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DOMESTIC CONDITIONS, RATIONAL CHOICE, AND FOREIGN CONFLICTS

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The main task of this study is overcoming the pitfalls of power-politics in theories of international relations. I point out that power-politics might have missed a consideration about actors' interaction. In the study, actors are not merely assumed as power or security maximizers. They are modeled to have a conjecture about the rival's intention and possible actions in international crisis. I analyze a general game of international crisis in an effort to explain the theoretical linkage between domestic constraints or inducements to use force and the likelihood of foreign conflicts under conditions of two-sided incomplete information. Therefore, uncertainty about the rival's type composes a basic part of my modeling.

My model helps us to identify the conditions under which the existing hypotheses about the effects of domestic conditions on foreign conflicts are sustained or rejected. The analysis provides a prospective explanation for oft observed rally-round-the-flag effects; the tendency for libertarian states to eschew violence with one another; and the propensity for domestic disputes to beget foreign conflict. It also shows conditions under which those same hypotheses are not expected to hold, thereby providing a theoretical basis for improved empirical assessments. The game theoretic analysis allows me to specify the theoretical conditions under which the prospects for peacefully resolved disputes are enhanced or diminished. The analysis also captures the problem of misperception hypothesis.

1. INTRODUCTION

This study investigates the interactions of nations, with emphasis on the domestic conditions that influence the use of force. I argue that models of nations' behavior in international crisis cannot omit the process of nations' dynamic interactions and the domestic tugs-and-pulls of foreign-policy decision making. The linkage between domestic politics and international conflicts is formalized using a game-theoretic framework. I show that rigorous theoretical modeling helps to uncover the pitfalls of conventional wisdom. My game-theoretic analysis helps to identify the conditions under which the hypotheses about the linkage between domestic characteristics and foreign conflicts work or do not work.

Realists (Neorealists) have argued that nations always try to enhance their power or security against their rivals under the external constraints of international political structure. The basic idea of power-politics came from Hobbes' "state of nature" (Hobbes 1968). "The state of nature" is a relationship among acting units. Because an actor is in danger of disappearing merely due to another actor's existence, he/she is assumed to maximize his/her own strength and to minimize the rival's strength in their community. The relationship among nations appears to closely resemble Hobbes' "state of nature." The fundamental purpose of international actors has been to secure their survival or national security.

How international political structures influence the actions of international actors is one of most important puzzles (neo)realists have tried to solve. If international structure

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matters, in terms of promoting peace and causing war, its important components may be identified by investigating certain characteristic of the structure. Scholars have theorized about and tested empirically the role of several major properties of international structure; including power distribution, poles, and alliances. Balance-of-power theory states that an approximately equal distribution of power among major powers tends to generate international peace and that major war is most likely in an unbalanced system (Claude 1962; Gulick 1955; Ferris 1973; Kissinger 1979; Mearsheimer 1991; Morgenthau 1973; Siverson and Tennefoss 1984; Wagner 1994; Wright 1965). Other scholars have suggested that this hypothesis is not always true. Garnham (1976a, 1976b), Gilpin (1981), Houweling and Siccama (1988), Modelski (1972), Moul (1988), Organski (1968), Organski and Kugler (1980), and Weede (1976) have argued that an unbalanced system tends to generate international peace and that major war is most likely when a power preponderance becomes destabilized. Contradictory claims about the role of poles and alliances in international relations are also found. Deutsch and Singer (1964) argue that multipolar systems tend to generate international peace, which is rebutted by Waltz (1964, 1979) who maintains that bipolar systems tend to generate international peace. Some studies (Organski 1968; Organski and Kugler 1980) have claimed that alliances do not play a major role in the initiation of war, however other studies have found a relationship between alliances and war (Claude 1962; Gulick 1955; Kaplan 1957; Kim 1989; Morgenthau 1973). To date, efforts to find robust relationships between essential elements of international political structure and conflict initiation have not been successful in general. This implies that existing models of power-politics might be, in most cases, misspecified.

Three scholars in the late fifties and early sixties wrote that the causes of war could be studied at three "levels of analysis" (Kaplan 1957; Singer 1960, 1961; Waltz 1959) – the individual level, the nation or national society level and the international structure level. Although most studies of international structure do not clarify the relationship between individual level variables and structure level variables, the model construction frequently assumes such a relationship. I notice that terms such as "uncertainty" and "dissatisfaction" created from structural attributes play an important role in relating power distribution, poles, and alliance to the outbreak of war. For instance, the hypothesis of power preponderance (Organski and Kugler 1980) argues that major war is more likely to break out when nations are dissatisfied with the discrepancy between their actual power and their nominal status in an international structure. Balance-of-power theory says that in an unbalanced structure, nations are war-prone because they feel uncertain about their national security under the imbalance of power. Power-politics supposes that national leaders form foreign policy objectives by considering external constraints and opportunities. Therefore, the actors – nations or national leaders – form an essential part of the triad of actors, international structure, and foreign policy. But power-politics fails to scrutinize the role played by actors. Most models of power-politics suppose logically that their major variables are filtered by variables at some other level although they do not theorize about this clearly. Therefore, what is needed is an analysis of actors' dynamic action and reaction if such models are to be consistent and complete at least theoretically. Actors are ultimately responsible for making foreign policies, and structure is an environment surrounding the actors. The following observation by Bueno de Mesquita (1980: 397) summarizes this point very well.

> "Thus nations do not seek power, individuals do, but national resources influence whether the quest for power is pursued through internal development, through the use of diplomacy, through the use of military might, or through some combination of these. By observing the distinction between environmental constraints on decisions and the decisions themselves we are likely to construct more meaningful and useful theories..."

As well as not paying enough attention to the puzzle of actors, power-politics has not recognized another important environmental constraint. Many studies have pointed out that foreign-policy decision making is heavily dependent on certain domestic conditions. Following Kant's proposition, many theoretical or empirical studies (Bentham, 1834; Bremer, 1992; Bueno de Mesquita and Lalman, 1992; Doyle 1986; Maoz and Abdolali, 1989; Maoz and Russett, 1992) have supported the fact that democracies seldom fight each other. The ample evidence of the "Kantian proposition" is important because the phenomenon is found under different international political structures. If nations or national leaders care only about international constraints in foreign policy decision making and always try to enhance their power and security, a pair of democracies cannot guarantee international peace. In reality, national leaders of democracies are cautious in attacking their democratic rivals because they are constrained not by international imperatives but by domestic conditions.

It is also well-known that national leaders typically enjoy high public support during the initial stage of an international crisis. Public support makes them very tough in dealing with their rival nations at the beginning stage of an international crisis (Campbell and Cain, 1965; May 1961; Mueller, 1973; Ostrom and Job, 1986; Stoll, 1984). Gaubatz (1991) has claimed that there is a relationship between democratic nations' war engagement and their electoral cycle. According to his study, wars tend to occur more frequently early in the electoral cycle. Public opinion and electoral cycles are not elements of international structure. The evidence shows that national leaders tend to refer to their internal situations in making foreign policies. Therefore, domestic affairs matter in understanding national leaders' international actions.

Ostrom and Job (1986: 559) argue domestic politics is the reason why models of power-politics have not been successful in studies of international relations. Their study concludes that "the international variables are not the single most important contextual determinant of decisions on the use of force" among all the environments classified according to the three "levels of analysis" – international factors, domestic factors, and personal factors. They have insisted that the effect of international factors on the presidential decision to use force is dramatically diminished, if one considers the sensitivity of domestic public perceptions on international disputes.

Bueno de Mesquita and Lalman (1992) pose a direct question about the source of national leaders' foreign policy goals. Power-politics assumes that leaders select the best foreign policy only under external constraints or opportunities. Therefore, there is no room for realist leaders to consider whether the decision makes a group of their people unhappy, thereby jeopardizing their hold over office. By contrast, Bueno de Mesquita and Lalman argue that the viability of a national leader is dependent upon his/her constituencies. They also insist that leaders may follow inferior foreign policy goals in the context of international imperatives, because of the dynamics of domestic politics. Their study sheds light on the importance of domestic imperatives in making foreign policies, which has been overlooked by realists.

The main task of this study is overcoming the pitfalls of power-politics in theories of international relations. To solve the puzzles of actors, I adopt a game-theoretical approach to model national leaders' foreign policy choices. The complex process of actors' action and reactions is analyzed to capture the relationship between actors and structural constraints. National leaders or nations are viewed as agents representing the preferences of domestic groups. They are not monotone "billiard balls," they bear domestic costs and benefits from choosing a foreign policy through domestic politics.

I analyze a general game of international crisis in an effort to explain the theoretical linkage between domestic constraints or inducements to use force and the likelihood of foreign war under conditions of two-sided incomplete information. A generalized game of this study allows nations in conflicts to hide their preferences over outcomes. Therefore, uncertainty about the rival's type composes a basic part of my modeling. The assumption of complete information has been relaxed in several studies of crisis games with asymmetric information (Banks 1990; Bueno de Mesquita 1990 and 1992; Powell 1987). In contrast to the asymmetric information crisis game in which only the crisis initiator has private information, I assume that the responder as well as the initiator has a type unknown to the opponent. Specifically, each nation has a type unknown to the opponent summarizing the situation of its domestic conditions that is assumed to influence the expected utilities about using force. Therefore, the actor's expected utilities about using force in a crisis situation depend on the type at least partially, which may change each actor's preference ordering of outcomes. My model helps us to identify the conditions under which the existing hypotheses about the effects of domestic conditions on foreign conflicts are sustained or rejected.

My analysis shows theoretical support for "liberal," "idealist" hypotheses that have also found some support in empirical investigations. The game provides a prospective explanation for oft observed rally-round-the-flag effects; the tendency for libertarian states to eschew violence with one another; and the propensity for domestic disputes to beget foreign conflict. It also shows conditions under which those same hypotheses are not expected to hold, thereby providing a theoretical basis for improved empirical assessments. The game theoretic analysis allows me to specify the theoretical conditions under which the prospects for peacefully resolved disputes are enhanced or diminished.

2. CONTENDING PUZZLES AND HYPOTHESES ON WAR AND PEACE

It is embarrassing that those who look for theories of war and peace find so many contradictory and unresolved claims about the causes of war and peace. Hypotheses about the causes of war that are capable of being tested empirically have provided results that support theories inconsistently. In particular, the existing studies of domestic causes of foreign war or peace, which has been the subject of many theoretical or empirical studies of war, has generated many controversial results reviewed as follows.

H1: Liberalism. *Libertarian or democratic states are less intensively involved in foreign conflicts.* [1]

H2: Domestic-Foreign Conflict Nexus. *There is a close relationship between*

[1] Babst 1972; Haas 1965; Rummel 1979. 1983a. 1983b.

domestic conflicts and foreign conflicts.[2]

H3: Peaceful Public. *Public opinion is inherently peaceful. Political leaders force war on an unwilling public.*[3]

H4: The "Rally-Round-the-Flag". *The public supports more hardline policies at the beginning of international crisis.*[4]

H5: Misperception. *Key decision makers' misperception is the main cause of war.*[5]

H6: Information. *Under complete information, rational actors do not promote war. War can occur only under incomplete information.*[6]

H1 has not been generally supported by recent studies (Chan 1984; Doyle 1986; Forde 1986; Russett and Monsen 1975; Small and Singer 1976; Weede 1984). The dominant conclusion about this hypothesis is that "democracy and war involvement are not consistently and significantly correlated each other (Weede 1984: 649)." Only Rummel's joint-freedom proposition that "libertarian systems mutually preclude violence (Rummel 1983a: 29)" has been supported by some studies (Babst 1972; Barringer 1972; Chan 1984; Mintz and Geva 1993; Small and Singer 1976). Many studies have criticized **H2** theoretically or empirically (Bueno dse Mesquita 1980; Levy 1988a, 1988b; Scolnick 1974; Stohl 1980; Ward and Widmaier 1982). In particular, the scapegoat hypothesis (the externalization of internal conflicts) has been shown erroneous theoretically (Bueno de Mesquita 1980; Levy 1988a; Stohl 1980). And Scolinick (1974: 499) has pointed out that "an outstanding omission of studies dealing with the relationship between internal and external conflict is their lack of a theoretical framework which generates testable hypotheses." Therefore, we may presume that the insufficient and incorrect theory building is mainly responsible for the contradicting results of this hypothesis.

H3 and **H4** suggest opposite views each other in part about the relationship between political leaders and the public. **H3** implies that the hawkish leader tends to promote international conflict contrary to the will of peaceful public. But **H4** may suggest that the dovish leader is encouraged to promote international conflicts by the hawkish public.[7] The specific relationship between public attitudes and foreign policy has not been specified clearly. Some scholars view public opinion as "controlled" by political leaders (Brody 1984; Kernell, 1978), some view it as "controlling" political leaders (Anderson 1967; Cotton 1986; Hinckley 1988; Lunch and Sperlich 1979; May 1961), and some view it as irrelevant to foreign policy (Caspary 1970; Leigh 1976; Stoll 1984).[8] Therefore, we cannot get any decisive conclusion about the effects of the public on international conflicts.

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[2]For the studies supporting various types (positive or negative relationship) of this hypothesis, refer to the Stohl's survey (1980: 312, Table 7-1). For the discussion of classifying the relationships of internal/external conflicts, see Levy (1988a), and Ward and Widmaier (1982).

[3]The summary of most liberal interpretations (Bentham 1843; Kant 1949) by Levy (1988b: 664).

[4]Campbell and Cain 1965; Mueller 1973; Ostrom and Job 1986; Stoll 1984.

[5]Holsti 1967; Jervis 1970, 1976, 1988; Wohlstetter 1962.

[6]Morrow 1989; Powell 1987.

[7]For example, the American and the Spanish public in the Spanish-American War (Hofstadter 1955; May 1961), and the British public in the Crimean War (Anderson 1967).

[8]For literature survey, see Abravanel and Hughes (1975), Levy (1988b), and Russett and Graham (1988).

The theoretical problems of **H5** have been reviewed by Stein (1982) and Vertzberger (1982). Because the concept misperception has been used as a generalized term to imply several different sorts of disagreement between the "reality" and individuals' "image" of that, the critiques have focused on identifying what misperception is truly related to war. For example, Stein (1982: 505-6) has pointed out that "misperception does not always affect an actor's choices or determine outcome; that, when misperception does have such effects, it is in a narrow range of circumstances; and that misperception can lead to cooperation as well as to conflict." Thus, misperception matters only under certain circumstances according to the critics. Therefore, **H5** needs more logical refinement to be a theoretical framework.

H6 has been refuted theoretically by Bueno de Mesquita and Lalman (1989, 1992). They have constructed a crisis game different from Morrow's and Powell's under complete information. They have shown that war is a possible outcome even if two rational actors prefer negotiating to war. The disputes surrounding **H5** and **H6** demonstrate that we need to clarify the problem again when information is closely related to the promotion of war or peace.

The above review shows that the studies of linkage between domestic factors and foreign war/peace do not have consistent evidence supporting each hypothesis. This seeming "chaos" makes it necessary to investigate whether there is any important intervening variable between domestic political factors and foreign war/peace which has been omitted. If there exists a missing link, the hypotheses about the domestic sources of foreign conflicts/peace has made the same error as power-politics have done. Kegley, Richardson, and Richter (1978) observe that the role of government mediating conflict at home and abroad remain still unclear in the studies of internal/external conflict nexus. And Ostrom and Job (1986) regard domestic factors as environmental variables influencing the presidential decision to use force. These two ideas suggest that the analysis of some individual-level variables is necessary to improve the study of domestic conditions/foreign war nexus. The effects of domestic conditions on foreign war/peace may depend highly on individual-level variables. If some intervening individual-level variable can reflect both positive and negative effects of domestic factors on foreign conflicts, the omission of that variable can seriously damage the assumed effects of domestic conditions on foreign war/peace. And I presume that it is exactly what happened to the above hypotheses **H1** to **H4**.

Therefore, we need a rigorous theoretical framework to analyze the relationship between domestic politics and foreign war (**H1** to **H4**) correctly. And the framework needs to generalize the dynamics of actors (**H5** and **H6**). Two previous studies (Bueno de Mesquita and Lalman, 1992; Ostrom and Job, 1986) are good examples of attempts to resolve this problem. Both studies include the strict models of domestic conditions and war/peace. Ostrom and Job have connected the different "levels of analysis" in the respects of a cybernetic model of decision-making.[9] Bueno de Mesquita and Lalman have formalized an uncertainty of domestic politics (domestic opposition) to explain its effects on war in their model (Bueno de Mesquita and Lalman 1990, 1992) with the help of a sequential game analysis. Both studies have focused on the strict individual-level

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[9]The necessity of integrating different "levels of analysis" has been realized by many students of international relations. Refer to Bueno de Mesquita (1988), Gurr (1980, Introduction), and Siverson and Sullivan (1983).

explanation of foreign war/peace incorporating the domestic-level factors.

Bueno de Mesquita and Lalman's theory, although it has some critique,[10] has at least three advantages in the respects of modeling domestic causes of foreign war/peace. First, it is a good example of theoretical framework on the study of war based on axioms and deductions. Deductive theory has been recognized to be very important in the process of accumulating scientific knowledge by many students of international politics.[11] The strict deductionism of their model can help us to develop meaningful hypotheses. Second, their model makes it clear that it is not attributes such as environmental variables, but rather actors are more important in deriving any theory regarding causation of war. It reminds us of the simple but forgettable fact that the road to war or peace is not inevitable under certain circumstances but avoidable by men's free-will. Thus, it can correct the illogic causation between some international or national attributes and foreign war/peace. A development of a general theoretical framework of war based on individual analysis can be promoted from their theory. Third, their model combined with game theory has the potential for integrating other "levels of analysis." For example, the calculation of each nation's capability, which is a part of expected utility, can include the international system-level variables such as alliances and power distribution. Also Bueno de Mesquita and Lalman's work (1990 and 1992) has shown the theoretical linkage between domestic opposition and foreign war. Their work has hinted that domestic uncertainty can be modeled in their theory to generalize the impact of actors' incomplete information.

In this study, I adopt Bueno de Mesquita and Lalman's expected utility theory and a game-theoretic approach and try to extend their model of international crisis. The main idea of my extension of their model is including two-sided incomplete information structure about domestic political uncertainty. Although it seems almost certain that the two parties participating in a crisis situation interact with two-sided incomplete information, most of existing formal studies have modeled complete or asymmetric information games. My model includes the responder's private information as well as the crisis initiator's private information about domestic factors of war to develop an international crisis game with two-sided incomplete information. Using my model, I intend to answer two specific questions about war/peace as following.

Question 1. *How can domestic constraints or inducements to use force be related (or not related) to the likelihood of foreign war or peace?*

Because many studies of linkage between domestic conditions and war have claimed that certain domestic attributes are responsible for the outbreak of war or maintaining peace, I try to resolve this question in the analysis of my model.

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[10]Nicholson (1987) and Wagner (1988) have argued that their early formulation of expected utility does not match Von Neumann and Morgenstern's original concept. They have also argued that the expected utility theory does not show any theoretical development and that it is just a changed form of former studies about alliances and national capabilities. Majeski and Sylvan (1984) have argued that the terms adopted by the expected utility theory are ambiguous. Zagare (1982) has mentioned the problem of interpersonal comparisons of utility. For the detailed discussion of the critiques, see Simowitz and Price (1990). For the responses to these critiques, see Bueno de Mesquita (1985, 1987) and Bueno de Mesquita and Lalman (1986).

[11]For example, see the debate by Bueno de Mesquita (1985), Jervis (1985), and Krasner (1985).

Question 2. *Is one actor's misperception of its opponent's unknown domestic characteristics responsible mainly for the outbreak of war?*

This question is about the claims that misperception is one of the main causes of war (**H5** and **H6**). I hope to show that the model with two-sided incomplete information can help us to theorize about the issue of misperception more accurately than the existing claims.

3. A MODEL WITH TWO-SIDED INCOMPLETE INFORMATION

There are two nations called the crisis initiator A and the responder B in this crisis game.[12] This game begins with Nature establishing an environment of crisis escalation. First, Nature chooses the types of players. In contrast to the previous studies (Bueno de Mesquita and Lalman 1990; Powell 1987) of crisis game with only initiator's private information (asymmetric information game), my model assumes Nature decides not only the initiator's type but also the responder's type. Although we could assume many different types for the nations, the model assumes that there are only two types – *Hawk* and *Dove*. The set of A's types is denoted by $T_A = \{H_A, D_A\}$ and the set of B's types is denoted by $T_B = \{H_B, D_B\}$. I assume that the types of the nations are private information. That is, each nation knows its own type but does not know the opponent's type. Each nation possesses prior beliefs about its opponent's type, and then updates them.

The actual possible crisis situation begins with the initiator A sending a message $m \in M = \{F_A, \overline{F_A}\}$ meaning "using force," and "not using force" respectively, as a signal to the opponent B, which must react to the message.

Because this game has two-sided incomplete information, the initiator's message is based on its prior belief about its opponent's type, as well as its private information about its own type. A strategy for the initiator A is a function s: $T_A \rightarrow \Delta(M)$ where $\Delta(M)$ denotes the set of probability distribution over M. The above specification implies the initiator can use either pure or a mixed strategy in initiating a crisis.

Receiving a message from A, the responder B updates its prior belief of A's type. $\mu(t_A \mid m)$ denotes B's belief of A's type given a message. B's response is denoted by q which is a member of $Q = \{F_B, \overline{F_B}\}$ meaning using force and not using force again. A strategy for B is a function r: $M \rightarrow \Delta(Q)$ which implies again the reactor can use also pure or mixed strategy in reacting to a message.

Figure 1 shows the complete structure of this crisis game.[13] The decision nodes a, b, c and d define another movement by A in the case B responds with using force although

[12] I adopt the common assumption that each nation can be modeled as a unitary actor, which is widely accepted as a key assumption in major theories of international conflicts such as Bueno de Mesquita (1981,1985), Gilpin (1981), Morgenthau (1973), Organski and Kugler (1980), Powell (1987), and several other studies. For the operational empirical test of this assumption, see Bueno de Mesquita, Siverson, and Woller (1992).

[13] This crisis game is a part of international interaction game by Bueno de Mesquita and Lalman (1990). I do not include the details of their international interaction game because my study is focusing on the situation of ultimate crisis escalation.

A has suggested negotiation. There are five outcomes in this game.

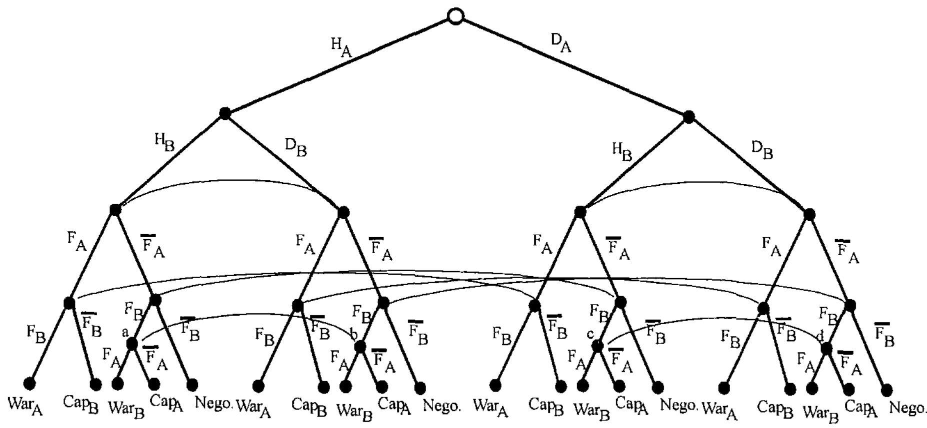

Figure 1. International Crisis with Two-Sided Incomplete Information

(1) If A decides to use force first, and B responds by using force, war by A denoted as War_A is the outcome.

(2) If B decides to use force first responding to the message of negotiation and A decides to retaliate it, war by B denoted as War_B is the outcome.

(3) If A and B do not use force, *Negotiate* is the outcome.

(4) If B capitulates to A's threat to use force, capitulation by B denoted as Cap_B is the outcome.

(5) If A capitulates to B's threat to use force, capitulation by A denoted as Cap_A is the outcome.

To specify the payoffs from the outcomes for each player in this crisis game, I use similar assumptions adopted by Bueno de Mesquita and Lalman (1990; Ahn 1998: 31-4). Because the model has two different wars as outcome – fighting away from one's home territory and war at home – different physical costs (α and γ respectively) are attached to their expected payoffs. I assume that a Hawk nation does not have any domestic political cost. By assuming this, Dove nations get less expected utilities than Hawk nations by $p_i \cdot \theta$ given the same outcome related to using force.[14] Bueno de Mesquita and Lalman have assumed that nations have only a domestic political cost to using force. However I insist that we cannot ignore the effects of domestic inducements of using force. I generalize these terms to include several different implications. For example, if we have a negative value of Ω, it can be interpreted as domestic political benefits appearing in the "Rally-Round-the-Flag" hypothesis (H4). And if Ω is equal to 0, there is no influence of domestic conditions on the rational actor. Table 1 summarizes expected utilities classified by nations and types.

[14]Notice that the composite term denoting domestic conditions of using force Ω is composed of $p_i \cdot \theta$ and π_i. Because domestic inducements (π_i) are assumed the same for a nation, whether it is a Hawk or a Dove, the difference is $p_i \cdot \theta$.

Table 1. Expected Utilities for Each Possible Outcomes: Two-Sided Incomplete Information Game

	For Hawk A
Nego	$p_A \cdot G_A + (1 - p_A) \cdot L_A$
War_A	$p_A \cdot G_A + (1 - p_A) \cdot L_A - (1 - p_A) \cdot \alpha_A - \pi_A$
War_B	$p_A \cdot G_A + (1 - p_A) \cdot L_A - (1 - p_A) \cdot \tau_A - \pi_A$
Cap_A	$L_A - p_A \cdot \gamma_A$
Cap_B	$G_A - (1 - p_A) \cdot \Gamma_A - \pi_A$
	For Dove A
Nego	$p_A \cdot G_A + (1 - p_A) \cdot L_A$
War_A	$p_A \cdot G_A + (1 - p_A) \cdot L_A - (1 - p_A) \cdot \alpha_A - \Omega_A$
War_B	$p_A \cdot G_A + (1 - p_A) \cdot L_A - (1 - p_A) \cdot \tau_A - \Omega_A$
Cap_A	$L_A - p_A \cdot \gamma_A$
Cap_B	$G_A - (1 - p_A) \cdot \Gamma_A - \Omega_A$
	For Hawk B
Nego	$p_B \cdot G_B + (1 - p_B) \cdot L_B$
War_A	$p_B \cdot G_B + (1 - p_B) \cdot L_B - (1 - p_B) \cdot \alpha_B - \pi_B$
War_B	$p_B \cdot G_B + (1 - p_B) \cdot L_B - (1 - p_B) \cdot \tau_B - \pi_B$
Cap_A	$L_B - p_B \cdot \gamma_B$
Cap_B	$G_B - (1 - p_B) \cdot \Gamma_B - \pi_B$
	For Dove B
Nego	$p_B \cdot G_B + (1 - p_B) \cdot L_B$
War_A	$p_B \cdot G_B + (1 - p_B) \cdot L_B - (1 - p_B) \cdot \alpha_B - \Omega_B$
War_B	$p_B \cdot G_B + (1 - p_B) \cdot L_B - (1 - p_B) \cdot \tau_B - \Omega_B$
Cap_A	$L_B - p_B \cdot \gamma_B$
Cap_B	$G_B - (1 - p_B) \cdot \Gamma_B - \Omega_B$

Note: $\Omega_i = (p_i \cdot \theta_i + \pi_i)$, $i \in A, B$.

I choose two transitive preference orderings (one for each type) satisfying the assumptions for each nation. The expected utilities of Dove type are calculated from those of Hawk type for the convenience of comparison. I denote $p_A \cdot \theta_A$ by Θ_A and $p_B \cdot \theta_B$ by Θ_B.

Hawk A: $Cap_B > Negotiate > War_A > War_B > Cap_A$ denoted by $a > b > c > d > e$.

Dove A: $Negotiate > Cap_B > War_A > Cap_A > War_B$ denoted by $b > (a - \Theta_A) > (c - \Theta_A) > e > (d - \Theta_A)$.

Hawk B: $Cap_A > Negotiate > War_B > War_A > Cap_B$ denoted by $a' > b' > c' > d' > e'$.

Dove B: $Negotiate > Cap_A > War_B > Cap_B > War_A$ denoted by $b' > (a' - \Theta_B) > (c' - \Theta_B) > e' > (d' - \Theta_B)$.

From this list of preference orderings, we can reduce the game described in Figure 1 using backward induction and eliminating dominated strategies. The reduced game is depicted at Figure 2. Although the original game tree has 20 final nodes, the new compact game tree has only 10 final nodes whose outcomes are underlined in a normal form game characterized in Table 2. Table 2 shows the complete list of expected utilities with the combination of types, messages and responses. And it composes the normal form game used by the equilibrium analysis.

Figure 2. Reduced Game

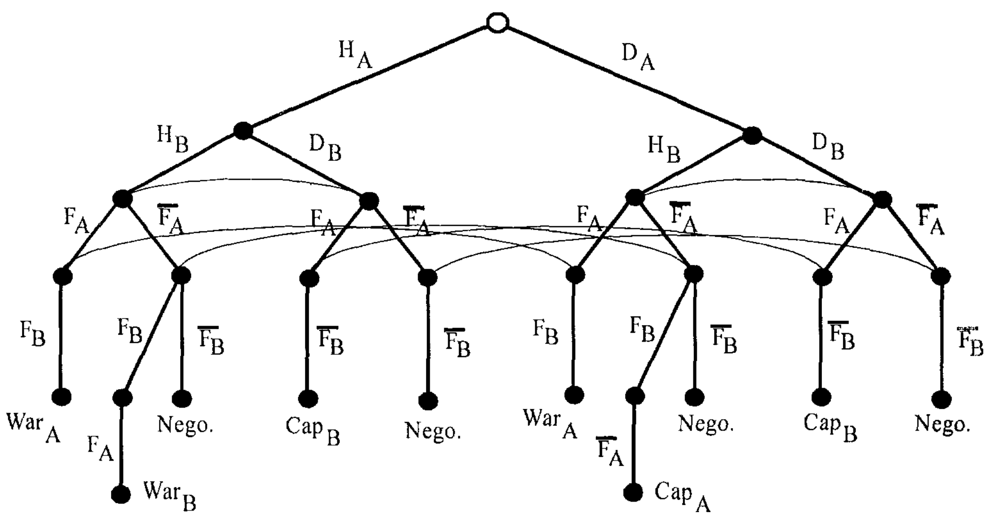

Table 2. The Summary of Expected Utilities

F_A	F_B	$\overline{F_B}$	$\overline{F_A}$	F_B	$\overline{F_B}$
H_A, H_B	$\underline{(c, d')}$	(a, e')	H_A, H_B	(d, c')	$\underline{(b, b')}$
H_A, D_B	$(c, d' - \Theta_B)$	$\underline{(a, e')}$	H_A, D_B	$(d, c' - \Theta_B)$	$\underline{(b, a' - \Theta_B)}$
D_A, H_B	$\underline{(c - \Theta_A, d')}$	$(a - \Theta_A, e')$	D_A, H_B	$\underline{(e, a')}$	(b, b')
D_A, D_B	$(c - \Theta_A, d' - \Theta_B)$	$\underline{(a - \Theta_A, e')}$	D_A, D_B	$(e, a' - \Theta_B)$	$\underline{(b, b')}$

To analyze this crisis game, I adopt the formal definition of sequential equilibrium generally used in the studies of signaling game (Banks and Sobel 1987; Cho and Kreps 1987; Kreps and Wilson 1982), but with one modification.[15] I call the equilibrium "Two-Sided Incomplete Information Sequential Equilibrium (hereafter TSE)." Some notations are added such that

· $t_A \in T_A$

· B's prior beliefs of A's type:

$p_A = p(H_A)$ (the prior of Hawk A) and $p(D_A)$ (the prior of Dove A)

· A's prior beliefs of B's type:

$p_B = p(H_B)$ (the prior of Hawk B) and $p(D_B)$ (the prior of Dove B)

· A's expected utility given types, messages and responses: $u(t_A, t_B, m, q)$

· B's expected utility given types, messages and responses: $v(t_A, t_B, m, q)$.

DEFINITION (TSE). *TSE consists of strategies s, r and beliefs p, μ such that*

(1) $\forall t_A \in T_A$, $s^*(m^* \mid t_A) > 0$ *only if*

$$\sum_{t_B \in T_B} u\left(t_A, t_B, m^*, r^*, (m', t_B)\right) \cdot p(t_B) = \max_{m \in M} \sum_{t_B \in T_B} u\left(t_A, t_B, m, r^*(m, t_B)\right) \cdot p(t_B)$$

(2) $\forall m \in M$, $r(q^* \mid m, t_B) > 0$ *only if*

$$\sum_{t_A \in T_A} v\left(t_A, t_B, m, q^*\right) \cdot \mu(t_A \mid m) = \max_{q \in Q} \sum_{t_A \in T_A} v\left(t_A, t_B, m, q\right) \cdot \mu(t_A \mid m)$$

(3) $\forall m \in M$ *such that* $s(m \mid t^*_A) > 0$ *for some* $t^*_A \in T_A$,

$$\mu\left(t^*_A \mid m\right) = \frac{s\left(m \mid t^*_A\right) \cdot p\left(t^*_A\right)}{\sum_{t_A \in T_A} s\left(m \mid t_A\right) \cdot p\left(t_A\right)}.$$

Condition 1 says that the initiator A must choose a message for B in TSE to maximize its expected utility. As I have explained in the beginning of this section, A's message is based on the prior belief of B's type and B's presumed best response. If there exist more than one message in TSE, all of them must have the same expected utility by this condition. Condition 2 says that the responder B must use its best response in any message (in or out of equilibrium) to maximize its expected utility. B's best response is determined by from A's message and B's updated belief. Condition 3 restricts the manner in which B updates its beliefs in TSE by requiring that B must use Bayes' rule to calculate its beliefs for any message sent with positive probability.

I classify TSE into four categories according to A's style of sending messages.

DEFINITION (CLASSIFICATION OF TSE)

(1) TSE with $s(m \mid t_A) = 1$ *and* $s(m' \mid t'_A) = 1$ *where* $m \neq m'$ *and* $t_A \neq t'_A$ *is a separating TSE.*

(2) TSE with $s(m \mid t_A) = 1$ $\forall$ t_A *is a pooling TSE.*

(3) TSE satisfying the following condition is a semi-mixing TSE.

[15] Because the definition is based on one-sided incomplete information, I change the form of condition (1) to include the idea that the message sender must have a conjecture of responder's types.

$$\begin{cases} s(m \mid t_A) = 1 \\ s(m \mid t'_A) \in (0,1) \\ s(m' \mid t'_A) \in (0,1) \end{cases}$$

(4) TSE satisfying the following condition is a complete-mixing TSE.

$$\begin{cases} s(m \mid t_A) \in (0,1) \\ s(m' \mid t_A) \in (0,1) \\ s(m \mid t'_A) \in (0,1) \\ s(m' \mid t'_A) \in (0,1) \end{cases}$$

In a separating TSE, A sends only one message for each type. If A sends a message in such a manner, B can update its prior beliefs to get A's exact type, which implies that A's type becomes common knowledge. But B cannot catch the full knowledge of A's type in a pooling TSE because different types of A can issue the same message. So B must use Bayes' rule to update its beliefs. Semi-mixing TSE stands around at the middle of separating and pooling TSE. A can send a message in TSE from only one type and another one from both types in a semi-mixing TSE. With a semi-mixed message, B can derive one of A's types exactly, but another type can only be guessed by using Bayes' rule. In a complete-mixing TSE, all the messages are issued from both types. B uses Bayes' rule again to update its beliefs.

So far I have established a sequential crisis game with two-sided incomplete information. Next section analyzes all the possible TSE.

4. THE EQUILIBRIUM ANALYSIS

The following lemmas describe B's best responses in TSE given messages and its types.[16]

LEMMA 1.

$$r(\overline{F_B} \mid F_A, D_B) = 1$$
$$r(F_B \mid F_A, H_B) = 1$$
$$r(\overline{F_B} \mid \overline{F_A}, D_B) = 1.$$

Lemma 1 says that Dove B always responds to given message by choosing $\overline{F_B}$. Hawk B uses force as a response to the message F_A. Notice that all of the equations imply B's pure strategies. This is the exact logic adopted for deriving the reduced game in the previous section.

LEMMA 2.

If A sends $\overline{F_A}$ as a TSE message, the following conditions are true.

[16]All the proofs for lemmas and propositions are shown at the Appendix.

$$\begin{cases} r\left(F_B \mid \overline{F_A}, H_B\right)=1 & \textit{iff} \quad \mu\left(H_A \mid \overline{F_A}\right)<\dfrac{a'-b'}{a'-c'} \\ r\left(\overline{F_B} \mid \overline{F_A}, H_B\right)=1 & \textit{iff} \quad \mu\left(H_A \mid \overline{F_A}\right)>\dfrac{a'-b'}{a'-c'} \\ r\left(F_B \mid \overline{F_A}, H_B\right)\in(0,1) & \textit{iff} \quad \mu\left(H_A \mid \overline{F_A}\right)=\dfrac{a'-b'}{a'-c'} \end{cases}$$

Lemma 2 explains how Hawk B reacts to the equilibrium message $\overline{F_A}$. Because there is no dominant strategy for Hawk B given $\overline{F_A}$, B must use its updated belief to maximize its expected utility. If Hawk B believes A more Hawkish (Dovish) roughly, its response is not fighting (fighting respectively). Therefore, in order to induce Hawk B not to fight, A needs to create the proper image of Hawk. Lemma 2 says also Hawk B's mixed strategy responses if the condition $\mu\left(H_A \mid \overline{F_A}\right)=\frac{a'-b'}{a'-c'}$ is satisfied. The following propositions establish all of the possible TSE paths. I abbreviate some mathematical expressions which will appear frequently in the propositions and their proofs.

$$\Pi_H=\frac{p_B\cdot(a-c)+b-a}{p_B\cdot(b-d)}$$

$$\Pi_D=\frac{p_B\cdot(a-c)+b-a+\Theta_A}{p_B\cdot(b-e)}$$

$$r_1=r\left(F_B \mid \overline{F_A}, H_B\right)$$

PROPOSITION 1. *There are two separating TSE paths, as follows.*

(1) If the condition $p(H_B)\leq \min\left(\frac{a-b}{a-c}, \frac{b-a+\Theta_A}{b-a+c-e}\right)$ *is satisfied: (a) Hawk A sends the message* F_A*, and B responds with* F_B *or* $\overline{F_B}$ *according to B's Hawk or Dove type respectively. (b) Dove A sends the message* $\overline{F_A}$*, and B responds in the same way at (a). If B responds with* F_B*, A responds with* F_A.

(2) If the condition $p(H_B)\geq \max\left(\frac{a-b}{a-c}, \frac{b-a+\Theta_A}{b-a+c-e}\right)$ *is satisfied: (a) Hawk A sends the message* $\overline{F_A}$ *as a pure strategy, and B responds with* $\overline{F_B}$ *regardless of its type. (b) Dove A sends the message* F_A. *Hawk B responds with* F_B*, Dove B responds with* $\overline{F_B}$.

In the first separating TSE path, A's prior belief of B's Hawkishness must be comparatively lower than $\frac{a-b}{a-c}$ and $\frac{b-a+\Theta_A}{b-a+c-e}$. In this category of equilibrium path, the outcome Negotiation is achieved only if both A and B are Doves. If A or B has a Hawk type, some use of force (War_A, Cap_B, or Cap_A) cannot be avoided. Notice that each of four possible outcomes in the first separating TSE path depends on the unique combination of A's and B's types. Therefore, we can claim that certain type is responsible for war or negotiation if the crisis initiator uses the first separating equilibrium strategy in this game. Suppose both nations A and B have the Dove and the conditions of separating TSE are satisfied, then negotiation is the only equilibrium outcome, which supports the Kantian claim and Rummel's joint-freedom hypothesis that two libertarian states are less intensively involved in war. In contrast, suppose at least one nation has the Hawk type, then some use of force is inevitable under separating TSE to resolve a crisis situation, which appears to support the "Rally-Round-the-Flag" hypothesis and the domestic-foreign conflict nexus.

In the second separating equilibrium path, nation A thinks B is more hawkish. Hawk A leads to negotiation regardless of B's type in this path. This contradicts with the hypotheses assuming the linkage between the domestic inducement of using force and international conflicts. And the fact that Dove A leads to war or intervention does not support the hypotheses of "Liberalism" and the "Peaceful Public." The striking difference between the two separating paths shows how the different perceptions of the rival's type influence the outcomes of international crises.

Misperception cannot occur to B. Because A separates its messages, B can have complete information of A's type. So the possible way of misperception in this category is A's misperceptions of B's type. If the responder is a Dove in the first path, misperception is not possible because the path is supported by A's prior belief of dovish B. If both nations are Hawks, the outcomes war and capitulation are possible. This supports the "Misperception" hypothesis. However, negotiation is possible also in the second path. If A has a Hawk type and B has a Dove type, negotiation is the outcome under A's belief hawkish B. This contradicts with the "Misperception" hypothesis.

PROPOSITION 2. *There are three possible pooling TSE paths, as follows.*

(1) If the condition $p(H_A) \leq \frac{a'-b'}{a'-c'}$ *and* $p(H_B) \geq \frac{b-a+\Theta_A}{b-a+c-e}$ *is satisfied, A with any type sends only the message* F_A. *Dove B responds with* $\overline{F_B}$ *and Hawk B responds with* F_B.

(2) If the condition $p(H_A) > \frac{a'-b'}{a'-c'}$ *and* $p(H_B) \geq \frac{a-b}{a-c}$ *is satisfied, A with any type sends the message* $\overline{F_A}$ *and B responds with* $\overline{F_B}$.

(3) If the condition $p(H_A) = \frac{a'-b'}{a'-c'}$ *and* $p(H_B) > \frac{a-b}{a-c}$ *is satisfied, A with any type sends the message* $\overline{F_A}$. *Dove B responds with pure strategy* $\overline{F_B}$ *and Hawk B responds with a mixed strategy such that* $0 < r(F_B \mid \overline{F_A}, H_B) \leq \min(\Pi_H, \Pi_D)$. *If Hawk B responds with* F_B, *Hawk A fights and Dove A does not fight.*

The first pooling equilibrium path establishes only the outcomes Cap_B and War_A, which shows the ultimate case of A's using force. This path is supported by Hawk B's relatively higher probability of using force ($r(F_B \mid \overline{F_A}, H_B) \geq \Pi_H$ and Π_D) in out-of-equilibrium path. It means Hawk B is assumed to try to exploit A's negotiation offer which would never occur actually. The second pooling equilibrium path shows the opposite side of the first TSE path. In this path, both of players with any types use negotiation ($\overline{F_B}$) as their pure strategies. Thus complete negotiation can be achieved in this case. There is a very important feature of this equilibrium path. This path cannot be supported sufficiently without the mutual image of the Hawkish. It implies negotiation under A's pooling equilibrium strategy must work with the higher estimated beliefs of opponent's Hawk type. This path also implies that misperception cannot change the outcome Negotiate into any other outcome because both A and B negotiate regardless of their types.

The third pooling TSE path has the same message with the second one, but B uses a mixed strategy to follow equilibrium path because its belief of Hawk A hits exactly the value $\frac{a'-b'}{a'-c'}$. Using the variation of responses, Hawk B can induce Cap_A and War_B as well as Negotiation. The proof of proposition gives us the required ratio of Hawk B's mixing. This equilibrium path is supported by B's more strict belief of A's type. But if B has a Dove type, negotiation is the only outcome available in this category.

The existence of several pooling TSE paths to the different outcomes implies that it cannot be claimed that a specific type is responsible for certain outcome of this game. For example, if Hawk A sends the message fight and Hawk B responds to that message, the outcome is War_A in this case. But the outcome *Negotiate* can be supported even with the same type A and B in the second pooling equilibrium path. Misperception also is not responsible generally for any specific outcome in pooling TSE. Suppose B misperceives Dove A as Hawk type and sends the message not to fight, which may be available from the second pooling TSE path, then we have the outcome *Negotiate*. But suppose that B misperceives Hawk A as Dove type and sends the message to fight following the first pooling TSE path, then we have the outcome War_A. Therefore, misperception cannot be assumed to be uniformly related to war or peace in the pooling equilibrium paths.

PROPOSITION 3. *There are three semi-mixing TSE paths as following:*

(1) If the condition $\mu\left(H_A \mid \overline{F_A}, H_B\right) = \frac{a'-b'}{a'-c'}$, $p(H_B) > \max\left(\frac{a-b}{a-c}, \frac{b-a+\Theta_A}{b-a+c-e}\right)$ *and* $\Pi_H \geq \Pi_D$ *is satisfied, Hawk A sends the message* $\overline{F_A}$ *and Dove A sends a mixed message. Dove B responds with* $\overline{F_B}$ *and Hawk B uses unique mixed strategy* $r(F_B \mid \overline{F_A}) = \Pi_D \leq \Pi_H$ *according to its belief* $\mu(H_A \mid \overline{F_A})$.

(2) If the condition $\mu\left(H_A \mid \overline{F_A}\right) > \frac{a'-b'}{a'-c'}$ *and* $p(H_B) = \frac{a-b}{a-c}$ *is satisfied, Dove A uses the pure strategy* $\overline{F_A}$ *and Hawk A sends a mixed message. B with any type responds* $\overline{F_B}$.

(3) If the condition $\mu\left(H_A \mid \overline{F_A}, H_B\right) = \frac{a'-b'}{a'-c'}$, $p(H_B) > \frac{a-b}{a-c}$ *and* $\Pi_H \leq \Pi_D$ *is satisfied, A sends message in the same way at (2). Dove B responds with* $\overline{F_B}$ *and Hawk B uses unique mixed strategy* $r(F_B \mid \overline{F_A}) = \Pi_H \leq \Pi_D$ *according to its belief. If Hawk B responds with* F_B, *Hawk A fights and Dove A does not fight.*

The first semi-mixing TSE path is based on the unique value of Hawk B's belief over A's type and its unique mixed strategy. Because only Dove A sends the message F_A, B

can get A's type exactly if B receives the message F_A . But B cannot know A's type if it has the message $\overline{F_A}$ which may be issued from both types. If A is a Hawk and B is a Dove, the outcome is *Negotiate*. But the various different outcomes except War_B in this path can be supported under some mixed strategies of Dove A and Hawk B.

The second semi-mixing TSE path is based on the unique value of A's belief over B's type and Hawk B's pure strategy not to fight responding to the message not to fight. This path guarantees *Negotiate* for Dove A and Cap_B or *Negotiate* for Hawk A.

The third semi-mixing TSE path is based on Hawk B's unique belief and unique mixed strategy as in the first path. In this category, all of the five possible outcomes are available in some equilibrium paths. We can get even War_B if both A and B have Hawk type. Also some different combinations of types can promote the same outcome. For example, *Negotiate* can be derived from any combination of A's and B's types.

From the above specification of semi-mixing TSE paths, we can see that certain type cannot be said responsible for war or negotiation. In particular, *Negotiate* is possible from any combination of types. Although War_A is not possible outcome if B is a Dove, it cannot be the evidence of the Hawk type and war nexus because both Hawk A and Dove A can be engaged in war in some equilibrium paths. Misperception also cannot be responsible for a specific outcome of this game in semi-mixing equilibrium paths. Suppose that Hawk A misperceives Dove B as a Hawk and sends the message $\overline{F_A}$, which may be derived from the first semi-mixing TSE path, then we have the outcome *Negotiate*. But suppose that Hawk A misperceives Dove B as a Hawk and sends F_A, which is possible in the second semi-mixing TSE path, then Cap_B is the outcome. So we can have different outcomes from the same kind of misperception by the same type A. Other examples of B's misperception about A's type and both actors' mutual misperception cannot be uniformly related to a specific outcome. It demonstrates that the equilibrium actions and outcomes in this crisis game do not solely depend on misperception.

PROPOSITION 4. *If the condition* $p(H_B) > \max\left(\frac{a-b}{a-c}, \frac{b-a+\Theta_A}{b-a+c-e}\right)$, *and* $\Pi_H = \Pi_D$ *is satisfied, there is unique complete-mixing TSE as following. A with any type mixes its message completely. Dove B responds with* $\overline{F_B}$ *and Hawk B with the belief* $\mu\left(H_A \mid \overline{F_A}\right) = \frac{a'-b'}{a'-c'}$ *uses unique mixed strategy* $r(F_B \mid \overline{F_A}) = \Pi_H$. *If Hawk B responds with* F_B *to A's message* $\overline{F_A}$, *then Hawk A fights and Dove A does not fight.*

This is a typical case of knife-edge equilibrium supported by the responder B's unique belief and mixed strategy. All of the five possible outcomes are available in this complete mixing equilibrium as in semi-mixing equilibrium. This TSE path cannot be interpreted as supporting specific domestic conditions and foreign war nexus because the same previous argument in the semi-mixing TSE is possible in this path. And we can easily see that misperception also cannot be directly related to certain outcome.

So far I have shown the details of all the possible TSE in this international crisis game. I discuss their important implications over war and peace in the following section.

For the convenience of comparison between different TSE paths, Table 3 summarizes the possible outcomes in each TSE path.

Table 3. The Possible Outcomes in Each Equilibrium Path:
Two-Sided Incomplete Information Game

	Types	*Nego.*	War_A	War_B	Cap_B	Cap_A
Separating TSE	(H_A, H_B)	√	√			
	(H_A, D_B)	√			√	
	(D_A, H_B)		√			√
	(D_A, D_B)	√			√	
Pooling TSE	(H_A, H_B)	√	√	√	√	
	(H_A, D_B)	√			√	
	(D_A, H_B)	√	√		√	√
	(D_A, D_B)	√			√	
Semi-Mixing TSE	(H_A, H_B)	√	√	√	√	
	(H_A, D_B)	√			√	
	(D_A, H_B)	√	√		√	√
	(D_A, D_B)	√			√	
Complete Mixing TSE	(H_A, H_B)	√	√	√	√	
	(H_A, D_B)	√			√	
	(D_A, H_B)	√	√		√	√
	(D_A, D_B)	√			√	

5. DISCUSSION

There are two conditions which appear frequently in the TSE paths: $\frac{a-b}{a-c}$ and $\frac{a'-b'}{a'-c'}$. I change them to other forms using the specification of expected utilities in Table 1.

(Eq. 1) $$\frac{a-b}{a-c}=\frac{(1-p_A)(G_A-L_A-\Gamma_A)-\pi_A}{(1-p_A)(G_A-L_A-\Gamma_A+\alpha_A)}$$

(Eq. 2) $$\frac{a'-b'}{a'-c'}=\frac{(1-p_b)(G_B-L_B-\Gamma_B)-\pi_B}{(1-p_b)(G_B-L_B-\Gamma_B+\alpha_B)}$$

Domestic Conditions and Foreign War/Peace

The features of the first separating equilibrium path appear to support the hypotheses in the introduction. In that path, outcomes are directly related to certain combinations of nations' types. **H1** and **H3** are supported by a Dove initiator's separating strategy and a

Dove responder's dominant strategy given certain A's prior belief of $p(H_B)$, which is comparatively lower than in other TSE paths. This is similar to the Kantian claim that peace is more likely to exist between libertarian states. That is, liberal states have been assumed to have a large domestic cost of foreign war in the Kantian causation, which is in turn supposed to provide the basis of international peace. The same interpretation is possible for Rummel's joint-freedom hypothesis. **H2** (the domestic-foreign conflict nexus) and **H4** (the "Rally-Round-the-Flag") also can be supported by another aspect of the first separating TSE path. If we consider a positive relationship between domestic conflict and foreign conflict in H2 (the scapegoat hypothesis), **H2** and **H4** can be simplified as saying that a Hawk nation is engaged more in using force in an international crisis situation. This is exactly appearing in separating TSE path if at least one nation in disputes is a Hawk.

But there are two important necessary conditions to support such causation in my analysis. First, the crisis initiator must disclose its exact type by sending a separating message. If the responder has any doubt about A's type, the hypotheses **H1** to **H4** cannot be sustained. Without the complete disclosure of A's type, other TSE paths such as pooling, semi-mixing, and complete mixing TSE, are to be selected by the parties in disputes. As shown in the previous section, any uniform connection between certain type and outcome cannot be true in other TSE paths. For example, both *Negotiate* and *War*$_A$ are possible outcomes in other TSE paths even though the two nations are Hawks, which clearly shows that the road to peace or war can be achieved regardless of nations' types in the cases without A's complete disclosure of its type.

Second, the crisis initiator must have relatively lower value of its belief about the responder's hawkishness to support the first separating TSE. Comparing a condition of separating TSE ($p(H_B) \leq$ (Eq.1)) against one appearing in other TSE paths ($p(H_B) \geq$ (Eq. 1)), we can know that separating TSE path is to be selected surely under A's prior belief that B has more dovish domestic political attributes.

The second path of pooling TSE clearly shows what can happen in the crisis game if the above conditions are not satisfied. It illustrates how negotiation can be achieved regardless of the players' types. Notice that the conditions $p(H_A) >$ (Eq. 2) and $p(H_B) \geq$ (Eq. 1) are required as necessary conditions to support the second pooling TSE path in Proposition 2. If I assume all of the values except π_A and π_B are fixed, then the smaller π_A (π_B) implies the larger (Eq. 1) [(Eq. 2) respectively]. Therefore A and B need to create a more hawkish image to produce *Negotiate* following this path as π_A and π_B become smaller --- meaning more public support for a tough foreign policy. This result is very suggestive. That is, the message of not fighting must be issued from the image of opponent's more hawkishness and the response of not fighting also must be based on the belief of initiator's more hawkishness to achieve negotiation. To show this clearly, suppose that both players A and B have almost the same expected utilities from *Negotiate* and *War* ($b \approx c$ and $b' \approx c'$),

$$p(H_A) \geq \frac{a'-b'}{a'-c'} \approx 1 \quad and \quad p(H_B) \geq \frac{a-b}{a-c} \approx 1$$

as the condition for supporting this equilibrium path, which implies that both players must believe almost without exception that the opponent is a Hawk. Thus, this path of complete negotiation is based on the beliefs of opponent's favor in using force. It shows that negotiation is also a possible outcome even though both nations are Hawks and they have the beliefs of mutual hawkishness. Therefore, the hypotheses H1 to H4 about the linkage between specific domestic type and foreign war or peace may be supported only under certain conditions. It can be a good explanation why they have been refuted by many empirical tests as reviewed in the introduction.

Misperception

The equilibrium analysis supports Stein's critique (1982) about the causation between actors' misperception and war. Misperception may generate the use of force under certain conditions, but negotiation may also result from misperception, as shown previously. The problem of H6 may be corrected by adding some typology to the concept of misperception. Instead of using misperception as a general term denoting the discrepancy between "reality" and its "image," we need to classify different kinds of misperception, as suggested by some scholars (Levy 1983; Stein 1982; Vertzberger 1982).

The model developed in this paper allows us to classify misperception into three categories:

(1) Circumstances in which the crisis initiator misperceives the type of the responder, while the responder accurately perceives the domestic constraints or inducements faced by the initiator;

(2) Circumstances in which the responder misperceives the initiator's type, while the initiator is fully informed about the key domestic characteristics of the opponent;

(3) Circumstances in which both the initiator and the responder misperceive each other's type.

Each category can be classified further according to the misperceiving party's type and the opponent's type. The first category has four different misperceptions: Hawk *A*'s misperception of Hawk *B*, Hawk *A*'s misperception of Dove *B*, Dove *A*'s misperception of Hawk *B*, and Dove *A*'s misperception of Dove *B*. The second and third category also can be classified similarly.

We need to check which misperception is responsible for war under what circumstances to analyze the issue of misperception correctly in the war studies. The analysis shows that we can have different outcomes even under the same type of misperception. This is so because the decision to fight or not to fight does not depend solely on information about opponent's type, but also on the actors' complicated calculation of their own and their opponent's utilities. For an illustration, let us say there is a hypothesis that the main cause of World War II was German misperception about the British type or British misperception about the German type. But World War II could have been avoided under the same situation of misperception at least theoretically in my analysis, if they followed a different equilibrium path according to some different utility calculations. Therefore, the hypothesis cannot be sustained by this study.

The issue of misperception must be integrated into a more rigorous analysis of actors' decision-making dynamics. Because the crisis initiator's intention, which cannot depend solely on information, plays a very important role in determining the outcome of crisis situation. It is obvious if we compare the first pooling TSE path with the second path. It shows that both negotiation and war are possible outcomes under the same information situation.

The discussion so far suggests some answers to the questions posed in the introduction. First, certain domestic constraints or inducements to use force can be claimed responsible for specific outcomes of international crises only under restricted conditions. Thus, Hypotheses 1 to 4 may be supported under the restricted conditions, but cannot be sustained otherwise. Second, actors' misperception cannot be blamed for the outbreak of war. The linkage between misperception and war needs more theoretical refinement including adequate typology and related discussion of actors' intention.

6. CONCLUSION

One of the most demanding puzzles of the Royal Geographic Society was finding the source of the Nile. How can we investigate the source of the Nile? A simple way is following the Nile from the end of the Nile. I guess that the ancient people tried to find the source using such a primitive way. But they failed in finding it because of their physical limits. They didn't have enough provision to sustain the long adventure of getting the Nile. The Greek people argued that the Nile has a source in "the Mountains of the Moon" of inner Africa. Did they see the mountains? No. It was their conjecture derived from their fledgling trials. If a river got such a huge amount of water even at the final place of their adventure, it must have been assumed to have a distance enough to gather the water. Therefore, the Royal Geographic Society dispatched a caravan for finding the source of the Nile not to the coast of the Mediterranean but to the remote east coast of Africa. And they succeeded in finding the source.

This illustration clarifies why we need the help of theoretical heuristic in studying political science. It is the principle of economy. Because we have infinite number of variables surrounding a political phenomenon, we cannot investigate all the effects of the variables. Theory is a guide to distinguish between significant variables and less important ones. As the Royal Geographic Society believed in a conjecture about the source of the Nile, we need to rely on proper theories to accumulate scientific knowledge in political science.

My study began with the idea that deductive modeling can help to solve chaotic puzzles in international relations. Deductive modeling has at least one advantage over other theoretical approaches – logical parsimony. It can generate useful hypotheses based on logical consistency. It also helps to break up existing ambiguous hypotheses into testable ones. My study has tried to fulfill the same job, and it has achieved a piece of success.

I pointed out that power-politics might have missed a consideration about actors' interaction. In the study, actors are not merely assumed as power or security maximizers. They are modeled to have a conjecture about the rival's intention and possible actions in international crisis. As Bueno de Mesquita and Lalman (1992) pointed out properly, nations sometimes cannot obtain the best outcome in dyadic confrontation. Nations look for better outcome *available* if their rivals are supposed not to give in. Nations also may confront a problem of selecting one of several equilibrium paths in crisis, which is dependent on their belief about the opponents' preference orderings of possible outcomes. Therefore, it is not enough to argue simply that all the nations are so greedy to maximize their own power or security under any circumstances.

I insisted also that domestic conditions of using force, which is ignored by power-politics in general, are essential elements of foreign-policy making. Domestic constraints and inducements of using force was modeled to form national leaders' preferences in international crisis. My analysis tried mainly to capture nations' conjecture about the rivals' uncertain domestic types. Applying the approach of signaling game, I showed that various outcomes are possible under two-sided incomplete information. Domestic constraints and inducements may be biased by the high uncertainty in the model. For example, *War* and *Negotiation* are possible outcomes for both Hawk and Dove initiators under different equilibrium paths. It implies that the effects of domestic conditions are likely to become more biased as uncertainty about rivals' types increases. This observation appears to provide a clue to the puzzle about war-proneness of democratic states. Whereas Kantian proposition specifies that two democracies do not fight each other, democracies tend to fight frequently against non-democratic states. I conjecture that almost perfect information between two democracies contributes enhancing peace in international crisis, yet that high uncertainty between democratic and non-democratic states reduces the chance of peaceful negotiation.

The model helps classify the conditions under which hypotheses about domestic conditions of using force are expected to hold or not to hold. The criteria of the classification come from nations' different equilibrium strategy and their belief system against their rivals. The analysis also captures the problem of misperception hypothesis. I insist, as in Stein (1982), that misperception is not always enhancing the likelihood of foreign conflicts. The peace by deterrence may be also an outcome of misperception. If we classify misperception more according to the misperceiving actors – initiator's, responder's and both actors' – , the misperception hypothesis may become more relevant in understanding nations' behavior. This study showed that the general crisis game can be very useful in resolving and giving an order to the controversial hypotheses about the effects of different domestic conditions.

APPENDIX: PROOFS FOR LEMMAS AND PROPOSITIONS

PROOF of LEMMA 1

$v(t_A, D_B, F_A, r(\overline{F_B}) = 1) = d'$ has a dominance over $v(t_A, D_B, F_A, r(F_B) = 1) = e'$. So $r(\overline{F_B} | F_A, D_B) = 1$ to satisfy the condition (2) of TSE definition. Similarly $r(F_B | F_A, H_B) = 1$ and $r(F_B | \overline{F_A}, D_B) = 1$ from dominance. Q.E.D.

PROOF of LEMMA 2

If $\overline{F_A}$ is a TSE message, B must update A's type given the message using Bayes' rule. From the condition (2) of TSE definition about B's best response of any message in TSE, the following must be satisfied to have $r(F_B | \overline{F_A}, H_B) = 1$.

$$v(H_A, H_B, \overline{F_A}, F_B) \cdot \mu(H_A | \overline{F_A}) + v(D_A, H_B, \overline{F_A}, F_B)(1 - \mu(H_A | \overline{F_A})) >$$
$$v(H_A, H_B, \overline{F_A}, \overline{F_B}) \cdot \mu(H_A | \overline{F_A}) + v(D_A, H_B, \overline{F_A}, \overline{F_B})(1 - \mu(H_A | \overline{F_A}))$$

To solve it, we have

$$c' \cdot \mu(H_A | \overline{F_A}) + a' \cdot (1 - \mu(H_A | \overline{F_A})) > b' \Rightarrow \mu(H_A | \overline{F_A}) < \frac{a' - b'}{a' - c'}.$$

From the condition $v(H_A, H_B, \overline{F_A}, F_B) \cdot \mu(H_A|\overline{F_A}) + v(D_A, H_B, \overline{F_A}, F_B) \cdot (1 - \mu(H_A|\overline{F_A})) < v(H_A, H_B, \overline{F_A}, \overline{F_B}) \cdot \mu(H_A|\overline{F_A}) + v(D_A, H_B, \overline{F_A}, \overline{F_B}) \cdot (1 - \mu(H_A|\overline{F_A}))$ we have $\mu(H_A \mid \overline{F_A}) > \frac{a' - b'}{a' - c'}$ for $r(\overline{F_B} \mid \overline{F_A}, H_B) = 1$. And if the left-hand side and the right-hand side equals (the same expected utility), it is immediate that B can mix F_B and $\overline{F_B}$. Q.E.D.

PROOF of PROPOSITION 1

The possible equilibrium path must be composed of either (1) $s(F_A|H_A) = 1$ and $s(\overline{F_A}|D_A) = 1$ or (2) $s(\overline{F_A}|H_A) = 1$ and $s(F_A|D_A) = 1$ from the definition of separating TSE.

(1) Suppose $s(F_A|H_A) = 1$ and $s(\overline{F_A}|D_A) = 1$ first. Because it is a separating TSE, B can know A's type exactly. Therefore, $\mu(H_A|F_A) = 1$ and $\mu(D_A|\overline{F_A}) = 1$. This implies that B can react with either F_B or $\overline{F_B}$ if its type is Hawk or Dove, respectively, to maximize its utility. Using the first condition of TSE definition and Lemma 1, we have the condition $u(H_A, H_B, F_A, F_B) \cdot p_B + u(H_A, D_B, F_A, \overline{F_B})(1 - p_B) \geq u(H_A, H_B, \overline{F_A}, \overline{F_B}) \cdot p_B + u(H_A, D_B, \overline{F_A}, \overline{F_B})(1 - p_B) \Rightarrow c \cdot p_B + a \cdot (1 - p_B) \geq b$. To solve it, we have the condition $p(H_B) \leq \frac{a - b}{a - c}$.

For $s(\overline{F_A}|D_A) = 1$ to be an equilibrium path, the expected utility of A's sending $\overline{F_A}$ given D_A also must be maximized. So we have

$$\begin{aligned}
&u(D_A, H_B, \overline{F_A}, F_B) \cdot p_B + u(D_A, D_B, \overline{F_A}, \overline{F_B})(1 - p_B) \geq \\
&u(D_A, H_B, F_A, F_B) \cdot p_B + u(D_A, D_B, F_A, \overline{F_B})(1 - p_B) \Rightarrow \\
&e \cdot p_B + b \cdot (1 - p_B) \geq (c - \Theta_A) \cdot p_B + (a - \Theta_A)(1 - p_B).
\end{aligned}$$

From this condition we have $p_B \leq \frac{b - a + \Theta_A}{b - a + c - e}$. From $\frac{a - b}{a - c} > 0$ and $\frac{b - a + \Theta_A}{b - a + c - e} > 0$, we know the existence of p_B satisfying both conditions.

(2) Suppose $s(\overline{F_A}|H_A) = 1$ and $s(F_A|D_A) = 1$ now. Using the same logic at (1), we must have the following conditions to get TSE in this category.

$$\begin{aligned}
&u(D_A, H_B, F_A, F_B) \cdot p_B + u(D_A, D_B, F_A, \overline{F_B})(1 - p_B) \geq \\
&u(D_A, H_B, \overline{F_A}, F_B) \cdot p_B + u(D_A, D_B, \overline{F_A}, \overline{F_B})(1 - p_B) \quad \textit{and} \\
&u(H_A, H_B, \overline{F_A}, \overline{F_B}) \cdot p_B + u(H_A, D_B, \overline{F_A}, \overline{F_B})(1 - p_B) \geq \\
&u(H_A, H_B, F_A, F_B) \cdot p_B + u(H_A, D_B, F_A, \overline{F_B})(1 - p_B).
\end{aligned}$$

From this, we have the condition $p_B \geq \max\left(\frac{a - b}{a - c}, \frac{b - a + \Theta_A}{b - a + c - e}\right)$. Q.E.D.

PROOF of PROPOSITION 2

By the definition of pooling TSE, A with any type can send either F_A or $\overline{F_A}$ as a pure strategy in a pooling TSE.

(1) Suppose $s(F_A|t_A) = 1$. B's belief of A's type is updated using Bayes' rule such that $\mu(H_A|F_A) = p(H_A)$ and $\mu(D_A|F_A) = p(D_A)$ implying the prior beliefs represent B's updated beliefs. But notice that the definition of TSE does not have any restriction about B's beliefs of A's type in the out-of-equilibrium path ($\overline{F_A}$ in this case). Therefore, B can have any beliefs of A's type for $\overline{F_A}$ if they satisfy condition (2) of TSE.

From Lemma 1, we have $r(F_B|F_A,H_B) = 1$, $r(\overline{F_B}\,|F_A,D_B) = 1$ and $r(\overline{F_B}\,|\,\overline{F_A},D_B) = 1$ in any TSE. So if B receives the equilibrium message F_A, Hawk B responds F_B and Dove B responds $\overline{F_B}$. If condition (1) of TSE is to be met, then the following conditions must be satisfied.

$$\begin{aligned}&u(H_A,H_B,F_A,F_B)\cdot p_B + u(H_A,D_B,F_A,\overline{F_B})(1-p_B) \geq \\ &u(H_A,H_B,\overline{F_A},r(\cdot))\cdot p_B + u(H_A,D_B,\overline{F_A},\overline{F_B})(1-p_B) \quad and \\ &u(D_A,H_B,F_A,F_B)\cdot p_B + u(D_A,D_B,F_A,\overline{F_B})(1-p_B) \geq \\ &u(D_A,H_B,\overline{F_A},r(\cdot))\cdot p_B + u(D_A,D_B,\overline{F_A},\overline{F_B})(1-p_B)\end{aligned}$$

Then we have

$$c\cdot p_B + a\cdot(1-p_B) \geq (d\cdot r_1 + (1-r_1)\cdot b)\cdot p_B + b\cdot(1-p_B) \Rightarrow r_1 \geq \frac{p_B\cdot(a-c)+b-a}{p_B\cdot(b-d)} = \Pi_H \quad \text{and}$$

$$(c-\Theta_A)\cdot p_B + (a-\Theta_A)\cdot(1-p_B) \geq (e\cdot r_1 + (1-r_1)\cdot b)\cdot p_B + b\cdot(1-p_B) \Rightarrow r_1 \geq \frac{p_B\cdot(a-c)+b-a+\Theta_A}{p_B\cdot(b-e)} = \Pi_D.$$

It is immediate that $r_1 = 0$ cannot satisfy the above condition. From $0 < r_1 \leq 1$ we have the condition

$$p_A \leq \frac{a'-b'}{a'-c'} \quad \text{and} \quad p_B \geq \frac{b-a+\Theta_A}{b-a+c-e}.$$

If this condition is satisfied, we can have a TSE path supported by B's out-of-equilibrium strategy such that $r_1 \geq \max(\Pi_H, \Pi_D)$.

(2) Suppose $s(\overline{F_A}\,|\cdot) = 1$. In this case, B's response to A's message follows Lemma 2. Suppose first $p_A < \frac{a'-b'}{a'-c'}$ implying $r_1 = 1$. But this cannot maximize A's expected utility of sending the message $\overline{F_A}$. Suppose now $p_A > \frac{a'-b'}{a'-c'}$ implying $r_1 = 0$. From the first condition of TSE,

$$\begin{aligned}&u(H_A,H_B,\overline{F_A},\overline{F_B})\cdot p_B + u(H_A,D_B,\overline{F_A},\overline{F_B})(1-p_B) \geq \\ &u(H_A,H_B,F_A,F_B)\cdot p_B + u(H_A,D_B,F_A,\overline{F_B})(1-p_B) \quad and \\ &u(D_A,H_B,\overline{F_A},\overline{F_B})\cdot p_B + u(D_A,D_B,\overline{F_A},\overline{F_B})(1-p_B) \geq \\ &u(D_A,H_B,F_A,F_B)\cdot p_B + u(D_A,D_B,F_A,\overline{F_B})(1-p_B).\end{aligned}$$

The second inequality is already satisfied, so we have

$$b\cdot p_B + b\cdot(1-p_B) \geq c\cdot p_B + a\cdot(1-p_B) \Rightarrow p_B \geq \frac{a-b}{a-c}.$$

Finally, suppose $p_A = \frac{a' - b'}{a' - c'}$ implying B's mixed strategy. To satisfy the condition (1) of TSE,

$$u(H_A, H_B, F_A, F_B) \cdot p_B + u(H_A, D_B, F_A, \overline{F_B})(1 - p_B) \le$$
$$u(H_A, H_B, \overline{F_A}, r(\cdot)) \cdot p_B + u(H_A, D_B, \overline{F_A}, \overline{F_B})(1 - p_B) \quad and$$
$$u(D_A, H_B, F_A, F_B) \cdot p_B + u(D_A, D_B, F_A, \overline{F_B})(1 - p_B) \ge$$
$$u(D_A, H_B, \overline{F_A}, r(\cdot)) \cdot p_B + u(D_A, D_B, \overline{F_A}, \overline{F_B})(1 - p_B).$$

To solve it, we have

$$r_1 \le \frac{p_B \cdot (a - c) + b - a}{p_B \cdot (b - d)} \quad \text{and} \quad r_1 \le \frac{p_B \cdot (a - c) + b - a + \Theta_A}{p_B \cdot (b - e)}.$$

From $0 < r_1 < 1$, we have the condition

$$p(H_B) > \frac{a - b}{a - c}.$$

Q.E.D.

PROOF of PROPOSITION 3:
I classify the possible semi-mixing TSE paths into four categories.

(1) Suppose $s(F_A|H_A) = 1$, $s(F_A|D_A) \in (0,1)$ and $s(\overline{F_A}|D_A) \in (0,1)$. Using Bayes' rule, we have $\mu(D_A|\overline{F_A}) = 1$ implying $r(F_B|\overline{F_A}, H_B) = 1$. Because both F_A and $\overline{F_A}$ are equilibrium messages, the following condition must be satisfied from the condition (1) of TSE.

$$u(H_A, H_B, F_A, F_B) \cdot p_B + u(H_A, D_B, F_A, \overline{F_B})(1 - p_B) =$$
$$u(H_A, H_B, \overline{F_A}, F_B) \cdot p_B + u(H_A, D_B, \overline{F_A}, \overline{F_B})(1 - p_B)$$

But this condition cannot be satisfied with any value of p_B. Therefore, there is no semi-mixing TSE in this category.

(2) Suppose $s(F_A|D_A) = 1$, $s(F_A|H_A) \in (0,1)$ and $s(\overline{F_A}|H_A) \in (0,1)$. We have $\mu(D_A|\overline{F_A}) = 0$ implying $r(\overline{F_B}|\overline{F_A}, H_B) = 1$. Using the same logic with the above proof, we can know there is no semi-mixing TSE in this category.

(3) Suppose $s(\overline{F_A}|H_A) = 1$, $s(\overline{F_A}|D_A) \in (0,1)$ and $s(F_A|D_A) \in (0,1)$ implying $\mu(D_A|F_A) = 1$. Because A sends the message $\overline{F_A}$ from both H_A and D_A, B must update his beliefs of A's type using Bayes' rule. It is easy to show that the condition (1) of TSE cannot be satisfied if $\mu(H_A | \overline{F_A}) \ne \frac{a' - b'}{a' - c'}$ in this case. So I check the case $\mu(H_A | \overline{F_A}) = \frac{a' - b'}{a' - c'}$. Under this belief, Hawk B uses a mixed strategy as I have shown at Lemma 2. To satisfy the condition (1) of TSE:

$$u(H_A,H_B,F_A,F_B)\cdot p_B+u(H_A,D_B,F_A,\overline{F_B})(1-p_B)\le$$
$$u(H_A,H_B,\overline{F_A},r(\cdot))\cdot p_B+u(H_A,D_B,\overline{F_A},\overline{F_B})(1-p_B) \quad and$$
$$u(D_A,H_B,F_A,F_B)\cdot p_B+u(D_A,D_B,F_A,\overline{F_B})(1-p_B)=$$
$$u(D_A,H_B,\overline{F_A},r(\cdot))\cdot p_B+u(D_A,D_B,\overline{F_A},\overline{F_B})(1-p_B).$$

To solve it, we have the condition

$$r_1\le\frac{p_B\cdot(a-c)+b-a}{p_B\cdot(b-d)} \quad \text{and} \quad r_1=\frac{p_B\cdot(a-c)+b-a+\Theta_A}{p_B\cdot(b-e)}.$$

From $0<r_1<1$ we have the condition $p_B>\frac{a-b}{a-c}$ and $p_B>\frac{b-a+\Theta_A}{b-a+c-e}$.

(4) Suppose $s(\overline{F_A}|D_A)=1$, $s(\overline{F_A}|H_A)\in(0,1)$ and $s(F_A|H_A)\in(0,1)$. By the same logic at (3), B's beliefs are based on Bayes' rule in responding to the message $\overline{F_A}$. It is immediate that we cannot get an equilibrium path if $r_1=1$. So suppose first $\mu(H_A\mid\overline{F_A})>\frac{a'-b'}{a'-c'}$ implying r_1=0. To satisfy the condition (1) of TSE,

$$u(H_A,H_B,F_A,F_B)\cdot p_B+u(H_A,D_B,F_A,\overline{F_B})(1-p_B)=$$
$$u(H_A,H_B,\overline{F_A},\overline{F_B})\cdot p_B+u(H_A,D_B,\overline{F_A},\overline{F_B})(1-p_B).$$

To solve it, we have $p_B=\frac{a-b}{a-c}$. And we can know

$$u(D_A,H_B,F_A,F_B)\cdot p_B+u(D_A,D_B,F_A,\overline{F_B})(1-p_B)\le$$
$$u(D_A,H_B,\overline{F_A},\overline{F_B})\cdot p_B+u(D_A,D_B,\overline{F_A},\overline{F_B})(1-p_B)$$

is satisfied by dominance. Thus we have a semi-mixing TSE with $p_B=\frac{a-b}{a-c}$.

Now suppose $\mu(H_A\mid\overline{F_A})=\frac{a'-b'}{a'-c'}$ which implies B's mixed strategy responding to $\overline{F_A}$. From the condition (1) of TSE

$$u(H_A,H_B,F_A,F_B)\cdot p_B+u(H_A,D_B,F_A,\overline{F_B})(1-p_B)=$$
$$u(H_A,H_B,\overline{F_A},r(\cdot))\cdot p_B+u(H_A,D_B,\overline{F_A},\overline{F_B})(1-p_B) \quad and$$
$$u(D_A,H_B,F_A,F_B)\cdot p_B+u(D_A,D_B,F_A,\overline{F_B})(1-p_B)\le$$
$$u(D_A,H_B,\overline{F_A},r(\cdot))\cdot p_B+u(D_A,D_B,\overline{F_A},\overline{F_B})(1-p_B).$$

To solve it, we have

$$r_1=\frac{p_B\cdot(a-c)+b-a}{p_B\cdot(b-d)} \quad \text{and} \quad r_1\le\frac{p_B\cdot(a-c)+b-a+\Theta_A}{p_B\cdot(b-e)}.$$

From $r_1>0$, we have the condition $p_B>\frac{a-b}{a-c}$. This completes the proof. Q.E.D.

PROOF of PROPOSITION 4

From the proof of Proposition 3, $0<r_1<1$ implying $\mu(H_A\mid\overline{F_A})=\frac{a'-b'}{a'-c'}$ is required in this category. The following condition is necessary to get a complete-mixing

TSE.

$$u(H_A, H_B, F_A, F_B)\cdot p_B + u(H_A, D_B, F_A, \overline{F_B})(1-p_B) =$$
$$u(H_A, H_B, \overline{F_A}, r(\cdot))\cdot p_B + u(H_A, D_B, \overline{F_A}, \overline{F_B})(1-p_B) \quad \textit{and}$$
$$u(D_A, H_B, F_A, F_B)\cdot p_B + u(D_A, D_B, F_A, \overline{F_B})(1-p_B) =$$
$$u(D_A, H_B, \overline{F_A}, r(\cdot))\cdot p_B + u(D_A, D_B, \overline{F_A}, \overline{F_B})(1-p_B).$$

From the proof (3) and (4) of Proposition 3, we have the following condition

$$r_1 = \frac{p_B\cdot(a-c)+b-a}{p_B\cdot(b-d)} \quad \text{and} \quad r_1 = \frac{p_B\cdot(a-c)+b-a+\Theta_A}{p_B\cdot(b-e)}.$$

So if we have the above condition satisfied, we can get a complete mixing TSE. From $0 < r_1 < 1$, the following condition is also necessary for the existence of complete mixing TSE

$$p_B > \frac{a-b}{a-c} \quad \text{and} \quad p_B > \frac{b-a+\Theta_A}{b-a+c-e}.$$

Q.E.D.

REFERENCES

Abravanel, M. and B. Hughes, 1975, "Public Attitudes and Foreign Policy Behavior in Western Democracies," in W. Chittick ed., *The Analysis of Foreign Policy Outputs,* OH: Charles Merill.

Ahn, B, 1998, "When Hawks Are Doves and Doves Are Hawks: Domestic Conditions and Foreign Conflicts," *Journal of International and Area Studies* 5: 21-44.

Anderson, O., 1967, *A Liberal State at War,* London: Macmillan.

Babst, D., 1972, "A Force for Peace," *Industrial Research* (April) : 55-58.

Banks, J. S., 1990, "Equilibrium Behavior in Crisis Bargaining Games," *American Journal of Political Science* 34: 599-614.

Banks, J. S and J. Sobel, 1987, "Equilibrium Selection in Signaling Games," *Econometrica* 55: 647-61.

Barringer, R., 1972, *War: Patterns of Conflict,* Cambridge, MA: MIT Press.

Bentham, J., 1834, *The Works of Jeremy Bentham,* edited by J. Bowring, Edinburgh.

Bremer, S. A., 1992, "Dangerous Dyads: Conditions Affecting the Likelihood of Interstate War, 1816-1965," *Journal of Conflict Resolution* 36: 309-41.

Brody, R. A., 1984, "International Crises: A Rallying Point for the President," *Public Opinion* 6: 43-60.

Bueno de Mesquita, B., 1980, "Theories of International Conflict: An Analysis and Appraisal," in T. R. Gurr ed., *Handbook of Political Conflict,* New York: Free Press.

——————, 1981, *The War Trap,* New Haven: Yale University Press.

——————, 1985, "The War Trap Revisited: A Revised Expected Utility Model," *American Political Science Review* 79: 156-77.

————————, 1987, "Conceptualizing War: A Reply." *Journal of Conflict Resolution* 31: 370-82.

Bueno de Mesquita, B. and D. Lalman, 1986, "Reason and War," *American Political Science Review* 80: 113-29.

————————, 1988, "Systemic and Dyadic Explanations of War," *World Politics* 41: 1-20.

————————, 1989, "The Road to War is Strewn with Peaceful Intentions," in Peter C. Ordeshook ed., *Models of Strategic Choice in Politics,* Ann Arbor: University of Michigan Press.

————————, 1990, "Domestic Opposition and Foreign War," *American Political Science Review* 84: 747-65.

————————, 1992, *War and Reason,* New Haven: Yale University Press.

Bueno de Mesquita, B., R. M. Siverson, and G. Woller, 1992, "War and the Fate of Regime: A Comparative Study," *American Political Science Review* 86: 638-46.

Campbell, J. T. and L. S. Cain, 1965, "Public Opinion and the Outbreak of War," *Journal of Conflict Resolution* 9: 318-29.

Caspary, W., 1970, "The Mood Theory?: A Study of Public Opinion and Foreign Policy," *American Political Science Review* 64: 536-47.

Chan, S., 1984, "Mirror, Mirror on the Wall: Are the Freer Countries More Pacific?" *Journal of Conflict Resolution* 28: 617-48.

Cho, I and D. Kreps, 1987, "Signaling Games and Stable Equilibria," *Quarterly Journal of Economics* 102: 179-221.

Claude, I. L. Jr., 1962, *Power and International Relations,* NY: Random House.

Cotton, T. Y. C., 1986, "War and American Democracy: Voting Trends in the Last Five American Wars," *Journal of Conflict Resolution* 30: 616-35.

Doyle, M., 1986, "Liberalism and World Politics," *American Political Science Review* 80: 1151-71.

Ferris, W., 1973, *The Power Capabilities of Nation-States,* Lexington, MA: Lexington Books.

Forde, S., 1986, "Thucydides on the Causes of Athenian Imperialism," *American Political Science Review* 80: 433-48.

Garnham, D., 1976a, "Power Parity and Lethal International Violence," *Journal of Conflict Resolution* 20: 379-94.

————————, 1976b, "Dyadic International War 1816-1965," *Western Political Quarterly* 29: 231-42.

Gaubatz, K. T., 1991, "Election Cycles and War," *Journal of Conflict Resolution* 35:212-44.

Gilpin, R., 1981, *War and Change in World Politics,* Cambridge: Cambridge University Press.

Gulick, E. V., 1955, *Europe's Classical Balance of Power*, Ithaca: Cornell University Press.

Gurr, T. R.,ed. 1980, *Handbook of Political Conflict,* New York: Free Press.

Haas, M., 1965, "Societal Approaches to the Study of War," *Journal of Peace Research* 4: 307-23.

Hinckley, R. H., 1988, "Public Attitudes toward Key Foreign Policy Events," *Journal of*

Conflict Resolution 32: 295-318.
Hobbes, T., 1968[1651], *Leviathan,* ed. by C. B. Macpherson, New York: Penguin Books.
Hofstadter, R., 1955, *The Age of Reform,* New York: Knopf.
Holsti, O. R., 1967, "Cognitive Dynamics and the Image of Enemy," in D. Finlay, O. Holsti and R. Fagen eds., *Enemies in Politics,* Chicago: Rand McNally.
Houweling, H. and J. G. Siccama, 1988, "Power Transitions as a Cause of War," *Journal of Conflict Resolution* 32: 87-102.
Jervis, R., 1970, *The Logic of Images in International Relations,* Princeton: Princeton University Press.
————, 1976, *Perception and Misperception in International Politics,* Princeton: Princeton University Press.
————, 1985, "Pluralistic Rigor: A Comment on Bueno de Mesquita," *International Studies Quarterly* 29: 145-49.
————, 1988, "War and Misperception," *The Journal of Interdisciplinary History* 18: 675-700.
Kant, I., 1949 [1795], "Eternal Peace," in C. J. Fredrich ed., *The Philosophy of Kant,* New York: Random House.
Kaplan, M. A., 1957, *System and Process in International Politics,* New York: Wiley.
Kegley, C., N. Richardson and G. Richter, 1978, "Conflict at Home and Abroad: An Empirical Extension," *Journal of Politics* 40: 742-52.
Kernell, S., 1978, "Explaining Presidential Popularity," *American Political Science Review* 72: 506-22.
Kim, W., 1989, "Power, Alliance, and Major Wars, 1816-1975," *Journal of Conflict Resolution* 33: 255-73.
Kissinger, H., 1979, *The White House Years,* Boston: Little Brown.
Krasner, S. D., 1985, "Toward Understanding in International Relations," *International Studies Quarterly* 29: 137-44.
Kreps, D. and R. Wilson, 1982, "Sequential Equilibria," *Econometrica* 50: 863-93.
Leigh, M., 1976, *Mobilizing Consent: Public Opinion and American Foreign Policy, 1937-1947,* Westport, Ct: Greenwood.
Levy, J. S., 1983, *War in the Modern Great Power System, 1495-1975*, Lexington: Univ. Press of Kentucky
————, 1988a, "The Diversionary Theory of War: A Critique," in M. I. Midlarsky ed., *Handbook of War,* Boston: Unwin Hyman.
————, 1988b, "Domestic Politics and War," *The Journal of Interdisciplinary History* 18: 653-73.
Lunch, W. L. and P. Sperlich, 1979, "American Public Opinion and the War in Vietnam," *Western Political Quarterly* 32: 21-44.
Majeski, S. and D. J. Sylvan, 1984, "Simple Choices and Complex Calculation: A Critique of *The War Trap,*" *Journal of Conflict Resolution* 28: 316-40.
Maoz, Z. and N. Abdolali, 1989, "Regime Types and International Conflict, 1816-1976," *Journal of Conflict Resolution* 33: 3-35.
Maoz, Z. and B. M Russett, 1992, "Alliance, Contiguity, Wealth and Potential Stability: Is the Lack of Conflict Among Democracies a Statistical Artifact?" *International*

Interactions 17: 245-68.
May, E., 1961, *Imperial Democracy,* New York: Harcourt, Brace & World.
Mearsheimer, J. J., 1991, "Back to the Future: Instability in Europe after the Cold War," in *The Cold War and After*, ed. S. M. Lynn-Jones, Cambridge: MIT Press.
Mintz, A. and N. Geva, 1993, "Why Don't Democracies Fight Each Other," *Journal of Conflict Resolution* 37: 484-503.
Modelski, G., 1972, "War and Great Powers," *Papers, Peace Research Society* 18: 45-59.
Morgenthau, H., 1973, *Politics Among Nations*, 5th edition, New York: Alfred Knopf.
Morrow, J., 1989, "Capabilities, Uncertainty, and Resolve: A Limited Information Model of Crisis Bargaining," *American Journal of Political Science* 33: 941-72.
Moul, W. B., 1988, "Balances of Power and the Escalation to War of Serious Disputes among the European Great Powers, 1815-1935: Some Evidence," *American Journal of Political Science* 32: 241-75.
Mueller, J. E., 1973, *War, Presidents and Public Opinion,* New York: John Wiley & Sons.
Nicholson, M., 1987, "The Conceptual Bases of The War Trap," *Journal of Conflict Resolution* 31: 346-69.
Organski, A. F. K., 1968, *World Politics,* 2nd edition, NY: Alfred Knopf.
Organski, A. F. K. and J. Kugler, 1980, *The War Ledger,* Chicago: University of Chicago Press.
Ostrom, C. W., Jr. and B. L. Job, 1986, "The President and the Political Use of Force," *American Political Science Review* 80: 541-66.
Powell, R., 1987, "Crisis Bargaining, Escalation, and MAD," *American Political Science Review* 81: 717-35.
Rummel, R. J., 1979, *Understanding Conflict and War, Vol. 4: War, Power, and Peace,* Beverly Hills, CA: Sage.
————, 1983a, "Libertarianism and International Violence," *Journal of Conflict Resolution* 27: 27-71.
————, 1983b, "Wiberg's Review Essay on Rummel: A Reply," *Journal of Peace Research* 20 : 279-80.
Russett, B. M. and T. W. Graham, 1988, "Public Opinion and National Security Policy: Relationships and Impacts," in M. I. Midlarsky ed., *Handbook of War Studies,* Boston:Unwin Hyman.
Russett, B. M. and R. J. Monsen, 1975, "Democracy and Polyarchy as Predictors of Performance: A Cross-National Examination," *Comparative Political Studies* 8: 5-31.
Scolnick, J. M., 1974, "An Appraisal of Studies of the Linkage between Domestic and International Conflict," *Comparative Political Studies* 6: 485-509.
Simowitz, R. and B. L. Price, 1990, "The Expected Utility Theory of Conflict: Measuring Theoretical Progress," *American Political Science Review* 84: 439-60.
Singer, J. D., 1960, "Threat Perception and the Armament-Tension Dilemma," in A. McClelland ed., *Nuclear Weapons, Missiles, and Future War,* San Francisco Chandler.
————, 1961, "The Level of Analysis Problem in International Relations," *World Politics* 14: 77-92.
Siverson. R. M. and M. Sullivan. 1983. "The Distribution of Power and the Onset of

War," *Journal of Conflict Resolution* 27: 473-94.
Siverson, R. M. and M. R. Tennefoss, 1984, "Power, Alliance, and the Escalation of International Conflict, 1815-1965," *American Political Science Review* 78: 1057-69.
Small, M. and J. D. Singer, 1976, "The War-Proneness of Democratic Regimes, 1816-1965," *Jerusalem Journal of International Relations* 1: 50-69.
Stein, A., 1982, "When Misperception Matters," *World Politics* 36: 505-26.
Stohl, M., 1980, "The Nexus of Civil and International Conflict," in Gurr ed., *Handbook of Political Conflict,* New York: Free Press.
Stoll, R., 1984, "The Guns of November," *Journal of Conflict Resolution* 27: 231-46.
Vertzberger, Y., 1982, "Misperception in International Politics: A Typological Framework for Analysis," *International Interactions* 9: 207-34.
Wagner, R. H., 1988, "War and Expected-Utility Theory (Review Article)," *World Politics* 41: 407-23.
——————, 1994, "Peace, War, and the Balance of Power," *American Political Science Review* 88: 593-607.
Waltz, K. N., 1959, *Man, the State and War,* New York: Columbia University Press.
——————,1964, "The Stability of a Bi-polar World," *Daedalus* 93: 881-909.
——————,1979, *Theory of International Politics,* Reading, MA: Addison-Wesley.
Ward, M. D. and U. Widmaier, 1982, "The Domestic-International Conflict Nexus: New Evidence and Old Hypothesis," *International Interactions* 9: 75-101.
Weede, E., 1976, "Overwhelming Preponderance as a Pacifying Condition Among Contiguous Asian Dyads, 1950-1969," *Journal of Conflict Resolution* 20: 395-411.
——————,1984, "Democracy and War Involvement," *Journal of Conflict Resolution* 28: 649-64.
Wohlstetter, R., 1962, *Pearl Harbor: Warning and Decision*, Stanford, California: Stanford University Press.
Wright, Q., 1965, *A Study of War,* 2nd edition, Chicago: University of Chicago Press.
Zagare, F., 1982, "Review of The War Trap," *American Political Science Review* 76: 738-39.

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