The Selection and Signaling Effects of Third-Party Intervention∗

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Abstract

Although mediation is one of the most widely used conflict management techniques, third parties do not always intervene in a conflict as a form of a mediator. Why do some disputes involve mediation while others do not? Do third parties strategically select cases for mediation? How does their decision to intervene influence the outcome of international bargaining? This paper formally analyzes the initiation of mediation and the effects of third parties’ decisions of (non)involvement on the likelihood of war. We find that informed mediators tend to avoid cases in which they expect to be unsuccessful; however, even such self-serving actions can reduce the likelihood of warfare by signaling the intransigence of a disputant to the other side and inducing the latter to make more concessions during bilateral bargaining. The Kargil War of 1999 illustrates this logic.

∗Earlier versions of this paper were presented at the Annual Meeting of the International Studies Association, San Francisco, March 2008, the Annual Meeting of the Midwest Political Science Association, Chicago, April 2008, the First Graduate Student Conference on Political Economy at the Alexander Hamilton Center, NYU, May 2008, and the Annual Meeting of the Peace Science Society (International), Claremont, October 2008. I thank the participants for their comments. I would also like to thank Nicole Asmussen, David Carter, John Duggan, Mark Fey, Hein Goemans, Tasos Kalandrakis, Matthew Platt, Shawn Ramirez, Yoji Sekiya, Curtis Signorino, Alastair Smith, Randall Stone and Robert Trager for helpful comments and suggestions. I am responsible for all remaining errors.

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1 Introduction

Although mediation is one of the most widely used conflict management techniques, third parties do not always intervene in a conflict in the form of a mediator. According to Bercovitch and Houston (1996), only 30 percent of international conflicts have experienced mediation. History offers ample examples of both mediated and unmediated disputes. For instance, the United States, Chile, and the Vatican intervened in the Falkland/Malvinas War, whereas no third parties offered mediation during the Kargil War of 1999. Likewise, the Soviet Union intervened in the Second Kashmir War of 1965, but it did not dispatch any officers to mediate the 1990 crisis between the same combatants. Why do we observe mediation in some conflicts while not in others? More precisely, why is there diversity in behavior among third parties as well as within a third party across conflicts? What are the consequences of third parties’ decisions of (non)involvement? Although there is a rich literature on mediation, little attention has been given to these questions. In the majority of mediation research, scholars analyze the effectiveness of mediation, assuming that a third party has already intervened in a conflict. However, just as mediators’ interests or attributes affect the outcome of international conflicts, they could influence third parties’ decision to mediate. If mediation does not take place randomly, any studies which do not take into account the selection process are subject to faulty inferences (Beardsley 2008; Savun 2008). Using a game-theoretic model, this paper analyzes the conditions under which third parties are most likely to mediate and how their decision to intervene influences the outcome of international bargaining.

Mediation is defined here as a form of third-party intervention which attempts to reduce the likelihood of war by peaceful means. Unlike military intervention, mediation does not rely on military might to end a conflict (Young 1967, 34-35), nor does it assist any disputants to win (Mitchell 1988, 40; Zartman and Touval 1985). While mediators can play a variety of roles in reducing the likelihood of war, we focus only on the informational role of mediation. In the bargaining liter-

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1Mediators can also help disputants save face when they make concessions or serve as a guarantor when they reach an agreement (Touval 1975, 54; Young 1967, 32-37; Zartman and Touval 1985, 34-35).
nature, private information and players’ incentives to bluff cause leaders of states to have different estimates of the likelihood of winning (Blainy 1988, 122) or to have erroneous beliefs about their opponent’s willingness to fight (Fearon 1995, 390-401). Under uncertainty, war occurs because leaders’ misperceptions prevent them from reaching an agreement, or because leaders resort to a costly signal to alter their opponent’s misperception. If third parties obtained disputants’ private information, they could reduce the likelihood of war either by providing a proposal which is acceptable to both parties or by alleviating the disputants’ misperception through signaling. We demonstrate that third parties’ decisions of (non)involvement can be as informative as the disputants’ costly signaling and help to reduce uncertainty without incurring a real risk of war.

Our results suggest that under certain conditions, mediation is most likely to occur if the disputants’ military capabilities are balanced and the potential mediator is impartial. While an uninformed mediator is expected to be most effective if she is biased and intervenes in a conflict where the balance of power is tilted toward her favored party, few third parties intervene in such conflicts. Therefore, an impartial mediator seems to be the most effective in reducing war. More importantly, while informed mediators tend to avoid cases in which they expect to be unsuccessful, even such self-serving actions can reduce the likelihood of war by revealing how intransigent a disputant is to the other side and inducing the latter to make more concessions during bilateral bargaining.

This paper consists of four sections. First, we briefly review the existing literature on mediation, focusing specifically on its onset. Then, we present a game-theoretic model of international mediation and the results of the model. Third, we conduct comparative statics analyses, and employ a case study of the 1999 Kargil War to illustrate our results. We conclude this paper with some implications.

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2 Kydd (2003) demonstrates that under certain conditions, conveying information can also reduce the likelihood of war. However, other scholars are suspicious of the argument that including third parties always decreases uncertainty. For example, Touval (1975) argues that “the chances of misperception and distortions are increased once communications are transmitted through a third party” (61). Smith and Stam (2003) also conclude that mere information transmission is not helpful for reducing the likelihood of war.
2 Information, War, and the Roles of Mediation

The mediation literature is rich in both formal and empirical analyses. Yet the majority of the preceding studies examine the effectiveness of mediation, assuming that a third party has already intervened in the conflict. They address questions, such as whether mediation is effective in reducing conflict (Beardsley 2008; Werner 1999; Wilkenfeld 2003), how the disputants’ power balance affects the efficiency of mediation (Young 1967; Zartman 1981), how the mediators’ attributes, such as bias or power, affect mediation success (Favretto 2009; Kydd 2003; Rauchhaus 2006; Savun 2008; Smith 1985; Smith and Stam 2003; Touval 1975), and how mediators build trust between the disputants (Kydd 2006).

Compared to the effectiveness of the mediation, the initiation of mediation has been given little scholarly attention. Theoretical approaches stress the importance of third-party attributes or interests for the onset of mediation, but their views are conflicting. On the one hand, traditional (normative) approaches argue that third parties initiate mediation for genuine humanitarian interests. In this view, only those parties who have incentives to halt assaults and terminate conflict become mediators. Mediation would take place if there exist third parties motivated by such altruism (Bercovitch 1997, 134; Smith 1985). However, this approach does not explain why even such an impartial mediator chooses a conflict to mediate.

On the other hand, realist (or rational actor) approaches contend that third parties are motivated by self-interest (Mitchell 1988; Schelling 1960; Touval 1975; 1985; 1992; Young 1972; Zartman and Touval 1985). Although mediators are not directly involved in the disputes over the issues at stake, they still have an incentive to promote their own interests. According to Bercovitch (1997), “[f]or many actors, mediation is a policy instrument through which they can pursue some of their interests without arousing too much opposition” (173). Thus, if third parties find that their interests are at stake, they are more likely to intervene in the conflict as a mediator. Yet, this perspective also fails to explain why a third party changes its attitude across time.
While these perspectives weigh the attributes of third parties to explain the onset of mediation, others focus on the characteristics of disputants and the nature of conflict. For example, Ott (1972) and Young (1967) argue that an outsider’s decision of involvement depends on the disputants’ relative power parity whereas Carnevale (1986) contends that it depends on the disputants’ intransigence. Using a quantitative analysis, Greig (2005) shows empirically that disconnection between the enduring rivalries is a key for the initiation of mediation. Following these arguments, recent scholars tend to take into account the selection process when they analyze the efficiency of mediation empirically (Beardsley 2008; Savun 2008).

Although the preceding literature is useful to understand the relationship between the initiation of mediation and the characteristics of the conflict, it provides few explanations for the underlying mechanisms of third-party involvement. Although a game-theoretic analysis is useful to unveil the underlying mechanisms, there exist few formal studies which examine the initiation of mediation. One exception is Terris and Maoz (2005) who demonstrate that mediation is more likely to occur if the nature of conflict is easily transformed into a game of cooperation. While they provide us the conditions for the occurrence of mediation, they do not explain when such a transformation is likely to occur and how other factors affect the onset of mediation. Using a game-theoretic model, we demonstrate how the characteristics of disputes influence the initiation of mediation and how the decisions of (non)involvement affect the outcome of international bargaining.

3 The Model

3.1 Players and Preferences

There are three strategic actors, state A, state B, and the mediator. State A and state B have a conflicting interest over a set of issues, which is represented by the interval $X = [0, 1]$. Like many

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3To avoid confusion, we call third parties mediators throughout this section even if they do not intervene in a conflict.
other interstate bargaining models (Fearon 1995; Powell 2002), we assume that state A’s ideal point is 1 and state B’s is 0. That is, state A prefers higher issue resolutions while state B prefers lower ones. We also assume that state A has private information over the cost of war, which is drawn from a uniform distribution $c_A \sim U[\underline{c}_A, \bar{c}_A]$ while state B’s cost of fighting, $c_B$, is fixed and known. We represent state A’s utility from the outcome $x \in X$ as $u_A(x|c_A) = x$, which is conditional on its cost of war, and state B’s as $u_B(x) = 1 - x$. The mediator’s ideal point is $\hat{x}_m \in [0, 1]$. If $\hat{x}_m$ is less (greater) than $\frac{1}{2}$, the mediator is biased in favor of state B (A) and if it is located around $\frac{1}{2}$, she is impartial. The mediator’s utility function is given by $u_m(x) = -|\hat{x}_m - x|$, which is the negative value of the absolute distance between her ideal point, $\hat{x}_m$ and the realized outcome, $x$. Suppose that if a war occurs, state A’s probability of winning is $p \in [0, 1]$ and that the winner takes the entire pie. If $p$ is greater (less) than $\frac{1}{2}$, then the power balance is tilted in favor of state A (B). If $p$ is around $\frac{1}{2}$, the disputants’ power is roughly balanced. State A’s expected utility for war is $p - c_A$ and state B’s is $1 - p - c_B$, both of which are each players’ probability of winning multiplied by their value of winning minus the cost of war. We assume that $c_A$ and $c_B$ are both nonnegative. Given this, there exists a bargaining range between $p - c_A$ and $p + c_B$ in which both states are better off if they agree on a peaceful settlement within this range. Figure 1 illustrates this.

Although the existing formal literature on mediation tends to assume that third parties have an informational advantage over the disputants (Kydd 2003; 2006; Rauchhaus 2006; Smith and Stam 2003), we allow third parties to choose whether to collect disputants’ private information. Some third parties often have superior intelligence service or personnel deployment which enables them to get access to information while the opponent cannot. This is partly because having such intelligence is very costly and not all parties can afford it. Moreover, warring parties often suspend their diplomatic relations, which leads to a shortage of information. In either case, the disputants rely on outsiders for information about their opponent. For example, during the 1990 Kashmir
Crisis, the government in New Delhi asked the United States to dispatch military attachés to the Line of Control, the *de facto* border between Pakistan and India, in order to monitor Pakistan’s military activities (Perkovich 1999, 338). The Pakistani government also asked the United States to verify the positions of the Indian forces (Chari et al. 2003, 97). Therefore, the United States had an informational advantage over the disputants and the disputants knew it. Also, during the Iranian Hostage Crisis, the United States asked for Algerian mediation because Algeria was one of the few countries that had close diplomatic relations with the Iranian revolutionary regime. The United States knew that Algeria had an informational advantage over Iran and the United States relied on Algeria as a source of information (Sick 1985, 28-30; Slim 1992, 208).

However, not all third parties have an informational advantage. Sometimes collecting information is too costly and even mediators do not have access to the information. When the Vatican initiated mediation during the Beagle Channel dispute, it did not have any informational advantage. In 1990, when the Bush administration decided to dispatch Deputy National Security Adviser Robert M. Gates to abate tension between Islamabad and New Delhi, Soviet Foreign Minister Eduard Shevardnadze was asked to go along with Gates. However, Moscow refused to dispatch personnel because it did not share information with Washington (Hersh 1993, 66; Reiss 1995, 218). These cases suggest that whether to collect information is a strategic decision and third parties gather information only if their interests in conflict overwhelm the cost. Hence, in my model, the first choice of the mediator is whether to collect information on state A’s cost of fighting. The mediator’s decision $z \in \{0, 1\}$ takes a value of 1 when she collects information and 0 otherwise. If the mediator obtains information, $c_A$ is revealed to the mediator, but she has to pay a cost $k > 0$ in return. We call the mediator who collects information an informed mediator and the mediator who does not an uninformed mediator.

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*The Vatican started gathering information after May 4, 1979, when its mediation officially began.*

*When the United States announced the mission, Gates was in Moscow preparing for a summit. The purpose of this mission was not to mediate the conflict by providing a substantive solution but to prevent the escalation of the crisis by alerting the disputants to the possibility of war (Chari et al., 2003, 109). After its refusal, Moscow maneuvered a photo-reconnaissance satellite to monitor Pakistan (Reiss 1995, 218).*
Next, the mediator chooses whether to intervene in the conflict. Since making an offer is one of the mediator’s main roles (Princen 1992, 38-41; Zartman and Touval 1985), we assume that when the mediator intervenes, she makes an offer to both disputants. The mediator’s decision \( w \in \{0, 1\} \) equals to 1 if she offers mediation and 0 otherwise, and if she decides to intervene, she has to bear a cost of intervention. Existing studies reach a consensus that mediation is a costly process (Bercovitch 1997, 134; Greig 2005; Slim 1992, 229; Young 1972, 60; Zartman and Touval 1985, 32). Once involved, third parties might have to expend considerable time and resources to settle the conflict between the disputants.\(^6\) For example, after the 1973 October War, Kissinger served as a mediator for nearly two years (Rubin 1981, 3). Likewise, during the Beagle Channel dispute, the Vatican spent six years settling the dispute, contrary to its initial expectation of six weeks (Princen 1992, 180). Indeed, another reason why the Soviet Union did not go along with Gates in May 1990 was because it did not want to expend its political resources (Hersh 1993, 66). Accordingly, when the mediator chooses to intervene, she makes a proposal \( x \in [0, 1] \) and bears a cost of intervention \( k_w > 0 \). We assume that \( z \) and \( w \) are observable to the public, meaning that both states know whether the mediator collects information and whether she intervenes. The mediator’s utility is \( u_m(x) = -|\hat{x}_m - x| - zk - wk_w \), which is the negative value of the absolute difference between her ideal point and the realized outcome minus the costs of collecting information and intervention. The mediator’s expected utility from war is \( u_m = (-|\hat{x}_m - x_{war}|) = p(-|\hat{x}_m - 1|) + (1 - p)(-|\hat{x}_m - 0|) = -p + 2p\hat{x}_m - \hat{x}_m \), which consists of her expected utilities when state A wins and when state B wins.

In sum, there are four types of mediators: an informed mediator who intervenes in the conflict, an informed mediator who chooses not to intervene, an uninformed mediator who mediates the disputants, and an uninformed mediator who does not intervene in the conflict. Comparing these four types, we analyze which type is superior in reducing the likelihood of war.

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\(^6\)While here we only raise examples of intangible costs, others might address tangible resources, such as financial aid to the disputants. However, since our focus is to examine the mediator as an information-transmitter and not a manipulator, we do not consider the case where the mediator attempts to enlarge the bargaining pie by offering financial assistance.
3.2 Structure of the Game

The interaction between the states and the mediator is represented as a noncooperative game under incomplete information. The game starts with nature’s move. Nature determines the exact value of the random variable $c_A$ and informs state A. Neither the mediator nor state B knows the true value of $c_A$; however, they know that it is drawn from a uniform distribution between $c_A^L$ and $c_A^U$. All players know the other parameters of the model (i.e., $c_A^L$, $c_A^U$, $k$, $k_w$, and $\hat{x}_m$).

After nature determines the value of $c_A$, the mediator decides whether or not to acquire information about state A’s cost of fighting. Recall that the mediator’s decision is publicly observable. If the mediator chooses to incur a cost $k$ to obtain information, then $z = 1$ and $c_A$ is revealed to the mediator but not to state B. If the mediator decides not to collect information, then $z = 0$ and both the mediator and state B remain ignorant of the value of $c_A$.

Next, the mediator chooses whether to intervene in the conflict. When she intervenes by bearing the costs of intervention, $k_w$, she makes a proposal $x \in [0, 1]$ to both states at the next node. When she does not intervene, state B makes an offer $y$ to state A at the next node. If a proposal is provided by the mediator, state A and state B must decide whether to accept the proposal simultaneously. If both states accept the offer, state A and state B will receive $x$ and $1 - x$, respectively. If at least one player rejects the offer, they enter a war. If the mediator does not intervene and an offer is made by state B, state A decides whether to accept the proposal $y$. If state A accepts the offer, $y$ is allocated to state A and $1 - y$ is allocated to state B. If state A rejects the offer, then war ensues. Finally, the outcome is realized and payoffs are assigned in accordance with the utility functions.

3.3 Strategies

Recall that when the mediator intervenes, she makes an offer $x$. The proposal is represented as $x_0$ if the mediator does not possess private information and as $x_1$ if she obtains it.\(^7\) When the mediator

\(^7\)Throughout this paper, the subscripts 0 and 1 indicate the mediator’s informational advantage, with 0 indicating that the mediator does not possess an informational advantage over state B and 1 indicating that she has an informa-
chooses not to intervene, state B proposes a settlement $y$ to state A. The proposal is represented by $y_0$ if state B offers a proposal knowing that the mediator does not collect information and by $y_1$ if state B knows that the mediator has an informational advantage. State A and state B’s decisions of whether to accept the offer are denoted as $a_A$ and $a_B$, respectively. Both $a_A$ and $a_B$ take a value of 1 if they accept the offer and 0 if they reject it.

We denote state A’s pure strategy as $s_A = \{a_A(x_0), a_A(x_1), a_A(y_0), a_A(y_1)\}$. The first two terms are state A’s actions following the uninformed and the informed mediator’s offer $x_0$ and $x_1$, respectively. Such actions are expressed as a function of $x$ because state A’s actions are dependent on the mediator’s offer. The third and the forth term are state A’s actions following state B’s offer when the mediator does not collect information and when she obtains it, respectively. Again, we denote such actions as a function of $y$. Likewise, we let state B’s pure strategy be $s_B = \{a_B(x_0), a_B(x_1), y_0, y_1\}$. The first two terms represent state B’s action observing the uninformed and the informed mediator’s offer, respectively. The last two terms are state B’s offer when the mediator does not possess information and when she obtains it, respectively. Let $s_M = \{z, w_0, w_1(c_A), x_0, x_1(c_A)\}$ be the mediator’s strategy. Recall that $z$ is the mediator’s decision whether to collect information. We denote $w_0$ as the uninformed mediator’s decision whether to intervene and $w_1(c_A)$ as the informed mediator’s decision of (non)intervention. Since the informed mediator’s decision is dependent on state A’s cost of fighting, we express it as a function of $c_A$. Finally, we represent the uninformed mediator’s offer as $x_0$ and the informed mediator’s offer as $x_1(c_A)$, which is also a function of $c_A$.

4 Equilibrium

In this section, we present one equilibrium outcome to this game. Proposition 1 shows the optimal action for state B and the mediator. All mathematical details and proofs omitted from the main text are in the Appendix.
Proposition 1. Given the restrictions of parameters and the refinements, there exists an equilibrium in which it is optimal for state B to offer

\[ y_0 = \frac{p + c_B}{2} \quad \text{and} \quad y_1 = \begin{cases} \frac{2p + c_B - c_A^*}{2} & \text{if } c_B \leq c_A^* \\ p & \text{if } c_B > c_A^* \end{cases} \]

and it is optimal for the mediator to play according to

\[ z = \begin{cases} 1 & \text{if } k \leq k^* \\ 0 & \text{if } k > k^* \end{cases}, \quad w_0 = \begin{cases} 1 & \text{if } k_w \leq k_w^* \\ 0 & \text{if } k_w > k_w^* \end{cases}, \quad w_1(c_A) = \begin{cases} 1 & \text{if } c_A \geq c_A^* \\ 0 & \text{if } c_A < c_A^* \end{cases} \]

\[ x_0 = \frac{p + 2\hat{x}_m(1 - p)}{2}, \quad \text{and} \quad x_1(c_A) = \begin{cases} \hat{x}_m & \text{if } \hat{x}_m \geq p - c_A \\ p - c_A & \text{if } \hat{x}_m < p - c_A \end{cases} \]

First, Proposition 1 states that when an uninformed mediator does not intervene, it is optimal for state B to offer \( y_0 = \frac{p + c_B}{2} \), which is half of the amount of state B’s reservation value. In contrast, if an informed mediator does not intervene, it is optimal for state B to offer \( y_1 = \frac{2p + c_B - c_A^*}{2} \) or \( y_1 = p \), depending on state B’s cost of fighting. Notice that whereas in the former case, the offer depends only on the probability of winning and state B’s cost of war, in the latter, it also depends on the cutpoint \( c_A^* \). The cutpoint is state A’s cost of fighting which makes an informed mediator indifferent between intervening and not intervening.\(^8\) An informed mediator intervenes if state A’s cost of fighting is less than this cutpoint. This suggests that the mediator’s decision of whether to obtain information influences state B’s beliefs and action.\(^9\) If state B’s cost of war is less than or equal to this cutpoint, it is optimal for state B to offer \( y_1 = \frac{2p + c_B - c_A^*}{2} \). If state B’s cost of war is greater than this cutpoint, it is optimal for state B to offer state A’s probability of winning, \( p \).

Notice that if \( c_B \leq c_A^* \), \( \frac{2p + c_B - c_A^*}{2} \) is less than or equal to \( p \), and the former could be smaller than

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\(^8\)In this game, the cutpoint \( c_A^* \) can take three values \( c_A^* = k_w, c_A^* = -c_B + 2k_w, \) or \( c_A^* = -2\hat{x}_m(1 - p) + k_w \).

\(^9\)We provide state B’s beliefs in the Appendix.
\( p - c_A \). In contrast, \( p \) is always within the bargaining range and it will always be accepted by state A. Therefore, if state B’s cost is sufficiently high, war does not occur even if an informed mediator does not intervene. In contrast, if an uninformed mediator chooses not to intervene, state B will offer \( y_0 = \frac{p+c_B}{2} \) in equilibrium. That is, an uninformed mediator’s decision of (non)involvement does not affect state B’s action and beliefs, and if \( \frac{p+c_B}{2} \) is less than \( p - c_A \), war ensues. Therefore, an informed mediator’s decision of whether to intervene in the conflict has the signaling effect which could reduce the likelihood of war.

Next, Proposition 1 shows that the mediator’s decision of whether to obtain information solely depends on the cost of collecting information. It states that \( z = 1 \) if \( k \leq k^* \), meaning that it is optimal for the mediator to obtain information if the cost of collecting information is sufficiently low and not to collect information otherwise. Note that \( k^* \) is a critical value and if the mediator’s cost, \( k \), is less than this value, the mediator will obtain information in equilibrium. Likewise, an uninformed mediator’s decision to intervene is solely dependent on the cost of intervention. Proposition 1 states that \( w_0 = 1 \) if \( k_w \leq k_w^* \); that is, it is optimal for an uninformed mediator to intervene if the cost of intervention is lower than the critical value \( k_w^* \). If an uninformed mediator’s cost of intervention is greater than this value, she will not intervene in equilibrium. Although an uninformed mediator’s decision to intervene depends solely on the cost of intervention, an informed mediator’s decision depends also on state A’s cost of fighting, \( c_A \). Proposition 1 states that \( w_1(c_A) = 1 \) if \( c_A \geq c_A^* \), meaning that it is optimal for an informed mediator to intervene if state A’s cost of fighting is relatively high (i.e., state A is less intransigent). Since if state A’s cost of war is high, mediation is more likely to be successful. This is the selection effect which suggests that we discount the effectiveness of an informed mediator because she tends to select easy cases to intervene.

\[ k^* = \frac{4 \lambda_m (1-p)(p-c_A) + p^2 + c_B^2 + 2 \hat{\lambda}_m^2 + 2 \hat{\lambda}_m}{4p} - k_w, \]
\[ k_w^* = \frac{4p \lambda_m (2-p) - 4c_B p \lambda_m (1-\hat{\lambda}_m) - p^2 - 2 \hat{\lambda}_m + 2 \hat{\lambda}_m^2}{4p} - k_w, \]
\[ k^* = \frac{-2 \lambda_m (1-p) - p^2 + 2 \hat{\lambda}_m}{4p}. \]

\[ k_w^* = \frac{-(c_A + p)^2 - 2c_B p (1-2\hat{\lambda}_m) + 4 \hat{\lambda}_m (1-p)^2 - p^2}{4p} + \hat{\lambda}_m \text{ or } k_w^* = \frac{(2 \lambda_m (1-p) - c_A)^2}{4p}. \]
The final part of Proposition 1 presents the optimal proposal for the mediator. When the mediator intervenes without collecting information, it is optimal to offer \( x_0 = \frac{p + 2 \hat{x}_m (1 - p)}{2} \). While this value is dependent only on \( p \) and \( \hat{x}_m \), when the mediator obtains information, her optimal offer depends also on state A’s cost of fighting. If an informed mediator finds that state A’s cost of fighting is relatively high, \( c_A \geq p - \hat{x}_m \) (i.e., \( \hat{x}_m \geq p - c_A \)), it is optimal to offer her ideal point \( \hat{x}_m \). Instead, if an informed mediator finds that state A’s cost of fighting is relatively low, \( c_A < p - \hat{x}_m \) (i.e., \( \hat{x}_m < p - c_A \)), it is optimal for her to propose \( p - c_A \). This implies that if the mediator knows that state A has an incentive to avoid a costly war, she proposes her most favored outcome. If she finds out that state A is rather intransigent, she offers state A’s reservation value. In either case, if an informed mediator intervenes, her proposal will be accepted by both players and war will not occur. In contrast, if an uninformed mediator intervenes, she offers \( x_0 = \frac{p + 2 \hat{x}_m (1 - p)}{2} \), which could be smaller than the threshold, \( p - c_A \). Therefore, once an informed mediator intervenes, she is more effective in reducing the likelihood of war than an uninformed mediator.

This result also suggests that if an informed mediator is relatively impartial, she has an incentive to manipulate the bargaining outcome. If her ideal point is less than state A’s reservation value (i.e., \( \hat{x}_m < p - c_A \)), she offers \( p - c_A \), whereas if her ideal point is greater or equal to this threshold (i.e., \( p - c_A \leq \hat{x}_m \)), she has an incentive to offer her ideal point \( \hat{x}_m \). In other words, if the mediator’s ideal point is within the bargaining range (i.e., she is relatively impartial), it is optimal to offer her most favored outcome rather than to offer state A’s reservation value. Due to this manipulation, state B receives a smaller allocation of resources. If the mediator proposes state A’s reservation value, state B receives \( 1 - p + c_A \); however, if the mediator instead offers \( \hat{x}_m \), state B would receive \( 1 - \hat{x}_m \). Since \( 1 - p + c_A \geq 1 - \hat{x}_m \), this proposal would make state B worse off. Note that since this manipulation takes place within the bargaining range, it is still optimal for state B to accept the offer. Therefore, this manipulation does not increase the likelihood of warfare.
5 Comparative Statics

In this section, we conduct comparative statics analyses to examine the initiation and the effectiveness of mediation. In particular, we analyze under what conditions mediation is most likely to occur, who is most willing to serve as a mediator, when mediation is most effective in reducing the likelihood of war, and how effective an informed mediator is in reducing the likelihood of war compared to her uninformed counterpart.

5.1 The Initiation of Mediation

Proposition 1 shows that an informed mediator is more likely to intervene if state A’s cost of fighting is high. Now we further investigate how other parameters affect the likelihood of mediation. The following proposition states that if we focus on the cutpoint \( c^*_A = -2\hat{x}_m(1 - p) + k_w \), the likelihood that an informed mediator intervenes increases as the mediator’s idealpoint moves away from 0. If we shift the value of \( \hat{x}_m \) upward, the entire value of \( c^*_A \) goes down. Since the mediator has an incentive to intervene if \( c_A \) is greater than \( c^*_A \), if \( c^*_A \) goes down, more third parties are willing to intervene in equilibrium. Hence, the rise of \( x_m \) increases the likelihood of intervention. From assumption, \( \hat{x}_m \leq \frac{p+2\hat{x}_m(1-p)}{2} \), so the maximum value that \( \hat{x}_m \) can take is 0.5. Thus, this proposition states that as the third party becomes more and more impartial, she is more likely to intervene in a conflict. Proposition 2 also states that if the mediator’s ideal point is sufficiently high relative to the cost of intervention, the likelihood of intervention increases as state A’s probability of winning decreases. If \( \hat{x}_m \) is large enough, \( c^*_A \) increases as \( p \) decreases and the increase of \( c^*_A \) induces more types of third parties to intervene. Thus, the probability of intervention increases as \( p \) decreases. Since we assume \( \hat{x}_m \in [0, p] \), the least possible value that \( p \) can take is the mediator’s ideal point. In other words, \( p \) cannot be smaller than \( \hat{x}_m \). Therefore, if an informed mediator is impartial (i.e., if \( \hat{x}_m \) is around 0.5), she is most likely to intervene if power parity between the disputants exists (i.e. \( p \) is roughly \( \hat{x}_m \)) and if the cost of intervention is sufficiently low. Consequently, under some con-
ditions, mediation is most likely to occur if an informed mediator is impartial and the disputants’ military capabilities are balanced.

**Proposition 2.** Suppose \( c_A^* = -2\hat{x}_m(1-p) + k_w \). If war is stochastic in the sense that \( p \neq 0, 1 \), then an informed mediator is more likely to intervene as the mediator’s ideal point shifts upward. Moreover, if \( 2\hat{x}_m > k_w \), then the likelihood of mediation increases as state A’s probability of winning decreases.

**Proof.** The likelihood of intervention is \( 1 - \frac{c_A^*}{p} = \frac{p+2\hat{x}_m(1-p)-k_w}{p} \). Let \( f = \frac{p+2\hat{x}_m(1-p)-k_w}{p} \). If we take the first derivative with respect to \( \hat{x}_m \), we get \( \frac{\partial f}{\partial \hat{x}_m} = \frac{2(1-p)}{p} \), which is strictly positive as long as \( p, 0, 1 \). Moreover, \( \frac{\partial f}{\partial p} = \frac{-2\hat{x}_m+k_w}{p^2} \), which is strictly negative if \( k_w < 2\hat{x}_m \). \( \square \)

The next proposition focuses on the behavior of an uninformed mediator. It states that if \( k_w^* = \frac{(2\hat{x}_m(1-p)-c_B)^2}{4p} \) and the mediator’s ideal point is high relative to state B’s cost of fighting, then an uninformed mediator is more likely to intervene as state A’s probability of winning decreases or the mediator’s ideal point increases. Recall that an informed mediator has an incentive to intervene if the cost of intervention \( k_w \) is less than \( k_w^* \). The value \( \frac{(2\hat{x}_m(1-p)-c_B)^2}{4p} \) decreases as \( p \) decreases or as \( \hat{x}_m \) shifts away from 0. Thus, the decrease in \( p \) or increase in \( \hat{x}_m \) reduces the values of \( k_w \), which increases the likelihood of mediation. Moreover, since \( \hat{x}_m \) can be at most 0.5 and \( p \) cannot be smaller than \( \hat{x}_m \), Proposition 3 says that an impartial mediator is most likely to intervene if power parity between the disputants exists.

**Proposition 3.** Consider the case where \( k_w^* = \frac{(2\hat{x}_m(1-p)-c_B)^2}{4p} \) and \( \hat{x}_m > \frac{c_B}{2(1-p)} \). An uninformed mediator is more likely to intervene as state A’s probability of winning decreases, or as the mediator’s ideal point moves away from state B’s.

**Proof.** The partial derivative of \( k_w^* \) with respect to \( p \) is \( \frac{\partial k_w^*}{\partial p} = \frac{(2\hat{x}_m(1-p)-c_B)(-2p\hat{x}_m-2\hat{x}_m+c_B)}{4p^2} \), which is strictly negative if \( \hat{x}_m > \frac{c_B}{2(1-p)} \). Likewise, if we take the partial derivative with respect to \( \hat{x}_m \), we get \( \frac{\partial k_w^*}{\partial \hat{x}_m} = \frac{(2\hat{x}_m(1-p)-c_B)(1-p)}{p} \), which is strictly positive if \( \hat{x}_m > \frac{c_B}{2(1-p)} \). \( \square \)
Consequently, both informed and uninformed mediators are more likely to intervene as state A’s probability of winning decreases or as they become more and more impartial.

### 5.2 Honest Broker vs. Biased Intermediary

Now we analyze whether a mediator is actually effective in reducing the likelihood of war. From Proposition 1, we know that if an informed mediator intervenes, she proposes an offer that both states will accept, so war will not occur. For this reason, we focus on the effectiveness of an uninformed mediator. Proposition 4 posits that the likelihood of war increases as state A’s probability of winning increases or as the mediator becomes more biased toward state B. If the mediator intervenes without collecting information, the likelihood of war is \( \frac{p-2\hat{x}_m(1-p)}{2p} \). This is the probability that the mediator’s offer, \( x_0 = \frac{p+2\hat{x}_m(1-p)}{2} \), is less than state A’s reservation value, \( p - c_A \). Since \( \frac{p-2\hat{x}_m(1-p)}{2p} \) increases as \( p \) increases or \( \hat{x}_m \) decreases, the likelihood of war increases as state A’s military capability overwhelms state B’s or as the mediator’s bias toward state B increases. Moreover, given that \( \hat{x}_m \) can be at most 0.5 and \( p \) cannot be less than \( \hat{x}_m \), Proposition 4 states that the likelihood of war decreases as an uninformed mediator becomes more and more impartial or as the military balance between the disputants becomes more balanced.

**Proposition 4.** Suppose war is stochastic in the sense that \( p \neq 0, 1 \) and the mediator’s ideal point does not coincide with state B’s ideal point. If the mediator does not collect information, then the probability of war increases as state A’s probability of winning increases or as the mediator’s ideal point decreases.

**Proof.** The likelihood of war is \( \frac{p-2\hat{x}_m(1-p)}{2p} \). Let \( f = \frac{p-2\hat{x}_m(1-p)}{2p} \). The partial derivative with respect to \( p \) is \( \frac{\partial f}{\partial p} = \frac{\hat{x}_m}{p^2} \), which is strictly positive if \( p \neq 0 \) or \( \hat{x}_m \neq 0 \). Likewise, \( \frac{\partial f}{\partial \hat{x}_m} = -\frac{1-p}{p} \), which is strictly negative unless \( p = 0 \) or \( p = 1 \). \( \square \)

Hence both the mediator’s ideal point and the power balance can affect the likelihood of war. Now we explore which combination of these parameter values is most effective in reducing the
likelihood of war. Proposition 5 argues that war is less likely when an uninformed mediator is biased in favor of state B and the balance of power is tilted toward state B than when the mediator is impartial and power parity exists.

**Proposition 5.** Let \( p > p' \) and \( \hat{x}_m > \hat{x}'_m \). Suppose \( \frac{p(1-p')}{p'(1-p)} > \frac{\hat{x}_m}{\hat{x}'_m} \). War is less likely to occur when both the mediator’s ideal point and state A’s probability of winning take low values than when both parameters take relatively high values.

**Proof.** The probability that war occurs if an uninformed mediator intervenes is \( \frac{p-2\hat{x}_m(1-p)}{2p} \). With some algebra, we can easily show that \( \frac{p-2\hat{x}_m(1-p)}{2p} > \frac{p'-2\hat{x}'_m(1-p')}{2p'} \) holds if \( \frac{p(1-p')}{p'(1-p)} > \frac{\hat{x}_m}{\hat{x}'_m} \). □

Hence, Proposition 5 shows that under some conditions, a biased mediator can reduce the likelihood of war more than an impartial mediator. Although this finding is not new (Kydd 2003; Calvert 1985), our result is different from Kydd (2003) in that a mediator is more effective if she is biased toward a *stronger* party. We speculate that such difference comes from the assumption that we impose: while Kydd focuses on an informed mediator, we are looking at an uninformed mediator.\(^\text{12}\)

[Figure 2 about here.]

Figures 2 (a) - (c) present numerical examples of how the probability of war shifts as we change the values of parameters. The outcomes vary depending on the range of the parameters \( \hat{x}_m \) and \( p \).

In Figure 2 (a), \( \hat{x}_m \) takes any value between 0.1 and 0.5 and \( p \) takes any value between 0.6 and 0.9. In this example, war is least likely when the mediator is impartial and state A has a slightly greater chance of winning. The minimum value of the likelihood is 0.155. In Figure 2 (b), \( \hat{x}_m \) takes any value between 0.1 and 0.4 and \( p \) takes any value between 0.01 and 0.5. Here, war is least likely if power parity exists and the mediator is relatively impartial. The minimum likelihood value of war

\(^{12}\)Since we impose some restrictions on the values that the parameters can take, we are not able to analyze how the mediator is effective in reducing the likelihood of war if she is biased in favor of state B while the power balance is tilted toward state A.
is 0.085. Hence, in this example, power parity is more effective in reducing the likelihood of war than the mediator’s impartiality. However, Figure 2 (c) illustrates that for any $\hat{x}_m \in [0.01, 0.05]$ and $p \in [0.1, 0.9]$, war is least likely if the mediator is biased toward state B (but not too biased) and state B’s military capability overwhelms state A’s. Here, the minimum value of the likelihood of war is 0. Therefore, a biased mediator is most effective in reducing the likelihood of war if power balance is tilted toward her favored party. However, from the Proposition 2, we know that few informed biased third parties intervene in such conflicts. Therefore, an impartial mediator seems to be more effective in reducing the probability of war. Given this selection effect, our results coincide with the preceding studies which argue that the smaller the power differences between the adversaries, the greater the effectiveness of international mediation (Young 1967, 43-4; Zartman 1981, 150).

So far we have looked at the likelihood of war in equilibrium where mediation actually took place. In order to examine the real effectiveness of a mediator, we need to compare it with the case where intervention does not take place. Hence we now analyze the impact of intervention by comparing the likelihood of war when an uninformed mediator intervenes and when she does not. The next proposition provides the conditions under which an uninformed mediator is actually effective in reducing the probability of war. It states that if state B’s cost of fighting is sufficiently low, then an uninformed mediator can reduce the likelihood of war through intervention.

**Proposition 6.** If $c_B < 2\hat{x}_m(1 - p)$, then the likelihood of war is smaller when an uninformed mediator intervenes than when she does not.

**Proof.** When an uninformed mediator intervenes, she will propose $x_0 = \frac{p + 2\hat{x}_m(1 - p)}{2}$. When she does not intervene, state B will propose $y_0 = \frac{p + c_B}{2}$. War occurs if these offers are less than state A’s reservation value, $p - c_A$. Thus, the probability of war when an uninformed mediator intervenes is $\frac{p - 2\hat{x}_m(1 - p)}{2p}$ and when she does not is $\frac{p - c_B}{2p}$. The inequality $\frac{p - 2\hat{x}_m(1 - p)}{2p} < \frac{p - c_B}{2p}$ holds as long as $c_B < 2\hat{x}_m(1 - p)$. \qed
Accordingly, when an uninformed mediator intervenes in a conflict, it could reduce the likelihood of war if state B’s cost of fighting is relatively low.

5.3 Signaling Effects

Finally, we look at the case where an informed mediator does not intervene. From Proposition 1, we know that if \( c_B > c_A^* \), that is, if state B’s cost of fighting is sufficiently high, war will not occur because state B will make a concession by proposing \( p \) which state A will always accept. Hence, we focus on the case where \( c_B \leq c_A^* \). Proposition 7 shows the conditions under which an informed mediator can reduce the likelihood of war even if she does not intervene in a conflict. It states that if state B’s cost of fighting and the mediator’s cost of intervention are sufficiently low, the likelihood of war when an informed mediator does not intervene is less than the probability of war when an uninformed mediator either intervenes or does not intervene.

**Proposition 7.** Suppose \( c_B < 2\hat{x}_m(1 - p) \) and \( c_A^* = -2\hat{x}_m(1 - p) + k_w \).\(^{13}\) The likelihood of war is smaller when an informed mediator decides not to intervene than when an uninformed mediator either intervenes or does not intervene if \( k_w < \frac{c_B + 2\hat{x}_m(1 - p)^2}{2\hat{x}_m(1 - p)} \).

**Proof.** Since we assume \( c_B \leq c_A^* \), state B will offer \( \frac{2p + c_B - c_A^*}{2} \) if an informed mediator does not intervene. Hence, the probability of war if an informed mediator does not intervene is \( \frac{c_B}{-4\hat{x}_m(1 - p) + 2k_w} + \frac{1}{2} \) and the likelihood of war if an uninformed mediator intervenes is \( \frac{p - 2\hat{x}_m(1 - p)}{2p} \). The former is smaller than the latter if \( k_w < \frac{c_B + 2\hat{x}_m(1 - p)^2}{2\hat{x}_m(1 - p)} \). \( \square \)

Proposition 7 posits that under some conditions, an informed third party can reduce the likelihood of war even if she does not intervene in the conflict. This happens because of signaling effects. From Proposition 1, we know that informed third parties tend to select themselves into the cases where they expect to be successful. This suggests that if no informed third party intervenes,\(^{13}\)

\^13 If we suppose \( c_B < 2\hat{x}_m(1 - p) \) and \( c_A^* = -c_B + 2k_w \), then the same result holds if \( k_w < \frac{c_B + 2c_A\hat{x}_m(1 - p)}{4\hat{x}_m(1 - p)} \). We can prove this case in the same way.
disputants update their beliefs about the opponent’s resolve based on a third party’s decision of nonintervention. That is, a third party’s decision of noninvolvement signals how intransigent the opponent is to the other disputant. Accordingly, after observing an informed third party’s decision of noninvolvement, the disputants are more willing to make concessions during bilateral bargaining in order to avoid a costly warfare. In the next section, we illustrate these signaling effects focusing on the Kargil war of 1999 which took place between India and Pakistan.

6 The Kargil War of 1999

The Kargil War began in early May 1999, when Pakistani-backed militants crossed the Line of Control (LoC) and moved into the Drass-Kargil-Batalik sector in Ladakh. It was the first military confrontation between India and Pakistan after their nuclear tests in May 1998. The mountainous terrain around Kargil endures heavy snowfalls during the winter which render military operations exceedingly difficult. It had been the tradition for both armies to evacuate their military positions in the fall and to recapture them at the advent of spring. In the spring of 1999, Pakistani troops returned to the Northern Light Infantry earlier than usual and occupied the strategically important heights on the Indian side of the LoC (Ganguly 2001, 114). Since the Pakistani intruders took positions from which they could overlook a supply route of the Indian forces, Pakistan initially enjoyed a strategic advantage. After suffering heavy losses, the Indian government embarked on Operation Vijay and launched air strikes to evict the Pakistani intruders. By mid-June, the Indian Army had recaptured the key heights, turning the tide in their favor (Qadir 2002, 27; Anand 1999). Facing intense counterattacks, Pakistani Prime Minister Nawaz Sharif visited Washington on July 4, to appeal for U.S. mediation. Although the United States has been collecting information on both disputants through satellite photographs and the deployment of military attachés, the Clinton administration refused to get involved in the conflict as a mediator (Clinton 2004, 864). Nonetheless, during Sharif’s visit, a joint statement was released by these two leaders, in which Pakistan
agreed to withdraw its troops and to resolve the dispute through bilateral talks. Moreover, on July 11, Pakistani and Indian forces concluded a cease-fire agreement (Wirsing, 2003, 84) and on the following day, Sharif publicly announced the withdrawal of the militants from the Indian side of LoC. Consequently, the Kargil War was defused by the end of July, 1999 (Ganguly 2001, 120).

Why did Pakistan withdraw its troops despite the absence of a mediator? The existing literature tends to stress that U.S. intervention provided a face-saving device for Sharif, who was reluctant to withdraw his troops in fear that it would end his tenure (Quadir 2002, 29). By announcing the joint statement, the United States gave Pakistan an excuse to withdraw its troops without incurring high domestic audience costs (Sidhu 2006, 178). However, such arguments are misleading for two reasons. First, it does not explain why Pakistan did not withdraw its troops when General Anthony Zinni, the commander-in-chief of the U.S. Central Command, visited Islamabad in late June. The Clinton administration dispatched Zinni on June 24 to urge Pakistan to call off its troops. Had Pakistan just wanted a face-saving arrangement, it could have used Zinni’s visit as an excuse for pullout. Yet, Pakistan did not show any signs of withdrawal when Zinni was in Pakistan. Second, although Clinton and Sharif announced the joint statement, Clinton disavowed getting involved in the conflict as a mediator (Clinton, 2000, 864). In the joint statement President Clinton agreed to put the sentence “the President would take personal interest to encourage an expeditious resumption and intensification of the bilateral efforts (i.e., Lahore) once the sanctity of LOC had been fully restored”; however, the President had already supported the bilateral talks and for Clinton the sentence only meant “a Pakistani withdrawal” (Riedel 2002, 13). If the US involvement would work as a face-saving devise, there does not seem to be enough reasons for the US refusal of mediation.

15 Some may suspect the main reason why Pakistan did not use this opportunity to withdraw was because Zinni was not U.S. President. However, when Deputy National Security Adviser Robert M. Gates visited both India and Pakistan during the 1990 crisis, both countries agreed to de-escalate the crisis. Many scholars and U.S. officials argue that Gates mission played an important role in providing a face-saving arrangement. See for example, Hagerty (1995/96).
17 Vajpayee and Sharif signed the Lahore Declaration on February 1999 after Vajpayee’s visit to Lahore in Pakistan.
Indeed, the joint statement did not prevent Sharif from facing domestic criticism. Opposition parties criticized Sharif for pulling back the troops while getting nothing in return. Sayed Salahuddin, the commander of the Jihad council, also denounced the joint statement as a betrayal. The former director general of the Inter Services Intelligence, General Hamid Gul and others criticized Sharif by saying that Pakistan “lost a war in Washington that had already been won in Kargil” (Jones 2002, 100). According to the New York Times, “[b]y retreating, Pakistan has invited internal instability as religious fundamentalists, army dissidents and others mobilize against Mr. Sharif’s regime”. Eventually, Sharif’s leadership was terminated with a military coup initiated by General Pervez Musharraf on October 12, 1999. Hence, the joint statement did not work as a face-saving device.

In this paper, we rather argue that Indian intransigence led to the U.S. reluctance to mediate and that U.S. noninvolvement credibly signaled India’s determination and the risk of escalation to the Pakistani leadership. After observing the US reluctance of involvement, Sharif was finally convinced that India’s intransigence was not bluff and it was better to pull out his troops. The war had broken out partly because Pakistan was suspicious of the Indian leaders’ willingness and commitment to protect their territory (Ganguly 2001, 121). Although India initially made an attempt to show its resolve through diplomatic bargaining, such cheap talk did not work on Pakistan’s leaders. On June 12, when Indian Minister of External Affairs Jaswant Singh met with Pakistani Foreign Minister Sartaj Aziz, Singh made it clear that Pakistan must evacuate from the Indian-held territory and restore the status quo ante. However, Aziz refused to meet such requests unless India first quit its military assaults. Therefore, diplomatic bargaining did not work to convince Pakistani leaders to withdraw their troops.

19See Guardian, 8 July 1999, 17.
22The public statement did not help the Indian government credibly show its resolve either. On June 7, Vajpayee publicly stated that Indian armies would not stop fighting until they dislodged the Pakistani intruders (New York Times,
Moreover, prior to the crisis, Pakistani leaders believed that the United States would intervene in the conflict. The fact that both counties were now nuclear seemed to encourage the international community to intervene in the conflict to prevent an escalation. The internationalization of the conflict would work in favor of Pakistan to offset its disadvantages in bilateral bargaining (Ganguly 2001; Wirsing 2003). Ganguly (2001) states that “[i]n making this incursion, the Pakistani leadership simply assumed that the United States and other major states would step in to prevent an escalation of the crisis.... They also believed that these states would bring concerted pressure on India to desist from taking any [action that might cause escalation]” (122). Pakistan hoped that intervention would place strong pressure on Indian leaders to make compromises during negotiations.

Contrary to Pakistan’s expectation, however, the United States did not support Pakistan and refused to get involved in the conflict. There are several reasons why the United States did not offer mediation. First, the cost of intervention seemed too high for the United States because there seemed to be no easy solution. The United States “remained loath to step into a region riven by a long-standing dispute with little or no prospect of easy or quick resolution” (Ganguly 2001, 119). Moreover, through its reconnaissance satellites and diplomatic contacts, the United States knew that India was so intransigent that it would also increase the cost of intervention. The main reason for Indian intransigence was that the benefits of the settlement did not overwhelm the costs of war. Like Pakistani leaders, the Indian government was also aware that internationalization of the conflict would work against India. Therefore, it was reluctant to accept the U.S. mediation. Finally, the United States did not get involved in the conflict because it was no longer strongly biased in favor of Pakistan. While the United States had had close diplomatic ties with Pakistan during the Cold War, it has tilted toward India during this crisis. According to Ataöv (2001), “[t]he Kargil episode caused an unequivocal tilt in U.S. policy in favor of India...” (158). For these reasons, the United States refused to get involved in this conflict.

8 July 1999, A9; Ganguly 2001, 118). However, it did not trigger the Pakistan’s pullout.
Sharif’s visit to Washington was vital to the conflict ending because he was finally convinced that the United States would not intervene in the conflict and that Indian intransigence was not a bluff. Riedel (2002) states that “[w]hatever hopes Sharif and the rest of the Pakistani leadership had of getting American support for their Kargil adventure vanished that afternoon in Washington” (16). The United States made its signal credible by not involving itself in the crisis. Had the United States’ response been more sympathetic, it “might have emboldened [Sharif] to allow the Pakistani military to persist with their plans. However, in the face of escalating losses and a paucity of international diplomatic support, Sharif was forced to reconsider the value of continuing military operations” (Ganguly 2001, 120). Therefore, Sharif decided to withdraw his forces despite the absence of a mediator.

7 Conclusion

In this paper, we analyze the conditions under which mediation is most likely to occur and how a third party’s decision of (non)intervention affects the outcome of international bargaining. We find that if disputants’ military capabilities are balanced and potential mediators are impartial, mediation is most likely to take place. Notably, under some conditions, an uninformed mediator is expected to be most effective in reducing the likelihood of war if she is biased and intervenes in a conflict where the power balance is tilted toward her favored party. However, few third parties intervene in such conflicts; therefore, an impartial mediator seems to be most effective in reducing the likelihood of war. This illustrates how selection effects influence the outcome of international bargaining. While some types of mediator seem to be most effective, they do not always intervene in a conflict. Unless mediation takes place randomly, we need to take into account the selection process of third-party involvement. More importantly, we find that if conflict occurs as a result of information asymmetry and states’ incentives to bluff, an informed mediator can reduce the likelihood of war by sending a costly signal. Given the fact that offering mediation is costly, a
potential mediator’s decision of whether to intervene in a conflict can be as informative as the disputants’ costly signals. Since third parties tend to avoid cases in which they expect to be least successful, their decision of noninvolvement can reveal how intransigent a disputant is to the other party and induce the latter to make more concessions during bilateral bargaining. We illustrate this signaling effect using the Kargil War of 1999.

While the importance of selection effects has been stressed in the empirical mediation literature (Beardsley et al. 2006, 75; Crescenzi et al., 2008; Savun 2008), few theoretical studies exist to show the underlying mechanisms. Moreover, the preceding literature tends to neglect the signaling effects of third-party intervention. In this paper, we demonstrate how selection effects affect the efficiency of mediation as well as how signaling effects influence the outcome of international bargaining.

While we assume that a third party intervenes in a conflict because of its interests in the outcome of bargaining, it may intervene in a conflict due to external factors. During the Cold War, the United States intervened in some conflicts to prevent the Soviet Union from extending its influence in the region. According to Mitchell (1988), “acting as an intermediary can be used as a deliberate strategy to exclude others’ influence from the region — usually the influence of a global or regional rival” (41). For this reason, the United States intervened in the conflicts in Rhodesia (Zartman and Touval 1985, 33) and the ones in the Middle East (Kalb and Kalb 1974, 193; Touval 1975, 65). Such possibilities might prevent us from observing signaling effects; however, the end of the Cold War may allow us to observe the occurrence of mediation without concern for its external causes. Of the crises where no mediation took place, 27 percent ended with an agreement (Wilkenfeld et al., 2003, 287). This suggests that third parties possibly influence the outcome of a conflict even if they do not intervene in the conflict.

Major powers are often criticized when they choose not to intervene in a conflict on the ground that intervention does not promote their self-interests. Yet, our study suggests that even such apparently self-serving actions can reduce the likelihood of war by alleviating the information
asymmetry between the disputants, one of the major causes of international war.

8 Appendix

In this Appendix, we provide the proofs of Proposition 1. We restrict parameter values such that \( p + c_B < 1 \) and \( \bar{c}_A = p \) and \( c_A = 0 \), meaning that state B’s reservation value is less than state A’s ideal point and state A’s reservation value is greater than state B’s ideal point. We also focus on the case where \( \hat{x}_m \in [p - \bar{c}_A, p - c_A] \) and \( \hat{x}_m \leq \frac{p + 2\hat{x}_m(1-p)}{2} \leq p - c_A \), that is, the mediator’s ideal point can be at most 0.5 and state A’s likelihood of winning always takes a value which is at least as good as the mediator’s ideal point.

Proof. We provide the proofs in 6 steps. In the first 4 steps, we show state A and B’s optimal actions. Then, we present the mediator’s optimal actions of whether to intervene and of whether to collect information.

8.1 Case 1: \( z = w = 0 \)

First, we look at the case where the mediator does not possess private information and she decides not to mediate. In this subgame, state B makes an offer \( y_0 \) and state A decides to accept or reject. We start with state A’s optimal action, which is given by

\[
a_A(y_0) = \begin{cases} 
1 & \text{if } y_0 \geq p - c_A \\
0 & \text{if } y_0 < p - c_A.
\end{cases}
\]

Now consider, state B’s optimal action. The expected utility for state B is

\[
Eu_B(y_0) = \left( \frac{p - y_0}{p} \right) (1 - p - c_B) + \left( \frac{y_0}{p} \right) (1 - y_0),
\]

25
so state $B$ will propose $y_0^{23}$ such that

$$y_0^* \in \arg\max_{y_0 \in [0, p]} u_B(y_0).$$

Since the objective function is a concave function of $y_0$ and the constraint set is convex, we can find the solution by solving the first order condition:

$$\frac{\partial u_B}{\partial y_0} = \left(\frac{p - y_0}{p}\right)(1 - p - c_B) + \left(\frac{y_0}{p}\right)(1 - y_0) = \frac{p + c_B - 2y_0}{p} = 0.$$

This equation yields $y_0 = \frac{p + c_B}{2}$. By definition, $0 < \frac{p + c_B}{2}$ and $c_B \leq p$, that is, $\frac{p + c_B}{2} \leq p$. Therefore, $\frac{p + c_B}{2}$ is the maximizer and it is optimal for state $B$ to offer $y_0 = \frac{p + c_B}{2}$.

Now, consider the mediator’s expected utilities when she does not collect information nor does she intervene. If state $B$ offers $y_0 = \frac{p + c_B}{2}$, then it is optimal for state $A$ to play according to

$$a_A(y_0) = \begin{cases} 1 & \text{if } \frac{p + c_B}{2} \geq p - c_A \\ 0 & \text{if } \frac{p + c_B}{2} < p - c_A. \end{cases}$$

Hence, the mediator’s expected utilities are

$$Eu_m \left( y_0 = \frac{p + c_B}{2} \right) = \begin{cases} \left(\frac{p + c_B}{2p}\right) \left( -p + 2p\hat{x}_m - \hat{x}_m \right) + \left(\frac{p + c_B}{2p}\right) \left( \frac{p + c_B}{2} + \hat{x}_m \right) & \text{if } \hat{x}_m \leq \frac{p + c_B}{2} \\ \left(\frac{p + c_B}{2p}\right) \left( -p + 2p\hat{x}_m - \hat{x}_m \right) + \left(\frac{p + c_B}{2p}\right) \left( -\hat{x}_m + \frac{p + c_B}{2} \right) & \text{if } \hat{x}_m > \frac{p + c_B}{2}. \end{cases}$$

8.2 Case 2: $z = 1, w = 0$

Next, consider the subgame where the mediator obtains information but she chooses not to intervene. In this subgame, state $B$ makes an offer $y_1$ and state $A$ decides to accept or reject. Let $c_A^*$ be the cutpoint where the mediator is indifferent between intervening and not intervening. We assume

$^{23}$We impose the constraint $y_0 \leq p$ since offering any $y_0 \in (p, 1]$ is strictly dominated.
that if state A’s cost of war is high, the potential mediator is more willing to intervene. Based on this assumption, state B will update her belief about state A’s type after observing the informed mediator’s decision of (non)intervention. The range of the updated belief is $c_A \in [0, c_A^*]$. As before, it is optimal for state A to play according to

$$a_A(y_1) = \begin{cases} 
1 & \text{if } y_1 \geq p - c_A \\
0 & \text{if } y_1 < p - c_A.
\end{cases}$$

The expected utility for state B is

$$Eu_B(y_1) = \left(\frac{p - y_1}{c_A^*}\right) (1 - p - c_B) + \left(\frac{c_A^* - p + y_1}{c_A^*}\right) (1 - y_1),$$

so state B will propose $y_1^*$ such that

$$y_1^* \in \arg\max_{y_1 \in [0, p]} u_B(y_1).$$

This objective function is also concave and the constraint set is convex, so we can find the solution by solving the first order condition:

$$\frac{\partial u_B}{\partial y_1} = \left(\frac{p - y_1}{c_A^*}\right) (1 - p - c_B) + \left(\frac{c_A^* - p + y_1}{c_A^*}\right) (1 - y_1) = \frac{2p + c_B - c_A^* - 2y_1}{p} = 0.$$ 

This equation yields $y_1 = \frac{2p + c_B - c_A^*}{2}$. Since $c_A^* < 2p + c_B$, $\frac{2p + c_B - c_A^*}{2} > 0$. If $\frac{2p + c_B - c_A^*}{2} \leq p$, that is, if $c_B \leq c_A^*$, then $\frac{2p + c_B - c_A^*}{2}$ is the maximizer. If $c_B > c_A^*$, then the boundary $p$ is the maximizer.

24 As before, we impose the constraint $y_1 \leq p$. 

27
Accordingly, it is optimal for state B to play according to

\[
y_1 = \begin{cases} 
\frac{2p + c_B - c_A^*}{2} & \text{if } c_B \leq c_A^* \\
p & \text{if } c_B > c_A^*. 
\end{cases}
\]

Hence, if \( c_B > c_A^* \), that is, if state B’s cost of fighting is sufficiently high, state B makes a concession by offering \( p \) and war will not take place.

Finally, let us find the mediator’s expected utility. When state B offers \( y_1 = \frac{2p + c_B - c_A^*}{2} \), it is optimal for state A to play according to

\[
a_A(y_1) = \begin{cases} 
1 & \text{if } \frac{2p + c_B - c_A^*}{2} \geq p - c_A \\
0 & \text{if } \frac{2p + c_B - c_A^*}{2} < p - c_A,
\end{cases}
\]

and when state B offers \( y_1 = p \), state A will always accept. Therefore, when the informed mediator does not intervene, her expected utilities are as follows:

\[
Eu_m\left(y_1 = \frac{2p + c_B - c_A^*}{2}\right) = \begin{cases} 
-\frac{2p + c_B - c_A^*}{2} + \hat{x}_m - k & \text{if } \frac{2p + c_B - c_A^*}{2} \geq p - c_A, c_B \leq c_A^*, \text{ and } \hat{x}_m \leq \frac{2p + c_B - c_A^*}{2} \\
-\hat{x}_m + \frac{2p + c_B - c_A^*}{2} - k & \text{if } \frac{2p + c_B - c_A^*}{2} \geq p - c_A, c_B \leq c_A^*, \text{ and } \hat{x}_m > \frac{2p + c_B - c_A^*}{2} \\
-p + 2p\hat{x}_m - \hat{x}_m - k & \text{if } \frac{2p + c_B - c_A^*}{2} < p - c_A, \text{ and } c_B \leq c_A^*, \text{ and } \hat{x}_m > \frac{2p + c_B - c_A^*}{2}
\end{cases}
\]

\[
Eu_m(y_1 = p) = -p + \hat{x}_m - k & \text{ if } c_B > c_A^*.
\]

8.3 Case 3: \( z = 0, w = 1 \)

Third, consider the subgame where the mediator intervenes without any informational advantage. In this case, the mediator makes an offer and state A and state B simultaneously decide whether to
accept the offer. Given the refinement, it is optimal for state A and state B to play according to

\[
\begin{align*}
    a_A(x_0) &= \begin{cases} 
        1 & \text{if } x_0 \geq p - c_A \\
        0 & \text{if } x_0 < p - c_A
    \end{cases}, \\
    a_B(x_0) &= \begin{cases} 
        1 & \text{if } x_0 \leq p + c_B \\
        0 & \text{if } x_0 > p + c_B
    \end{cases}.
\end{align*}
\]

Next, consider the mediator’s optimal action. Since \( \hat{x}_m \in [0, p] \), offering any \( x_0 \in (p, 1] \) is strictly dominated. So the mediator makes an offer between 0 and \( p \), which state B always accepts. Hence, the probability of war depends solely on state A’s action. The mediator’s expected utility is

\[
Eu_m(x_0) = \left( \frac{p - x_0}{p} \right) (p(-|\hat{x}_m - 1|) + (1 - p)(-|\hat{x}_m - 0|)) + \left( 1 - \frac{p - x_0}{p} \right) (-|\hat{x}_m - x_0|) - k_w
\]

\[
= \left( \frac{p - x_0}{p} \right) (-p + 2p\hat{x}_m - \hat{x}_m) + \left( \frac{x_0}{p} \right) (-|\hat{x}_m - x_0|) - k_w.
\]

To find an optimal action, we need to look at two cases: 1) \( \hat{x}_m \leq x_0 \) and 2) \( \hat{x}_m \geq x_0 \). First consider the case where \( \hat{x}_m \leq x_0 \). In this case, the mediator’s expected utility is

\[
Eu_m(x_0) = \left( \frac{p - x_0}{p} \right) (-p + 2p\hat{x}_m - \hat{x}_m) + \left( \frac{x_0}{p} \right) (-x_0 + \hat{x}_m) - k_w,
\]

so the mediator will propose \( x_0^* \) such that

\[
x_0^* \in \arg\max_{x_0 \in [\hat{x}_m, p]} u_m(x_0).
\]

Again, \( Eu_m(x_0) \) is a concave function of \( x_0 \) and the constraint set is convex, so we can find the solution by solving the first order condition:

\[
\frac{\partial u_m}{\partial x_0} = \left( \frac{p - x_0}{p} \right) (-p + 2p\hat{x}_m - \hat{x}_m) + \left( \frac{x_0}{p} \right) (-x_0 + \hat{x}_m) - k_w = \frac{p - 2p\hat{x}_m + 2\hat{x}_m - 2x_0}{p} = 0.
\]

This yields \( x_0 = \frac{p + 2\hat{x}_m(1 - p)}{2} \). By assumption, \( \hat{x}_m \leq \frac{p + 2\hat{x}_m(1 - p)}{2} \leq p \), so \( \frac{p + 2\hat{x}_m(1 - p)}{2} \) is the maximizer. The
expected utility for the mediator is

\[ Eu_m(x_0) = \frac{p + 2\hat{x}_m(1-p)}{2} \]

\[ = \left( \frac{p - 2\hat{x}_m(1-p)}{2p} \right) \left(-p + 2p\hat{x}_m - \hat{x}_m\right) + \left( \frac{p + 2\hat{x}_m(1-p)}{4p} \right) \left(-p + 2p\hat{x}_m\right) - k_w. \]

(4)

Now, consider the case where \( x_0 \leq \hat{x}_m \). Under this condition, the mediator’s expected utility is

\[ Eu_m(x_0) = \left( \frac{p - x_0}{p} \right) \left(-p + 2p\hat{x}_m - \hat{x}_m\right) + \left( \frac{x_0}{p} \right) \left(-\hat{x}_m + x_0\right) - k_w, \]

so the mediator will propose \( x_0^* \) such that

\[ x_0^* \in \arg\max_{x_0 \in [0, \hat{x}_m]} u_m(x_0). \]

Since the objective function is concave and the constraint set is convex, we can find the solution by solving the following first order condition:

\[ \frac{\partial u_m}{\partial x_0} = \left( \frac{p - x_0}{p} \right) \left(-p + 2p\hat{x}_m - \hat{x}_m\right) + \left( \frac{x_0}{p} \right) \left(-\hat{x}_m + x_0\right) - k_w = \frac{p - 2p\hat{x}_m + 2x_0}{p} = 0. \]

This equation yields \( x_0 = \frac{2p\hat{x}_m - p}{2} \). If \( \frac{2p\hat{x}_m - p}{2} < 0 \), that is, if \( \hat{x}_m < 0.5 \), then the endpoint \( \hat{x}_m \) is the maximizer. Hence, \( 0 < \frac{2p\hat{x}_m - p}{2} \) holds if \( 0.5 < \hat{x}_m \). However, by assumption, \( \hat{x}_m \leq \frac{p + 2\hat{x}_m(1-p)}{2} \), that is, \( \hat{x}_m \leq 0.5 \), so \( \hat{x}_m \) cannot be strictly greater than 0.5. If \( \hat{x}_m = 0.5 \), then \( Eu_m(x_0 = \frac{2p\hat{x}_m - p}{2}) < Eu_m(x_0 = \hat{x}_m) \). Therefore, \( x_0 = \hat{x}_m \) is the maximizer. The mediator’s expected utility when \( x_0 \leq \hat{x}_m \) is

\[ Eu_m(x_0 = \hat{x}_m) = \left( \frac{p - \hat{x}_m}{p} \right) \left(-p + 2p\hat{x}_m - \hat{x}_m\right) - k_w. \]

(5)

By comparing (4) and (5), and given the assumption \( \hat{x}_m \leq 0.5 \), we get \( Eu_m(x_0 = \frac{p - 2p\hat{x}_m + 2\hat{x}_m}{2}) \geq Eu_m(x_0 = \hat{x}_m) \). Thus, it is optimal for the uninformed mediator to offer \( x_0 = \frac{p + 2\hat{x}_m(1-p)}{2} \).
8.4 Case 4: $z = 1, w = 1$

Now consider the case where the mediator intervenes after collecting state A’s private information. In this case, from the refinement, it is optimal for state A and state B to play according to

$$a_A(x_1) = \begin{cases} 1 & \text{if } x_1 \geq p - c_A \\ 0 & \text{if } x_1 < p - c_A, \end{cases}$$

$$a_B(x_1) = \begin{cases} 1 & \text{if } x_1 \leq p + c_B \\ 0 & \text{if } x_1 > p + c_B. \end{cases}$$

Let $\hat{c}_A = p - \hat{x}_m$ and let $x$ be an arbitrary offer made by the informed mediator. State B’s beliefs are as follows. In the case where $\hat{x}_m \leq x \leq p - c_A^*$, state B will believe $c_A = p - x$ with probability 1. In the case where $x = \hat{x}_m$, state B’s belief will be given by a uniform density over $[\hat{c}_A, p]$. In the case where $x > p - c_A^*$, state B will believe $c_A = c_A^*$ with probability 1. That is, if state B observes $x > p - c_A^*$, it will believe that state A’s cost of fighting that the mediator observes is equal to $c_A^*$. In the case where $x < \hat{x}_m$, state B’s belief will be given by a uniform density over $[\hat{c}_A, p]$.

Next, we consider the informed mediator’s optimal offer. Suppose $\hat{x}_m \geq p - c_A$. If the mediator offers $x_1 = \hat{x}_m$, then it will be accepted and her expected utility is $Eu_m(x_1 = \hat{x}_m) = -k - kw$ and no other proposal can make the mediator better off. Now suppose $\hat{x}_m < p - c_A$. If the mediator offers $x_1 = p - c_A$, then her expected utility is $Eu_m(x_1 = p - c_A) = -p + c_A + \hat{x}_m - k - kw$. If she offers $x_1 < p - c_A$ or $p + c_B < x_1$, then war ensues and her expected utility for war is $Eu_m(x_1) = -p + 2p\hat{x}_m - \hat{x}_m - k - kw$. Since $-p + c_A + \hat{x}_m - k - kw \geq -p + 2p\hat{x}_m - \hat{x}_m - k - kw$, offering $x_1$ such that $x_1 < p - c_A$ or $p + c_B < x_1$ is not her optimal action.\(^{25}\) If she offers $x_1$ such that $p - c_A < x_1 \leq p + c_B$, then the offer is accepted and her expected utility is $Eu_m(x_1) = -x_1 + \hat{x}_m - k - kw$. Since $-p + c_A + \hat{x}_m - k - kw > -x_1 + \hat{x}_m - k - kw$, it is optimal for the mediator to offer $x_1 = p - c_A$.

\(^{25}\) The equation holds if $x_m = c_A = 0$ or if $p = 1$ and $c_A = 0$. 

31
Accordingly, it is optimal for the informed mediator to play according to

\[ x_1(c_A) = \begin{cases} 
\hat{x}_m & \text{if } \hat{x}_m \geq p - c_A \\
p - c_A & \text{if } \hat{x}_m < p - c_A.
\end{cases} \]

Note that state A will always accept such an offer. Therefore, war will not take place if the informed mediator intervenes. The expected utilities for the mediator are

\[ Eu_m(x_1(c_A) = \hat{x}_m) = -|\hat{x}_m - \hat{x}_m| - k - k_w = -k - k_w \text{ if } \hat{x}_m \geq p - c_A \]  
\[ Eu_m(x_1(c_A) = p - c_A) = -|p - c_a - \hat{x}_m| - k - k_w = -p + c_A + \hat{x}_m - k - k_w \text{ if } \hat{x}_m < p - c_A. \]  

8.5 The Mediator’s Decision to Intervene

Now, we examine the conditions under which the mediator makes her decision of intervention and find the cutpoint \( c^*_A \). We need to consider two cases: one in which the mediator collects information and the other in which she does not. We first look at the case where the mediator does not have any informational advantage, that is, we compare (1) and (4). Suppose \( \hat{x}_m \leq \frac{p + c_B}{2} \). The mediator is indifferent between intervening and not intervening if

\[ Eu_m \left( y_0 = \frac{p + c_B}{2} \right) = Eu_m \left( x_0 = \frac{p + 2\hat{x}_m(1 - p)}{2} \right) \]

that is,

\[ -4c_Bp\hat{x}_m + 4c_B\hat{x}_m - c_B^2 = 4\hat{x}_m^2 - 8p\hat{x}_m^2 + 4p^2\hat{x}_m^2 - 4pk_w \]

that is,

\[ 4pk_w = 4\hat{x}_m^2(1 - p)^2 - 4c_B\hat{x}_m(1 - p) + c_B^2 \]

that is,

\[ k_w = \frac{(2\hat{x}_m(1 - p) - c_B^2)}{4p}. \]
Therefore, if $\hat{x}_m \leq \frac{p+c_B}{2}$, it is optimal for the mediator to play according to

$$w_0 = \begin{cases} 
1 & \text{if } k_w \leq \frac{(2\hat{x}_m(1-p)-c_B)^2}{4p} \\
0 & \text{if } k_w > \frac{(2\hat{x}_m(1-p)-c_B)^2}{4p}.
\end{cases}$$

Next, suppose $\frac{p+c_B}{2} < \hat{x}_m$. The mediator is indifferent between intervening and not intervening if

$$\text{Eu}_m\left(y_1 = \frac{p + c_B}{2}\right) = \text{Eu}_m\left(x_1 = \frac{p + 2\hat{x}_m(1-p)}{2}\right)$$

that is,

$$-4p\hat{x}_m + 4c_Bp - 4c_Bp\hat{x}_m + c_B^2 = -2p^2 + 4\hat{x}_m(1-p)^2 - 4pk_w$$

that is,

$$4pk_w - 4p\hat{x}_m = -2p^2 - c_B^2 - 4c_Bp + 4c_Bp\hat{x}_m + 4\hat{x}_m(1-p)^2$$

that is,

$$4p(k_w - \hat{x}_m) = -(p^2 + 2pc_B + c_B^2) - 2c_Bp + 4c_Bp\hat{x}_m + 4\hat{x}_m(1-p)^2 - p^2$$

that is,

$$k_w = \frac{-(c_B + p)^2 - 2c_Bp(1 - 2\hat{x}_m) + 4\hat{x}_m(1-p)^2 - p^2}{4p} + \hat{x}_m.$$ 

Thus, it is optimal for the uninformed mediator to play according to

$$w_0 = \begin{cases} 
1 & \text{if } k_w \leq \frac{-(c_B + p)^2 - 2c_Bp(1 - 2\hat{x}_m) + 4\hat{x}_m(1-p)^2 - p^2}{4p} + \hat{x}_m \\
0 & \text{if } k_w > \frac{-(c_B + p)^2 - 2c_Bp(1 - 2\hat{x}_m) + 4\hat{x}_m(1-p)^2 - p^2}{4p} + \hat{x}_m.
\end{cases}$$

Second, we consider the case where the mediator intervenes after collecting information. When the mediator does not intervene, the mediator’s expected utilities are either (2) or (3), depending on the conditions, and when the mediator chooses to intervene, her utilities are (6) or (7), depending on the conditions. Although it is possible for the mediator not to change her action regardless of the values of $c_A$, we are interested in the cases where the mediator takes different actions, depending on the values of $c_A$. Notice that when $c_A \geq p - \hat{x}_m$, the mediator offers $x_1(c_A) = \hat{x}_m$, which makes her utility constant, $-k - k_w$. When her expected utility is constant, we cannot expect any cutpoints.\(^{26}\)

\(^{26}\)The only exception occurs when $\text{Eu}_m(y_1) = \text{Eu}_m(x_1)$; that is, when the mediator’s utilities for intervening and not intervening are identical at $c_A \geq p - \hat{x}_m$. However, we focus on the cases where these two utilities cross at a single
Accordingly, we only look at the case where \(c_A < p - \hat{x}_m\) (i.e., we only look at (7)).

The cutpoint \(c_A^*\) can exist under one of the following conditions: either \(c_A^* < c_B\) or \(c_B \leq c_A^*\). First, we seek conditions where we can find a cutpoint such that \(c_A^* < c_B\). Suppose \(c_A^* < c_B\). Compare (3) and (7). Fixing \(c_A\) at \(c_A^*\), the mediator is indifferent between intervening and not intervening if

\[
Eu_m(y_1 = p|c_A = c_A^*) = Eu_m(x_1 = p - c_A|c_A = c_A^*)
\]

that is,

\[
-p + \hat{x}_m - k = -p + c_A^* + \hat{x}_m - k - k_w
\]

that is, \(c_A^* = k_w\).

This suggests that \(c_A^* < c_B\) is equivalent to \(k_w < c_B\) and \(c_A^* < p - \hat{x}_m\) is equivalent to \(k_w < p - \hat{x}_m\), both of which satisfy the assumption \(k_w < c_B \leq p - \hat{x}_m\). Thus, \(c_A^* = k_w\) is a cutpoint and it is optimal for the mediator to play according to

\[
w_1(c_A) = \begin{cases} 
1 & \text{if } c_A \geq c_A^* \\
0 & \text{if } c_A < c_A^*.
\end{cases}
\]

Second, we consider the cases where we can find a cutpoint such that \(c_B \leq c_A^* < p - \hat{x}_m\). There are two possibilities. First, we compare the first case of (2) and (7).\(^{27}\) The mediator is indifferent between intervening and not intervening if

\[
Eu_m\left(y_1 = \frac{2p + c_B - c_A^*}{2}|c_A = c_A^*\right) = Eu_m(x_1 = p - c_A|c_A = c_A^*)
\]

that is,

\[
\frac{2p + c_B - c_A^*}{2} + \hat{x}_m - k = -p + c_A^* + \hat{x}_m - k - k_w
\]

that is, \(c_A^* = -c_B + 2k_w\).

\(^{27}\)Note that under the condition \(c_B \leq c_A^* < p - \hat{x}_m\), \(\hat{x}_m > \frac{2p + c_B - c_A^*}{2}\) does not hold. So we do not consider the second case of (2).
This is a cutpoint if \( \frac{2p + c_B - c_A^*}{2} \geq p - c_A, c_B \leq k_w \) and \( \hat{x}_m \leq \frac{2p + c_B - c_A^*}{2} \) (i.e., \( \hat{x}_m \leq p + c_B - k_w \)) all hold. Therefore, if these conditions hold, it is optimal for the mediator to play according to

\[
   w_1(c_A) = \begin{cases} 
     1 & \text{if } c_A \geq c_A^* \\
     0 & \text{if } c_A < c_A^*,
   \end{cases}
\]

where \( c_A^* = -c_B + 2k_w \) is a cutpoint.

Second, we compare the third case of (2) and (7). The mediator is indifferent between intervening and not intervening if

\[
   Eu_m(\hat{y}_1 = \frac{2p + c_B - c_A^*}{2}|c_A = c_A^*) = Eu_m(\hat{x}_m|c_A = c_A^*)
\]

that is, \(-p + 2p\hat{x}_m - \hat{x}_m - k = -p + c_A^* + \hat{x}_m - k - k_w\)

that is, \(-2\hat{x}_m(1 - p) + k_w = c_A^*\).

This is a cutpoint if both \( \frac{2p + c_B - c_A^*}{2} < p - c_A \) and \( c_B \leq -2\hat{x}_m(1 - p) + k_w < p - \hat{x}_m \) hold. Therefore, if these conditions hold, then \( c_A^* = -2\hat{x}_m(1 - p) + k_w \) is a cutpoint and it is optimal for the mediator to play according to

\[
   w_1(c_A) = \begin{cases} 
     1 & \text{if } c_A \geq c_A^* \\
     0 & \text{if } c_A < c_A^*,
   \end{cases}
\]

8.6 The Mediator’s Decision to Collect Information

Finally, we analyze the conditions under which the mediator collects state A’s private information. Recall that the mediator’s expected utilities when she does not obtain information are (1) if the mediator does not intervene and (4) if she does. When the mediator collects information, her expected utilities are (2) or (3) if she does not intervene and (6) or (7) if she intervenes. To save the space, here we only provide the proof for the cases where \( k_w < c_B \) holds. However, we can solve
other cases (i.e., the cases where \( c_B \leq k_w < p - \hat{x}_m \) holds) in the same way.

In this case, the informed mediator will intervene if \( c_A \geq c_A^* \). When the mediator intervenes, she will offer a different proposal, depending on the values of \( c_A \). If \( p - c_A \leq \hat{x}_m \), then the mediator proposes \( x_1(c_A) = \hat{x}_m \) and receives (6). If \( p - c_A > \hat{x}_m \), then the mediator proposes \( x_1(c_A) = p - c_A \) and receives (7). When the informed mediator does not intervene, state B makes an offer \( p \) which state A always accepts. So the mediator receives (3). Accordingly, the mediator’s expected utility from collecting information is

\[
Eu_m(z = 1) = \int_{p - \hat{x}_m}^{p} (-k - k_w) \frac{1}{p} dc_A + \int_{c_A^*}^{\hat{x}_m} (-p + c_A + \hat{x}_m - k - k_w) \frac{1}{p} dc_A + \int_{0}^{c_A^*} (-p + \hat{x}_m - k) \frac{1}{p} dc_A
\]

\[
= \left( \frac{\hat{x}_m}{P} \right) (-k - k_w) + \left( \frac{p - \hat{x}_m - c_A^*}{P} \right) \left( -p + \hat{x}_m + c_A^* - k - k_w \right) + \left( \frac{c_A^*}{P} \right) (-p + \hat{x}_m - k)
\]

\[
= \left( \frac{\hat{x}_m}{P} \right) (-k_w) + \left( \frac{p - \hat{x}_m - k_w}{P} \right) \left( -p + \hat{x}_m - k_w \right) + \left( \frac{k_w}{P} \right) (-p + \hat{x}_m - k).
\]

(8)

Now compare (8) with her expected utilities from not collecting information. First, suppose \( \hat{x}_m \leq \frac{p + c_B}{2} \), and \( k_w > \frac{(2\hat{x}_m(1 - p) - c_B)^2}{4p} \). We compare the first equation of (1) and (8). The mediator is indifferent between collecting and not collecting information if the following condition is met:

\[
Eu_m(z = 0) = Eu_m(z = 1)
\]

that is, \( 4p^2 \hat{x}_m - 4c_B p \hat{x}_m + 4c_B \hat{x}_m - c_B^2 = p^2 + 4p \hat{x}_m - 2\hat{x}_m^2 + 2k_w^2 - 4k_w p - 4k_p \)

that is, \( 4p(k + k_w) = 4p \hat{x}_m - 4p^2 \hat{x}_m - 4c_B p \hat{x}_m + 4c_B p \hat{x}_m + p^2 + c_B^2 - 2\hat{x}_m^2 + 2k_w^2 \)

that is, \( 4p(k + k_w) = 4p \hat{x}_m(1 - p) - 4c_B \hat{x}_m(1 - p) + p^2 + c_B^2 - 2\hat{x}_m^2 + 2k_w^2 \)

that is, \( 4p(k + k_w) = 4\hat{x}_m(1 - p)(p - c_B) + p^2 + c_B^2 - 2\hat{x}_m^2 + 2k_w^2 \)

which is equivalent to \( k = \frac{4\hat{x}_m(1 - p)(p - c_B) + p^2 + c_B^2 - 2\hat{x}_m^2 + 2k_w^2}{4p} - k_w \).

28 If \( c_A^* = -c_B + 2k_w \), then \( k = \frac{p^2 + 4\hat{x}_m(1 - p)(p - c_B) - 2\hat{x}_m^2 - 4k_w^2 + 2c_B - 2c_B^2}{4p} \), and if \( c_A^* = -2\hat{x}_m(1 - p) + k_w \), then \( k = \frac{p^2 + 4\hat{x}_m(1 - p) - 2\hat{x}_m^2 - 2c_B + 2k_w^2}{4p} \).
Thus, if \( \hat{x}_m \leq \frac{p+c_B}{2} \) and \( k_w > \frac{(2\hat{x}_m(1-p)-c_B)^2}{4p} \), then it is optimal for the mediator to play according to

\[
z = \begin{cases} 
1 & \text{if } k \leq \frac{4\hat{x}_m(p-c_B)+p^2+c_B^2-2\hat{x}_m^2+2k_w^2}{4p} - k_w, \\
0 & \text{if } k > \frac{4\hat{x}_m(p-c_B)+p^2+c_B^2-2\hat{x}_m^2+2k_w^2}{4p} - k_w.
\end{cases}
\]

Second, suppose \( \frac{p+c_B}{2} < \hat{x}_m \) and \( k_w > \frac{-(c_B+p)^2-2c_Bp(1-2\hat{x}_m)+4\hat{x}_m^2(1-p)^2-p^2}{4p} + \hat{x}_m \). We compare the second equation of (1) and (8). The mediator is indifferent between collecting and not collecting state A's private information if the following condition is met:

\[
E_{u_m}(z = 0) = E_{u_m}(z = 1)
\]

that is, \( 4p^2\hat{x}_m + 4c_Bp - 4c_Bp\hat{x}_m + c_B^2 = -p^2 + 8p\hat{x}_m - 2\hat{x}_m^2 + 2k_w^2 - 4k_wp - 4kp \)

that is, \( 4p(k + k_w) = 8p\hat{x}_m - 4p^2\hat{x}_m - 4c_Bp + 4c_Bp\hat{x}_m - c_B^2 - p^2 - 2\hat{x}_m^2 + 2k_w^2 \)

that is, \( 4p(k + k_w) = 4p\hat{x}_m(2 - p) - 4c_Bp(1 - \hat{x}_m) - c_B^2 - p^2 - 2\hat{x}_m^2 + 2k_w^2 \)

which is equivalent to \( k = \frac{4p\hat{x}_m(2 - p) - 4c_Bp(1 - \hat{x}_m) - c_B^2 - p^2 - 2\hat{x}_m^2 + 2k_w^2}{4p} - k_w. \)

Therefore, if \( \frac{p+c_B}{2} < \hat{x}_m \) and \( k_w > \frac{-(c_B+p)^2-2c_Bp(1-2\hat{x}_m)+4\hat{x}_m^2(1-p)^2-p^2}{4p} + \hat{x}_m \), then it is optimal for the mediator to play according to

\[
z = \begin{cases} 
1 & \text{if } k \leq \frac{4p\hat{x}_m(2 - p) - 4c_Bp(1 - \hat{x}_m) - c_B^2 - p^2 - 2\hat{x}_m^2 + 2k_w^2}{4p} - k_w, \\
0 & \text{if } k > \frac{4p\hat{x}_m(2 - p) - 4c_Bp(1 - \hat{x}_m) - c_B^2 - p^2 - 2\hat{x}_m^2 + 2k_w^2}{4p} - k_w.
\end{cases}
\]

Third, consider the cases in which the mediator decides to intervene without collecting information; that is, suppose \( \hat{x}_m \leq \frac{p+c_B}{2} \) and \( k_w \leq \frac{(2\hat{x}_m(1-p)-c_B)^2}{4p} \), or \( \frac{p+c_B}{2} < \hat{x}_m \leq p \) and \( k_w \leq \frac{-(c_B+p)^2-2c_Bp(1-2\hat{x}_m)+4\hat{x}_m^2(1-p)^2-p^2}{4p} + \hat{x}_m \). We compare (4) and (8). The mediator is indifferent between

\[
k = \frac{p^2+4p\hat{x}_m(2-p)-2\hat{x}_m^2+(c_B-4k_w)p^2-8k_w^2-c_Bp(1-\hat{x}_m)}{4p}, \quad \text{if } c_A^* = -2\hat{x}_m(1-p) + k_w, \]

\[
k = \frac{p^2+4p\hat{x}_m(2-p)-8k_w(1-p)+8k_w^2(1-p)^2-2\hat{x}_m^2+2k_w^2-4c_Bp(1-\hat{x}_m)-c_B^2-4k_wp}{4p}, \quad \text{if } c_A^* = -2\hat{x}_m(1-p) + k_w.
\]
collecting and not collecting information if the following conditions are met.\(^{30}\)

\[
Eu_m(z = 0) = Eu_m(z = 1)
\]

that is, \(4p^2\hat{x}_m^2 - 8p\hat{x}_m^2 + 4\hat{x}_m^2 + 4p^2\hat{x}_m = p^2 + 4p\hat{x}_m - 2\hat{x}_m^2 + 2k_w^2 - 4kp\)

that is, \(4kp = -4p^2\hat{x}_m^2 + 8p\hat{x}_m^2 - 4\hat{x}_m^2 + 4p\hat{x}_m - p^2 - 2\hat{x}_m^2 + 2k_w^2\)

that is, \(4kp = -4\hat{x}_m^2(1 - p)^2 + 4p\hat{x}_m(1 - p) + p^2 - 2\hat{x}_m^2 + 2k_w^2\)

which is equivalent to \(k = \frac{-(2\hat{x}_m(1 - p) - p)^2 + 2p^2 - 2\hat{x}_m^2 + 2k_w^2}{4p}\).

Thus, if \(\hat{x}_m \leq \frac{p+c_B}{2} \) and \(k_w \leq \frac{(2\hat{x}_m(1-p)-c_B)^2}{4p}\), or if \(\frac{p+c_B}{2} < \hat{x}_m \leq p\) and \(k_w \leq \frac{-(c_B+p)^2-2c_Bp(1-2\hat{x}_m)+4\hat{x}_m^2(1-p)^2-p^2}{4p}\), then it is optimal for the mediator to play according to

\[
z = \begin{cases} 
1 & \text{if } k \leq \frac{-(2\hat{x}_m(1-p)-p)^2+2p^2-2\hat{x}_m^2+2k_w^2}{4p} \\
0 & \text{if } k > \frac{-(2\hat{x}_m(1-p)-p)^2+2p^2-2\hat{x}_m^2+2k_w^2}{4p}.
\end{cases}
\]

\[\square\]

**References**


**URL:** [http://www.ciaonet.org/olj/sa/sa_99anv05.html](http://www.ciaonet.org/olj/sa/sa_99anv05.html)


\(^{30}\)If \(c^*_A = -c_B + 2k_w\), then \(k = \frac{p^2-6\hat{x}_m^2+4p\hat{x}_m(1-p\hat{x}_m)+2(\hat{x}_m-k_w)^2}{4p}\), and if \(c^*_A = -2\hat{x}_m(1-p) + k_w\), then \(k = \frac{p^2-4\hat{x}_m(1-p-2k_w)+2\hat{x}_m^2+2k_w^2-4p\hat{x}_m^2(2-p)}{4p}\).


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A's expected utility for war \quad B's expected utility for war

\[ \frac{A's \text{ expected utility for war}}{B's \text{ expected utility for war}} \]

0 \quad p - c_A \quad \hat{s}_m \quad p \quad p + c_B \quad 1

B's ideal point \quad \text{mediator's ideal point} \quad A's ideal point

Figure 1: The Bargaining Range
Figure 2: The Likelihood of War When an Uninformed Mediator Intervenes