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A General Explanation of the Cuban Missile Crisis

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Abstract

After briefly surveying and evaluating previous attempts to use game theory to explain the Cuban missile crisis, this study develops a new explanation drawn from a general escalation model of interstate conflict. Specifically, the equilibrium structure of the Asymmetric Escalation Game with incomplete information is used to explain the initiation, the development and the resolution of the crisis. One, and only one, of the model's several equilibria is shown to be consistent with the beliefs, the action choices of US and Soviet decision makers and, significantly, with the political bargain that ended the crisis. Answers to all three of the foundational questions traditionally associated with the crisis are derived from an examination of the model's strategic dynamic.

A general explanation of the Cuban missile crisis

More than fifty years have passed since the Cuban missile crisis was settled. The crisis began with the discovery that the Soviet Union was in the process of installing medium- and intermediate-range ballistic missiles in Cuba. As is well-known, these missiles were capable of delivering a nuclear blow to a large portion of the continental United States, including most of its major population centers. The Kennedy administration responded by clamping a blockade around the island. Thirteen days later the crisis was resolved when the Soviets agreed to withdraw the missiles in return for a public U.S. pledge not to invade Cuba and a private U.S. promise to dismantle its missiles in Turkey. Until this agreement was reached, however, thermonuclear war remained a distinct possibility.

At the time most western observers coded the crisis as a clear-cut victory for the United States. Since all but a few contemporaneous accounts were

based on U.S. government leaks or on information provided by Kennedy administration insiders,[1] this is not at all surprising. But with the release of key documents from the Soviet archives and the publication of transcribed deliberations of the United States government in the late 1990s, the initial interpretation of the conflict shifted.[2] Today, the consensus view among historians and strategic analysts is that the crisis was a draw (Gaddis 1997, 261). In other words, when push came to shove, both sides blinked.

But regardless of how it is scored, three questions have dominated discussions of the crisis in the security studies literature. First, why did the Soviets install the missiles in Cuba? Second, why did the United States respond with a blockade and not an air strike or an invasion? And third, why did the Soviets remove the missiles?

Given the way these questions have been framed, it is more than understandable that most attempts to explain the crisis have been tied to the particulars of the Cuban case. Allison and Zelikow, for example, (1999, 78-109) discuss four different rational actor explanations of the Soviet decision to install the missiles, all couched in terms of the strategic situation that existed in early 1962 when the decision was actually made. It is clear, however, that case-specific explanations such as these fall short of the explanatory mark. As Abraham Kaplan (1964, 339) reminds us, "to explain something is to exhibit it as a special case of what is known in general."

The purpose of this essay is to develop a new explanation of the crisis that not only is consistent with the documentary record as it is known today but also is more general than idiosyncratic explanations like those summarized by Allison and Zelikow. To this end I explore its strategic dynamic in the context of a single integrated game-theoretic model of interstate conflict initiation, limitation, and escalation called the Asymmetric Escalation Game. This model brings with it a clear set of theoretical expectations about the conditions under which intense interstate disputes, such as the missile crisis, are resolved short of an all-out war. Thus the explanation I offer is neither ad hoc nor post hoc. Rather, it is a logically implied consequence of an explicit set of assumptions applied to a transparent theoretical model and not, as are most extant explanations, an after the fact

[1] See, for example, Schlesinger (1965) and Sorenson (1965).

[2] Many of the released Soviet documents are available online at the Cold War International History Project: http://www.wilsoncenter.org/program/cold-war-international-history-project. For the Kennedy tapes, see May and Zelikow (1997).

rationalization of US and Soviet action choices. Put in a slightly different way, the explanation that is derived from the model applies not only to the Cuban case but to other interstate conflicts as well. This is as it should be; as King, Keohane and Verba (1998, 43) point out, "where possible, social science research should be both general and specific: it should tell us something about classes of events as well as about specific events at particular places."

None of which is to suggest that there have been no other attempts to develop a general explanation of what the Soviets referred to as the Caribbean crisis. Indeed, several prominent game theorists have tried to analyze the confrontation systematically. But, as will be discussed shortly, these efforts too have come up short, at least by today's standards. With one exception, all of the noteworthy attempts by game theorists to explain the crisis have assumed complete information, a strong and clearly unsatisfied limiting assumption. By contrast, the explanation I construct benefits from the explanatory refinements that have taken place in the game-theoretic literature over time. More specifically, it makes use of the modern theory of games with incomplete information to explain the crisis. As well, since it is able to exploit the more extensive documentary record that is now available, it is built on a firmer empirical foundation.

A game-theoretic history of the Cuban missile crisis[3]

There is a long history of attempts by game theorists to explain the missile crisis. The first and the most well-known, of course, was made by Thomas Schelling who discussed the crisis in several lengthy passages in his now classic book *Arms and Influence*. It is not altogether clear that Schelling's intent was to *explain* the crisis. Rather, as he noted in the book's preface, his purpose was to use it and other intense interstate conflicts to illustrate "a few of the principles that underlie…[the]…diplomacy of violence" (Schelling 1966, vi). Nonetheless, despite Schelling's disclaimer, others read into his analysis an explanation that has all but become the standard interpretation of the crisis' outcome.[4] Trachtenberg (1985, 162) refers to this take on the crisis as an explanation "à la Thomas Schelling."

For Schelling (1966, 97), "the essence of the crisis is its unpredictability." Since "the participants [in a crisis] are not fully in control of events" there

[3] For a more extensive analysis of the literature discussed in this section, see Zagare (2014).
[4] See, for example, Dodge (2012); Hesse (2010).

is always an *autonomous risk of war*, that is, a danger that things will spiral out of control, regardless of the action choices of the players in a high stakes game (of Chicken). Schelling's insight was that this was a risk that could be exploited by an adroit crisis manager. He offered President Kennedy's decision to blockade Cuba as a case in point, as a good example of the effective use of what he had elsewhere referred to as the "threat-that leaves-something-to-chance" (Schelling 1960, ch. 8).

As Schelling (1966, 96) noted, "there was nothing about the blockade of Cuba by American naval vessels that could have led straightforwardly into general war." Still, since Schelling believed that the blockade had raised the probability of an uncontrolled escalation of the crisis beyond the point that the Soviets could tolerate, he concluded that Kennedy had won the war of nerves and that, therefore, Khrushchev was forced to back down (Schelling 1966, 121, n8).[5] In short, Schelling saw the crisis as a clear-cut victory for the United States, which was the direct consequence of the coercive bargaining tactics that President Kennedy had so deftly used.

On its face, Schelling's explanation is plausible. Unfortunately, there is little empirical support for it. Not only does Schelling's interpretation of the crisis run counter to what is now the consensus view among diplomatic historians and strategic analysts—that the crisis ended in a tie and, therefore, the blockade did not have the effect that Schelling attributed to it—but there is also scant evidence that the Kennedy administration either manipulated the risk of war during the crisis with "mathematical precision," as Schlesinger (1965, 767) and some other insider accounts have claimed, or successfully made use of any of the related brinkmanship tactics that Schelling highlighted in connection with the crisis (Dobbs 2008, 2012; Trachtenberg 1985, 162). Making matters even worse is the incompatibility of Schelling's underlying theoretical framework with the facts as they are known today. To wit: a formal analysis of the "threat-that-leaves-something-to-chance" clearly demonstrates that a risk-taking contest such as the one Schelling described can never, rationally, result in a draw (Powell 1987, 1990).[6] All of which is to say that an explanation "à la Thomas Schelling" is both theoretically and empirically at odds with the behavior of both superpowers during the crisis as well as with the political bargain that brought the crisis to a close.

After Schelling, the next attempt by a prominent game theorist to try his

[5] For an early formalization of the logic of this argument, see Ellsberg (1959).
[6] See also Dixit and Skeath (2004, ch 14).

hand at explaining the crisis was made by Nigel Howard. Howard's (1971) explanation was developed in the context of an alternative game-theoretic methodology he calls the "theory of metagames." A *metagame* is a game that is played in the heads of the players before a game begins. The metagame is based on the ability of the players to anticipate each other's strategy choices. In the metagame, players choose *metastrategies* rather than strategies. The metastrategies can be interpreted as signals the players send to one another, verbally or otherwise, before the game begins.

Howard's analysis begins by identifying those communication patterns (i.e., sets of metastrategies) that are stable in the sense that no one player would send an alternative signal given that the metastrategies of all the other players remain constant. Stable sets of metastrategies and the outcomes associated with them are termed *metaequilibria*. For Howard, the metaequilibria constitute theoretical possibilities, and the metastrategies are theoretical statements about the content of the communication necessary to lead to some outcome in equilibrium. In Howard's view, no particular metaequilibrium has special status. Each, therefore, describes a logical possibility in a game between rational players. Which metaequilibrium eventually comes into play depends on what the players expect from one another, or what they communicate to each other, in pre-play bargaining and discussion.

Like Schelling, Howard's analysis begins with a payoff structure that defines the missile crisis as a game of nuclear Chicken. But unlike Schelling, Howard accepts the now standard view that the dénouement of the crisis was a political bargain or compromise. Interestingly, while the compromise outcome is not (Nash) an equilibrium in Chicken, it emerges as part of a metaequilibrium in what Howard terms the second-level metagame in which both players make strategy choices based on what they anticipate the other to do. It is in this way that Howard explains the U.S. decision to blockade Cuba and the Soviet decision to dismantle the missile sites: these choices are mutually best responses to one another and, hence, are (minimally) consistent with meta-rational choice.

Howard's claim, however, is a strong one that did not go unchallenged. Although the compromise outcome is part of a metaequilibrium, one of the metastrategies associated with it is (weakly) dominated by another metastrategy that implies a different outcome (i.e., a Soviet victory). Taking Howard to task, Harsanyi (1974b) argued convincingly that the use of any dominated strategy, meta or otherwise, is irrational and, hence,

incredible.[7] All of which suggests that Howard is unable to explain why rational agents would settle on the compromise outcome other than by observing that one of the players in his model (i.e., the United States) would lose if it were "perfectly" rational. Needless to say, rational choice explanations that reject the logical imperatives of the rationality postulate are less than satisfying.

With all of this in mind, Niall Fraser and Keith Hipel (1982-1983) developed what was at the time their innovative *analysis of options* (or *improved metagame*) technique and used it to try to explain the crisis. Starting with a listing of all possible strategy combinations and their consequences, Fraser and Hipel ask which sets of strategies are consistent with rational choice, that is, are stable. Their answer (i.e., their "stability analysis") to this question, however, involved a subtle refinement of Nash's (1951) equilibrium concept. Specifically, Fraser and Hipel specify a number of stability criteria beyond Nash's,[8] the most pertinent of which they refer to as a *sanction*. More specifically, a sanctioned outcome is any outcome for which one player's incentive to switch to another strategy is eliminated by a credible (i.e., a rational) threat (response) by another player. A credible threat is one that brings about a better outcome for the sanctioning player and a worse outcome for the player whose strategy switch is thereby sanctioned.

Given the above, two strategy combinations and their implied outcomes emerge as equilibria in their model. To choose between them, Fraser and Hipel, in another innovation, examine the game's status quo or the state of the world as it existed on October 15, the day before the missiles were discovered. This is the outcome that results when the Soviets install the missiles and the United States does nothing. Fraser and Hipel then show that the blockade was the best response available to the United States given the game's initial outcome, and that the rational response by the Soviet Union to the blockade was to withdraw the missiles. Since the strategy combination of blockade and withdrawal not only is one of the two equilibria in their model but also conforms to the actual flow of events, Fraser and Hipel claim to explain the strategic dynamic of the missile crisis.

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[7] For the particulars of their debate, see Harsanyi (1973, 1974a, 1974b) and Howard (1973, 1974a, 1974b).

[8] For Nash, a strategy set (or outcome) is stable (or rational) if no player has an incentive to switch unilaterally to another strategy. A Nash equilibrium is the standard measure of rational choice in static (or normal-form) games.

Fraser and Hipel, however, are unable to explain why the dynamic process they described stopped at that point. As noted, there are two equilibria in their model, and the second equilibrium more closely tracks the final settlement. Under the second equilibrium, the Soviets withdraw their missiles, and the United States drops the blockade. But Fraser and Hipel's methodology does not lead them to this, the eventual outcome. Thus, their explanation of the crisis, while impressive, still falls short of the explanatory mark.[9]

It is clear that the descriptive inadequacy of Fraser and Hipel's analysis of options technique as it was applied to the missile crisis can be traced to the arbitrary stopping rule they use to define a sanctioned outcome. Recall that the definition of a sanctioned outcome involves a determination by a player of the consequences of a strategy switch given the rational response of another player. In effect, this restriction limits the foresight of the players to a single move and a single counter move (or two total moves). Without this limitation, however, the dynamic process implied by their model would lead to the second equilibrium and to a more empirically accurate description of political bargain that ended the crisis.

Perhaps sensing this, Steven J. Brams developed a more general dynamic modeling framework called the "Theory of Moves" (or TOM) and uses it to offer several (empirically and theoretically plausible) explanations of the crisis (Brams, 1985, 48-62; 2011, 226-40).[10] Like Fraser and Hipel, Brams takes every possible combination of action choices as a state of the world (i.e., as a possible outcome) and assumes that once a game begins either player can move from whatever outcome is the initial state (or status quo), and if it does, the other can respond. But unlike Fraser and Hipel, he places no arbitrary limitation on the number of moves and countermoves

[9] Fraser and Hipel (1982-1983, 8-15) describe a *computational* model, called the *state transition model*, that conforms to the actual outcome of the crisis. While it uses the input of their improved metagame technique, it is not a game-theoretic model. Moreover, their application of the model to the crisis is theoretically ad hoc.

[10] Brams also develops a few explanations using standard game-theoretic concepts. For instance, he suggests that the compromise outcome can also be supported in equilibrium if Khrushchev either deceived the United States by suggesting that the compromise outcome was his most preferred (when it was not) or if his preferences "deteriorated" as the crisis progressed and the compromise outcome actually was his most preferred outcome. Additionally, Brams constructed an extensive-form game model in which the compromise outcome is a (subgame perfect) Nash equilibrium.

available to the players in a game. In other words, he also assumes that if there is a response, the player who moves first can counter-respond, the second can counter-counter-respond, and so on. Any outcome from which neither player, looking ahead indefinitely, has an incentive to move to another state of the world, including the initial state, is said to be a *nonmyopic equilibrium* (Brams 1994).

Brams' (2011) most recent analysis of the crisis begins on October 22, the day the blockade was announced. This established the state of the world he labels "Soviet Victory/U.S. Capitulation," which he considers the best possible outcome for the Soviets, as the initial state of the game. Brams next suggests several reasons why the Soviet Union would then withdraw the missiles and induce its next-best outcome, the outcome he labels "Compromise," rather than stick with its initial choice. For example, if the United States had *moving power*, which is the ability to continue moving in a game when the other player cannot, it could induce the Soviet Union to compromise by forcing it to choose between its next-best and its worst outcome. Or, if the United States possessed *threat power*, which is the ability to threaten a mutually disadvantageous outcome in the first play of a repeated game, it could similarly induce the Soviet Union to withdraw the missiles by threatening to remove them with an air strike if they did not. But regardless of the reason why the Soviets decided to withdraw the missiles, once they did, the game would end. Brams' explanation is that the Compromise outcome is a nonmyopic equilibrium, that is, neither player could do better by moving the game to another state of the world by changing its strategy choice, given that the other might then switch to another strategy, it might then be forced to also change its strategy, and so on.

Collectively, Brams' explanation of why the Soviet Union decided to withdraw the missiles is theoretically insightful. Nonetheless, his analysis of the crisis remains incomplete. Because the concept of a nonmyopic equilibrium has not as yet been successfully defined in a game in which the players have more than two strategies each, it can only be used to access the rationality of four outcomes at a time.[11] This is one reason why Brams' analysis begins after President Kennedy's nationally televised address to the nation. In consequence, however, Brams is unable to answer two of the three core questions about the crisis: why did the Soviet Union

[11] Brams (1994, 11) analyzes one game in which each player has three strategies. Nonetheless, the general applicability of the concept of a nonmyopic equilibrium to more general categories of games remains unclear.

decide to contest the status quo by installing the missiles in the first place, and why the "initial" step taken by the United States was not an escalatory choice.

R. Harrison Wagner's (1989) examination of the crisis was the first to exploit the modern theory of games with incomplete information. Starting with a straightforward crisis bargaining model that broadly mirrors both the choices and the sequence of moves made by the United States and the Soviet Union, he deduces what must have been true, game-theoretically, 1) for Khrushchev to introduce the missiles in Cuba; 2) for Kennedy to have implemented a blockade (or some other ultimatum) rather than respond in a more aggressive way; and 3) for the bargain that ended the crisis to have come about. For example, in terms of preferences, Wagner asserts, persuasively, albeit predictably, that Khrushchev could not have anticipated the actual resolution of the crisis since, by Wagner's reckoning, it was "extremely unlikely that Khrushchev preferred this outcome to the one that would have resulted from an initial decision not to place the missiles in Cuba" (Wagner 1989, 181). Along the same lines he suggests, in terms of beliefs or probabilities, that "Khrushchev must not have believed that…[the probability that Kennedy was prepared to take military action]…was high enough that he would choose voluntarily to remove the missiles if Kennedy demanded it, since otherwise he would not have decided to put them in Cuba" (Wagner 1989, 184-85).[12]

Wagner's study provides a plausible *description* of the strategic dynamic that characterized the missile crisis. And since it addresses all of the central questions about the crisis, it is more complete than previous game-theoretic examinations. As well, his model was carefully constructed from the facts of the crisis as they were known to him at the time; in fact, his evidentiary base included a limited number of transcripts of Kennedy administration deliberations. Nonetheless, the explanatory power of his model is suspect. Theories and models that are constructed from facts cannot but fail to explain those facts. In consequence, explanations like Wagner's that verge on the tautological, must ultimately be judged to be unconvincing (King, Keohane and Verba 1994, 19-23; Morrow 1994, 22).

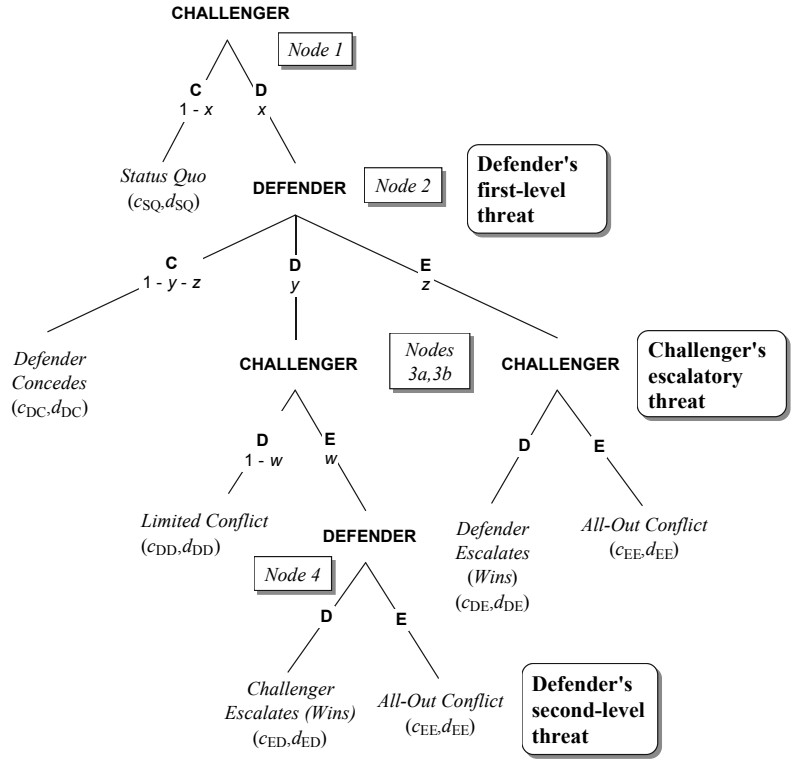
[12] Wagner's approach, called *revealed preferences*, should be contrasted with the approach I use in the next section called *posited preferences* that assumes an actor's goals rather than deducing them from actual behavior. For a discussion of the implications and differences, see Riker and Ordeshook (1973, 14-16). See also Hausman (2011, ch. 3).

The Asymmetric Escalation Game

In this section I construct a new explanation of the missile crisis that addresses the shortcomings not only of extant idiosyncratic studies but also of the prominent game-theoretic attempts at explanation surveyed above. The explanation I construct is both general and specific; as such, it tells us something about the Cuban crisis and also about crises as a distinct class of events. This new explanation also exploits a documentary record that was unavailable to those who studied the crisis before Soviet archives were opened in the late 1990s; and it makes use of those advances in the modern theory of games with incomplete information that were just beginning to be recognized by security studies analysts around the time that Wagner wrote.

To develop this explanation I explore the equilibrium structure of a general model of conflict initiation, limitation, and escalation called the Asymmetric Escalation Game (see Figure 1). The equilibria of this model, or of any game-theoretic model for that matter, provide a clear set of a priori theoretical expectations about the conditions under which certain behavioral patterns are expected. In other words, game-theoretic explanations (and predictions) are implicit in a model's equilibrium structure. As Riker (1990, 175) explains: "equilibria are...identified consequences of decisions that are necessary and sufficient to bring them about. An explanation is…the assurance that an outcome must be the way it is because of antecedent conditions. This is precisely what equilibrium provides."

The Asymmetric Escalation Game provides a rich theoretical context in which to explore the missile crisis. For one, it is a general model that admits a range of conflict possibilities. In consequence it potentially provides a theoretical instrument for addressing all three of the questions that have traditionally been asked of the crisis, albeit more generally than they have previously been posed. First, why did the crisis take place at all? (i.e., why did the Soviets install medium and intermediate missiles in Cuba?) Second, why was the U.S. response measured? (i.e., why did the United States respond with a blockade and not an air strike or an invasion?) And third, why was the crisis resolved short of war? (i.e., why did the Soviets remove the missiles?)



Key:

Challenger:	**C = Cooperate**	*x* = probability Challenger initiates at node 1
	D = Demand	w = probability Challenger escalates at node 3a
	E = Escalate	*y* = probability Defender responds-in-kind at node 2
		z = probability Defender escalates at node 2
Defender:	**C = Concede**	
	D = Defy	
	E = Escalate	

(c_{xx},d_{xx}) = Utility of outcome (xx) to Challenger, Defender

Figure 1: The Asymmetric Escalation Game with incomplete information (Zagare and Kilgour 2000)

Beyond its generality, the internal structure of the Asymmetric Escalation Game model also closely tracks the decision-making environment that conditioned the Cuban crisis. This is, perhaps, its most attractive feature and the principal reason it provides a compelling theoretical context for

explaining why the United States and the Soviet Union were able to settle their dispute short of war. Of course, closeness of fit is not a sufficient condition for rendering an abstract model suitable for empirical application. Also required is a set of theoretically derived and empirically supported preference and information assumptions. Below I show this to be the case as well.

As Figure 1 shows, there are two players, Challenger and Defender, and six outcomes in the Asymmetric Escalation Game. Challenger (i.e., the Soviet Union) begins play at node 1 by deciding whether to contest the status quo. If Challenger makes no demand (by choosing C), the outcome called *Status Quo* (SQ) obtains. But if Challenger initiates conflict and demands a change to the existing order (by choosing D), Defender (i.e., the United States) decides (at node 2) whether to capitulate (by choosing C) or to respond, and if the latter, whether to respond-in-kind (by choosing D), or to escalate the conflict (by choosing E).

Capitulation ends the game at *Defender Concedes* (DC). If Defender responds, Challenger can escalate or not at nodes 3a or 3b. If Challenger is the first to escalate (at node 3a), Defender is afforded an opportunity at node 4 to counter-escalate. *Limited Conflict* (DD) occurs if Defender responds-in-kind and Challenger chooses not to escalate at node 3a. *Challenger Escalates/Wins* (ED) if, at node 4, Defender chooses not to counter-escalate. Similarly, the outcome is *Defender Escalates/Wins* (DE) if Challenger chooses not to counter-escalate at node 3b. *All-Out Conflict* (EE) results whenever both players escalate.

Because the Asymmetric Escalation Game is a general model, it is applicable to a wide range of empirical circumstances and is in no way restricted by the terms used to denote its component parts. For example, the outcome labeled *Limited Conflict*, which occurs if and only if both players defect but neither escalates, could easily and quite naturally be associated with an ongoing real world dispute that lingers on short of war. But the outcome could also be used to capture the dénouement of an intense crisis that is resolved, possibly in short-order, by political negotiations, as was the case in 1962. It would be a straightforward exercise to change the nomenclature of the Asymmetric Escalation Game to conform to the specifics of the Cuban crisis, in which case the outcome *Limited Conflict* could be variously labeled “brokered settlement,” “negotiated outcome,” or “compromise,” but that would change nothing. Thus, to maximize generality and to facilitate cross case comparisons, the

labels originally used to construct the model will be retained.[13]

All of which raises the issue of how closely the Asymmetric Escalation Game model conforms to the actual situation in 1962. It is not a reach at all to suggest that Challenger's choice at node 1 captures the dilemma facing Khrushchev early that year. Had Khrushchev done nothing, i.e., chosen "C," the lopsided strategic relationship of the superpowers would have remained unbalanced, and a status quo in which Cuba was open to an American attack would continue indefinitely (Khrushchev 1970, ch. 20). On the other hand, the Soviet Premier was obviously contesting the status quo, i.e., choosing "D," when he decided to ship the missiles to Cuba. American decision-makers saw it this way as well (May and Zelikow 1997, 235).

But what about Defender's tripartite choice at node 2? It is widely accepted that the Kennedy administration considered a bewildering number of nuanced responses, including but not limited to doing nothing, blockading Cuba, removing the missiles with a "surgical" air strike, and removing the missiles *and* Castro with a massive air strike and a subsequent invasion (Allison and Zelikow 1999). Nonetheless, all were tactical options that correspond roughly to the choices available to Defender at node 2. Of course, doing nothing (i.e., choosing C) was always an available response; but, as Secretary of Defense McNamara put it on October 18, there were only two additional alternatives: "one is a minimum action, a blockade approach, with a slow buildup to subsequent action. The other is a very forceful military action with a series of variances as to how you enter it" (May and Zelikow 1997, 162). In terms of the model, the United States could either measure its response (i.e., choose D) or escalate the conflict (i.e., choose E).

It is noteworthy that McNamara went on to recommend to those advising the President that they "consider how the Soviets are going to respond" to whatever course of action the United States took. Significantly, at that point the State Department's Soviet expert Llewellyn Thompson chimed in: "Well, not only the Soviet response, but what the response to the response will be" (May and Zelikow 1997, 162). Nodes 3a and 3b reflect the possible Soviet counter-response to an American action choice: to escalate (i.e., to choose E) or not (i.e., to choose D). Of course, if the

[13] The Asymmetric Escalation Game model has also been used to explore the July crisis of 1914 (Zagare 2009, 2011) and NATO's 1998 war with Serbia over Kosovo (Quackenbush and Zagare 2006).

Soviets were the first to escalate (at node 3a), the United States always had the option of counter-escalating. Node 4 takes account of this possibility, which is the one that Thompson had in mind.

To summarize briefly: the Asymmetric Escalation Game is a general model of interstate action that bears a prima facie connection to the broad outlines of the Cuban missile crisis. It admits two distinct conflict possibilities, one limited and one all-out. As well, there are two distinct paths to *All-Out Conflict* in the model. One occurs when Defender escalates at node 2 and Challenger counter-escalates at node 3b. The second, which corresponds to the classic escalation spiral, results when Challenger initiates a conflict, Defender resists at node 2, Challenger escalates at node 4a, and Defender counter-escalates at node 4. To a large extent it was a fear of this potentially disastrous sequence of moves and countermoves that conditioned the choices made by both Kennedy and Khrushchev during the crisis.

Preferences and type designations

The preference assumptions that will be used to explore the underlying strategic dynamic of the Cuban missile crisis are summarized in Table 1. Challenger's preferences are listed in the first column, from best to worst; Defender's are given in the second. For example, the assumption is that Challenger most prefers *Defender Concedes*, next-most prefers *Status Quo*, and so on. No fixed preference assumption is made for outcomes contained in the same cell of Table 1. Thus, in what follows, Challenger could prefer *Defender Escalates* to *All-Out Conflict* or the reverse. Similarly, Defender's preference between *Defender Concedes* and *Limited Conflict* and between *Challenger Escalates* and *All-Out Conflict* is left open. Challenger and Defender's relative preferences for these three sets of paired outcomes are the crucial explanatory variables of the version of the model described herein.

The three pairs of unspecified preference relationships represent threats that the players may or may not prefer to execute. Challenger has only one threat: to escalate (i.e., choose E) or not (i.e., choose D) at nodes 3a and 3b. Defender, however, has two threats: a *tactical level* threat to respond-in-kind (i.e., choose D) at node 2 and a *strategic level* threat to escalate (i.e., choose E) at nodes 2 and 4.

Challenger:	**Defender:**
Defender Concedes	*Status Quo*
Status Quo	*Defender Escalates*
Challenger Escalates	*Defender Concedes* or *Limited Conflict*
Limited Conflict	*Challenger Escalates or All-Out Conflict*
Defender Escalates or *All-Out Conflict*	

Table 1: Preference assumptions for Asymmetric Escalation Game

Each player's willingness, or lack thereof, to execute its threat(s) determines its *type*. Since Challenger has only one threat, it may be one of two types: *Hard* Challengers are those that prefer *All-Out Conflict* to *Defender Escalates*; Challengers with the opposite preference are called *Soft*. Defenders, by contrast, are more difficult to type cast. A Defender that prefers *Limited Conflict* to *Defender Concedes* is said to be Hard at the first (or tactical level) while a Defender with the opposite preference is said to be Soft at the first level. Similarly, a Defender that prefers *All-Out Conflict* to *Challenger Escalates* is said to be Hard at the second (or strategic level) while a Defender with the opposite preference is said to be Soft at the second level. Thus, Defender may be one of four types: Hard at the first level but Soft at the second (i.e., type HS); Soft at the first level but Hard at the second (i.e., type SH); of type HH: Hard at both levels; or of type SS: Soft at both levels.

The assumption will be that each player knows its own type (preferences) but is unsure of its opponent's. Defender's lack of information about Challenger's type, and Challenger's lack of information about Defender's, constitutes the principal source of uncertainty in the model. Specifically, Defender believes Challenger to be *Hard* with probability p_{Ch} and Soft with probability $1 - p_{Ch}$. Likewise, Challenger believes Defender to be of type HH with probability p_{HH}, of type HS with probability p_{HS}, of type SH with probability p_{SH}, and of type SS with probability p_{SS}. These beliefs and all other elements of the model, including the choices available to the players at each decision point, the outcomes of the game, and the preference relationships, as specified in Table 1, are assumed to be

common knowledge.

For the most part, the (postulated) preferences that will be used to analyze the Asymmetric Escalation Game are both straightforward and transparent. Underlying the arrayed preferences given in Table 1 is the standard assumption that the players prefer winning to losing. To reflect the costs of conflict, the players are also presumed to prefer to win or, if it comes to it, to lose at the lowest level of conflict. Thus Challenger prefers *Defender Concedes* (outcome DC) to *Challenger Wins* (outcome ED)—and so does Defender.

There is, however, one assumption that may not be so obvious. Specifically, the assumption is that neither player prefers that the other execute any threat it may possess. In terms of preferences, this means that both players prefer the *Status Quo* to *Limited Conflict*, and *Limited Conflict* to *All-Out Conflict*. In other words, all threats, when executed, hurt. Threats that hurt are called *capable* (Schelling 1966, 7; Zagare 1987, 34).

Capable threats should be distinguished from threats that are *credible*. Credible threats are defined as threats that are believable precisely because they are rational to execute, that is, threats that a player prefers to carry out. Clearly, perfectly credible threats require complete information about preferences. Such is not the case, however, in the present analysis of the Asymmetric Escalation Game where the players are assumed to have only probabilistic knowledge (i.e., subjective beliefs) about one another's type. In the analysis that follows, these beliefs are taken as a measure of each player's credibility.

For instance, the greater the value is of p_{Ch} (i.e., Defender's belief that Challenger is Hard), the greater the perceived credibility of Challenger's threat. Similarly, the greater the value is of p_{HH}, the greater the perceived credibility of Defender's tactical and strategic level threats. The overall probability that Defender prefers conflict to capitulation at the first (or ***tac***tical) level is the perceived credibility of Defender's first-level threat. This probability, that Defender is of type HH *or* type HS, is denoted $p_{Tac} = p_{HH} + p_{HS}$; similarly, the perceived credibility of Defender's second-level (or ***str***ategic) threat is $p_{Str} = p_{HH} + p_{SH}$.

Equilibria

In this section, I briefly describe the equilibrium structure of the Asymmetric Escalation Game with incomplete information. The accepted standard of rational behavior in dynamic (i.e., extensive-form) games with incomplete information is a perfect Bayesian equilibrium. A perfect Bayesian equilibrium specifies an action choice for every type of every player at every decision node or information set belonging to the player. For example, it must specify the action choice of both a Hard and a Soft Challenger at nodes 1, 3a and 3b and for all four types of Defender at nodes 2 and 4. A perfect Bayesian equilibrium must also indicate how each player updates its beliefs rationally (i.e., according to Bayes's Rule) about other players' types in the light of new information obtained as the game is played out. For instance, should Challenger instigate a crisis by choosing D at node 1, Defender will have an opportunity to re-evaluate its initial beliefs about Challenger's type before it makes a choice at node 2. Similarly, if and when Challenger is faced with a decision at node 3a, it will have observed Defender's choice of D at node 2. The assumption is that Challenger will rationally reassess its beliefs about Defender's type and, therefore, Defender's likely response at node 4, based on that observation.

The equilibrium structure of the Asymmetric Escalation Game is more than complex. There are 18 perfect Bayesian equilibria in the Asymmetric Escalation Game with incomplete information (Zagare and Kilgour 2000, app 8; Kilgour and Zagare 2007). Making matters worse, many of the equilibria are distinguished only by minor technical differences that are of little theoretical interest or import. Clearly, a straightforward description of these equilibria would not only be tedious but unproductive as well.

A special case analysis, however, will alleviate the problem. The number of perfect Bayesian equilibria in the Asymmetric Escalation Game is dramatically reduced when the assumption is made that Challenger is likely Hard. Moreover, the perfect Bayesian equilibria in the special case fully exemplify the existence conditions in the general case. In other words, although this assumption about Challenger's type simplifies the analysis of the Asymmetric Escalation Game, it does so without any serious loss of information. Little is to be gained, therefore, by examining its strategic structure in the absence of this simplifying assumption.

The assumption that Challenger is likely Hard, however, is not only convenient; it is also consistent with the beliefs and the expectations of the

Kennedy administration throughout the crisis. Both the President and the vast majority of his advisors firmly believed that the Soviets would respond forcefully regardless of the course of action they took.[14] Kennedy himself thought that the most probable Soviet target would be Berlin. Others, however, feared an attack on the missile sites in Turkey. All of which is to say that the special case analysis is both theoretically and empirically justified.[15]

Of the six perfect Bayesian equilibria that exist in the special case (see Table 2), three are deterrence equilibria (Det_1, Det_2, and Det_3).[16] Under any deterrence equilibrium, Challenger, regardless of type, always chooses C at node 1 (i.e., $x_H = x_S = 0$). Clearly the three deterrence equilibria are inconsistent with Soviet behavior during the crisis and can, therefore, be immediately eliminated as possible descriptors of the striking events of October 1962. There are, therefore, only three other rational strategic possibilities: the *No-Response equilibrium* (NRE), one representative of the *Constrained Limited-Response equilibrium* group ($CLRE_1$), and one

[14] The belief was accurate (Fursenko and Naftali 2006, 472).

[15] Secretary of State Dean Rusk even put it in the terms of the model. Speaking at a meeting in the Cabinet Room of the White House just before the President's televised address he remarked that it was "clear now that the hard-line boys have moved into the ascendancy" in the Kremlin (May and Zelikow 1997, 255).

[16] Table 2 is excerpted from Table A8.1 in Zagare and Kilgour (2000, app. 8), which should be consulted for details of definitions and interpretations. Definitions of the strategic and belief variables appearing in Table 2 are summarized here for convenience.

The probability that Challenger initiates at node 1 of the Asymmetric Escalation Game is denoted x. In fact, this probability can depend on Challenger's type—if Challenger is Hard, the initiation probability is x_H; if Soft, x_S. Likewise, w_H and w_S are the probabilities that Hard and Soft Challengers, respectively, escalate at node 3a. At node 3b, Challenger always chooses E if Hard and D if Soft.

Similarly, Defender chooses D at node 2 with probability y, E with probability z, and C with probability $1 - y - z$. Again, these probabilities can depend on Defender's type, so they are denoted y_{HH}, z_{HS}, etc. It can be proven that $y_{SH} = y_{SS} = 0$ at any perfect Bayesian equilibrium. At node 4, Defender chooses E if strategically Hard (type HH or SH), and chooses D otherwise.

Finally, players revise their initial probabilities about their opponent's type as they observe the opponent's actions. Of these revised probabilities, the only two that are important to the equilibria are shown in Table 2. Defender's revised probability that Challenger is Hard, given that Challenger initiates, is denoted r. Challenger's revised probability that Defender is of type HH, given that Defender chooses D (response-in-kind) at node 2, is denoted q_{HH}.

member of the *Escalatory Limited-Response equilibrium* group ($ELRE_3$). Under any of these equilibria, Challenger always chooses D at node 1 (i.e., $x_H = x_S = 1$). At minimum, then, each is consistent with the Soviet decision to install ballistic missiles in Cuba. In addition, the most likely outcome under each equilibrium is *Defender Concedes*. Thus we have a compelling theoretical reason, rather than an empirical inference, to explain why Khrushchev was taken aback when Kennedy announced the blockade in a televised speech on Monday, October 22. Of the three remaining rational strategic possibilities, the No-Response equilibrium can also be eliminated on empirical grounds. As its name suggests, under this equilibrium form Defender always concedes and never responds, either in-kind or by escalating at node 2 (i.e., the strategic variables *y* and *z* always equal zero for all four types of Defender), which is why the only outcome that is consistent with rational choice under the No-Response equilibrium is *Defender Concedes*. The same cannot be said, however, about either the Constrained-Limited Response equilibrium $CLRE_1$ or the Escalatory Limited-Response equilibrium $ELRE_3$. In fact, since a *Limited Conflict* is a theoretical possibility under either equilibrium form, both remain potential descriptors of actual play during the Cuban missile crisis. What remains to be shown, therefore, is not whether the action choices of the United States and the Soviet Union are consistent with these two equilibria, but whether the beliefs of President Kennedy, but especially of Premier Khrushchev, are consistent with those that are necessary to support these choices in equilibrium.

	Challenger					**Defender**						
	x		w		q_{HH}	y		z				r
	x_H	x_S	w_H	w_S		$y_{H\,H}$	$y_{H\,S}$	$z_{H\,H}$	$z_{H\,S}$	$z_{S\,H}$	$z_{S\,S}$	
Escalatory Deterrence Equilibria (typical)												
Det_1	0	0	1	1	Small	0	0	1	1	1	1	$\leq d_1$
No-Response Equilibrium												
NRE	1	1	Large		Small	0	0	0	0	0	0	p_{Ch}
Spiral Family of Equilibria												
Det_2	0	0	0	0	$p_{Str\|Tac}$	1	1	0	0	0	0	$\geq d_2$
Det_3	0	0	d^*/r	0	c_q	1	v	0	0	0	0	$\geq d_2$

$CLRE_1$	1	1	0	0	$p_{Str\|Tac}$	1	1	0	0	0	0	p_{Ch}
$ELRE_3$	1	1	d^*/p_{Ch}	0	c_q	1	v	0	0	0	0	p_{Ch}

Table 2: Equilibria of the asymmetric escalation game when challenger has high credibility. Source (Zagare and Kilgour 1998).

Under either $CLRE_1$ or $ELRE_3$, Challenger always initiates and the *Status Quo* never survives. Defender responds-in-kind, either with certainty or probabilistically, if it is tactically Hard (i.e., of type HH or HS). Otherwise, it simply capitulates, and the outcome is *Defender Concedes*. Since both $CLRE_1$ and $ELRE_3$ exist only when Defender is seen to be likely Soft at the first-level, (i.e., when p_{Tac} is low), a response-in-kind will always come as a surprise to Challenger. Of course, when this happens, Challenger is forced to update its beliefs about Defender's type. Clearly, Challenger will now know that Defender is, in fact, tactically Hard, since only tactically Hard Defenders can rationally choose D at node 2.

Up to this point of surprise and reevaluation, behavior and expectations are similar under $CLRE_1$ and $ELRE_3$. What separates these two equilibria are Challenger's expectations should Defender unexpectedly choose D at node 2. Under $CLRE_1$, if Defender is Hard at the first level, then it is also likely Hard at the second level, which is why Challengers never escalate first under a Constrained Limited-Response Equilibrium. It is also why a *Limited Conflict* is a distinct theoretical possibility when $CLRE_1$ is in play.

While a *Limited Conflict* is also a theoretical possibility under $ELRE_3$, that possibility is, at best, remote. $ELRE_3$ exists only when a tactically Hard Defender is much more likely to be of type HS than of type HH. It is for this reason that Hard Challengers tend to escalate first at node 3a. At this point, Defender will most likely back off and the outcome will be *Challenger Escalates* (*Wins*). But from time to time, Challenger's guess about Defender's type will be wrong. When this happens, Defender will counter escalate and an *All-Out Conflict* will take place. The escalation spiral that brought about the First World War is a case in point (Zagare 2011).

In the Asymmetric Escalation Game with incomplete information, therefore, a *Limited Conflict* can only take place when either $CLRE_1$ or $ELRE_3$ is in play. For either equilibrium to exist, however, Challenger must, at minimum, believe that Defender is likely to capitulate

immediately (because it was thought to be tactically soft). Clearly, this theoretical requirement was met during the Cuban crisis and helps to explain why the missiles were placed in Cuba in the first place. But for the crisis to have been resolved as it was, additional conditions would have to be met. Obviously, Defender would also have to respond unexpectedly and its response would have to be in-kind rather than escalatory—precisely because Defender believes that an escalatory response would lead to a conflict spiral. Again, this belief is consistent with the expectations of the Kennedy administration about the likely Soviet response to either an air strike and/or an invasion. None of this is in the least bit surprising. What would be surprising, however, is for a *Limited Conflict* to actually occur under $ELRE_3$. But if and until it can be eliminated on other than probabilistic grounds, it must be considered a rational strategic possibility.

Explanation

To this point I have shown that *Limited Conflicts* are most likely to occur in the Asymmetric Escalation Game with incomplete information when play takes place under the Constrained Limited-Response equilibrium $CLRE_1$, and that the key to its existence is Challenger's initial and updated beliefs about Defender's type. Thus, the hypothesis is that crises that are resolved politically will most likely occur when a Challenger, expecting an easy victory, meets unexpected resistance and then concludes, perhaps reluctantly, that discretion is the better part of valor. In this section, I explain the political compromise that resolved the Cuban missile crisis by demonstrating a strict correspondence between these behavioral expectations and Soviet action choices *and* beliefs. Since this is, fortunately, a straightforward exercise, the explanation that I offer is at once natural and intuitive. But this is as it should be, at least most of the time. Moreover, a theoretically derived explanation that is in accord with the facts on the ground is at once more compelling and more satisfying than ad hoc explanations and ex post rationalizations, but especially when many of the relevant facts are no longer in dispute (Gaddis 1997). Facts do not necessarily speak for themselves. Theories are required to give them both meaning and context.

In the Cuban case, many of the undisputed facts involve Soviet action choices: although Khrushchev's motivation is unclear (Allison and Zelikow 1969, 107-109), the missile crisis was precipitated when U.S. decision-makers became aware that the Soviet Union was in the process of installing medium and intermediate range ballistic missiles in Cuba in

mid-October 1962. Khrushchev was surprised not only that the missiles were discovered but also that the Kennedy administration reacted by clamping a blockade around Cuba. We also know that, eventually, a settlement was brokered: in exchange for removing the missiles, Khrushchev received a public assurance from the United States that it would not invade Cuba and a secret assurance that it would, in due course, remove American controlled Jupiter missiles from Turkey. The clear theoretical expectation is that the brokered agreement (i.e., a limited conflict) would have had to have been preceded by a series of events that led Khrushchev to reevaluate his initial beliefs about the likely consequences of his actions. Otherwise, the crisis's resolution is simply inexplicable.

The reevaluation process, which began even before a personal letter from the President and a copy of his televised address was delivered to the Kremlin on October 22, did not take very long. What explains Khrushchev's dramatic policy reversal? It was not, as many have concluded, the thinly veiled threat that the President's brother, Robert Kennedy (1969, 108), delivered when he met with Soviet Ambassador Anatoly Dobrynin (1995, 88) on Saturday, October 27; nor was it the Attorney General's pledge to remove the Jupiters from Turkey made the same evening; it was also none of the "seven things" that happened during the day of October 27 that Secretary of State Dean Rusk thought might induce the Soviets to reverse course (May and Zelikow 1997, 616). It wasn't even just the blockade (Allison and Zelikow 1999, 128). With the exception of the blockade, all of these supposed signals were sent after Khrushchev (1970, 553) changed his mind and decided "to look for a dignified way out of this conflict."

"No single piece of information seems to have moved Khrushchev to his new position" (Fursenko and Naftali 1977, 260). And while "there is little evidence to explain exactly why Khrushchev reversed his assessment of American intentions" (Allison and Zelikow 1999, 125), there is no doubt and very little dispute that, for one reason or another, he became "convinced that the Soviet Union could not keep ballistic missiles in Cuba without going to war" (Fursenko and Naftali 1977, 259). And it was war that Khrushchev (1990, 176) "didn't want."

Khrushchev's strong belief that war was likely should the Soviets "inflame the situation"[17] and escalate the conflict by running the blockade and pushing forward with the installation of the missiles is consistent with the beliefs necessary to support $CLRE_1$ in equilibrium, but inconsistent with the beliefs associated with the existence of $ELRE_3$. Recall that under $CLRE_1$, Challenger believes that a Defender who is tactically Hard is likely to be strategically Hard as well. This belief leads logically to the expectation that escalation at Node 3a will result in an *All-Out Conflict*. By contrast, under $ELRE_3$, Challenger believes that a Defender who is tactically Hard is more likely to be strategically Soft and that, therefore, an escalatory choice at Node 3a will most likely bring about the outcome *Challenger Escalates* (*Wins*). All of which is to say that $ELRE_3$ can now be eliminated on empirical grounds as a viable rational strategic alternative, leaving $CLRE_1$ as the only perfect Bayesian equilibrium in the Asymmetric Escalation Game, which is consistent with both the beliefs and the action choices of U.S. and Soviet decision-makers throughout the crisis.

Consistent with his beliefs about the consequences of an escalatory choice, Khrushchev did a strategic about face and decided to "conduct a reasonable policy."[18] "The decision to end the crisis through diplomatic means was made on the night of Wednesday, October 25" (Fursenko and Naftali 2006, 616, fn. 69)[19] at a meeting of the Soviet Presidium. Khrushchev began that meeting by explaining why he thought that the missiles should be withdrawn: "The Americans say that the missile installations in Cuba must be dismantled. Perhaps this will need to be done. This is not capitulation on our part. Because if we fire, they will also fire."

But he did not back down entirely. He wanted to bargain: "We have to give the opponent a sense of calm and, in return, receive assurances concerning Cuba." Then he suggested his terms: "Kennedy says to us: take your missiles out of Cuba. We respond: 'Give firm guarantees and pledges

[17] "Central Committee of the Communist Party of the Soviet Union Presidium Protocol No. 61."
[18] "Central Committee of the Communist Party of the Soviet Union Presidium Protocol No. 61."
[19] Fursenko and Naftali got their days of the week mixed up. October 25 was a Thursday.

that the Americans will not attack Cuba.' That is not a bad [trade.]"[20]

Not surprisingly, his proposal was unanimously supported by the Presidium. But it was left up to Khrushchev to decide when and how to seal the deal. That moment came soon after the Presidium met. "Early on Friday, October 26, Khrushchev received a stream of information indicating the likelihood that the Americans were readying an attack for October 27" (Fursenko and Naftali 2006, 486). Time was obviously running out, or so he believed. Hence his long rambling letter to Kennedy of October 26 that outlined the bargain that, eventually, ended the crisis (May and Zelikow 1997, 485-91). Most of what occurred afterwards, including Khrushchev's infamous second letter of October 27 in which he roiled Kennedy by publically demanding the removal of the missiles in Turkey, was simply diplomatic haggling, even if no one recognized it at the time. It would take a few more days to work out the details.[21]

Coda

After briefly surveying and evaluating previous attempts to use game theory to explain the strategic dynamic of the Cuban missile crisis, this study develops a new explanation drawn from a general model of interstate conflict that was developed without reference to the facts of the Cuban case. Specifically, the equilibrium structure of the Asymmetric Escalation game was used to explain the initiation, the development, and the resolution of the crisis. One and only one of the model's several equilibria, ($CLRE_1$), a member of the Constrained Limited Response family, was shown to be consistent with the beliefs, the action choices of U.S. and Soviet decision makers and, significantly, with the way the crisis was eventually resolved. Answers to all three of the foundational questions associated with the crisis were derived from an examination of its strategic characteristics. These answers are neither ad hoc nor ex post; rather, they are the clear a priori theoretical expectations of a single integrated game-theoretic model of interstate conflict initiation, escalation and resolution.

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[20] "Central Committee of the Communist Party of the Soviet Union Presidium Protocol No. 61."

[21] This is not to say that the deal could not have fallen apart. But that was unlikely. Khrushchev, who did not bring up the missiles in Turkey in his first letter, was prepared to settle the crisis even without their removal. And Kennedy was prepared to sweeten the pot by including a promise to remove U.S. controlled missiles in Italy and, perhaps, Great Britain.

For example, why did the Soviet Union precipitate a crisis by installing nuclear capable missiles in Cuba? Under $CLRE_1$ the answer is manifest: Soviet actions were motivated, at least in part, by the clear expectation that the United States would not respond, either because it would be too late to do so if and when the missiles were discovered, or because it thought that the Kennedy administration would be unwilling to respond forcefully. Whether the Soviet decision was further motivated by a strong desire to redress an unfavorable strategic balance, protect a well-placed ally, or some combination of these and other factors is a secondary question that will most likely never be definitively answered (Allison and Zelikow 1999, 77-109).

Why was the response of the United States measured and not escalatory? Again, the strategic characteristics of $CLRE_1$ provide a unambiguous answer. The blockade was seen as an "initial step" that carried with it a message: stop or we will shoot. U.S. decision-makers believed as well that it was the course of action "most likely to secure our limited objective—removal of the missiles—at the lowest cost" (Sorensen 1965, 782). At the same time, an air strike and/or an invasion carried with it an unacceptably high risk of a superpower war, which Kennedy famously estimated to be "somewhere between one out of three and even" (Sorensen 1965, 795). Needless to say, both of these beliefs are required for a limited conflict to occur under any Constrained Limited-Response equilibrium including $CLRE_1$.

Finally, why was the settlement of the crisis a political compromise under which the Soviets withdrew their missiles in exchange for a public U.S. promise and a private U.S. assurance? The short answer is that the Soviets got the message implicit in the blockade and the other signals, intended or not, sent by the United States. Or as Snyder and Diesing (1977, 397) would put it, the Soviet Union underwent a "strategy revision…[that was]…initiated when a massive input of new information [broke] through the barrier of the image and [made Soviet decision makers] realize that [their] diagnosis and expectations were somehow radically wrong and must be corrected." All of which is to say that the Soviet decision to withdraw the missiles was the rational response to the additional information they acquired about U.S. preferences while the crisis was playing out. For both the United States and the Soviet Union, then, an escalatory move was simply too risky. Hence their bargain.

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