 2 or job 3 outcome with 100% probability.

Mediators can improve the gains from trade in this model by making noisy signalling credible. Consider, for example, a mediator who promises to both parties to follow the following process:

1) The mediator first caucuses privately with the applicant and asks the applicant to report her "type." The mediator (like the employer) cannot independently verify whether the applicant is telling the truth.

2) The mediator then caucuses privately with the employer and follows a simple rule in passing on the applicant's report:

The mediator flips two coins (which the employer cannot see).

If at least one coin comes up head (which occurs 75% of the time), the mediator faithfully reports what the mediator was told by the applicant. However, if both coins come up tails (which occurs 25% of the time), the mediator misreports what the applicant said. Unlike the unmediated interaction, this mediated process credibly adds noise to the applicant's signal.<sup>113</sup>

The mediation induces an equilibrium in which the applicants tell their true type to the mediator and the employer assigns job 2 when the mediator says "poet" and job 3 when the mediator says "geek." In this equilibrium, the applicants no longer have an incentive to free ride on the noisy signals of others, because all applicants send the mediator a true and precise signal of their abilities. These applicant and employer strategies constitute a stable equilibrium because (given that the other side plays the equilibrium strategy) neither party has an incentive to deviate.<sup>114</sup> Given that the employer is going to assign job 2 if the mediator says poet, poets will want to maximize the chance of that event by truthfully reporting their type (and analogously for geeks). Given that applicants are truthfully reporting their type (and knowing that the mediator will misreport one-quarter of the time), the employer will believe that the mediator's report is reliable three-quarters of the time—and accordingly will assign the mediator-reported poets job 2 and mediator-reported geeks job 3.

This equilibrium allows the parties to enhance the expected joint gains from trade. Without mediation, we showed that in equilib-

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<sup>113</sup> Unlike our earlier examples, the mediator here also has private information (about the two coin flips).

<sup>114</sup> In game-theoretic terms, these strategies constitute a Nash equilibrium. See Fudenberg & Tirole, *supra* note 18, at 11.

rium the applicants report their true type to the employers—but that employers assign the applicants to jobs that do not maximize the total gains from trade. In the unmediated equilibrium, the total expected gains of trade are thus 16 (6 for the applicant and 10 for the employer). With mediation, however, the applicants are assigned to the first-best job three-quarters of the time and to the third-best job one-quarter of the time. In the mediated equilibrium, the total expected gains from trade are 16.25 ( $= 19 \times .75 + 8 \times .25$ ). Thus, mediation can help induce greater expected gains from the employment relationship.<sup>115</sup>

This model of mediation captures several aspects of reality. The mediator caucuses privately with the individual parties to the dispute in order to acquire private information. The private parties are induced to tell the mediator the truth. The model suggests how mediators can create the conditions that will lead parties to make such disclosures. Too often, ADR practitioners and scholars gloss over this dynamic, seemingly assuming that with enough trust and good faith in the mediator, the parties will begin to make confessions and concessions. One mediation training manual, for example, extols the benefits of the caucus but fails to explain how mediators can maximize its benefits: “[O]ften the only way to explore real positions is in private. A person is more willing to reveal just what his or her bottom line is if there is no risk of revealing his/her ‘final’ position to the other party.”<sup>116</sup> Lon Fuller similarly recognizes the importance of *ex parte* conferences

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<sup>115</sup> These additional gains are not equally distributed, however. The expected payoff for the applicant is 8.5 ( $10 \times .75 + 4 \times .25$ ) and the expected payoff for the employer is 7.75 ( $9 \times .75 + 4 \times .25$ ). The employer’s expected payoff is lower with mediation than without (7.75 vs. 10). Thus, although mediation is *ex ante* efficient, it is not interim efficient: players that do not yet know whether they would be employer or employee would agree to the procedure. See *supra* text accompanying notes 69-71. People, however, always know whether they are the employer or the applicant at the time of negotiation.

Applicants may be willing to pay the employers to participate in the job selection mediation. For example, if the applicant paid the employer 2.30, the employer’s payoff would increase to 10.05 (which is higher than the employer’s unmediated payoff of 10) and the employee would retain 6.20 (which is higher than the applicant’s unmediated payoff of 6). The same transactions costs that block other applications of the Coase theorem, however, might also block voluntary agreement. See *supra* note 108. A legal mandate, therefore, may be necessary to achieve the mediated equilibrium.

<sup>116</sup> Center for Dispute Resolution, *Mediation Training Manual* 26 (1988) [hereinafter *Training Manual*].

between the mediator and each party, but fails to explain how the mediator can use confidential information to “shape the negotiations” without “premature disclosure of details”:

[The mediator can hold] separate confidential meetings with the parties, where each party gives the mediator a relatively full and candid account of the internal posture of his own interests. Armed with this information, but without making a premature disclosure of its details, the mediator can then help to shape the negotiations in such a way that they will proceed most directly to their goal, with a minimum of waste and friction.<sup>117</sup>

Those who practice and write about mediation know that mediators add value to negotiations when they can elicit information from the parties and work with that information to increase the parties' gains from trade. Yet this process of collecting and synthesizing information has been a mystery, of which a mediator might say, “I can't describe it, but I know it when I see it.”<sup>118</sup>

In the real world, mediators do not explicitly commit to probabilistic lying. Mediators, however, often *do* indirectly disclose information by innuendo and imprecise translation. Our examples of imprecise translations show how “imprecise but true” and “precise, but probabilistically false” translations can mitigate adverse selection inefficiency. As long as the listener is fully aware that the mediator intends to lie a certain percentage of the time, either form of noisy translation can be effective. Indeed, when the information at stake has a dichotomous nature, the “precise, but probabilistically false” translation may be the only way to send a noisy signal. In the job selection game, for example, it would be difficult for the mediator to make an “imprecise, but true” statement.<sup>119</sup> This example underscores that the precise form of the noisy translation will often determine whether the mediation will be effective. These models only begin to rigorously capture the

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<sup>117</sup> Fuller, *supra* note 87, at 318.

<sup>118</sup> To paraphrase Justice Potter Stewart in *Jacobellis v. Ohio*, 378 U.S. 184, 197 (1964) (Stewart, J., concurring) (discussing how to recognize obscenity).

<sup>119</sup> While telling the seller that the buyer's report was not less than \$50 was an effective noisy signal, telling the employer that the applicant is not a geek conveys with precision that she is a poet. When the informational category is dichotomous, the mediator cannot create an overinclusive (fuzzy) translation by adding additional possibilities to the precise report.

nuanced ways that mediators can productively translate caucus information.

This Part has shown that private (or asymmetric) information is a but-for cause of adverse selection inefficiencies. We have provided a series of models to show how mediation can mitigate adverse selection by committing mediators to translate imprecisely, break off negotiations, and equally divide reported gains. Each commitment was shown to facilitate more effective disclosure of private information and thus mitigate a prerequisite of adverse selection inefficiency.

## II. MITIGATING THE INEFFICIENCIES OF MORAL HAZARD

Maximizing the gains from a contractual agreement often requires coordinated performance by different contracting parties. The contractual provisions themselves are often sufficient to effect this coordination by specifying what each party will do and when. Some aspects of performance, however, may be difficult to reduce to enforceable provisions: one contracting party may not be able to observe whether the other party took certain actions, and even if the conduct is observable to the parties in *privity*, it may not be verifiable to third parties (such as courts).<sup>120</sup>

When contractual provisions fail to give the contractors legal incentives to maximize the joint gains from trade, individual parties may choose to maximize their individual returns—preferring, for example, to shirk rather than to exert best efforts. This failure of contractual incentives is often referred to as moral hazard. In the insurance context, the failure of insurers to condition insurance on insureds taking adequate care leads insureds to take too many risks and too few precautions. In more general contractual settings,

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<sup>120</sup> Economists describe aspects of performance that can not be verified as “non-contractible.” See Ayres & Gertner, *supra* note 40, at 741. Promises to use “best efforts” are classic examples of the difficulty of writing binding provisions, because it is so difficult to measure a contracting party’s degree of fulfillment of this promise. For example, although courts often find that an exclusive dealing arrangement is supported by consideration because the distributor has an implicit duty to “use reasonable efforts” to sell the goods, see *Wood v. Lucy, Lady Duff-Gordon*, 118 N.E. 214, 215 (N.Y. 1917) (Cardozo, J.), E. Allan Farnsworth, *Contracts* 77-78 (2d ed. 1990), they will sometimes refuse to imply such a duty. See *HML Corp. v. General Foods Corp.*, 365 F.2d 77, 81 (3d Cir. 1966). Inducements for appropriate action on part of the distributor must come from nonlegal sources.

moral hazard can undermine the ability of parties to efficiently coordinate their performance. Just as hidden information is the but-for cause of adverse selection, (contractually) hidden conduct is the but-for cause of moral hazard.<sup>121</sup>

This Part shows how mediation can enhance contractual coordination and thus mitigate this form of moral hazard. To focus on the inefficiencies of moral hazard, we purge our examples of private information and consequently of any adverse selection.<sup>122</sup> We provide two examples in which mediators enhance coordination by sending both public and private signals to the individual parties. Although these signals can easily be interpreted as recommendations, they differ from nonbinding arbitration both because they are not rights-based adjudication,<sup>123</sup> and because the mediator does not expect the recommendation to be reduced to contract. To the contrary, mediation to mitigate moral hazard is explicitly used as a substitute for contract when contractual coordination of performance is not practicable.

These examples also illustrate that the information need not flow only from one party to another during a mediation. The mediator may herself create information and send it to the disputants. In our stylized examples, the mediator creates a signal or recommendation by flipping a coin or rolling a die and then discloses the

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<sup>121</sup> Commentators also sometimes refer to adverse selection and moral hazard as forms of precontractual and postcontractual opportunism:

Adverse selection [refers] to the kind of *precontractual opportunism* that arises when one party to a bargain has private information about the something that affects the other's net benefit from the contract . . . [Moral hazard refers] to the form of *postcontractual opportunism* that arises when actions required or desired under the contract are not freely observable.

Milgrom & Roberts, *supra* note 35, at 595, 601. Adverse selection is deemed to be precontractual opportunism because the parties' private information exists prior to any contract, whereas moral hazard is deemed to be postcontractual opportunism because the inability to write detailed binding contracts distorts performance. It should be emphasized, however, that, foreseeing moral hazard problems, parties may fail to enter any agreement or distort the terms of their agreement. Thus, in our mediation examples concerning moral hazard, the parties' moral hazard is postcontractual only relative to some hypothetical or implicit contract they might have entered but for the moral hazard.

<sup>122</sup> When the parties have no private information about their characteristics, there is no opportunity for the inefficiencies of adverse selection. But even without adverse selection, trading inefficiencies can be caused by failures to coordinate behavior.

<sup>123</sup> Although nonbinding arbitration could be used in an interest-based, deal-making context, the far more frequent use is in dispute-settlement contexts.

information to the disputants. We show not only that precise, public disclosure can enhance mediation, but that noisy, private disclosure of the mediator's information can be productive. Thus, noisy translation (now of the mediator's information) can be effective in mitigating moral hazard as well as adverse selection.

Finally, we show that mediation cannot mitigate all forms of moral hazard inefficiency. Moral hazard as a failure of adequate contractual incentives can potentially affect any executory aspect of performance—even aspects only executory by one side of the contractual relationship. All of our examples in which mediation mitigates moral hazard consist of efforts to coordinate the future conduct of multiple parties. Mediation can coordinate the conduct of multiple parties, but we show that it cannot enhance the performance of an individual party who, because of moral hazard, may have insufficient incentives to behave optimally.

#### *A. Mediators Can Efficiently Increase Coordination By Sending Public Signals*

The canonical coordination game is traditionally called “the battle of the sexes.”<sup>124</sup> Two players have a strong preference to spend the evening together, but player 1 prefers to go the opera and player 2 prefers the ballet. Table 3 depicts a normal form representation for this game (with arbitrarily chosen payoffs).<sup>125</sup> “O” represents a player's choice of going to the opera; “B” represents a

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<sup>124</sup> The traditional description includes gender-based stereotypes (e.g., the man prefers to go to “the fights”). There is an unfortunate tendency for game-theoretic descriptions to employ sexist images. For example, in discussing a hostage model designed to prevent induced breach, Oliver Williamson suggests that “an ugly princess” might be an effective hostage—because she would be valued by her father, but not by another king (because she is ugly). See Oliver E. Williamson, *The Economic Institutions of Capitalism* 176-77 (1985) (“[A] king who is known to cherish two daughters equally and is asked, for screening purposes, to post a hostage is better advised to offer the ugly one.”). Another example is provided by the title of this game, see Eric Rasmusen, *Games and Information: An Introduction to Game Theory* 34 (1989), not only because of the original assumptions about what activities the parties preferred, but also because the metaphor of “battle” is used, rather than a metaphorical conflict or competition in which women are likely to participate.

<sup>125</sup> This game is based upon the example found in Rasmusen, *supra* note 124, at 34-35. Unlike extensive-form representations (an example of which can be found in the Appendix), normal form representations do not allow the depiction of sequential actions that affect players' information. See Fudenberg & Tirole, *supra* note 18, at 85-87.

TABLE 3: BATTLE OF THE SEXES COORDINATION GAME

		Player 2	
		O	B
Player 1	O	5,1	0,0
	B	0,0	1,5

player's choice of going to the ballet. If the players cannot communicate to coordinate their behavior, the only equilibrium will be a pair of mixed strategies in which player 1 chooses to go to the opera five-sixths of the time, and player 2 decides to go to the ballet five-sixths of the time.<sup>126</sup> This "no communication" equilibrium is massively inefficient because the players forego the benefits of going to the same event 72% of the time.<sup>127</sup> The expected payoff to each player in this mixed-strategy equilibrium is only .83.<sup>128</sup>

There are tremendous gains from coordination—because either of the coordinated equilibria (in which both go to the same event) is Pareto superior to a "no communication" equilibrium.<sup>129</sup> Even though player 1 strongly prefers going to the opera, this player prefers attending the ballet with player 2 to the expected outcome of the mixed-strategy equilibrium. While both parties realize that the

<sup>126</sup> These mixed strategies are a Nash equilibrium. See Rasmusen, *supra* note 124, at 34. If player 1 goes to the opera with probability  $5/6$ , then player 2 is indifferent between choosing the opera and the ballet (because the expected payoff of either choice is  $5/6$ ):

$$\text{Player 2's Expected Payoff of Going To Opera} = (5/6) \times 1 + (1/6) \times 0 = 5/6$$

$$\text{Player 2's Expected Payoff of Going to Ballet} = (5/6) \times 0 + (1/6) \times 5 = 5/6.$$

Player 2 then expects to receive the same profits—regardless of whether he goes to the ballet 100% of the time, goes to the opera 100% of the time or mixes probabilistically between these two venues. Given that player 1 follows her mixed strategy, player 2 then has no reason to deviate from playing his mixed strategy. An analogous argument establishes that player 1 has no incentive to deviate—so the mixed strategies constitute a Nash equilibrium.

<sup>127</sup> Player 1 goes to the opera and player 2 goes to the ballet with probability  $25/36$  ( $5/6 \times 5/6$ ) and player 1 goes to the ballet and player 2 goes to the opera with probability  $1/36$  ( $1/6 \times 1/6$ ).

<sup>128</sup> Each player receives 5 with probability  $5/36$  and 1 with probability  $5/36$ :

$$5 \times (5/6) \times (1/6) + 1 \times (5/6) \times (1/6) =$$

$$5 \times (5/36) + 1 \times (5/36) = 30/36 = 5/6 = .83.$$

<sup>129</sup> Either coordinated equilibria is Pareto superior to the unmediated equilibrium, because the expected return to each player is greater in either of the coordinated equilibria than in the unmediated equilibrium. See Rasmusen, *supra* note 124, at 34-35.

uncoordinated mixed-strategy equilibrium is dominated by *either* pure strategy, they may have difficulty coordinating their behavior *even* if they are allowed to communicate with each other. One can imagine that in this “your place or mine” discussion, each side would argue “but I think we should go to my preferred place.” And if neither party is able to commit to a course of action, there is no natural end to the communication that would ensure that they both go to the same venue.<sup>130</sup>

Mediation, however, can help to overcome this coordination problem. Roger Myerson describes how this is possible:

[T]he mediator should toss a fair coin. If it is heads then [the mediator] should recommend that [the players choose opera]; if it is tails then the mediator should recommend that [the players choose ballet]. Neither player could ever expect to gain by disobeying the mediator’s recommendations, if the other player is expected to obey them.<sup>131</sup>

The nonbinding recommendations of the mediator allow the parties to beneficially coordinate their behavior—even in circumstances when binding contracts might not be legally enforceable (because they are not verifiable). The expected payoff to the parties with mediation are 3,<sup>132</sup> more than a three-fold improvement over the unmediated mixed-strategy equilibrium.<sup>133</sup>

As opposed to the rights-based adjudicatory function of binding and nonbinding arbitration,<sup>134</sup> a mediator in this battle-of-the-sexes

<sup>130</sup> In a real-world “battle of the sexes,” external constraints and socialization might impose an end to the communication and ensure that the couple would more frequently go to the venue chosen by the man. Social scientists and legal scholars have observed that women’s socialization and resulting tendency to value relationships can lead them to compromise their individual preferences more frequently than men are socialized to do. See, e.g., Carol Gilligan, *In a Different Voice: Psychological Theory and Women’s Development* 16-17, 42-43 (1982); Deborah Tannen, *You Just Don’t Understand: Women and Men in Conversation* 149-87 (1990); Trina Grillo, *The Mediation Alternative: Process Dangers for Women*, 100 *Yale L.J.* 1545, 1577-78 (1991); Carol M. Rose, *Women and Property: Gaining and Losing* Grond, 78 *Va. L. Rev.* 421, 445 (1992).

<sup>131</sup> Roger B. Myerson, *Multistage Games with Communication*, 54 *Econometrica* 323, 327 (1986).

<sup>132</sup>  $.5(5) + .5(1) = 3$ .

<sup>133</sup> See *supra* note 128 and accompanying text.

<sup>134</sup> See Fuller, *supra* note 79, at 29-30 (the objective of reaching a settlement is different from that of rendering an award, and different information may be relevant to each process). But note that many mediators will use a rights-based approach to reality

game only needs randomly to select one of two signals and transmit this signal to both parties. Indeed, the mediator doesn't even have to know the meaning of the signals (say, "O" and "B"), as long as the disputants do. Although the mediator in a sense makes a recommendation, this recommendation (unlike in nonbinding arbitrations) is not intended to be solemnized by a subsequent contract. To the contrary, the inability of the parties to write contracts that coordinate this dimension of their behavior gives rise to the need for mediation as a substitute for contract.<sup>135</sup>

Although few mediators are instructed to flip coins before making recommendations, the structure of some mediations resemble this simple model: the parties realize that there are great gains from coordinating their activity but disagree about how to coordinate. The choice of an independent mediator can be interpreted as choosing someone whose recommendations are hard to predict with certainty. In practice, of course, the parties retain sufficient control of the outcome that they can avoid feeling completely subject to the mediator's declarations. But the parties' agreement to bring the dispute before a mediator might allow the parties to look to the mediator's action as a focal point to coordinate their behavior. The mediator is expected to recommend coordinated action—but whether coordination will benefit one party or the other is left to mediative chance.

The model also shows that the parties might voluntarily opt for mediation. Thus, in contrast to our conclusion in the discussion of the solicit offer game, it is not necessary legally to mandate mediation in order to ensure the players' participation. In the adverse selection context, the parties' private information induced some

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checking in mediation, comparing a party's position to the likely adjudicative outcome. See Doyle & Haydock, *supra* note 5, at 91; Singer, *supra* note 5, at 20.

<sup>135</sup> In the "battle-of-the-sexes" game, it seems that the parties could explicitly contract to flip a coin (though even under this arrangement the neutral third party might serve as a valuable witness). In other contexts, however, parties' performance will be noncontractible because it is impossible or sufficiently difficult to prove to third parties (such as a court) whether the conduct breaches an explicit or implicit agreement. The "joint venture" mediation game provides a more natural example of noncontractibility. Commentators have suggested that "battle-of-the-sexes" payoffs might arise in a variety of contexts. See, e.g., Jon Elster, *Solomonic Judgments: Against the Best Interest of the Child*, 54 U. Chi. L. Rev. 1, 39 n.116 (1987) (providing an analogy to child custody disputes); Randal C. Picker, *Security Interests, Misbehavior, and Common Pools*, 59 U. Chi. L. Rev. 645, 661 (1992) (providing an analogy to creditor monitoring of debtors).

disputants to resist efficient mediation.<sup>136</sup> But when the bargaining inefficiency is caused solely by moral hazard, the private information is less likely to impede voluntary acceptance of mediation procedures. Indeed, in the battle of the sexes game, the parties have no private information and therefore no strategic barriers to contractually committing to an efficient mechanism.<sup>137</sup> We will return to the distinction between moral hazard and adverse selection problems when we explore the legal implications of this analysis.<sup>138</sup>

### *B. Mediators Can Enhance Coordination By Sending Private Correlated-But-Noisy Signals*

In the battle of the sexes game the mediator's recommendations were made publicly, although there are contexts in which caucusing privately with the parties is necessary to improve coordination. Earlier we showed that mediators could create value by taking information disclosed in a private caucus and transmitting a noisy translation to the other side. In this Section we show that sequential caucusing can create value even if the parties do not disclose any private information to the mediator: sequential caucusing can be useful because it allows the mediator to send private messages to the parties. Perversely, sending noisy signals to the individual parties can enhance a mediator's ability to coordinate the disputants' behavior.

Consider a joint venture game in which two firms must decide whether to make efforts to market a new product. The marketing is a team effort and it is impossible for the firms to write an enforceable contract that they will both work hard—because a court cannot observe *ex post* whether either firm tried.<sup>139</sup>

If both firms “try,” they each expect to earn 80. If one firm shirks and the other tries, the shirking firm earns 100 (by saving the

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<sup>136</sup> See *supra* Part I.A.3.

<sup>137</sup> When there is no private information, there will be no distinction between *ex ante*, *interim*, and *ex post* perspectives (the three terms are defined and distinguished in terms of private information).

<sup>138</sup> See *infra* text accompanying notes 161-71.

<sup>139</sup> Of course, the parties might draft the contract to contain some standards for performance that are objective and easily observable. But in many contracting situations, it will not be possible to observe and verify all important aspects of performance. See Ayres & Gertner, *supra* note 40, at 741.

cost of effort), while the trying firm makes only 30.<sup>140</sup> Finally, if neither tries, the marketing fails and each firm's payoff is 0. The normal form representation of this game is presented in Table 4.<sup>141</sup> The joint gains from trade are maximized if both parties try. But

TABLE 4: JOINT VENTURE GAME

		Firm 2	
		Shirk	Try
Firm 1	Shirk	0,0	100,30
	Try	30,100	80,80

this is not an equilibrium outcome—if a firm believes that the other firm is going to try, it will have an incentive (similar to the incentives of the prisoners' dilemma game)<sup>142</sup> to deviate from the cooperative outcome and begin shirking.

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<sup>140</sup> For example, assume that the firms agree to split total revenues but must bear their costs of effort individually: if both try, the total revenues are 300; if only one tries the total revenues are 200; and if neither tries, the total revenues are 0. In addition, assume that the cost of trying is 70, but that firms can avoid these costs if they shirk. These assumptions generate the payoffs of Table 4:

If both firms try, each will have a net payoff of 80—half of the 300 total revenue minus the 70 cost of trying ( $80 = (300/2) - 70$ );

If one firm tries while the other shirks, the trying firm's net payoff will be 30—half of the 200 total revenue minus the 70 cost of trying ( $30 = (200/2) - 70$ );

If one firm shirks while the other tries, the shirking firm's net payoff will be 100—half of the 200 total revenue minus the 0 cost of shirking ( $100 = (200/2) - 0$ );

If both firms shirk, each will have a net payoff of 0—because both the revenues and the costs are 0.

<sup>141</sup> This game is adapted from Robert J. Aumann, Subjectivity and Correlation in Randomized Strategies, 1 J. Mathematical Econ. 67 (1974); see also Kreps, *supra* note 14, at 411 (describing Aumann's correlated equilibrium).

<sup>142</sup> Prosecutors might create a "prisoners' dilemma" by telling each [prisoner] that he will receive a favorable deal if he cooperates but that he will face full-scale prosecution if he does not." Pamela S. Karlan, Discrete and Relational Criminal Representation: The Changing Vision of the Right to Counsel, 105 Harv. L. Rev. 670, 693 (1992). Even though stonewalling minimizes the total expected jail time, the prisoners' dilemma is that each prisoner has an individual incentive to fink on the other. David A. Lax and James K. Sebenius have analogized the prisoners' dilemma to a game they call the "negotiator's dilemma." Here, the choice is between "creating value" (being open, sharing information about preferences and beliefs, not being misleading about minimum requirements, and so forth) and "claiming value" (being cagey and misleading about preferences, beliefs, and minimum requirements; making commitments and threats; and so forth). Because the

If the parties fail to achieve any form of coordination, the only equilibrium is one in which the players make random choices about whether to try or to shirk. In equilibrium, each firm will try 60% of the time and will earn an expected payoff of 60.<sup>143</sup>

The parties could improve these payoffs by adopting the minimalist mediation process outlined above for the battle of the sexes game—only here when the mediator's flip is heads, the mediator would recommend that firm 1 try and that firm 2 shirk (with converse recommendations when the flip is tails). This minimalist mediation would increase the expected payoff for each player to 65.<sup>144</sup>

But there is another form of mediation that can produce even larger expected gains from trade. Imagine that instead of flipping a coin, the mediator rolls a die and without telling the parties what number came up, goes to the individual firms and makes the private recommendations listed in Table 5:

expected pay-offs of claiming value are greater than for creating value, each party will have a strong incentive to claim, even though this strategy leaves joint gains on the table and yields only a "mediocre" outcome for each. See David A. Lax & James K. Sebenius, *The Manager as Negotiator: Bargaining for Cooperation and Competitive Gain* 29-35 (1986).

In the "joint venture" game, unlike the prisoners' (or negotiator's) dilemma, it is not a dominant strategy for both firms to shirk. If a firm believed that the other firm was going to shirk, it would be in the firm's interest to try. Even though there are great joint incentives for coordinated trying, each firm has private incentives not to coordinate. A firm will want to shirk if its opponent is trying; a firm will want to try if its opponent is shirking. In the prisoners' dilemma game, on the other hand, if one party defects by "finking" or "claiming value," this only increases the other party's incentive to do the same.

<sup>143</sup> For mixed strategies to be an equilibrium one firm's chance of shirking must make the other firm indifferent between trying and shirking. Thus if the probability that firm 2 will try is equal to  $P$ , then:

Firm 1's Expected Payoff from trying =  $80 \times P + 30 \times (1-P)$

Firm 1's Expected Payoff from shirking =  $100 \times P + 0 \times (1-P)$ .

Setting these expected payoffs equal to each other and solving for  $P$  yields:

$$80 \times P + 30 \times (1-P) = 100 \times P + 0 \times (1-P)$$

$$50 \times P + 30 = 100 \times P$$

$$P = 30/50 = 0.6 = 60\%.$$

The expected gains from trade in this equilibrium for each player equal the payoff for a particular outcome multiplied by the probability of that outcome:

$$0 \times (1 - 0.6) \times (1 - 0.6) + 30 \times (1 - 0.6) \times (0.6) + 100 \times (0.6) \times$$

$$(1 - 0.6) + 80 \times (0.6) \times (0.6) = 60.$$

<sup>144</sup>  $(30+100)/2 = 65$ . Following the mediator's recommendation is an equilibrium, because deviating from a "shirk" recommendation reduces the payoff from 100 to 80 and deviating from a "try" recommendation reduces the payoff from 30 to 0.

TABLE 5: JOINT VENTURE MEDIATION MECHANISM  
*Mediator's Recommendations to Firms Conditional  
 on Roll of Die*

		Roll of Die					
		1	2	3	4	5	6
Firm 1	Try	Try	Try	Try	Shirk	Shirk	
Firm 2	Shirk	Shirk	Try	Try	Try	Try	

So, for example, if the mediator rolls a 5, she recommends that firm 1 should shirk and that firm 2 should try.<sup>145</sup> If a firm is told to shirk, it knows with certainty that the other firm is being told to try. Thus, if firm 1 hears a recommendation of “shirk,” it knows that the mediator must have rolled a 5 or a 6 and that the mediator will recommend to firm 2 to try.

If a firm hears a recommendation of “try,” however, it will know only that there is a 50% chance the other firm was told to “try.” Thus, if firm 1 hears a recommendation of “try,” it will know only that the mediator rolled some number between 1 and 4—so that half the time (if the roll was a 1 or a 2) firm 2 will be told to shirk, and half the time (a roll of 3 or 4) firm 2 will be told to try.

Using this form of mediation can induce an equilibrium in which the parties always follow the recommendations of the mediators. Mediation helps the firms avoid the inefficiency of joint shirking (which occurred at times in the mixed strategy equilibrium), and induces both parties to “try” at the same time one-third of the time (an outcome never achieved under the minimalist “coin-flip” mediation).<sup>146</sup>

<sup>145</sup> This mediation mechanism is identical to one using a three-sided die with recommendations (try, shirk); (try, try); (shirk, try). The two mechanisms are identical because with the six-sided die the recommendation for rolls 1 & 2, 3 & 4, and 5 & 6 are identical. A six-sided die is used in this example because this type of die is more commonplace.

<sup>146</sup> The “coin-flip” mediation never caused both firms to try, because the mediator always recommended that one firm try and one firm shirk. In the unmediated game, the firm’s self-interest induced each to try 60% of the time. Counterintuitively, in the unmediated game, both parties try 36% of the time ( $= (0.6)^2$ ), which is a higher proportion of the time than joint trying is observed in the noisy signal mediation (33.3%). But the unmediated mixed strategies are only able to produce this high probability of joint

We can prove that following the mediator's recommendations is an equilibrium by showing that neither party has an incentive to deviate from the recommendation (given that the other firm follows the recommendation). There are two cases of interest. First, if a firm hears a recommendation of "shirk," it knows with certainty that the other firm is being told to try. Given that the other firm is going to follow its recommendation, a firm being told to shirk will not deviate because it will expect to earn 100 if it follows the shirk recommendation and only 80 if it decides to try instead.

The second case to consider is a firm that hears a recommendation of "try." A firm hearing "try" knows that half the time the other firm will be told to try and half the time will be told to shirk. Given that the other firm is expected to follow its recommendation, a firm told to try will not have an incentive to deviate because it expects to earn 55 if it tries (the average of 30 and 80), and only 50 (the average of 100 and 0) if it shirks.<sup>147</sup>

The payoffs in Table 4 were structured so that it was difficult to induce a firm to try if it believed that the other firm was going to try as well. In the minimalist coin-flip mediation, the parties conceded this difficulty and simply decided to achieve the limited efficiency of inducing one firm to try. But in the die mediation, the mediator can induce both firms to try one third of the time (when the die is either 3 or 4) because parties told to try do not know whether their opponent has been told to try or not. This mediation mechanism is an example of what Aumann called a "correlated strategy equilibrium,"<sup>148</sup> because the mediator sends noisy but cor-

cooperation by accepting a high probability of joint shirking. In the unmediated game, both firms shirk 16% of the time ( $= (0.4)^2$ ) and receive nothing, but this never happens with coordinated signals mediation. See *supra* note 142.

<sup>147</sup> More generally it would be possible to construct a random mechanism that told the mediator to recommend:

(try, shirk) with probability  $p_1$ ,

(try, try) with probability  $p_2$ , and

(shirk, try) with probability  $p_1$  where  $2p_1 + p_2 = 1$ ,

and the bracketed terms indicate as follows: (recommendation to firm 1, recommendation to firm 2). In die mediation,  $p_1 = p_2$ . But even in the random mechanism mediation, it will still be an equilibrium for the firms to follow the mediator's recommendation as long as  $p_2 < (3/7)$ . Setting  $p_2 = 3/7$  would increase each firm's expected gains of trade to 71.429 as each firm would earn 80 with  $3/7$  probability and average 65 for the remainder of the time ( $80 \times (3/7) + 30 \times (2/7) + 100 \times (2/7) = 71.429$ ).

<sup>148</sup> Aumann, *supra* note 141, at 71.

related signals (her recommendations) that do not always reveal what she told the other side.<sup>149</sup>

The correlated mediation mechanism creates an equilibrium with higher expected gains from trade than under either the mixed strategy or the minimalist "coin flip" mediation. Under the mixed-strategy equilibrium the expected gains from trade were only 60 and under the coin flip mediation the expected gains are 65—but with the correlated mechanism, the expected gains are 70.<sup>150</sup>

This correlated mediation mechanism has many distinguishing features. First, the mediator is able to increase both firms' payoffs even though the mediator is not able to observe the firms' behavior. The mediator need neither trust nor verify. Second, the communication of information flows solely from the mediator to the individual private parties. In contrast to the job selection game (where the mediator solicited information from the applicant), in this mediation process the mediator has private information and sends noisy signals to the parties about what her information is. Moreover, the information flows from the mediator confidentially; it is communicated to each party alone in private caucuses. Although ADR practitioners also provide adjudicatory predictions ("reality checks") in nonbinding ADR, under this correlated mediation mechanism the mediator's signals (recommendations) are not predictive of an unmediated outcome.<sup>151</sup>

The correlated recommendation of the mediator is also an example of how mediation can be valuable as a form of face saving. The individual firms can explain to their constituencies (say, shareholders) that there are significant expected benefits from following the recommendations of the mediator—even if from time to time the firm ends up being the only party that tries. The firm can make the persuasive argument that it is better to be a coordinated sucker

<sup>149</sup> The die mediation can also be interpreted as an additional example of a "precise, but probabilistically false" signal: when the mediator recommends "try," she is effectively saying "I told the other firm to shirk, but remember that I misrepresent the truth 50% of the time."

<sup>150</sup> The expected return for a firm equals the payoff for a particular outcome multiplied by the probability that the outcome will occur in equilibrium:

$$30 \times (1/3) + 100 \times (1/3) + 80 \times (1/3) = 70.$$

<sup>151</sup> Shavell has shown that even nonpredictive binding arbitration may increase expected gains from trade if it has lower transaction costs than formal litigation and has similar expected outcomes. See Shavell, *supra* note 1, at 14-15.

sometimes than it is to bear the costs of a less coordinated outcome. The mediator then can serve as a scapegoat for the times when the parties' payoffs turn out to be disproportionate.<sup>152</sup> But again the firms should be pleased to accept this partial coordination when contractual attempts to induce joint effort are unenforceable.<sup>153</sup>

### C. Mediators Cannot Mitigate Single-Sided Moral Hazard

Although there is a certain symmetry in our demonstration that mediation can mitigate the twin foes of efficient contracting—adverse selection and moral hazard—it is important to emphasize that mediation as a substitute for contractual incentives can only mitigate moral hazard when multiple parties need to coordinate contractual performance. Moral hazard often distorts the incentives of *individual* contracting parties to perform efficiently, as in the canonical example of an insured person who takes too much risk. Although mediation can enhance coordination when the conduct of more than one party affects the joint gains from trade, mediation cannot change the incentives of a single party. Thus, mediation can mitigate double-sided or multiple-sided moral hazard, but not single-sided moral hazard. Mediators' ability to mitigate moral hazard is limited to the *coordination* of conduct.

In both the battle of the sexes and the joint venture games, mediators were able to establish more efficient equilibria by changing the perceived costs of acting inefficiently. In the battle of the sexes mediation, the mediator's announcement of "opera" or "ballet" changed the players' perception of the payoffs associated with each choice. Once the mediator announces "opera," the player who prefers ballet can be reasonably certain that the only way to spend the evening with the other player is to go to the opera.<sup>154</sup>

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<sup>152</sup> Often mediators play the role of scapegoat to allow parties out of an untenable position or to explain themselves to constituencies. See Deborah M. Kolb, *The Mediators* 24 (1983); Rogers & Salem, *supra* note 7, at 36; Singer, *supra* note 5, at 20; Susskind & Cruikshank, *supra* note 10, at 140.

<sup>153</sup> See Thomas C. Schelling, *The Strategy of Conflict* 71 (1960) ("If one is to make a finite concession that is not to be interpreted as capitulation, he needs an obvious place to stop. A mediator's suggestion may provide it. . .").

<sup>154</sup> The ballet-preferring player's belief is reasonable because there would be little reason that the opera-preferring player would deviate from the recommendation (proposed equilibrium) that both go to the opera.

Given her preferences for companionship *and her new, mediated beliefs about the other player's action*, going to the opera becomes the clear choice. Mediation was effective because it changed each player's belief about how the other player was likely to behave.

This was also true in the joint venture mediation. Without mediation, each firm believed that the other firm was likely to shirk forty percent of the time. Under mediation, however, firms that received a "try" recommendation believed that there was a 50% chance that the other firm would shirk. Perversely, increasing the belief that the other firm will shirk increases a firm's willingness to follow the mediator's "try" recommendation.<sup>155</sup>

If, however, the joint gains from contracting turn on only one party's performance, mediation cannot affect that party's belief about how others will act, because other players have no other action left to take. Returning to the insurance example, mediation would not be effective in changing the incentives of an insured to take inefficient risks, because it is difficult to imagine how mediation would change an insured's belief about how an insurer will act.<sup>156</sup> Mediation is only effective when the players' payoffs are contingent on more than one person's conduct.

### III. IMPLICATIONS FOR LAWMAKERS AND PRACTITIONERS

This Article's analysis can inform our choice of legal rules to govern the mediation process. This Section explores the proper scope of mandatory mediation, professional standards regarding confidentiality, and the appropriate contractual rules governing the mediator's contract with the disputants. We also suggest how mediators can implement some of our results to create value. These stylized suggestions are not a call for legislation or common law rulemaking. Our analysis illustrates, however, how economic

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<sup>155</sup> A firm believing that the other firm has a 50% probability of "shirking" expects to earn 55 from "trying" but only 50 from "shirking." See supra note 147 and accompanying text. Unlike the players in a prisoners' dilemma, a firm will want to try if it believes that the other firm is going to shirk. This is because the profits from being the only firm to try can still be larger than the cost of trying. See supra note 140 (showing if one firm trying will produce gross profits of 200, it is worthwhile for one firm to expend 70 on effort—even if it knows other firm is going to shirk).

<sup>156</sup> One might, however, be able to imagine that the insurer's future decision on whether to be "generous" or "stingy" in paying claims might be a type of executory performance subject to coordination through mediation.

rationales could support certain approaches to mediation regulation and practice.

### A. *Mandatory vs. Voluntary Mediation*

An important implication of both the battle of the sexes game and the joint venture game is that the parties had an incentive to opt for mediation voluntarily. When mediation enhanced gains from trade by fostering more coordinated behavior (mitigating the effects of moral hazard), the parties had a mutual incentive to agree to mediation. Mandatory (including court-ordered) mediation was not necessary.<sup>157</sup> Moral hazard does not need to be cured by mandatory mediation, because voluntary mediation processes should be adopted by the parties when the processes create value.

This finding, however, sharply contrasts with the results of the adverse selection games. In those games, certain types of players would resist voluntarily adopting mediation schemes that enhanced ex ante efficiency. Moreover, the resistance of these players could by itself destroy the value-creating properties of mediation for the remaining players.<sup>158</sup> The same private information that created a barrier to resolving the underlying dispute could also create a barrier to the voluntary adoption of efficient mediation mechanisms.<sup>159</sup> On the other hand, when there is a problem of coordination (or moral hazard) the inefficiencies are not caused by private information, and there is not the same reason to suspect

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<sup>157</sup> See Susan M. Leeson & Bryan M. Johnston, *Ending It: Dispute Resolution in America* 141 (1988) (discussing different contexts where mediation is mandated, including labor contracts and divorce); Andree G. Gagnon, *Ending Mandatory Divorce Mediation for Battered Women*, 15 *Harv. Women's L.J.* 272, 282-90 (1992) (discussing a variety of statutes that mandate mediation in divorce and custody matters); Grillo, *supra* note 130, at 1547 & n.4 (explaining that in some states divorcing couples are required by statute or local rule to enter mandatory mediation to resolve custody disputes). Even "binding" arbitration clauses may not be as mandatory as some of the mediation programs that have evolved. Under the Federal Arbitration Act, for example, one party can trigger the enforcement of an arbitration clause over the other party's preference to go to court by filing a motion to stay and to compel arbitration. If both parties choose to stay in court, however, they can mutually "opt out" by waiving the arbitration clause. See 9 U.S.C. § 3 (1992).

<sup>158</sup> The equilibrium of the solicit offer mediation, for example, might unravel if the high-valuing sellers and the low-valuing buyers were allowed to opt out of the mediation process. See *supra* text accompanying notes 71-75.

<sup>159</sup> See *supra* Part I.A.3.

that the parties would be unwilling to participate in value-enhancing mediation.<sup>160</sup> Thus, mandatory mediation may be needed to mitigate the inefficiencies of adverse selection but is contraindicated when the inefficiency at stake is moral hazard (or a failure to coordinate the players' behavior).

It should be emphasized that adverse selection inefficiency is a necessary, but clearly not a sufficient, condition for mandatory mediation. As is always the case, the costs of imperfectly implementing a mandatory regime may outweigh the benefits of any intervention,<sup>161</sup> especially since our examples suggest that the mediator might be given the power to terminate negotiations.<sup>162</sup>

The wisdom and feasibility of mandated mediation also turns upon the context of the dispute or deal subject to mediation. Frank Sander and Jeffrey Rubin have noted the distinction between "dispute settlement" and "deal making" negotiation.<sup>163</sup> Mandatory mediation is particularly appropriate when a dispute involves parties that did not choose to transact business with each other, as in most tort cases. Mandating mediation in such cases may be wise because the parties involved could not have agreed to resolve their case through mediation prior to the occurrence giving rise to the dispute.<sup>164</sup> Hence, they fit the model we have sketched of parties

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<sup>160</sup> Moral hazard inefficiency is caused by the inability to write enforceable contracts regarding certain aspects of contract formation. But the inability to write a contract about substantive performance should not undermine the parties' ability to adopt a contract about a mediation procedure.

Of course, many disputes will involve elements of both moral hazard and adverse selection. The private information that creates the adverse selection may be sufficient to keep the disputants from solving their moral hazard problems.

<sup>161</sup> For discussion of the ways mandatory mediation in the divorce context might impose costs disproportionately on women, see generally Gagnon, *supra* note 157; Grillo, *supra* note 130.

<sup>162</sup> Underestimating the costs of government regulation has been termed by Harold Demsetz as the "mirvana fallacy." See Harold Demsetz, *Information and Efficiency: Another Viewpoint*, 12 *J.L. & Econ.* 1 (1969); see also Jennifer G. Brown, Posner, Prisoners, and Pragmatism, 66 *Tul. L. Rev.* 1117, 1147 n.136 (1992) (discussing its application in civil remedies); Fred McChesney, *Economics, Law, and Science in the Corporate Field: A Critique of Eisenberg*, 89 *Colum. L. Rev.* 1530, 1543 & n.45 (1989) (discussing same in corporate law).

<sup>163</sup> See Sander & Rubin, *supra* note 25.

<sup>164</sup> But some Fortune 500 companies have signed a pledge in which they agree *ex ante* that if they get into any sort of legal dispute with another signatory of the pledge, they will attempt to resolve the dispute through some form of ADR before filing suit. See Center

who have private information before the time comes to agree to mediation.

When, on the other hand, the subject of the parties' negotiation is their future relationship, the parties may be able to agree to mediation voluntarily.<sup>165</sup> If a state wanted to mandate mediation in order to reduce inefficiencies caused by adverse selection, it might regulate the formation of applicable contracts so that only contracts that were the product of a mediation would be enforceable. This would not enable anyone to force another into mediation simply by proposing a contract, but it would require that if both parties wanted to form an enforceable contract, they would have to use the mediation process to do so.

Our analysis also suggests that the benefits of mandatory mediation might often be achieved by making mediative participation merely a default.<sup>166</sup> For example, lawmakers might imply a default mediation provision into construction contracts in the absence of explicit words to the contrary. Making a mediation agreement an implicit part of an underlying contract would mean that the default mediation provisions would be binding unless *both* parties explicitly opted out of the mediation coverage.<sup>167</sup>

The current policy debate regarding mandatory versus voluntary mediation usually ignores this intermediate possibility. Under mandatory schemes, the mediation process becomes an immutable rule that cannot be altered even by joint agreement. Under voluntary schemes, the default rule is that there is no mediation unless both parties opt in. Under a mediation default, however, an individual disputant could insure that the mediation agreement was binding by refusing to agree to another procedure.

Properly crafted mediation defaults could retain many of the advantages of mandatory mediation. The same private information that makes it difficult for disputants to contract around the current

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for Public Resources, CPR Legal Program to Develop Alternatives to Litigation Brochure (1993).

<sup>165</sup> As health care providers increasingly turn to ADR mechanisms for the resolution of cases, they may ask customers to agree to mediation *prior* to treatment, which could have the effect of transforming a tort case into the sort that could be subjected to mediation by voluntary agreement before the parties gain private information.

<sup>166</sup> See Ayres & Gertner, *supra* note 33.

<sup>167</sup> Contracting out could occur at the time of the initial agreement or at the time of a later dispute.

default and affirmately opt for efficient mediation might also make it difficult for them to contract away from an efficient mediation default. Individual parties may be deterred from proposing less efficient mechanisms, because making such offers may reveal adverse information about their respective valuations.

Solicit offer mediation, however, does not have this “sticky” characteristic. Sellers whose cost is greater than \$75 and buyers whose value is less than \$25 expect never to trade under solicit offer mediation.<sup>168</sup> These negotiators have nothing to lose by offering to opt out of solicit offer mediation—especially because revealing their types signals that trade will need to take place at a more favorable price.<sup>169</sup> Moreover, we showed that in solicit offer mediation, once the parties can infer each other’s value, they may have a mutual incentive to contract around a mediator’s order to terminate negotiations. To be effective, mediated instructions to terminate negotiations must not be subject to contractual modification.<sup>170</sup>

Thus, while the current debate regarding mandatory mediation can be faulted for excluding the possibility of mediation defaults, an economic analysis does not exclude the possibility that mandatory mediation might improve bargaining efficiency.<sup>171</sup> Indeed, one of the powers of our analysis is that by distinguishing adverse selection and moral hazard inefficiencies, it suggests a method for limiting the scope of such intervention.

### *B. Cracking the Chinese Wall of Confidentiality in Caucusing*

A second implication of our analysis stems from our insight that mediators can add value to the negotiation process by revealing private information indirectly and imprecisely. The process of collecting and distributing caucus information can give rise to questions about a mediator’s (implicit or explicit) duties under a mediation contract to maintain the confidentiality of information revealed in caucus.

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<sup>168</sup> See *supra* text accompanying notes 65-66.

<sup>169</sup> Sellers with a high cost signal that the price needs to be high, and buyers with a low value signal that the price needs to be low.

<sup>170</sup> See *supra* text accompanying notes 77-79.

<sup>171</sup> But see Bernstein, *supra* note 1, at 8 (arguing in economic terms that mandating court-annexed nonbinding arbitration is unwarranted).

Various professional standards of confidentiality could be applied to the caucus and the information that emerges there. One standard could be that the mediator not only is barred from disclosing the information to the other party, but also is forbidden to *use* the information in any way—such as formulating questions for the other side, exploring lines of possible agreement, or structuring proposals for agreement.<sup>172</sup> This would be the most restrictive, impenetrable “Chinese wall” type of confidentiality that would prevent the mediator from giving the parties even a benign reassurance that they have room for agreement.<sup>173</sup>

A more flexible standard for confidentiality seems to have emerged in current practice: the mediator has discretion indirectly to reveal information disclosed in caucus, with the exact contours of the mediator’s discretion remaining poorly defined. Because the strictest forms of Chinese wall confidentiality do not allow the mediator to make any use of the caucus information, it seems unlikely that the parties would want the mediation contract to impose this extreme standard of confidentiality.<sup>174</sup> Thus, a flexible standard may comport more with the hypothetical approach to contractual governance, which attempts to fill gaps with the provisions for which the parties would have contracted.<sup>175</sup>

Although this flexible standard has considerable appeal, our analysis suggests that it may be necessary for mediators to give the disputants more specific information about how the mediator intends to use caucus information.<sup>176</sup> Credibly describing how the

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<sup>172</sup> Cf. Model Rules of Professional Conduct Rules 1.6, 1.9 (1983) (forbidding lawyers either to reveal or to use client confidences for the lawyer’s own gain).

<sup>173</sup> Such a statement, after all, would reveal that the parties’ reservation prices overlap and that a zone of agreement exists.

<sup>174</sup> If the mediator were not allowed to take confidential information into account in any way, the parties would have no incentive to disclose private information. The more sensible inference to draw from their disclosure is that the parties have some expectation that the mediator will make use of the information without actually disclosing it, and that this use will facilitate agreement.

<sup>175</sup> See David Charny, *Hypothetical Bargains: The Normative Structure of Contract Interpretation*, 89 Mich. L. Rev. 1815 (1991).

<sup>176</sup> All of our mediation games make the assumption that the mediation process is common knowledge. This is stronger than merely assuming that each party knows about the mediation process; it also assumes that each party knows that the other party knows, and that each party knows that each one knows that the other party knows, and so on. See John Geanakoplos, *Common Knowledge*, 6 J. Econ. Persp. 53 (1992).

information will be used may be necessary to induce the disputants' to disclose accurate information. The common practice of claiming confidentiality and then indirectly disclosing may undermine the individual parties confidence that their disclosures will not be used against them.

We tentatively suggest that the default confidentiality standard should be stricter than the one currently used. We propose a "penalty" default meant to encourage mediators to notify disputants more explicitly about how the mediators intend to use (and not use) caucus information.<sup>177</sup> Mediators would need to give notice of how they intended to use caucus information *before* soliciting this information. A strict confidentiality default would not necessarily reduce a mediator's discretion: some mediators, for example, retain the discretion to disclose any caucus information unless explicitly instructed to the contrary.<sup>178</sup> But it would require mediators to give the disputants notice that such broad discretion was being retained. This strict confidentiality default might be particularly useful because many disputants are uninformed about the real rules of the game and because there seems to be a large gap between the confidentiality talk of practitioners and their actual practice.

In contrast to our discussion of mandatory mediation, our preference is that the confidentiality standard be mutable by private agreement.<sup>179</sup> Because the strict confidentiality default is intended to encourage explicit contracting, it is especially important that the explicit efforts to contract around a default be honored by the

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<sup>177</sup> The term penalty default is extensively discussed in Ayres & Gertner, *supra* note 33. Penalty defaults are intentionally chosen to depart from the hypothetical contract choice in order to encourage the parties to provide more information by contracting around the default standard. In this instance, the strict confidentiality standard would encourage the mediator to give notice that a different mediation procedure would be used.

<sup>178</sup> It is the practice of some mediators to ask a party at the end of the caucus, "Is there anything that you've just told me that you want me to keep from the other side at this time?" Others tell the parties that they will keep all of the caucus communications private unless the party gives them explicit permission to reveal specific pieces of information. See Training Manual, *supra* note 116, at 26 ("Tell them everything they say will be kept confidential unless they instruct otherwise."). Apparently, mediators disagree about whether the approach taken makes any practical difference.

<sup>179</sup> However, when a mediation is mandatory, the law may also need to place limits on the ways that the parties may alter the process to make it meaningless.

courts. As we demonstrated above,<sup>180</sup> mediators can increase the expected gains from trade when they enforce commitments to break off negotiations when private revelations are not sufficiently optimistic. The most straightforward way to make such a commitment credible is to empower mediators by explicit contract. Yet given current judicial practice, the enforcement of such a contract would not be without doubt.<sup>181</sup>

### *C. Implications for Practitioners*

Although practitioners have been adept at recognizing how mediation can overcome psychological barriers to dispute resolution,<sup>182</sup> this Article suggests additional techniques that may be useful in overcoming strategic (or economic) barriers. In practice, mediators will almost always be confronted with both strategic and psychological barriers and thus will need to balance competing methodologies. At times, mediators may even be able to enhance efficiency by dissuading individual players from adopting hyper-rational strategies that lead to pathological equilibria.<sup>183</sup>

Our focus on noisy disclosure also suggests many avenues for mediation training and practice. Mediators need to think more

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<sup>180</sup> See *supra* text accompanying notes 59-62.

<sup>181</sup> For a discussion with examples of this judicial tendency toward nullification, see Charles J. Goetz & Robert E. Scott, *The Limits of Expanded Choice: An Analysis of the Interactions Between Express and Implied Contract Terms*, 73 Cal. L. Rev. 261, 271-72 (1985).

<sup>182</sup> See Mnookin & Ross, *supra* note 4.

<sup>183</sup> For example, the tit-for-tat strategy may be a technically irrational strategy for any individual player to adopt in any individual round of the prisoners' dilemma game, but it may well lead to higher joint gains if the mediator can induce both sides to play. See Robert Axelrod, *The Evolution of Cooperation* (1984) (devising the tit-for-tat strategy as a way out of the prisoners' dilemma in multiple rounds of the game). But see Goldberg, Sander & Rogers, *supra* note 79, at 60-61 (suggesting that provocability and retaliation may work as a tit-for-tat strategy when playing against a computer, but that such strategies could back-fire when used against people, even when multiple rounds allowed for a player to be "forgiving" following the other's defection and subsequent reform).

Further research may be able to illuminate the tradeoff between psychological and strategic barriers by embedding our rational choice models within the more general psychological models of prospect theory. See Lee Ross, *Reactive Devaluation in Negotiation and Conflict Resolution*, in *Barriers to the Negotiated Resolution of Conflict*, *supra* note 4, at ch. 2; Amos Tversky & David Kahneman, *Conflict Resolution: A Cognitive Perspective*, in *Barriers to the Negotiated Resolution of Conflict*, *supra* note 4, at ch. 3; Amos Tversky & David Kahneman, *Advances in Prospect Theory: Cumulative Representation of Uncertainty*, 5 J. Risk & Uncertainty 297 (1992).

carefully about how their use of caucus information will affect the quantity and quality of privately revealed information. Mediators seldom inform the disputants how they will put such information to use<sup>184</sup>—and lack of certainty about the mediator's *modus operandi* may deter parties from coming forward.

Instead of giving lip service to standards of confidentiality which by necessity must be breached, we suggest that mediators should focus on the relative efficacy of different ways of making noisy translations. We have shown that both "imprecise, but true" and "precise, but probabilistically false" translations could serve to overcome adverse selection inefficiency. The latter, which also might be termed commitments to probabilistically lie, is especially provocative, but may be necessary to induce private revelation concerning some dichotomous piece of information (that is, when the information is either X or not-X, and cannot be expressed in more general terms). In our job selection game, the information related to whether the applicant was a poet or a geek, but we can imagine other contexts as well.<sup>185</sup>

Although much of our inquiry has focused on private information in dealmaking, our analysis of adverse selection also applies to more traditional dispute resolution settings. For example, when couples divorce, each parent may have private information about his or her preference for custody. Distinctions between the types of custody could create "types" of disputing parents: those who want 1) full custody for themselves; 2) joint custody; or 3) full custody in the other parent (with rights of visitation for themselves). Adverse selection may lead both parents to demand full custody—even if they do not want it—because each may fear that conceding full custody will allow the other parent to exploit the concession.<sup>186</sup> A mediator might use a form of disclosure analogous to the job-selection game in order to mitigate the effects of this adverse selection.

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<sup>184</sup> Indeed, materials about mediation often mention the caucus as an important part of the process, but do not outline the way a mediator ought to explain the special rules of confidentiality that adhere.

<sup>185</sup> For example, the mediator's recommendation in the joint venture game was also dichotomous: try or shirk. See *supra* note 143 and accompanying text.

<sup>186</sup> See Robert H. Mnookin & Lewis Kornhauser, *Bargaining in the Shadow of the Law: The Case of Divorce*, 88 *Yale L.J.* 950, 972-73 & n.77 (1979).

Although our game-theoretic analysis is highly reductive, it highlights the importance of private information and the mediator's role as a conduit for this information. Because information is the raw material of the mediator's craft, the game-theoretic models of strategic interaction are especially well suited to give mediators an additional perspective on the consequences of their activity.

### CONCLUSION

Private information and the inability of parties to write enforceable provisions regarding certain aspects of performance lead to the twin evils of adverse selection and moral hazard. Rational actors may not be able to avoid these inefficiencies by direct negotiation. This Article has shown, however, that mediation can mitigate both adverse selection and moral hazard.

Mediation can mitigate adverse selection by increasing the amount and quality of information that private parties choose to disclose. Mediators can induce more disclosure by limiting the ability of the other party to adversely exploit the information. In particular, we showed that soliciting offers to split the reported gains from trade and commitments to transmit only noisy translations could increase the parties' individual incentives to reveal information. A mediator's commitment to "add noise" to the disclosures can perversely enhance the quality of the parties' communications because without such commitments the parties might choose to disclose nothing.

We also showed that allowing mediators to terminate negotiations when the reported valuations were not sufficiently optimistic could also increase the expected gains from trade by inducing more truthful valuations. The threat of termination dampens both the buyers' usual incentive to understate their reservation price and the sellers' usual incentive to overstate theirs. This countervailing incentive, created by the threat of termination, increases the costs of private misrepresentation and reduces the inefficiencies of adverse selection.

Mediation can mitigate moral hazard by enhancing the parties' abilities to coordinate performance. In the joint venture game, for example, mediators sent noisy recommendations to the parties to alter their beliefs about how their opponents would act. Simultaneously changing both parties' beliefs could make certain kinds of

coordinated performance possible that would not have been possible by direct communication. Yet we also showed that a mediator's ability to mitigate moral hazard inefficiency was limited to issues of coordination. Mediation can only dampen the moral hazard incentive by altering one player's beliefs about how another player will act. It cannot dampen moral hazard when only one party's incentives need to be improved.

Our core examples of solicit offer, job selection, and joint venture mediation showed that mediators could create value not by adjudicating claims or proposing contractual settlements, but by mediating the flow of information between the parties. These models illustrate how mediators can use private caucusing to send one party a noisy translation of the other party's disclosure or to send both parties a noisy (but correlated) signal about the mediator's recommended equilibrium.

Our suggestion (from the job selection game) that mediators might create value by lying some proportion of the time will strike many as offensive. Our reductive assumption of probabilistic misrepresentation is only a crude way of illustrating the myriad of nuanced ways that mediators may be able to indirectly reveal information. Far from undermining the ethical duties of mediators, our purpose is to place mediation ethics on a firmer footing. Indirect and incomplete revelation of information is central to any economic rationale for mediation. Mediation ethics should recognize this core function and seek to frankly inform private parties and the mediators themselves about the appropriate forms and extent of such disclosure.

Although mediators can create value in many ways, we have focused on sequential caucusing because other ways that mediators create value are not distinctively mediative<sup>187</sup> or do not provide an

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<sup>187</sup> Mediators, for example, may usefully provide individual disputants with reality checks. But reality checks often resemble nonbinding arbitration in attempting to predict the outcome of binding adjudication.

One dissimilarity, however, that is worth exploring concerns whether the submissions are public or private. Nonbinding arbitration is usually based upon submissions that are disclosed to the other side as well as the arbitrator, whereas mediated "reality checks" and similar assessments are more often based on a combination of public and private submissions. One reason for this distinction is that arbitrated predictions are usually right-based whereas mediated predictions are more often interest-based. Cf. Fuller, *supra* note 79, at 37-41 (giving a similar comparison of when arbitration and mediation are most

explanation for how mediators can facilitate trade among rational actors.<sup>188</sup> Although others have succeeded in identifying how mediators can reduce noneconomic barriers,<sup>189</sup> and economists have succeeded in rationalizing other forms of alternative dispute resolution,<sup>190</sup> we hope this paper will serve as a bridge between the diverging literatures and provide a basis for further research.

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appropriate). It may be that adjudication based on private submissions might qualify as another distinctly mediative function that deserves independent analysis.

<sup>188</sup> As discussed in the Introduction, neither strict Chinese wall mediation nor precise transmittal provide economic explanations for how a mediator can enhance the gains from trade.

<sup>189</sup> See Mnookin & Ross, *supra* note 4; sources cited *supra* notes 5 and 6.

<sup>190</sup> See Bernstein, *supra* note 1; Shavell, *supra* note 1.

## APPENDIX

This Appendix explicitly derives the equilibria for three games described in the text: the unmediated “take-it-or-leave-it” negotiations;<sup>191</sup> the solicit offer mediation;<sup>192</sup> and the mediation with “imprecise, but true” translations.<sup>193</sup>

*A. The Unmediated Asymmetric Bargaining Model*

Consider a game in which the players, consisting of a buyer B and a seller S, possess private information regarding their reservation prices. Player B is assumed to value the good at  $v$  dollars. Player S is assumed to face a cost of  $c$  dollars for delivery of the good. “ $v$ ” and “ $c$ ” (the players’ “types”) are distributed independently according to a uniform distribution between \$0 and \$100. Both agents are risk neutral. The seller is assumed to have complete bargaining power, in that she makes one take-it-or-leave-it proposal ( $p$ ) to the buyer, which can either be accepted or rejected by the buyer. Making this offer, however, is costly to S, and she must pay  $\mu$  if she makes an offer. The seller’s cost of making offers is common knowledge. The extensive form representation of this unmediated game is depicted in Figure 6.

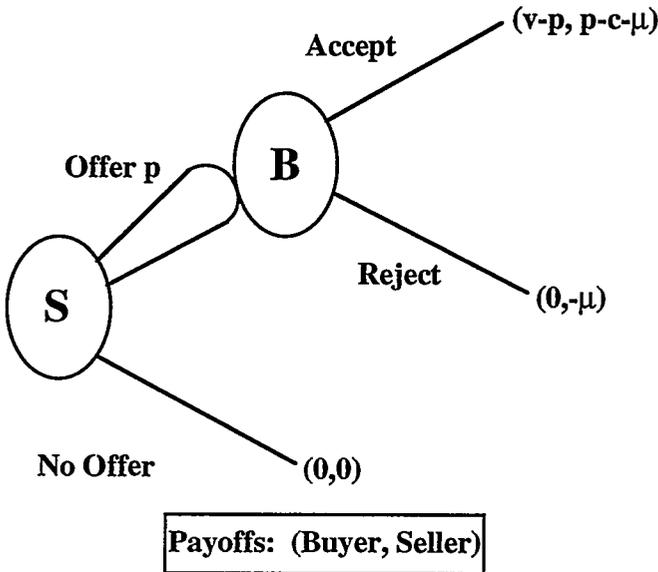
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<sup>191</sup> See supra note 47 and accompanying text.

<sup>192</sup> See supra note 73 and accompanying text.

<sup>193</sup> See supra note 102 and accompanying text.

FIGURE 6  
UNMEDIATED ASYMMETRIC BARGAINING GAME



We will now calculate the equilibrium strategies. The seller will make an offer,  $p$ , that maximizes her expected surplus, if indeed she decides to make an offer. Thus, the seller's objective function, assuming she makes an offer, is the following:

$$\text{Max}_{p \in [0,1]} F(p)(p-c) - \mu \equiv \text{Max}_{p \in [0,1]} \frac{(100-p)}{100} (p-c) - \mu \quad (4)$$

Taking the derivative of (4) with respect to  $p$ , we find the first order condition for expected profits is:

$$\frac{(100-p)}{100} - \frac{(p-c)}{100} = 0 \quad (5)$$

which implies that the optimal bid  $p^*$  for seller  $S$  of type  $c$  who makes a bid is given by:

$$p^*(c) = \frac{c+100}{2} \quad (6)$$

This yields an expected profit for the seller (contingent on making a bid) of:

$$\pi_s(c) = \frac{(100-c)^2}{400} - \mu \quad (7)$$

Assuming this expected profit is nonnegative, then the seller will propose  $p^*(c)$  in equilibrium.

The seller will not make an offer, however, if the expected profit in Equation 7 is negative. It is easily verified that the only sellers who refuse to make offers are the ones for which:

$$\pi_s(c) > 0 \Rightarrow c > 100 - 20\sqrt{\mu} \quad (8)$$

The optimal offering strategy for the seller in this game is thus:

$$\sigma_s^*(c) = \begin{cases} \text{offer } p^*(c) & \text{for } c \leq 100 - 20\sqrt{\mu} \\ \text{no offer} & \text{else} \end{cases} \quad (9)$$

Yielding expected profits for player S:

$$E \pi_s(c) = \begin{cases} (100-c)^2/400 - \mu & \text{for } c \leq 100 - 20\sqrt{\mu} \\ 0 & \text{else} \end{cases} \quad (10)$$

Note that the seller's optimal strategy implies that no buyers with  $v < 50$  will ever receive an acceptable bid from the seller. In essence, the seller excludes these buyers from participating in the market, because there is still a relatively large buyer probability mass above  $v = 50$ , and thus the promise of capturing a large fraction of the distribution of the surplus. This conclusion is consistent with the finding that for many bargaining games, the "spread" that is necessary between the buyer's and seller's valuations to achieve trade effectively eliminates low valuers from the market altogether, and focuses on the "upper tail" of the distribution.<sup>194</sup>

Given the strategy of the seller, the expected payoffs of the buyer are given by equation (11):

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<sup>194</sup> See Ian Ayres, *Fair Driving: Gender and Race Discrimination in Retail Car Negotiations*, 104 Harv. L. Rev. 817 (1991); Chatterjee & Samuelson, *supra* note 43.

$$E \pi_B(v) = \begin{cases} 0 & \text{for } v \leq 50 \\ \frac{(v-50)^2}{100} & \text{for } 50 < v \leq \frac{\bar{c}+100}{2} \\ \frac{\bar{c}}{100} (v-50-\frac{\bar{c}}{4}) & \text{for } v > \frac{\bar{c}+100}{2} \end{cases} \quad \text{where } \bar{c} = 100-20\sqrt{\mu} \quad (11)$$

The first region of this profit function represents the buyers whose reservation price is lower than the sellers' minimum offer. The second region represents the case in which the buyer may receive either unacceptable or acceptable bids from the seller. If the bid is unacceptable, his payoff is zero; if acceptable, his payoff is the difference between his valuation and the bid. The third region represents the case where the buyer's type is so high that he knows he will receive an acceptable bid from all sellers who choose to bid.

In this unmediated game with uniform distributions, the expected (ex ante) social surplus  $S_U(\mu)$  is:

$$S_U(\mu) = \frac{25}{2} - \frac{\mu^{3/2}}{10} \quad (12)$$

### B. Solicit Offer Mediation

Chatterjee and Samuelson showed that when the buyer and seller play the optimal strategies,<sup>195</sup> the expected interim payoffs equal:

$$\pi_b(v) = \frac{(v-25)^2}{200} \quad \text{and} \quad \pi_s(c) = \frac{(c-75)^2}{200} \quad (13)$$

Integrating these interim payoffs with respect to the possible reservation prices yields the "ex ante payoffs."

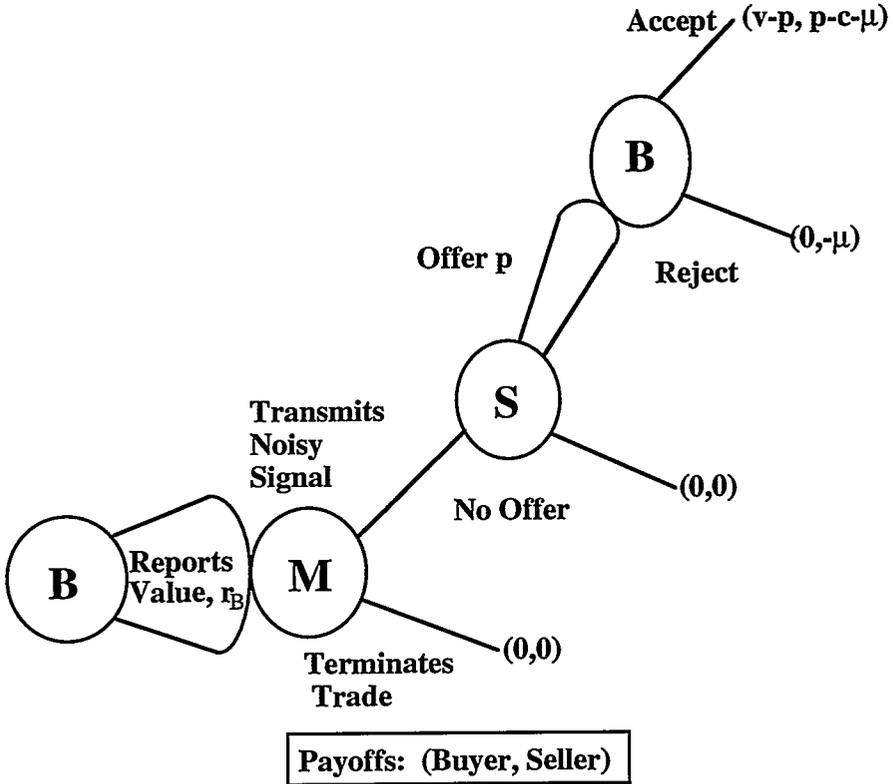
$$\pi_b(v) = \pi_s(c) = \frac{5625}{8} = 7.03 \quad (14)$$

The total expected gains from trade simply equal 14.06, the sum of the buyer's and seller's expected payoffs ( $14.06 = 7.03 + 7.03$ ). The ex ante payoffs from the unmediated take-it-or-leave-it game can be calculated by integrating Equations 7 and 11 and equal 8.33 and 4.16 for the seller and buyer, respectively.

<sup>195</sup> See *supra* notes 54 and 55.

C. Mediation With "Imprecise, But True" Translations

FIGURE 7  
THE MEDIATED ASYMMETRIC BARGAINING GAME



Suppose now that instead of soliciting offers, the mediator merely solicits a precise, private report of the buyer's reservation price. If the reported value is less than 50, the mediator terminates the negotiation. If the reported reservation price is greater than 50, the mediator discloses: "The buyer's reported value was greater than 50" and allows the same unmediated bargaining to proceed (which as above was a take-it-or-leave-it seller offer). The extensive form representation of this game is depicted in Figure 7.

We now describe an equilibrium of the game depicted above. In this equilibrium, all buyers report their precise reservation price.

Hence, for the buyers, truth-telling is an optimal strategy.<sup>196</sup> The optimal bidding strategy for the seller,  $p_M^*$ , in this mediated game for the seller is now:

$$\sigma_M^*(c) = \begin{cases} (c+100)/2 & \text{for } c \leq 1-\sqrt{200\mu} \\ \emptyset & \text{else} \end{cases} \quad (15)$$

yielding expected payoffs:

$$E \pi_{SM}(c) = \begin{cases} (100-c)^2/400 - \mu/2 & \text{for } c \leq c^* \\ 0 & \text{else} \end{cases} \quad \text{where } c^* = 1-\sqrt{200\mu} \quad (16)$$

The mediator's noisy translation enables more sellers to make offers, as  $c^* > \bar{c}$ .

The buyer's expected payoffs are type-dependent as well, and similar in form to the unmediated game. For a buyer of type  $v$ , this expression is given below:

$$E \pi_{BM}(v) = \begin{cases} 0 & \text{for } v \leq 50 \\ \frac{(v-50)^2}{100} & \text{for } 50 < v \leq \frac{c^*+100}{2} \\ \frac{c^*}{100} (v-50-\frac{c^*}{4}) & \text{for } v > \frac{c^*+100}{2} \end{cases} \quad (17)$$

The expected (ex ante) social surplus in this mediated game,  $S_M(\mu)$ , can be found by integrating the buyer's and seller's expected profits and equals:

<sup>196</sup> This is but one Bayesian Perfect Equilibrium of the game. See Fudenberg & Tirole, supra note 18, at 210 (defining this equilibria concept). Truth-telling is an equilibrium largely because the buyers have no affirmative incentive to deviate from telling the truth. But it should be emphasized that they have no great commitment to the truth either. Because the mediator is only passing on an imprecise signal, a buyer is indifferent between reporting any number within the two relevant ranges (greater than 50 and less than 50). Low valuing buyers' indifference, however, includes any possible alternative report. Because they know that they will never trade in equilibrium, and because they can costlessly receive offers in this model, they would be indifferent about even inducing sellers to waste an offer by reporting a reservation price greater than 50. This latter problem of non-uniqueness could be fairly easily corrected by small modifications to the model (e.g., adding acceptance costs for buyers, not allowing sellers a "no-offer" option in the continuation game of the mediated mechanism, etc.). Because the parties are indifferent between reporting a wide number of values, truth-telling is an equilibrium because no party would have an affirmative incentive to deviate from such a proposed equilibrium.

$$S_M(\mu) = \frac{25}{2} - \frac{(2\mu)^{3/2}}{80} \quad (18)$$